nationalgrid

Brian Bermingham, P.E.
Project Engineer
Site Investigation and Remediation

May 12, 2017

Mr. Henry Willems
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau C
625 Broadway, 11th Floor
Albany, New York 12233-7014

Re: Interim Site Management Plan
Former Metropolitan Works Manufactured Gas Plant (MGP) Site
124-136 2nd Avenue
Borough of Brooklyn, Kings County, New York
Site No. 2-24-046

Dear Mr. Willems:

Please find attached one (1) electronic copy of the Interim Site Management Plan (ISMP) for the National Grid former Metropolitan Works MGP Site located in Brooklyn, New York.

This ISMP has been prepared based on the results of the Remedial Investigation Report (AECOM, 2014) and in accordance with the Multi-site Order on Consent and Administrative Settlement [Index No. A2-0522-06-06, (NYSDEC, 2007)] between The Brooklyn Union Gas Company (now d/b/a National Grid) and the NYSDEC, and the NYSDEC Final DER-10 Technical Guidance for Site Investigation and Remediation, dated June 2010.

The Draft ISMP was prepared using the NYSDEC SMP template and presents a detailed description of current environmental impacts on the site, the Engineering Controls (ECs)/Institutional Controls (ICs) proposed for the site, and monitoring and reporting requirements for managing and implementing the ECs and ICs.

If you have any questions, please feel free to contact me at (718) 608-5102 or at brian.bermingham@nationalgrid.com.

Sincerely,

Brian Bermingham, P.E.
Project Engineer

Enclosure

cc: Chris Doroski, NYSDOH
Peter Cox, P.G., AECOM

Environment

Metropolitan Former MGP Site

KINGS COUNTY, BROOKLYN, NEW YORK

Interim Site Management Plan

NYSDEC Site Number: 224046

Prepared for:

National Grid

287 Maspeth Ave, Brooklyn, New York

Prepared by:

AECOM

125 Broad Street, 16th Fl.

New York, New York

212-377-8700

Revisions to Final Approved Interim Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date

May 2017

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List of Acronyms

AECOM	AECOM, Inc.
asml	above mean sea level
AWQSGV	Ambient Water Quality Standards Guidance Values
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, total xylenes
CAMP	Community Air Monitoring Plan
CCS	composite cover system
CFR	Code of Federal Regulation
DER	Division of Environmental Remediation
DNAPL	dense nonaqueous phase liquid
EC	Engineering Control
EWP	Excavation Work Plan
ft	feet
gpm	gallons per minute
HASP	Health and Safety Plan
Historical MGP Site	former Metropolitan Works MGP Site
IC	Institutional Control
ISMP	Interim Site Management Plan
ISRR	Interim Status Review Report
MGP	Manufactured Gas Plant
mg/kg	milligram per kilogram
MNA	monitored natural attenuation
NAPL	nonaqueous phase liquid
National Grid	National Grid NY

NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
OM&M	Operation, Maintenance and Monitoring
PAHs	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
Previously Remediated Area	Site under VCA No. A20430-009 located at 124-136 Second Avenue, Brooklyn, New York. Portion of former Metropolitan Works MGP Site investigated and remediated by FC Gowanus Associates, LLC
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QEP	Qualified Environmental Professional
RI	Remedial Investigation
ROW	Right of Way
RP	Remedial Party and Respondent
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
Site	NYSDEC Site No. 224046, Portion of former Metropolitan Works MGP Site located in Brooklyn, New York
SMP	Site Management Plan
SVOC	semi volatile organic compounds
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
µg/L	microgram per liter

Executive Summary

The following provides a brief summary of the interim controls implemented for the Site area managed under the ISMP, as well as the inspections, monitoring, maintenance and reporting activities required by this Interim Site Management Plan:

Site Identification: NYSDEC Site No. 224046 Former Metropolitan Works MGP Site, 124-136 2nd Avenue, Brooklyn, NY

Interim Institutional Controls:	1. The Site area managed under this ISMP may be used for commercial use.
	2. The environmental easement must be implemented.
	3. No farms or vegetable gardens.
	4. Groundwater may not be used for any purpose without prior notification and approval from the New York State Department of Environmental Conservation.
	5. All interim ECs must be inspected at a frequency and in a manner defined in the ISMP.
Interim Engineering Controls:	1. Composite Cover System present over the Site area managed under this ISMP comprised of asphalt, concrete sidewalks, and building slabs.
	2. Security fence present in the northeastern portion of the Site area managed under this ISMP
	3. Monitored Natural Attenuation of groundwater.
Inspections	**Frequency**
Composite Cover inspection	Annually and following a subsurface intrusion activity, an emergency, or storm event with potential to damage the Composite Cover
Security Fence	Annually and following an emergency or storm event with potential to damage the security fence.
Monitoring	**Frequency**
Groundwater Monitoring Network	Annually
Reporting	**Frequency**
Interim Status Review Report	Annually or after any ground intrusive activity

Further descriptions of the above requirements are provided in detail in the latter sections of this Interim Site Management Plan.

1.0 Introduction

1.1 General

This Interim Site Management Plan (ISMP) is a required element of the remedial program for the former Metropolitan Works Manufactured Gas Plant (MGP) Site located in Brooklyn, New York. See Figure 1-1. A portion of the former Metropolitan Works MGP Site is currently in the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program, Site No. 224046, which is administered by New York State Department of Environmental Conservation (NYSDEC).

The Brooklyn Union Gas Company d/b/a National Grid NY (hereinafter “National Grid” or “Remedial Party (RP)”) entered into an Order on Consent on August 10, 2007 with the NYSDEC to remediate MGP-related impacts within a portion of the former Metropolitan Works MGP Site. Figure 1-2 presents the limits of the former Metropolitan Work MGP Site. A portion of the former Metropolitan Work MGP Site (124-136 Second Avenue, presently the Lowes Hardware Store and associated parking lot) was the subject of previous remedial/redevelopment activities undertaken by FC Gowanus Associated LLC, an independent third party developer, with NYSDEC oversight. The previous remedial/redevelopment and ongoing Operation, Monitoring, and Maintenance (OM&M) activities are completed under a Voluntary Cleanup Agreement (Index No.: A2-0430-009) between NYSDEC and FC Gowanus Associates, LLC. The remainder of the former Metropolitan Works MGP Site is subject to this ISMP. For purposes of further discussion in this ISMP:

- the term “Historical MGP Site” will represent the former Metropolitan Work MGP Site (as shown in Figure 1-2),
- the term “Previously Remediated Area” will represent the portion of the Historical MGP Site managed by FC Gowanus Canal, LLC under the Voluntary Cleanup Agreement (Index No. : A2-0430-009) and not included within the scope of this ISMP,
- the term “Site” will represent the portion of the former Metropolitan Works MGP Site not previously remediated (i.e., the Historical MGP Site with the exception of the Previously Remediated Area), and
- the term “ISMP Site Area” will represent the portion of the Site that will be managed in accordance with this ISMP.

Figure 1-3 provides the Site location and boundaries of ISMP Site Area. The boundaries of the ISMP Site Area are more fully described in the metes and bounds description that will be part of an Environmental Easement and will be included as Appendix A.

Currently some MGP-related impacts are present in the subsurface within the ISMP Site Area. The MGP-related impacts are either located in the deeper soils, underneath asphalt, concrete, and/or landscaping cover, or in subsurface soil in an area enclosed by security fence and do not have the potential for day-to-day exposure to the public. Interim institutional and engineering controls (ICs and ECs) established within the ISMP Site Area control exposure to MGP-related impacts to ensure protection of public health and the environment. An Environmental Easement will be granted to the NYSDEC by the property owner (the “Grantor”) of the ISMP Site Area, and recorded with the Kings

County Clerk by National Grid, and once approved, requires compliance with this ISMP and all interim ECs and ICs placed within the ISMP Site Area.

The interim ECs established within the ISMP Site Area include a composite cover system, security fence, and monitored natural attenuation (MNA). Interim ICs consist of the Environmental Easement, property use restriction, farming/vegetable garden restriction, groundwater use restriction, and notifications requirements. This ISMP was prepared to manage MGP-related impacts within the ISMP Site Area until a remedy for the Site is implemented, at which point it will be finalized into an SMP. The primary goal of this ISMP is to ensure that site work is conducted in such a manner that construction workers and the general public's (including site workers) exposure to MGP-related residual material within the ISMP Site Area is minimized through site controls, appropriate monitoring, and safe work practices. This document also provides a plan for management of the MGP-related impacted media that may impact site activities, including redevelopment activities, and present a hazard to the public and environment. This ISMP has been approved by the NYSDEC, and compliance with this ISMP is required by the Grantor of the Environmental Easement and the Grantor's successors and assigns. This ISMP may only be revised with the approval of the NYSDEC.

It is important to note that:

- This ISMP details the Site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the ISMP is a violation of the Environmental Easement; and
- Failure to comply with this ISMP is also a violation of Environmental Conservation Law and 6NYCRR Part 375 and thereby subject to applicable penalties.

All reports associated with the Site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in NYS. A list of contacts for persons involved with the Site is provided in Appendix B of this ISMP.

This ISMP was prepared by AECOM Inc. (AECOM), on behalf of National Grid, in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 2010 (NYSDEC, 2010a), and the site-specific guidelines provided by the NYSDEC. This ISMP addresses the means for implementing the interim ICs and/or ECs that are required by the Environmental Easement for the ISMP Site Area.

For the purpose of this document, surface soil is considered to be the top 6 inches of soil on the ISMP Site Area while subsurface soil is considered to be 6 inches below the surface of the ISMP Site Area. In areas currently covered with a concrete or paved surface, subsurface is consider any soils below the asphalt or base of the concrete.

1.2 Revisions

Revisions to this ISMP will be proposed in writing to the NYSDEC's project manager as an Addendum. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, removal of contaminated sediment or soil, or other significant change to the conditions within the ISMP Site Area. In accordance with the Environmental Easement for the ISMP Site Area, the NYSDEC will provide a notice of any approved changes to the ISMP, and append these notices to the ISMP that is retained in its files.

1.3 Notifications

Notifications will be submitted by the ISMP Site Area property owner to the NYSDEC and National Grid, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

- 60-day advance notice of any proposed changes in property use (within the ISMP Site Area) that are required under the terms of 6 New York Code, Rules, and Regulations (NYCRR) Part 375 and/or Environmental Conservation Law.
- 7-day advance notice of any field activity associated with the remedial program.
- 30-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan (EWP).
- Once National Grid is made aware, notice will be provided to NYSDEC within 48hours of any damage or defect to the foundation, structures or interim EC that reduces or has the potential to reduce the effectiveness of an interim EC, and likewise, any action to be taken to mitigate the damage or defect.
- Once National Grid is made aware, notice will be provided to NYSDEC via verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of interim ECs in place at the ISMP Site Area, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the interim ECs.

Any proposed change in the ownership within the ISMP Site Area or the responsibility for implementing this ISMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC and National Grid will be notified in writing of the proposed change by the current property owner. This will include a certification that the prospective purchaser has been provided with a copy of the Order on Consent, and all approved work plans and reports, including this ISMP.
- Within 15 days after the transfer of all or part of the property within the ISMP Site Area, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC and National Grid.

Table 1-1 on the following page includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of Site-related contact information is provided in Appendix B.

Table 1-1: Notifications

Name	Contact Information
Henry Willems, NYSDEC Project Manager	(518) 402-9473, htwillem@gw.dec.state.ny.us
Gardiner Cross, NYSDEC Regional HW Engineer	(518) 402-9473, gwcross@gw.dec.state.ny.us
Brian Bermingham, National Grid Project Manager	(718) 608-5102, Brian.Bermingham@nationalgrid.com
Pete Cox, AECOM	(978) 905-2168, pete.cox@aecom.com

* Note: Notifications are subject to change and will be updated as necessary.

2.0 Summary of Previous Investigations and Remedial Actions

2.1 Site Location and Description

The Historical MGP Site extended from 2nd avenue to the Gowanus Canal along 12th Street in Brooklyn, New York. The Previously Remediated Area was located on 124-136 2nd Avenue and included Block 1007 Lots 1 (parking lot, 1 11th Street), 118 (Lowes, 118 2nd Avenue), 219 (parking lot, 12th Street), and 220 (Lowes, 73 12th Street). The Site is located south of 12th Street between 2nd Avenue and Hamilton Place and between 11th Street Basin and Gowanus Expressway west of Hamilton Place in Brooklyn, New York and included Block 1007 and lot 172 (former Pathmark, 1 12th Street), Block 1025 lots 18 (12th Street Extension), 1 (parking lot, no address), 16 (parking lot, 42 12th Street), 20 (parking lot, no address), 100 (vacant lot, 50 12th Street), 26 (commercial business, 12 12th Street), and New York City Right of Ways (ROW) .

The ISMP Site Area within the Site includes all or portion of Block 1007, Lot 172 and 269 and Block 1025, Lots 10, 16, 18, 20, and 100, and a portion of Hamilton Place between 12th Street and 13th Street on the King's County Tax Map (see Figure 2-1). The ISMP Site Area is an approximate 4.2-acre area and is bounded by the 11th Street basin, former 11th Street, and Lowes parking lot to the north, portion of a vacant parking lot and 13th Street to the south, commercial businesses and Lowes to the east, and the Gowanus Canal to the west (see Figure 1-3 – Site Layout Map). The boundaries of the ISMP Site Area are more fully described in Environmental Easement survey. The owner(s) of the parcels within the ISMP Site Area at the time of issuance of this ISMP are Team Slope LLC and the City of New York for the ROWs (Hamilton Place). Figure 2-2 presents the ownership details within the ISMP Site Area.

2.2 Physical Setting

2.2.1 Land Use

The ISMP Site Area consists of the following: a slab on grade building with associated parking lot and City ROWs. The ISMP Site Area is zoned commercial and is currently occupied by a series of retail businesses in the open mall area adjacent to the former Pathmark Supermarket entrance including a Dunkin Donuts, a vision center, and a liquor store. It formerly housed a Pathmark Supermarket and associated parking lot and a used car dealership.

The properties adjoining the Site and in the neighborhood surrounding the Site primarily include commercial properties. The properties immediately south of the Site include 13th Street and commercial properties; the properties immediately north of the Site include Lowes Hardware shop, commercial parking and ROWs; the properties immediately east of the Site include commercial properties and 2nd Avenue beyond the commercial properties; and the properties to the west of the Site include the Gowanus Canal and commercial properties on the opposite side of the canal.

2.2.2 Geology

The topography of the ISMP Site Area is relatively flat with an elevation ranging from approximately 7 to 10 feet (ft) above mean sea level (amsl). The upper 120 ft of the ISMP Site Area subsurface geology is dominated by four primary units:

2.2.2.1 Fill

Fill was observed to be present in all areas of the ISMP Site Area in thicknesses typically ranging up to 15 ft, and within the range of the groundwater table. The fill is comprised of mostly poorly graded sand, silt, and gravel with varying amounts of anthropogenic material: coal fragments, ash, concrete slabs, wood pieces, wood fragments, brick fragments, glass, and other urban fill debris.

2.2.2.2 Meadow Mat

The meadow mat consists of varying amounts of a densely compacted decomposed vegetative material (peat), organic clays, marine clays with shell fragments, and silt, and is brown/tan or grey in color with a distinctive organic-like odor. The unit acts to separate the underlying native soils from the overlying fill. The meadow mat likely represents the former ground surface prior to development (filling) in the ISMP Site Area. This layer ranges from five to fifteen ft thick, was encountered 15 ft to 20 ft below ground surface (bgs).

2.2.2.3 Sand and Silts

Between the bottom of the meadow mat and the top of the Gardiners Clay are units of glacial outwash dominated by sands and silts. The unit varies in composition, occurring as tan and grey interbedded sand and silt beds and as well graded to poorly graded sands and silt zones. These zones vary in depth and distribution across the ISMP Site Area, and are not defined by clear boundaries. Therefore, on the cross-section referenced below, they have been grouped into a single unit designated sand/silt.

Within the sand/silt unit are discontinuous lenses of sand and gravel, organic silt, and silty clay. The sand/gravel unit is the most abundant of these, and occurs in lenses from 3 to 25 ft thick, as single lenses or two stacked lenses.

2.2.2.4 Gardiners Clay

A high plasticity, stiff, gray clay and silty clay were encountered from 121 to 135 ft bgs at one boring location. This 14 foot thick unit was identified as the Gardiners Clay, a regional marine clay confining unit with low permeability representing the lower extent of the shallow sand/silt aquifer.

The Jameco Gravel, encountered at a depth of 135 ft bgs, was the deepest unit encountered beneath the ISMP Site Area.

A representative geologic cross section is shown in Figures 2-3 and 2-4. Site-specific boring logs are provided in Appendix C.

2.2.3 Hydrogeology

The Upper Pleistocene glacial deposits, which act as an aquifer overlying the Gardiners Clay, include terminal moraine deposits, ground moraine deposits, and glacial outwash deposits consisting of clay, sand, gravel and boulders. The hydrogeologic properties of the Upper Pleistocene glacial deposits (upper glacial aquifer) are highly variable. The till has low permeability, the sand and gravel part of the outwash is highly permeable. Yields of individual wells are as much as 1,700 gallons per minute (gpm.) Specific capacities of wells are as much as 109 gpm per foot of drawdown and the horizontal hydraulic conductivity ranges from 20-80 ft/d in the moraines to 200-300 ft/d in the outwash (Misut and Monti, 1999).

The surface of the groundwater table ranges from 1.9 and 10.93 ft bgs across the ISMP Site Area (Figure 2-5). Three zones in the shallow overburden underneath the Site were investigated - shallow zone (wells screened across the water table surface in the fill and at depths generally ranging from 3 to 15 ft bgs), intermediate zone (wells screened directly below the meadow mat and within the sand/silt unit at depths generally ranging from 25 to 50 ft bgs), and deep zone (wells screened within the sand/silt unit at depth from 60 to 70 ft bgs.) Groundwater flow across the ISMP Site Area in the shallow, intermediate, and deep screened zones is from the east to the west, with a slightly more northwest flow direction towards the Gowanus Canal observed at low tide in the shallow zone above the meadow mat.

The calculated average hydraulic conductivity of the shallow zone ranged from 1.404 to 68.28 ft/day, with a geometric mean of 17.9 ft/day. The calculated average hydraulic conductivity of the intermediate zone ranged from 1.905 to 74.72 feet/day, with a geometric mean of 10.0 ft/day. The calculated average hydraulic conductivity of the deep zone ranged from 1.041 to 38.04 ft/day, with a mean of 11.9 ft/day.

Using the geometric mean hydraulic conductivity estimate of the shallow zone of 17.9 ft/day and the average horizontal gradient of 5.77 x 10-3 ft/ft, the estimated shallow groundwater horizontal seepage velocity is 0.44 ft/day, or 126 ft/year. Using the geometric mean hydraulic conductivity estimate of the intermediate zone of 10.0 ft/day and the average horizontal gradient of 3.16 x 10-3 ft/ft, the estimated intermediate groundwater horizontal seepage velocity is 0.105 ft/day, or 38.4 ft/year. Using the geometric mean hydraulic conductivity estimate of the deep zone of 11.9 feet/day and the average horizontal gradient of 2.02 x 10-3 ft/ft, the estimated deep groundwater horizontal seepage velocity is 0.080 ft/day, or 29.2 ft/year.

Based on the tidal cycle monitoring, the strongest tidal effects are noted in the groundwater levels measured in the intermediate and deep zones. Groundwater elevations in the deep zone are influenced as far as 725 ft from the canal, and fluctuate by more than a foot. The water levels in the intermediate zone also have fluctuations of about one foot, but the influence appears to dissipate between 410 ft and 425 ft from the canal. The tidal influence in the shallow zone, above the meadow mat, is less pronounced, with water level fluctuations of less than a foot and slightly irregular compared to the intermediate and deep zone responses. The tidal influence in the shallow zone dissipates by 200 ft from the canal. The reduced influence may be the result of a dampening effect of the low permeability meadow mat, and the bulkhead supporting the bank of the canal preventing direct contact between groundwater in the fill and the surface water in the canal.

No private wells are known to exist in the ISMP Site Area.

A representative groundwater contour map for the overburden aquifer is shown in Figure 2-5. Groundwater elevation data is provided in Table 2-1. Groundwater monitoring well construction logs are provided in Appendix C.

2.3 Site History

The area prior to development of the MGP was a tidal marshland that extended to the east of the current location of 2nd Avenue. Before the mid-1840s, the creek and its tributaries were dammed and used primarily to power tide mills (USEPA, 2012). By the mid-1840s, Brooklyn was rapidly growing and the Gowanus marshes were considered to be a detriment to local development (USEPA, 2012). The Gowanus Canal served as an open sewer when it was initially constructed in the late 1860s (USEPA, 2012). By the late 1870s, sewers entering the canal carried a combination of household waste, industrial effluent, and stormwater runoff (USEPA, 2012). By the 1880s the canal was constructed to its current configuration.

The Historic MGP Site was operated by the Metropolitan Gas and Light Company as early as 1872. Around the spring of 1883, the eight gas companies of Brooklyn had been reduced by consolidation or by the purchase of a controlling portion of their stock by the Fulton Municipal Gas Company which had the backing of the Standard Oil Trust. The Fulton Municipal Gas Company ("Fulton Municipal") began undercutting its competitors until a number of companies agreed to settlement terms with Fulton Municipal. This intense competition was referred to by the media at the time as a "gas war". As a result of the 1883 Gas Wars in Brooklyn, the Metropolitan Gas Light Company agreed to stop producing gas and instead buy naphtha or 'water gas' supplied by Fulton Municipal. The fact that Metropolitan was buying gas from Fulton Municipal may explain why available maps dating from 1886 show the MGP site as being "used for storage only". Shortly thereafter, the Standard Oil Trust held approximately one-third of the stock in Metropolitan. In 1892, the Directors of Metropolitan had decided it would be more economical to make its own gas rather than continue purchasing it from Fulton Municipal and resumed its manufacturing once again. The 1893 Brown's Directory identifies the process used to manufacture gas changed from the Tessie du Motay, the patent for which was held by the Standard Oil Trust, to the Wilkinson process.

Historical records suggest that the Historic MGP Site operated a coal carbonization process until sometime prior to 1889, by when the plant appears to have been converted to a carbureted water gas process, and included oil storage tanks located east of Holder No. 2. The locations of historic and current features are shown on Figure 1-2. In general, there were two classifications of holders: relief holders, where gas was held and cooled prior to purification, and distribution holders, where purified gas was held. A hand-written note on Brooklyn Union Gas Company drawing 1G120, dated 1909 and revised in 1935, states that in 1935, the Metropolitan Works between 12th and 13th Streets was demolished, and some buildings south of 12th Street, including Holder No. 5 continued to operate as "Brooklyn Union Gas Company 12th Street Holder Station." The 12th Street Holder Station is identified on all aerial Historic MGP Site figures. By 1950, the northeastern portion (Block 1007, Lot 118) of the Historic MGP Site was listed as housing the US Post Office Garage and Repair shop, with some former MGP structures (e. g., Holder No. 4 and a boiler house) located closer to the Gowanus Canal on the western portion of the Historic MGP Site. The southern portion of the Historic MGP Site, also identified as the 12th Street Holder Station, still housed Holder No. 5 and the exhaust house, with the parcel listed as a storage area for old electric cables.

The 1969 Sanborn map indicates Brooklyn Union Gas Company as the owner of parcels on Block 1025 (the 12th Street Holder Station), where Holder No. 5 was still shown to be present. All other above ground structures related to the former MGP operations are no longer present. The 1969 Sanborn map also shows a food products warehouse present adjacent to the Gowanus Canal, on current Block 1007, Lot 172. By 1977, the Sanborn map indicated that all structures from the former MGP had been removed from the surface of the Historic MGP Site. Sanborn maps from 1982 through 1996 show no major changes in the Historic MGP Site usage, with the US Postal Service (now demolished) and formerly present in the current Lowes property (Block 1007, Lots 1, 118, 219, and 220), the food products warehouse (till recently a Pathmark Supermarket), and parking covering the footprint of the former MGP on Block 1007, Lots 16, 18, 172, and 269. The portion of the MGP south of 12th Street, also identified as the 12th Street Holder Station, on Block 1025, Lot 26 was developed into a two story building which remains present. The building housed a former maintenance garage and is currently used for mixed retail and office space.

Other historical non-MGP businesses operated within or adjacent to the Historic MGP Site including the former Brooklyn Alcatraz Asphalt Company, the former Cranford Asphalt Company, and the Bayside Coal and Fuel Oil Company. Locations of these former businesses are shown in Figure 2-2.

2.4 Investigation and Remedial History

The following narrative provides the current remedial history timeline and a brief summary of the available project records to document key investigative milestones for the Site. Full titles for each of the reports referenced below are provided in Section 8.0 - References.

National Grid conducted a Remedial Investigation (RI) of the Site, including portions of the former 12th Street Holder Station. Portions of the Historic MGP Site (Previously Remediated Area) were previously investigated and remediated by FC Gowanus Associates, LLC by excavating impacted soils, removal of former structures where possible, and installation of a series of closely-spaced recovery wells along the perimeter of the remediated area.

The results of the RI are described in detail in the Remedial Investigation Report (AECOM, 2014). To determine whether the soil, groundwater, soil vapor, and/or indoor air contain MGP-related residuals at levels of concern, data from the RI were compared to the following standards, criteria and guidance (SCGs):

- Groundwater, drinking water, and surface water SCG are based on the NYSDEC “Ambient Water Quality Standards and Guidance Values” (AWQSGV) and Part 5 of the New York State Sanitary Code (NYSDEC, 1998.)
- Soil SCGs are based on the NYSDEC Part 375-6 Unrestricted and Commercial Soil Cleanup Objectives (NYSDEC, 2006.)
- Indoor air standards, criteria, and guidance are based on the New York State Department of Health (NYSDOH) Database “Summary of indoor and outdoor air sample results in control homes collected and analyzed by New York State Department of Health (NYSDOH) from 1989 through 1996.”

Many soil, groundwater, ambient, and indoor air samples were collected during the RI to characterize the nature and extent of MGP-related residual impacts. Figure 2-6 shows all the investigative locations. The main categories of contaminants that exceed their SCGs are volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). An additional human health and environmental risk identified during previous investigations is the distribution of non-aqueous phase liquid (NAPL) residuals throughout the ISMP Site Area.

Site investigation included surface soil, subsurface soil, groundwater, and sub-slab vapor/air investigations. Tables 2-2 through 2-4 summarize the laboratory samples for each media and the chemical analyses performed.

The majority of the ISMP Site Area is covered with impervious materials and has been redeveloped since the cessation of MGP operations. The surface soil sample results illustrate that the present day surface soil quality has not been impacted by the former MGP operations.

Based on visible impacts and subsurface soil analytical results, MGP-related impacts are present in subsurface soil in three areas:

1. west and south of the Previously Remediated Area
2. in the vicinity of the former tar tanks along the Gowanus Canal
3. in the northern corner of Block 1007, Lot 1, adjacent to the Gowanus Canal

Groundwater samples collected beneath and adjacent to the Site contain MGP-related and other compounds at concentrations above the AWQSGVs. The compounds that may be MGP-related and that are above AWQSGVs include BTEX, PAHs, and limited occurrences of cyanide (two locations in the shallow zone only). Compounds unrelated to MGP operations that were detected in groundwater samples, at concentrations above the AWQSGVs, include chlorinated VOCs and MTBE. All of these compounds were detected in the shallow, intermediate, and deep groundwater zones sampled during the RI. In general the greatest groundwater impacts were detected in the intermediate zone, consistent with the most visibly impacted soil horizon.

Concentrations of VOCs detected in the indoor air samples are comparable to those detected in the ambient air samples and what is typically found in indoor air of non-residential buildings. Sub-slab soil samples were typically below typical background levels for non-residential buildings.

Based on the visible impacts and the subsurface soil and groundwater analytical results, potential MGP-related source areas include:

- the Previously Remediated Area (adjacent to and in the vicinity of Holders No. 1 through No. 3) on Block 1007, Lots 118, and 219)
- the impacted area on Block 1025, Lots 1, 16, 20, and 100, west of and due to migration of MGP residuals from former Holders No. 1 through No. 3 prior to remediation of these structures
- the former tar tanks along the Gowanus Canal on Block 1007, Lot 172
- the impacted area adjacent to the canal and adjacent to the former BAAC site (on Block 1025, Lot 1)
- the northern corner of the Lowes parking lot adjacent to the Gowanus Canal on Block 1007, Lot 1
- the Gowanus Canal and impacts therein that have originated from multiple sources of NAPL and PAHs

According to the historical figures, former MGP structures were previously located in the area of the Hamilton Plaza Shopping Center building on Block 1007 Lot 172. These former MGP structures were not investigated during the RI due to access limitations, the hours of operation and the retail nature of the businesses occupying the shopping center. It is not known if these former structures are a potential source of contamination. A subsurface investigation of the shopping center footprint will be performed as areas of the building become accessible pending future access agreements.

2.5 MGP-Related Impacts

A qualitative human health exposure assessment was completed for the Site as part of the RI. The qualitative human health exposure assessment included a review of the site conceptual site model and evaluated potential source areas, potential release mechanisms, and identified potential human receptors and receptor-specific exposure pathways. The RI determined that there were no known complete exposure pathways and that impacts present at the Site did not pose a current risk to human health and the environment. The Site surface is either covered with buildings or asphalt, which further reduces the likelihood of direct contact with impacted soil. Exposure to impacted groundwater is not occurring as there are no known supply wells located in the impacted area. The area surrounding the Site is served by a public water supply, which is regularly tested to ensure that it meets state and federal drinking water standards for a number of contaminants, including those associated with the Site. Indoor air samples from buildings on and surrounding the Site have shown no unacceptable risk levels from MGP-related residual compounds in the subsurface. However, the RI concluded that under future use conditions, absent any remedial action(s), potential exposure pathways primarily associated with a construction worker included:

- Dermal contact with surface soil, subsurface soil or groundwater impacted with MGP-related residuals;
- Incidental ingestion of soils or groundwater impacted with MGP-related residuals; and
- Inhalation of soil vapors impacted with MGP-related residuals.

In summary, future exposure routes are limited to exposure to PAHs, metals, and/or VOCs in subsurface soil and groundwater for Site construction workers who perform excavation work. Figure 2-7 shows the extent of visible MGP-related impacts observed in soils following completion of the RI. **Only properly trained field personnel should complete subsurface work within the ISMP Site Area using methods specified in this ISMP and the site-specific HASP.**

2.5.1 Soil

2.5.1.1 Surface Soil

Three surface soil samples were collected along the western boundary of the Site from the upper six inches of soil. This is the only area where exposed surface soil is present. All samples were analyzed for VOCs, SVOCs, metals, and total cyanide. One sample also included analysis for pesticides, herbicides, and polychlorinated biphenyl (PCBs). Sample analytical results indicate that VOCs, including BTEX, were typically not detected in the surface soil. Two PAHs (benzo(a)pyrene at 1.1 milligram per kilogram (mg/kg) and indeno(1,2,3-cd)pyrene at 0.52 mg/kg) were detected at concentrations above the Unrestricted Use soil cleanup objectives (SCOs) in one sample. Total PAH concentrations ranged between 4.9 and 8.2 mg/kg in the surface soil samples. A few other SVOCs were detected at concentrations below the Unrestricted Use and Commercial Use SCOs as summarized in Table 2-2. Several metals were detected in each surface soil sample at concentrations above the Unrestricted Use SCOs but below the Commercial Use SCOs. Total cyanide was detected at concentrations below both the Unrestricted Use and Commercial Use SCOs in each surface soil sample.

One surface soil sample included analysis for pesticides, herbicides, and PCBs. One pesticide (4,4-DDT) was detected at an estimated concentration of 0.014 mg/kg which is above the Unrestricted Use SCO of 0.0033 microgram per kilogram (µg/kg.) One pesticide and two PCB aroclors were detected at concentrations below the Commercial Use SCOs (if listed); however, the total estimated PCB concentration (1.13 mg/kg) is above both the Unrestricted Use SCO (0.1 mg/kg) and the Commercial Use SCO (1.0 mg/kg). PCBs and pesticides are not associated with former MGP operation and are likely related to the presence of urban fill.

Table 2-2 and Figure 2-8 summarize the results of all surface soil samples collected that exceed the Unrestricted Use SCOs and Commercial Use SCOs at the Site.

2.5.1.2 Subsurface Soil

Analytical soil samples collected across the Site had detections of BTEX and PAHs, with the highest concentrations found in areas where visible DNAPL was present. Outside of the zones of DNAPL impacts, BTEX and PAHs concentrations decrease rapidly. Individual BTEX compounds were detected at concentrations above the Unrestricted Use SCOs in 29 subsurface soil samples; however, concentrations of individual BTEX compounds were only detected above the Commercial Use SCOs in four of the 80 subsurface samples collected. As illustrated on Figure 2-8, these four samples were collected immediately west of former Holders No. 1 through No. 3. The samples that contained concentrations of one or more of the BTEX compounds above the Commercial Use SCOs were collected at depths coincident with visible DNAPL impacts.

Twenty-two of the 80 samples contained concentrations of one or more PAH that are above the respective Commercial Use SCOs as summarized in Table 2-2 and illustrated on Figure 2-8. Thirteen of the 22 samples that contained PAH concentrations above Commercial Use SCOs collected from ten locations, contained total PAH concentrations that are above the NYSDEC CP-51 Soil Cleanup Guidance (NYSDEC, 2010b) total PAH alternative criterion of 500 mg/kg (illustrated with green highlighting on Figure 2-8). Total PAH concentrations ranged from not detected to 14,106.2 mg/kg in the 35 to 40 ft bgs sample collected downgradient of the Previously Remediated Area. All of these thirteen samples, except SB-6(4-5), were collected from soils visibly impacted with DNAPL and/or soils with a strong hydrocarbon or naphthalene-like odor.

Metals were detected in all of the 80 subsurface soil samples collected and analyzed during the RI as summarized in Table 2-2. Arsenic was detected at concentrations above the Commercial Use SCO in three samples and barium and lead were detected at concentrations above Commercial Use SCOs in one sample. Several samples contained concentrations of lead and mercury at concentrations above the Unrestricted Use SCOs. All of these samples were collected from depths shallower than 13 ft bgs, and the majority was collected from depths shallower than 5 ft bgs. These detections are not considered related to the operation of the former MGP and are likely related to the presence of urban fill.

Free cyanide was detected in eight of the 80 subsurface soil samples collected during the RI. Part 375-6 does not include SCOs for free cyanide; however, the detected free cyanide concentrations are below the Unrestricted Use and Commercial Use SCOs for total cyanide which are both 27 mg/kg.

No PCBs, pesticides, or herbicides were detected in subsurface soils.

Table 2-2 and Figure 2-8 summarize the results of all subsurface oil samples collected that exceed the Unrestricted Use SCOs and Commercial Use SCOs at the Site.

2.5.2 Groundwater

Groundwater beneath the Site is impacted with MGP-and non-MGP related residuals. No measurable DNAPL was observed in any groundwater monitoring wells or groundwater grab sample locations. Monitoring wells were screened at three depth intervals within the shallow overburden aquifer (shallow, intermediate, and deep). Total BTEX concentrations ranged from 0.11 µg/L to 9,110 µg/L. Total PAH concentrations in shallow groundwater ranged from not detectable to 3.31 µg/L. Several metals were detected at concentrations above the AWQSGVs as summarized in Table 2-3 and illustrated on Figure 2-9. The metals detected at concentrations above AWQSGVs most frequently include iron, magnesium, manganese, and sodium. These metals are not related to former MGP operations. Total cyanide was detected in 10 of the 12 shallow groundwater samples and ranged in concentration from 8.7 to 279 µg/L. Total cyanide was detected at concentrations above the AWQSGV of 200 µg/L in two of the 10 samples. PCBs were not detected above the reporting limit in any of the four samples analyzed. Three pesticides (Beta BHC [0.51 µg/L], Delta BHC [0.078 µg/L], and Gamma-BHC [0.072 µg/L]) were detected above the reporting limit in one of the four samples analyzed. AWQSGVs are not listed for these compounds.

Table 2-3 and Figures 2-9A, 2-9B, and 2-9C summarize the results of MGP-related residual compounds in all samples of groundwater that exceed the SCGs after completion of the RI.

2.5.3 Soil Vapor

Carbon disulfide was the only MGP-related constituent detected in sub-slab vapor (SV-1: 2010 sampling event) above NYSDOH's background indoor air values. However, carbon disulfide was not detected in the paired indoor air sample. In addition, there were detections of various constituents in the ambient air samples during the sampling event consistent with urban background concentrations. Based on the collected data, there were no MGP-related constituents detected in indoor air above background concentrations. However, four non-MGP-related compounds (1,2-dichloropropane, 1,4-dichlorobenzene, chloroform, and trichlorofluoromethane [Freon 11]) were detected in indoor air above background concentrations. In general, the concentrations of VOCs detected in the indoor air are comparable with those detected in the ambient air and those typically found in indoor air of non-residential buildings.

The RI concluded that for a potential future use change scenario, absence any RAs, further monitoring of soil vapor and air samples may be required to monitor for potential indoor air exposures.

Table 2-4 and Figure 2-10 summarize the results of all samples of soil vapor and indoor air that were collected during the RI and compares the data with the SCGs for all samples collected during the investigation activities.

3.0 Institutional and Engineering Control Plan

3.1 General

Since MGP-related impacts are present within the ISMP Site Area, interim ICs and interim ECs are necessary to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all interim IC/ECs within the ISMP Site Area. The IC/EC Plan is one component of the ISMP and is subject to revision by the NYSDEC.

This plan provides:

- A description of all interim IC/ECs within the ISMP Site Area;
- The basic implementation and intended role of each interim IC/EC;
- A description of the key components of the interim ICs set forth in the Environmental Easement;
- A description of the controls to be evaluated prior to any subsurface activity;
- A description of plans and procedures to be followed for implementation of interim IC/ECs, such as the implementation of the EWP (as provided in Appendix D) for the proper handling of MGP-related impacted material that may be disturbed during maintenance or redevelopment work within the ISMP Site Area; and
- A description of the roles and responsibilities of each party with respect to this ISMP; and
- Any other provisions necessary to identify or establish methods for implementing the interim IC/ECs, as determined by the NYSDEC.

3.2 Interim Institutional Controls

A series of interim ICs are necessary to: (1) implement, maintain and monitor interim ECs; (2) prevent future exposure to any MGP-related impacts; and, (3) limit the use and development of the ISMP Site Area to commercial uses only. Adherence to these interim ICs within the ISMP Site Area is required by the Environmental Easement. Interim ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The interim IC boundaries correspond to the limits of the ISMP Site Area and are shown on Figure 1-3. These interim ICs are:

- The ISMP Site Area property may be used for commercial use;
- All interim ECs must be operated and maintained by the property owner as specified in this ISMP;
- All interim ECs must be inspected at a frequency and in a manner defined in the ISMP.
- The use of groundwater underlying the ISMP Site Area is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health to render it safe for use as drinking water or for industrial or commercial purposes, and the user must first notify and obtain written approval to do so from the NYSDEC.

- Groundwater and other environmental or public health monitoring must be performed as defined in this ISMP;
- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this ISMP;
- All future ground intrusive activities that will disturb MGP-related impacted material must be conducted in accordance with this ISMP;
- Monitoring to confirm current conditions as presented in the RI Report must be performed as defined in this ISMP;
- Access to the ISMP Site Area must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement;
- The potential for vapor intrusion must be evaluated for any buildings redeveloped or constructed in the area within the IC boundaries noted on Figure 1-3, and any potential impacts that are identified must be monitored or mitigated; and
- Vegetable gardens and farming within the ISMP Site Area are prohibited.

3.3 Interim Engineering Controls

3.3.1 Composite Cover System

Exposure to MGP-related impacts within the ISMP Site Area is prevented by a composite cover system (CCS) placed over the ISMP Site Area. This CCS is comprised of existing asphalt, concrete sidewalks, and/or concrete building slabs. Figure 3-1 presents the location of the CCS. The EWP provided in Appendix D outlines the procedures required to be implemented in the event the CCS is breached, penetrated or temporarily removed, such that its structural integrity is compromised, and any underlying MGP-related impacts are disturbed. Procedures for the inspection of this CCS are provided in the Monitoring and Sampling Plan included in Section 4.0 of this ISMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP) prepared for the ISMP Site Area. Examples of both documents are provided in Appendix E.

The CCS is a pre-remedial action control and the quality and integrity of this system will be inspected at defined, regular intervals in accordance with this ISMP until the Site remedy is implemented. The CCS purpose is to maintain a barrier between the public and MGP-related impacts and the inspection will focus on its structural/remedial integrity of the cover system. Monitoring for aesthetics or functionality apart from the remedial purpose is not required by this ISMP.

3.3.2 Security Fencing

The grassy bulkhead area between the former Pathmark supermarket and the Gowanus Canal is the only area of the ISMP Site Area that does not include an existing CCS (Figure 3-1). The area is fenced along the boundaries accessible by land. Access is limited through a gate that remains locked to prevent unauthorized access to the bulkhead area. No other access is available from land. Trespassing and hence exposure to the impacted media in areas where the CCS is missing is prevented by the fence. The fence is stainless steel chain link fence and is 8 feet tall.

3.3.3 Groundwater Monitoring

Groundwater monitoring activities to assess stability or trends in dissolved phase constituents and monitor the potential for MNA will continue, as determined by the NYSDEC with consultation with NYSDOH, until the final remedy for the Site is implemented or the groundwater concentrations are found to be consistently below AWQSGV over an extended period. Details of the groundwater monitoring program are provided in Section 4.

4.0 Monitoring and Sampling Plan

4.1 General

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the interim IC/ECs. National Grid, as the RP, maintains responsibility for implementing the requirements of the Monitoring and Sampling Plan. The owner of the ISMP Site Area property is responsible for complying with the notification requirements included in this ISMP. This Monitoring and Sampling Plan may only be revised with the approval of the NYSDEC. Details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of site management for the ISMP Site Area are included in the Quality Assurance Project Plan (QAPP) provided in Appendix F.

This Monitoring and Sampling Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor, soils);
- Assessing compliance with applicable NYSDEC SCGs, particularly groundwater standards and Part 375 SCOs for soil; and
- Evaluating ISMP Site Area information periodically to confirm that existing conditions continue to be effective in protecting public health and the environment.

To adequately address these issues, this Monitoring and Sampling Plan provides information on:

- Sampling locations, protocol and frequency;
- Information on all designed monitoring systems;
- Analytical sampling program requirements;
- Inspection and maintenance requirements for monitoring wells;
- Reporting requirements;
- Monitoring well decommissioning procedures; and
- Interim Status Review Reports.

Reporting requirements are provided in Section 7.0 of this ISMP.

4.2 Site-wide Inspection

Site-wide inspections will be performed by National Grid’s Qualified Environmental Professional (QEP) annually and following any ground intrusion activity. The QEP will also evaluate and inspect the security fence condition annually to confirm that the grassy bulkhead area security remains unchanged, and continues to be protective of human health and the environment. An individual that is familiar with the site will complete the inspection. Site-wide inspections will also be performed after all severe weather conditions that may affect interim ECs. During these inspections, an inspection form will be completed as provided in Appendix G – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all interim ICs, including ISMP Site Area usage;
- An evaluation of the condition and continued effectiveness of interim ECs;
- General ISMP Site Area conditions at the time of the inspection;
- The ISMP Site Area management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirm that ISMP Site Area records are up to date.

The inspections will determine and document the following:

- Whether interim ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this ISMP and the Environmental Easement;
- Achievement of remedial performance criteria; and
- If ISMP Site Area records are complete and up to date.

Reporting requirements are outlined in Section 7.0 of this plan.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the interim ECs occurs that reduces or has the potential to reduce the effectiveness of interim ECs in place at the ISMP Site Area. Once National Grid is notified, verbal notice to the NYSDEC must be given by noon of the following day, to the extent possible. In addition, an inspection of the ISMP Site Area will be conducted within 5 days of the event (to the extent possible) to verify the effectiveness of the interim IC/ECs implemented at the ISMP Site Area by a QEP, as determined by the NYSDEC. Written confirmation must be provided to the NYSDEC within 7 days of the event (to the extent possible) that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public. This confirmation will be made by National Grid or its QEP.

4.3 Groundwater Monitoring and Sampling

Groundwater monitoring will be performed annually to assess stability or trends in dissolved phase constituents and the potential for MNA. It is anticipated that a review of the frequency and sampling requirements may be performed in consultation with NYSDEC following two years of monitoring. Modification to the frequency or sampling requirements will require approval from the NYSDEC. A network of monitoring wells (Figure 4-1) has been installed to monitor up-gradient, on-site, and down-gradient groundwater conditions at the ISMP Site Area. The network of wells has been designed based on the following criteria:

- One monitoring well cluster (MW-1S/MW-1I/MW-1D) consisting of one shallow zone well, one intermediate zone well, and one deep zone well, was installed in the shallow overburden groundwater aquifer underlying the ISMP Site Area to determine the up-gradient groundwater conditions;

- One monitoring well (MW-2D) was installed in the deep zone in the shallow overburden groundwater aquifer underlying the ISMP Site Area to determine the up-gradient groundwater conditions;
- Two monitoring well clusters (MW-6S/MW-6I and MW-7S/MW-7I), each consisting of one shallow zone well and one intermediate zone well, were installed in the shallow overburden groundwater aquifer underlying the ISMP Site Area to determine the side-gradient groundwater conditions; and
- One monitoring well (MW-21D) was installed in the deep zone in the shallow overburden groundwater aquifer underlying the ISMP Site Area to determine the side-gradient groundwater conditions;
- One monitoring well cluster (MW-22I/MW-22D) consisting of one intermediate zone well and one deep zone well, was installed in the shallow overburden groundwater aquifer underlying the ISMP Site Area to determine the side-gradient groundwater conditions;
- Three monitoring well clusters (MW-3S/MW-3I; MW-4S/MW-4I; and MW-8S/MW-8I), each consisting of one shallow zone well and one intermediate zone well, were installed in the shallow overburden groundwater aquifer underlying the ISMP Site Area to determine the on-site groundwater conditions; and
- One monitoring well cluster (MW-9S/MW-9I/MW-9D) consisting of one shallow zone well, one intermediate zone well, and one deep zone well, was installed in the shallow overburden groundwater aquifer underlying the ISMP Site Area to determine the on-site groundwater conditions.

Table 4-1 summarizes the wells identification number, as well as the purpose, location, depths, diameter and screened intervals of the wells. As part of the groundwater monitoring, four up-gradient wells, seven side-gradient wells, nine on-site wells, and four downgradient wells are sampled to evaluate the effectiveness of the remedial system.

Monitoring well boring and construction logs are included in Appendix C.

4.3.1 Monitoring Schedule

The monitoring well network will be monitored annually to evaluate groundwater conditions and determine concentration trends of MGP-related residuals in groundwater. Groundwater samples will be collected for a minimum of two years. Sampling locations, required analytical parameters and schedule are provided in Table 4-2 – Groundwater Sampling Requirements and Schedule below. Groundwater monitoring may be discontinued in monitoring wells if concentrations decrease below AWQSGV for two consecutive sampling events and as approved by the NYSDEC or discontinued as directed by the NYSDEC.

Modification to the frequency or sampling requirements will require approval from the NYSDEC. The ISMP will be modified to reflect changes in sampling plans approved by the NYSDEC.

Table 4-2: Groundwater Sampling Requirements and Schedule

Sampling Location	Analytical Parameters			Schedule
	BTEX (EPA Method 8260B)	PAHs (EPA Method 8270C)	MNA Parameters (Dissolved Oxygen, Nitrate, Ammonia, Total Iron, Ferrous Iron, Sulfate, Sulfide, Methane, Alkalinity, Oxidation Reduction Potential, and pH)	
Monitoring Well Network	X	X	X	Annually

4.3.2 Sampling Protocol

All monitoring well sampling activities, performed by National Grid, will be recorded in a field book and a groundwater-sampling log (an example is presented in Appendix H). Other observations (e.g., well integrity, etc.) will be noted on the groundwater-sampling log. The groundwater-sampling log will serve as the inspection form for the groundwater monitoring well network. Each sample will be collected utilizing low flow groundwater sampling collection methods provided in the Field Sampling Plan (Appendix H). Each groundwater sample will be analyzed for BTEX via USEPA Method 8260B, PAHs via USEPA Method 8270C, and monitored natural attenuation parameters (Dissolved Oxygen, Nitrate, Ammonia, Total Iron, Ferrous Iron, Sulfate, Sulfide, Methane, Alkalinity, Oxidation Reduction Potential, and pH) by a NYSDOH environmental laboratory approval program - certified laboratory. The groundwater samples will also be collected, handled, and analyzed according to the example QAPP (Appendix F).

4.3.3 Monitoring Well Repairs, Replacement, and Decommissioning

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped by National Grid. Additionally, monitoring wells will be properly decommissioned and replaced by National Grid, if an event renders the wells unusable. It is the obligation of the property owner to aid in properly maintaining the monitoring wells and notifying National Grid if there is damage to the wells or if damage to the wells is noticed.

Repairs and/or replacement of wells in the monitoring well network will be performed by National Grid based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of any monitoring well for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent Interim Status Review Report. Well decommissioning without replacement will be done only with the prior approval of the NYSDEC. Well abandonment will be performed in accordance with NYSDEC's guidance entitled "CP-43: Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be replaced in kind in the nearest available location, unless otherwise approved by the NYSDEC.

Deliverables for the groundwater monitoring program are specified in Section 7.0 – Reporting Requirements.

4.3.4 Monitoring Quality Assurance/Quality Control

All sampling and analyses will be performed in accordance with the requirements of the QAPP prepared for the Site (Appendix F). Main Components of the QAPP include:

- QA/QC objectives for data measurement;
- Sampling Program:
  - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) by the analytical laboratory prior to their use. Containers with preservative will be tagged as such.
  - Sample holding times will be in accordance with the NYSDEC Analytical Services Protocol requirements.
  - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody;
- Calibration Procedures:
  - All field analytical equipment will be calibrated immediately prior to use each day. Calibration procedures will conform to manufacturer's standard instructions.
  - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;
- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method;
- Internal quality control (QC) and Checks;
- Quality assurance (QA) Performance and System Audits;
- Preventative Maintenance Procedures and Schedules; and
- Corrective Action Measures.

5.0 Operation and Maintenance Plan

5.1 General

The ISMP Site Area is currently in the feasibility study phase and as such does not rely on any mechanical systems, such as groundwater treatment systems, sub-slab depressurization systems or air sparge/soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this ISMP.

6.0 Periodic Assessments/Evaluations

6.1 Climate Change Vulnerability Assessment

Increases in both the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of interim IC/ECs. Vulnerability assessments provide information so that the interim ECs are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

This section provides a summary of vulnerability assessments conducted in the ISMP Site Area, and briefly summarizes the vulnerability of the ISMP Site Area and/or interim ECs to severe storms/weather events and associated flooding.

The City of New York's Economic Development Corporation (NYCEDC) completed a detailed Storm Surge Barrier Study and vulnerability assessment in 2016 that included the Brooklyn-Queens waterfront/Gowanus Canal. Results of this study for the Brooklyn-Queens waterfront are located at (https://www.nycedc.com/sites/default/files/filemanager/Resources/Studies/Stronger_More_Resilient_NY/Ch14_Brooklyn_Queens_FINAL_singles.pdf). Basic information for the ISMP Site Area including a summary of flood plains, site drainage and storm water management, erosion potential, high wind susceptibility, electricity, and spill/containment releases are summarized in the following bullets:

- The ISMP Site Area is located within the current 100-year flood plain.
- Surface water collects in storm drains and discharges to the nearby Gowanus Canal.
- The bulkhead along Gowanus Canal adjacent to a portion of the ISMP Site Area is degraded and in need of repair. Bulkhead replacement is a component of USEPA's remedy for the Gowanus Canal remediation.
- The ISMP Site Area is not in an area susceptible to high winds.
- No specific susceptibility to electrical outages is expected nor will it affect performance of any controls outlined in this ISMP.

Photographs documenting the existing condition of the Gowanus Canal bulkhead adjacent to the ISMP Site Area is provided in Appendix I.

7.0 Reporting Requirements

7.1 Site Management Monitoring/Inspection Reports

All site management inspection, maintenance, and monitoring events will be recorded on the appropriate site management forms provided in Appendix G. These forms are subject to revision by NYSDEC for use on the ISMP Site Area.

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the ISMP Site Area during the reporting period will be provided in electronic format to the NYSDEC by National Grid's Qualified Environmental Professional in accordance with the requirements of Table 7-1 and summarized in the Interim Status Review Report (ISSR).

Table 7-1: Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Inspection Report	Annually
Interim Status Review Report	Annually, or as otherwise determined by the NYSDEC

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

All interim monitoring/inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc.);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and

- A determination as to whether ISMP Site Area conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting maintenance activities;
- Description of maintenance activities performed;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

Non-routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Description of non-routine activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

Data will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link http://www.dec.ny.gov/chemical/62440.html.

7.2 Interim Status Review Report

An ISRR will be submitted by National Grid's Qualified Environmental Professional to NYSDEC beginning sixteen (16) months after the ISMP is issued. After submittal of the initial ISRR, the next ISRR shall be submitted annually to the NYCDEC or at another frequency as may be required by the NYSDEC. In the event that the ISMP Site Area is subdivided into separate parcels with different ownership, a single ISRR will be prepared that addresses the ISMP Site Area described in Appendix A - Environmental Easement. The ISRR will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the ISRR. The ISRR will include:

- Identification, assessment and certification of all interim ECs/ICs.
- Results of as needed inspections and severe condition inspections, if applicable.

- All applicable site management forms and other records generated for the ISMP Site Area during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.
- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends.
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.
- A ISMP Site Area evaluation, which includes the following:
  - The compliance of the interim ICs/ECs with the requirements of this ISMP;
  - Any new conclusions or observations regarding MGP-related impacts based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;
  - Recommendations regarding any necessary changes to the interim ICs/ECs y and/or Monitoring and Sampling Plan;
  - Trends in contaminant levels in the affected media will be evaluated to determine if the current conditions continues to be protective of the public and environment; and
  - The overall performance and effectiveness of the remedy.

7.2.1 Certification of Interim Institutional and Engineering Controls

Following the last inspection of the reporting period, National Grid's qualified environmental professional will prepare, and include in the ISRR, the following certification as per the requirements of NYSDEC DER-10:

"For each interim institutional or engineering control identified for the ISMP Site Area, I certify that all of the following statements are true:

- *The inspection of the ISMP Site Area to confirm the effectiveness of the interim institutional and engineering controls required by the remedial program was performed under my direction;*
- *The interim institutional control and/or engineering control employed at this ISMP Site Area is unchanged from the date the control was put in place, or last approved by NYSDEC;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*

- *Access to the ISMP Site Area will continue to be provided to the NYSDEC and National Grid to evaluate existing conditions, including access to evaluate the continued maintenance of this control;*
- *Use of the ISMP Site Area is compliant with the environmental easement, when finalized and in compliance with the Access Agreement in the interim;*
- *The interim engineering control systems are performing as designed and are effective;*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the ISMP; and*
- *The information presented in this report is accurate and complete.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as Remedial Party's Designated Site Representative."

The signed certification will be included in the ISSR.

The ISSR will be submitted, in electronic format to the NYSDEC Central Office and the NYSDOH Bureau of Environmental Exposure Investigation. The ISSR may need to be submitted in hard-copy format, as requested by the NYSDEC project manager.

8.0 References

AECOM, 2014. Remedial Investigation Report, Former Metropolitan Works MGP Site, 124-136 2nd Avenue, Brooklyn, Kings County, New York. September 29, 2014.

Misut, P. E. and Jack Monti Jr., 1999. "Simulation of ground-water flow and pumpage in Kings and Queens Counties, Long Island, New York," in the U. S. Geological Survey Water-Resources Investigations Report 98-4071

New York State Department of Environmental Conservation (NYSDEC), 1998. Ambient Water Quality Standards and Guidance Values, Division of Water Technical and Operational Guidance Series (TOGS 1. 1. 1), and all associated addendums. Division of Water, Albany, New York.

NYSDEC, 2006. NYSDEC Rules and Regulations, 6 NYCRR Subpart 375-6, Remedial Program Soil Cleanup Objectives, December 14, 2006.

NYSDEC, 2010a. DER-10 Technical Guidance for Site Investigation and Remediation, May 3, 2010.

NYSDEC, 2010b. CP-51 / Soil Cleanup Guidance, October 21, 2010

USEPA, 2012. Superfund Proposed Plan, Gowanus Canal.

Tables

AECOM

Table 2-1
Groundwater Elevations
Metropolitan Former MGP Site, Brooklyn, New York

Well ID	Date Installed	Coordinates				Ground Surface Elevation (ft)	Top of Casing Elevation (ft)	Well Diameter (inches)	Screened Interval (ft btoc)	Total Depth (ft btoc)
		Northing	Easting	Latitude	Longitude					
Canal Surface	8/24/2010	184286.64	984929.73	NA	NA	9.11	N/A	N/A	N/A	N/A
Shallow Wells										
MW-1S	4/8/2010	183754.21	985753.83	40-40-15.742	73-59-40.484	11.99	11.62	2	3 to 13	15.0
MW-3S	4/13/2010	183865.47	985269.49	40-40-16.842	73-59-46.769	8.61	8.05	2	3 to 13	15.0
MW-4S	4/28/2010	184145.24	984868.25	40-40-19.606	73-59-51.977	6.86	6.45	2	3 to 13	15.0
MW-6S	4/21/2010	183755.76	985095.95	40-40-15.758	73-59-49.0216	9.81	9.59	2	3 to 13	15.0
MW-7S	4/29/2010	183682.08	985205.99	40-40-15.030	73-59-47.594	10.36	9.94	2	3 to 13	15.0
MW-8S	5/5/2010	184072.81	985056.75	40-40-18.890	73-59-49.530	7.46	7.23	2	3 to 13	15.0
MW-9S	9/17/2010	184284.23	984942.57	40-40-20.980	73-59-51.012	9.36	8.98	2	5 to 15	17.0
Intermediate Wells										
MW-1I	4/8/2010	183751.96	985757.21	40-40-15.720	73-59-40.440	12.09	11.58	2	30 to 40	42.0
MW-3I	4/13/2010	183865.47	985269.49	40-40-16.842	73-59-46.769	8.61	8.07	2	25 to 50	52.0
MW-4I	4/28/2010	184145.24	984868.25	40-40-19.606	73-59-51.977	6.86	6.31	2	25 to 35	37.0
MW-6I	4/21/2010	183755.76	985095.95	40-40-15.758	73-59-49.0216	9.81	9.21	2	30 to 40	42.0
MW-7I	4/29/2010	183682.08	985205.99	40-40-15.030	73-59-47.594	10.36	9.81	2	30 to 40	42.0
MW-8I	5/5/2010	184072.81	985056.75	40-40-18.890	73-59-49.530	7.46	7.12	2	30 to 40	42.0
MW-9I	9/17/2010	184280.34	984939.39	40-40-20.941	73-59-51.053	9.29	8.81	2	30 to 45	47.0
MW-22I	10/6/2011	184316.19	985224.90	40-40-21.295	73-59-47.348	8.12	7.68	2	25 to 35	37.0
Deep Wells										
MW-1D	4/8/2010	183751.96	985757.21	40-40-15.720	73-59-40.440	12.09	11.46	2	60 to 70	72.0
MW-2D	4/9/2010	183753.85	985474.32	40-40-15.739	73-59-44.111	10.26	9.97	2	60 to 70	72.0
MW-9D	9/17/2010	184280.34	984939.39	40-40-20.941	73-59-51.053	9.29	8.83	2	60 to 70	72.0
MW-21D	10/18/2011	184246.62	985321.01	40-40-20.608	73-59-46.101	10.07	9.73	2	60 to 70	72.0
MW-22D	10/6/2011	184316.19	985224.90	40-40-21.295	73-59-47.348	8.12	7.68	2	60 to 70	72.0

Notes:

NA - Not Applicable

NS - Not Sampled due to well not installed.

NM - Not Measured

ft btoc - feet below top of casing

Top of casing elevations in feet above North American Vertical Datum of 1988 (NAVD-88).

Canal surface reference adjacent to MW-9 location.

Table 2-2
Remedial Investigation Surface Soil Sample Exceedances
Former Metropolitan MGP, Brooklyn, New York

Sample Location Sample Date Sample Interval (feet)	CAS Number	NYSDEC PART 375-6 Unrestricted	NYSDEC Part 375-6 Commercial	CP-51	SS-01 9/14/2010 0-2"	SS-02 9/14/2010 0-2"	SS-03 9/16/2010 0-2"
BTEX (mg/Kg)							
Total BTEX	***CALC-BTEX***	***NL***	***NL***	***NL***	***ND***	***ND***	***ND***
Volatile Organic Compounds (VOCs)(mg/Kg)							
1,1-Dichloroethene	75-35-4	0.33	500	NL	< 0.0065 U	**0.0016 J**	< 0.0053 U
Total VOCs	*CALC-VOC*	*NL*	*NL*	*NL*	*ND*	***0.0016***	*ND*
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)							
Acenaphthene	83-32-9	20	500	NL	< 0.21 U	**0.042 J**	**0.039 J**
Acenaphthylene	208-96-8	100	500	NL	**0.081 J**	**0.083 J**	**0.082 J**
Anthracene	120-12-7	100	500	NL	**0.073 J**	**0.14 J**	**0.1 J**
Benzo(a)anthracene	56-55-3	1	5.6	NL	**0.55**	**0.63**	**0.38**
Benzo(a)pyrene	50-32-8	1	1	NL	**0.62**	**0.66**	**0.41**
Benzo(b)fluoranthene	205-99-2	1	5.6	NL	**0.9**	**1.1**	**0.58**
Benzo(ghi)perylene	191-24-2	100	500	NL	**0.52**	**0.63**	**0.32**
Benzo(k)fluoranthene	207-08-9	0.8	56	NL	**0.4**	**0.46**	**0.3**
Chrysene	218-01-9	1	56	NL	**0.57**	**0.79**	**0.47**
Dibenz(a,h)anthracene	53-70-3	0.33	0.56	NL	**0.13 J**	**0.16 J**	**0.091 J**
Fluoranthene	206-44-0	100	500	NL	**0.65**	**1.2**	**0.77**
Fluorene	86-73-7	30	500	NL	< 0.21 U	**0.038 J**	**0.038 J**
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	5.6	NL	**0.42**	**0.52**	**0.27**
Naphthalene	91-20-3	12	500	NL	< 0.21 U	< 0.23 U	**0.032 J**
Phenanthrene	85-01-8	100	500	NL	**0.26**	**0.54**	**0.38**
Pyrene	129-00-0	100	500	NL	**1**	**1.2**	**0.69**
Total PAHs	*CALC-PAH*	*NL*	*NL*	*500*	***6.174***	***8.193***	***4.952***
Other Semivolatile Organic Compounds (SVOCs) (mg/Kg)							
Acetophenone	98-86-2	NL	500	NL	< 0.21 U	**0.048 J**	< 0.18 U
Benzaldehyde	100-52-7	NL	NL	NL	**0.054 J**	**0.096 J**	**0.043 J**
bis(2-Ethylhexyl) phthalate	117-81-7	NL	NL	NL	**26**	**1.1**	**0.54**
Butyl benzyl phthalate	85-68-7	NL	NL	NL	**0.36**	**0.49**	**0.35**
Caprolactam	105-60-2	NL	NL	NL	**0.028 J**	**0.099 J**	**0.035 J**
Carbazole	86-74-8	NL	NL	NL	**0.036 J**	**0.089 J**	**0.053 J**
Di-n-butyl phthalate	84-74-2	NL	NL	NL	**0.086 J**	**0.25**	**0.092 J**
Total Other SVOCs	*CALC-SVOC*	*NL*	*NL*	*NL*	***32.738***	***10.365***	***6.065***
Inorganic Compounds (mg/Kg)							
Aluminum	7429-90-5	NL	NL	NL	**3320**	NS	NS
Antimony	7440-36-0	NL	NL	NL	**2.7**	NS	NS
Arsenic	7440-38-2	13	16	NL	**3.6**	**5.1**	**4.1**
Barium	7440-39-3	350	400	NL	**128**	**180**	**126**
Beryllium	7440-41-7	7.2	590	NL	**0.11 J**	NS	NS
Cadmium	7440-43-9	2.5	9.3	NL	**3.7**	**5.9**	**3.7**
Calcium	7440-70-2	NL	NL	NL	**10700**	NS	NS
Chromium	7440-47-3	30	1500	NL	**51.4**	**65.9**	**29.1**
Cobalt	7440-48-4	NL	NL	NL	**5.5**	NS	NS
Copper	7440-50-8	50	270	NL	**119**	NS	NS
Iron	7439-89-6	NL	NL	NL	**14300**	NS	NS
Lead	7439-92-1	63	1000	NL	**300**	**445**	**218**
Magnesium	7439-95-4	NL	NL	NL	**2910**	NS	NS
Manganese	7439-96-5	1600	10000	NL	**186**	NS	NS
Mercury	7439-97-6	0.18	2.8	NL	**0.5**	**0.66**	**0.32**
Nickel	7440-02-0	30	310	NL	**54**	NS	NS
Potassium	7440-09-7	NL	NL	NL	**514**	NS	NS
Silver	7440-22-4	2	1500	NL	**1.0 J**	**2**	**0.89 J**
Sodium	7440-23-5	NL	NL	NL	**202**	NS	NS
Vanadium	7440-62-2	NL	NL	NL	**14.4**	NS	NS
Zinc	7440-66-6	109	10000	NL	**693**	NS	NS
Total Cyanide	57-12-5	27	27	NL	**0.312 J**	**0.319 J**	**0.226 J**
Pesticides (mg/Kg)							
DDT,4,4-	50-29-3	0.0033	47	NL	**0.014 NJ**	NS	NS
Endrin aldehyde	7421-93-4	NL	NL	NL	**0.045 J**	NS	NS
Endrin ketone	53494-70-5	NL	NL	NL	**0.016 NJ**	NS	NS
PCBs (mg/Kg)							
Aroclor 1254	11097-69-1	NL	NL	NL	**0.62 J**	NS	NS
Aroclor 1260	11096-82-5	NL	NL	NL	**0.51 J**	NS	NS
PCB (Total) (ppm)	*CALC-PCBs*	*0.1*	*1*	*NL*	***1.13***	*NS*	*NS*
Herbicides (mg/Kg)							
Herbicides	93-72-1	3.8	500	NL	ND	NS	NS
Percent Solids/Moisture							
Moisture, percent	MOIST	NL	NL	NL	**23**	**30**	**12**
Percent Solids	SOLIDS	NL	NL	NL	**77**	**70**	**88**

Notes:

mg/Kg - milligrams per kilogram

NA = Not Analyzed

ND = Not Detected

NL = Not Listed

J = The associated numerical value is an estimated quantity.

R = The associated data is rejected. , , ( )

Quantitation Limit (PQL).

UJ = The analyte was not detected at or above the PQL. However, the reported PQL is approximate and may be inaccurate or imprecise.

Bold indicates the analyte detected at a concentration greater than the MDL.

Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Unrestricted Use Soil Cleanup Objective

Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Commercial Use Soil Cleanup Objective Commercial value.

Green highlight indicates result is above the NYSDEC CP-51 Alternate Criteria of 500 mg/Kg for Total PAHs.

Table 2-2
Remedial Investigation Soil Sample Exceedances
Former Metropolitan MGP, Brooklyn, New York

Sample Location / Sample Date / Sample Interval (feet)	CAS Number	NYSDEC PART 375-6 Unrestricted	NYSDEC Part 375-6 Commercial	CP-51	SB-01 4/5/2010 4-5	SB-01 4/5/2010 40-45	SB-01 4/5/2010 71-72	SB-01 4/8/2010 5-7	SB-02 4/8/2010 1-2	SB-02 4/9/2010 40-45	SB-02 4/9/2010 71-72	SB-03 4/13/2010 4-5	SB-03 4/13/2010 30-35	SB-03 4/13/2010 59-60	SB-04 DUP 4/27/2010 32-34	SB-04 4/27/2010 4-5	SB-04 4/27/2010 32-34	SB-04 4/27/2010 58-60	SB-05 4/21/2010 4-5	SB-05 4/22/2010 39-40	SB-05 4/22/2010 70-72	SB-06 4/20/2010 4-5	SB-06 4/20/2010 26-28	SB-06 4/21/2010 49-50	SB-07 4/28/2010 4-5	SB-07 4/28/2010 10-12
BTEX (mg/Kg)																										
Benzene	71-43-2	0.06	44	NL	< 1.27 U	< 0.0073 U	< 0.0060 U	0.409 J	< 0.0033 U	< 0.0041 U	< 0.0040 U	< 1.21 U	20.7 J	0.0031 J	< 6.62 U	< 0.0077 U	0.809	< 0.0060 U	< 0.0702 U	0.0429	< 0.0054 U	1.38	< 0.0716 U	< 0.0066 U	< 0.139 U	< 8.54 U
Ethylbenzene	100-41-4	1	390	NL	4.74	< 0.0073 U	< 0.0060 U	4.43	< 0.0052 U	< 0.0065 U	< 0.0063 U	32.5	255	< 0.0049 U	6.62 J	< 0.0077 U	6.24 J	< 0.0060 U	< 0.0702 U	0.0075	< 0.0054 U	0.958	< 0.0716 U	< 0.0066 U	0.159 J	47.9
m+p-Xylene	1330-20-7-M,P	NL	NL	NL	17.4 J	< 0.0145 U	< 0.0120 U	15.9 J	< 0.0091 U	< 0.0112 U	< 0.0109 U	23.7 J	189 J	< 0.0097 U	< 13.2 UJ	< 0.0155 U	5.07 J	< 0.0119 U	< 0.14 UJ	< 0.0147 U	< 0.0109 U	0.374 J	< 0.143 UJ	< 0.0131 U	0.292 J	< 17.1 U
o-Xylene	95-47-6	NL	NL	NL	6.75 J	< 0.0073 U	< 0.0060 U	4.91 J	< 0.0036 U	< 0.0044 U	< 0.0043 U	9.71 J	75 J	< 0.0049 U	5.03 J	< 0.0077 U	3.93 J	< 0.0060 U	< 0.0702 UJ	< 0.0074 U	< 0.0054 U	0.3 J	< 0.0716 UJ	< 0.0066 U	0.131 J	8.79
Toluene	108-88-3	0.7	500	NL	2.16	< 0.0073 U	< 0.0060 U	1.4	< 0.0051 U	< 0.0063 U	< 0.0061 U	< 1.21 U	160	0.0045 J	< 6.62 U	< 0.0077 U	< 0.685 U	< 0.0060 U	< 0.0702 U	< 0.0074 U	< 0.0054 U	0.333	< 0.0716 U	< 0.0066 U	< 0.139 UJ	< 8.54 U
Total Xylenes	Calc-Xylenes	NL	500	NL	24.15	< 0.0073	< 0.0060	20.81	< 0.0091	< 0.0044	< 0.0043	33.41	264	< 0.0097	5.03	< 0.0077	9	< 0.0060	< 0.0702	< 0.0074	< 0.0054	0.674	< 0.0716	< 0.0066	0.423	8.79
Total BTEX	*CALC-BTEX*	*NL*	*NL*	*NL*	*31.05*	*ND*	*ND*	*27.049*	*ND*	*ND*	*ND*	*65.91*	*699.7*	*0.0076*	*11.65*	*ND*	*16.049*	*ND*	*ND*	*0.0504*	*ND*	*3.345*	*ND*	*ND*	*0.582*	*56.69*
Volatile Organic Compounds (VOCs)(mg/Kg)																										
1,1,1-Trichloroethane	71-55-6	0.68	500	NL	< 1.27 U	< 0.0073 U	< 0.0060 U	< 0.634 U	< 0.0053 U	< 0.0065 U	< 0.0063 U	< 1.21 U	< 26.6 U	< 0.0049 U	< 6.62 U	< 0.0077 U	< 0.685 U	< 0.0060 U	0.249	< 0.0074 U	< 0.0054 U	< 0.0963 U	< 0.0716 U	< 0.0066 U	< 0.139 U	< 8.54 UJ
1,1-Dichloroethane	75-34-3	0.27	240	NL	< 1.27 U	< 0.0073 U	< 0.0060 U	< 0.504 U	< 0.0042 U	< 0.0052 U	< 0.0050 U	< 1.21 U	< 26.6 U	< 0.0049 U	< 6.62 U	< 0.0077 U	< 0.685 U	< 0.0060 U	0.0582 J	< 0.0074 U	< 0.0054 U	< 0.0963 U	< 0.0716 U	< 0.0066 U	< 0.139 U	< 8.54 U
1,2,4-Trimethylbenzene	95-63-6	3.6	190	NL	NS	NS	NS	NS	NS	NS	NS	36.1	89.3	< 0.0049	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1,2-Dichlorobenzene	95-50-1	1.1	500	NL	< 1.27 U	< 0.0073 U	< 0.0060 U	< 0.6 U	< 0.0050 U	< 0.0062 U	< 0.0060 U	< 1.21 U	< 26.6 U	< 0.0049 U	< 6.62 U	< 0.0077 U	< 0.685 U	< 0.0060 U	0.996	< 0.0074 U	< 0.0054 U	< 0.0963 U	< 0.0716 U	< 0.0066 U	< 0.139 U	< 8.54 U
1,2-Dichloroethane	107-06-2	0.02	30	NL	< 1.27 U	< 0.0073 U	< 0.0060 U	< 0.654 U	< 0.0055 U	< 0.0067 U	< 0.0065 U	< 1.21 U	< 26.6 U	< 0.0049 U	< 6.62 U	< 0.0077 U	< 0.685 U	< 0.0060 U	< 0.0702 U	< 0.0074 U	< 0.0054 U	< 0.0963 U	< 0.0716 U	< 0.0066 U	< 0.139 U	< 8.54 U
1,3,5-Trimethylbenzene	108-67-8	8.4	190	NL	NS	NS	NS	NS	NS	NS	NS	11.2	37.5	< 0.0049	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1,4-Dichlorobenzene	106-46-7	1.8	130	NL	< 1.27 U	< 0.0073 U	< 0.0060 U	< 0.552 U	< 0.0046 U	< 0.0057 U	< 0.0055 U	< 1.21 U	< 26.6 U	< 0.0049 U	< 6.62 U	< 0.0077 U	< 0.685 U	< 0.0060 U	0.0610 J	< 0.0074 U	< 0.0054 U	< 0.0963 U	< 0.0716 U	< 0.0066 U	0.21 J	< 8.54 U
Acetone	67-64-1	0.05	500	NL	R	0.0786 J	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Carbon disulfide	75-15-0	NL	NL	NL	< 2.54 UJ	< 0.0145 U	< 0.0120 U	< 1.36 UJ	< 0.0114 U	< 0.0140 U	< 0.0136 U	< 2.41 UJ	< 53.2 UJ	< 0.0097 U	< 13.2 UJ	< 0.0155 U	< 1.37 UJ	< 0.0119 U	< 0.14 UJ	< 0.0147 U	< 0.0109 U	< 0.193 UJ	< 0.143 UJ	< 0.0131 U	< 0.278 UJ	< 17.1 U
cis-1,2-Dichloroethene	156-59-2	0.25	500	NL	< 1.27 U	< 0.0073 U	< 0.0060 U	< 0.579 U	< 0.0048 U	< 0.0060 U	< 0.0058 U	< 1.21 U	< 26.6 U	< 0.0049 U	< 6.62 U	< 0.0077 U	< 0.685 U	< 0.0060 U	< 0.0702 U	< 0.0074 U	< 0.0054 U	< 0.0963 U	< 0.0716 U	< 0.0066 U	< 0.139 U	< 8.54 U
Cyclohexane	110-82-7	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Isopropylbenzene	98-82-8	NL	NL	NL	1.37	< 0.0073 U	< 0.0060 U	1.02	< 0.0036 U	< 0.0045 U	< 0.0044 U	7.04 J	22.9 J	< 0.0049 U	< 6.62 UJ	< 0.0077 U	2.28 J	< 0.0060 U	< 0.0702 UJ	< 0.0074 U	< 0.0054 U	2.28 J	< 0.0716 UJ	< 0.0066 U	0.271 J	10.8
Methylcyclohexane	108-87-2	NL	NL	NL	20	NS	NS	21.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Methylene chloride	75-09-2	0.05	500	NL	< 2.54 U	< 0.0145 U	< 0.0120 U	< 1.36 UJ	< 0.0114 U	< 0.0140 U	0.0168	< 2.41 U	< 53.2 U	< 0.0097 U	< 13.2 U	< 0.0155 U	< 1.37 U	< 0.0119 U	< 0.14 U	< 0.0147 U	< 0.0109 U	< 0.193 U	< 0.143 U	< 0.0131 U	< 0.278 U	< 17.1 U
n-Butylbenzene	104-51-8	12	500	NL	NS	NS	NS	NS	NS	NS	NS	2.29	< 26.6	< 0.0049	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
n-Propylbenzene	103-65-1	3.9	500	NL	NS	NS	NS	NS	NS	NS	NS	3.41	21.5	< 0.0049	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
p-Isopropyltoluene	99-87-6	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	3.7	< 26.6	< 0.0049	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
sec-Butylbenzene	135-98-8	11	500	NL	NS	NS	NS	NS	NS	NS	NS	1.15	< 26.6	< 0.0049	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Styrene	100-42-5	NL	NL	NL	< 1.27 UJ	< 0.0073 U	< 0.0060 U	< 0.341 UJ	< 0.0028 U	< 0.0035 U	< 0.0034 U	0.941 J	< 26.6 UJ	0.0025 J	< 6.62 UJ	< 0.0077 U	< 0.685 UJ	< 0.0060 U	< 0.0702 UJ	< 0.0074 U	< 0.0054 U	0.0790 J	< 0.0716 UJ	< 0.0066 U	< 0.139 UJ	< 8.54 U
Tentatively Identified Compounds	TICS	NL	NL	NL	NS	0	0	NS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tetrachloroethene	127-18-4	1.3	150	NL	< 1.27 U	< 0.0073 U	< 0.0060 U	< 0.593 U	< 0.0050 U	< 0.0061 U	< 0.0059 U	< 1.21 U	< 26.6 U	< 0.0049 U	< 6.62 UJ	< 0.0077 U	< 0.685 UJ	< 0.0060 U	1.08	< 0.0074 U	< 0.0054 U	< 0.0963 U	< 0.0716 U	< 0.0066 U	0.159 J	< 8.54 U
trans-1,2-Dichloroethene	156-60-5	0.19	500	NL	< 1.27 U	< 0.0073 U	< 0.0060 U	< 0.641 U	< 0.0054 U	< 0.0066 U	< 0.0064 U	< 1.21 U	< 26.6 U	< 0.0049 U	< 6.62 U	< 0.0077 U	< 0.685 U	< 0.0060 U	< 0.0702 U	< 0.0074 U	< 0.0054 U	< 0.0963 U	< 0.0716 U	< 0.0066 U	< 0.139 U	< 8.54 U
Trichloroethene	79-01-6	0.47	200	NL	< 1.27 U	< 0.0073 U	< 0.0060 U	< 0.668 U	< 0.0056 U	< 0.0069 U	< 0.0067 U	< 1.21 U	< 26.6 U	< 0.0049 U	< 6.62 U	< 0.0077 U	< 0.685 U	< 0.0060 U	0.267	< 0.0074 U	< 0.0054 U	< 0.0963 U	< 0.0716 U	< 0.0066 U	< 0.139 U	< 8.54 U
Total VOCs	*CALC-VOC*	*NL*	*NL*	*NL*	*52.42*	*0.0786*	*ND*	*49.369*	*ND*	*ND*	*0.0168*	*131.741*	*870.9*	*0.0101*	*11.65*	*ND*	*18.329*	*ND*	*2.7112*	*0.0504*	*ND*	*5.704*	*ND*	*ND*	*1.222*	*67.49*
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)																										
2-Methylnaphthalene	91-57-6	NL	NL	NL	1.03 J	< 0.104 UJ	< 0.0918 U	0.511 J	< 0.931 UJ	< 0.197 UJ	< 0.197 U	6.61	909	0.0273 J	32.7	< 0.215 U	36.1	0.0211 J	< 7.86 U	< 0.205 U	< 0.192 U	2.54 J	0.197 J	0.0238 J	< 0.706 U	495
Acenaphthene	83-32-9	20	500	NL	0.111 J	< 0.104 U	< 0.0918 U	0.0323 J	< 0.931 U	< 0.197 U	< 0.197 U	0.905 J	410	< 0.26 U	23.6	0.0478 J	27.4	0.0190 J	< 7.86 U	0.0568 J	< 0.192 U	22.7 J	0.0569 J	< 0.193 U	12.5 J	238
Acenaphthylene	208-96-8	100	500	NL	< 0.128 U	< 0.104 U	< 0.0918 U	< 0.291 U	< 0.931 U	< 0.197 U	< 0.197 U	< 2.95 U	53 J	< 0.26 U	4.01 J	< 0.215 U	4.7 J	< 0.18 U	< 7.86 U	< 0.205 U	< 0.192 U	23.7 J	< 0.202 U	< 0.193 U	11.7 J	58.5
Anthracene	120-12-7	100	500	NL	0.122 J	< 0.104 U	< 0.0918 U	0.0323 J	< 0.931 U	< 0.197 U	< 0.197 U	0.536 J	181	< 0.26 U	10.7	0.102 J	12.5	< 0.18 U	1.65 J	< 0.205 U	< 0.192 U	42.3 J	< 0.202 U	< 0.193 U	34	189
Benzo(a)anthracene	56-55-3	1	5.6	NL	0.153	< 0.104 U	< 0.0918 U	0.0511 J	0.5 J	< 0.197 U	< 0.197 U	0.733 J	100 J	< 0.26 U	5.56 J	0.192 J	6.67 J	< 0.18 U	3.57 J	< 0.205 U	< 0.192 U	37.4 J	< 0.202 U	< 0.193 U	22.5	96.7
Benzo(a)pyrene	50-32-8	1	1	NL	0.132	< 0.104 U	< 0.0918 U	0.0446 J	0.564 J	< 0.197 U	< 0.197 U	0.661 J	74.1 J	< 0.26 U	3.84 J	0.16 J	4.7 J	< 0.18 U	3.7 J	< 0.205 U	< 0.192 U	49.1 J	< 0.202 U	< 0.193 U	22.3	81.2
Benzo(b)fluoranthene	205-99-2	1	5.6	NL	0.126 J	< 0.104 U	< 0.0918 U	< 0.291 U	0.455 J	< 0.197 U	< 0.197 U	< 2.95 U	38.3 J	< 0.26 U	< 9.69 U	0.113 J	< 9.74 U	< 0.18 U	< 7.86 U	< 0.205 U	< 0.192 U	27.3 J	< 0.202 U	< 0.193 U	10.8 J	35.6 J
Benzo(ghi)perylene	191-24-2	100	500	NL	0.0548 J	< 0.104 U	< 0.0918 U	< 0.291 U	0.308 J	< 0.197 U	< 0.197 U	0.435 J	24.3 J	< 0.26 U	1.31 J	0.0839 J	1.67 J	< 0.18 U	1.65 J	< 0.205 UJ	< 0.192 UJ	22.3 J	< 0.202 UJ	< 0.193 UJ	9.96 J	31.8 J
Benzo(k)fluoranthene	207-08-9	0.8	56	NL	0.106 J	< 0.104 U	< 0.0918 U	0.0411 J	0.459 J	< 0.197 U	< 0.197 U	0.441 J	36.3 J	< 0.26 U	2.8 J	0.165 J	3.3 J	< 0.18 U	4.14 J	< 0.205 U	< 0.192 U	26.6 J	< 0.202 U	< 0.193 U	8.32 J	37.9 J
Chrysene	218-01-9	1	56	NL	0.13	< 0.104 U	< 0.0918 U	0.0429 J	0.525 J	< 0.197 U	< 0.197 U	0.762 J	97.5 J	< 0.26 U	5.38 J	0.19 J	6.57 J	< 0.18 U	3.83 J	< 0.205 U	< 0.192 U	37.5 J	< 0.202 U	< 0.193 U	20.1	96.5
Dibenz(a,h)anthracene	53-70-3	0.33	0.56	NL	< 0.128 U	< 0.104 U	< 0.0918 U	< 0.291 U	< 0.931 U	< 0.197 U	< 0.197 U	< 2.95 U	< 122 U	< 0.26 U	< 9.69 U	0.0239 J	< 9.74 U	< 0.18 U	< 7.86 U	< 0.205 U	< 0.192 U	3.33 J	< 0.202 U	< 0.193 U	< 0.513 U	< 1.55 U
Fluoranthene	206-44-0	100	500	NL	0.479	< 0.104 U	< 0.0918 U	0.146 J	0.916 J	< 0.197 U	< 0.197 U	1.45 J	210	< 0.26 U	11.2	0.443	13	< 0.18 U	7.69 J	< 0.205 U	< 0.192 U	50.5 J	< 0.202 U	< 0.193 U	46.1	206
Fluorene	86-73-7	30	500	NL	0.121 J	< 0.104 U	< 0.0918 U	0.0405 J	< 0.931 U	< 0.197 U	< 0.197 U	0.661 J	290	< 0.26 U	15.6	0.0543 J	18	< 0.18 U	< 7.86 U	< 0.205 U	< 0.192 U	35.8 J	< 0.202 U	< 0.193 U	41.3	234
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	5.6	NL	0.0698 J	< 0.104 U	< 0.0918 U	< 0.291 U	0.325 J	< 0.197 U	< 0.197 U	0.381 J	22.3 J	< 0.26 U	1.23 J	0.0882 J	1.49 J	< 0.18 U	1.46 J	< 0.205 U	< 0.192 U	16.4 J	< 0.202 U	< 0.193 U	7.77 J	24.1 J
Naphthalene	91-20-3	12	500	NL	2.59	< 0.104 U	< 0.0918 U	0.723	< 0.931 U	< 0.197 U	< 0.197 U	30.1	1720	0.0951 J	54.1	0.0443 J	56.6	0.0525 J	< 7.86 U	0.227	< 0.192 U	6.06 J	1.14	0.0639 J	< 1.23 U	949
Phenanthrene	85-01-8	100	500	NL	0.512	< 0.104 U	< 0.0918 U	0.146 J	0.414 J	< 0.197 U	< 0.197 U	2.18 J	690	< 0.26 U	37.6	0.385	42.5	0.0200 J	5.57 J	< 0.205 U	< 0.192 U	90.9 J	< 0.202 U	< 0.193 U	4.09 J	518
Pyrene	129-00-0	100	500	NL	0.355	< 0.104 U	< 0.0918 U	0.107 J	0.892 J	< 0.197 U	< 0.197 U	1.9 J	287	< 0.26 U	15.8	0.37	18.7	< 0.18 U	8.21	< 0.205 U	< 0.192 U	116 J	< 0.202 U	< 0.193 U	77.4	330
Total PAHs	*CALC-PAH*	*NL*	*NL*	*500*	*6.0916*	*ND*	*ND*	*1.9178*	*5.358*	*ND*	*ND*	*47.755*	*5142.8*	*0.1224*	*225.43*	*2.4624*	*253.9*	*0.1126*	*41.47*	*0.2838*	*ND*	*610.43*	*1.3939*	*0.0877*	*328.84*	*3621.3*
Other Semivolatile Organic Compounds (SVOCs) (mg/Kg)																										
1,1'-Biphenyl	92-52-4	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1-Methylnaphthalene	90-12-0	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	4.94	606	< 0.26	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Acetophenone	98-86-2	NL	500	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Benzaldehyde	100-52-7	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
bis(2-Ethylhexyl) phthalate	117-81-7	NL	NL	NL	< 0.256 U	< 0.208 U	< 0.184 U	< 0.581 U	< 1.86 U	< 0.393 U	< 0.395 U	< 5.9 U	< 243 U	< 0.52 U	< 19.4 U	< 0.43 U	< 19.5 U	< 0.361 U	< 15.7 U	< 0.41 U	< 0.384 U	R	< 0.405 U	< 0.386 U	< 6.13 U	< 18.6 U
Carbazole	86-74-8	NL	NL	NL	0.109 J	< 0.208 U	< 0.184 U	< 0.581 UJ	< 1.86 UJ	< 0.393 UJ	< 0.395 U	< 5.9 U	< 243 U	< 0.52 U	< 19.4 U	0.0374 J	< 19.5 U	< 0.361 U	< 15.7 U	< 0.41 U	< 0.384 U	R	< 0.405 U	< 0.386 U	< 1.16 U	< 3.51 U
Dibenzofuran	132-64-9	7	350	NL	0.0672 J	< 0.208 U	< 0.184 U	< 0.581 U	< 1.86 U	< 0.393 U	< 0.395 U	< 5.9 U	24.5 J	< 0.52 U	1.57 J	0.0243 J	1.89 J	< 0.361 U	< 15.7 U	< 0.41 U	< 0.384 U	R	< 0.405 U	< 0.386 U	< 0.387 U	< 1.17 U
Phenol	108-95-2	0.33	500	NL	< 0.256 U	< 0.208 U	< 0.184 U	< 0.581 U	R	< 0.393 U	< 0.395 U	< 5.9 U	< 243 U	< 0.52 U	< 19.4 U	< 0.43 U	< 19.5 U	< 0.361 U	< 15.7 U	< 0.41 U	< 0.384 U	< 48.4 U	< 0.405 U	< 0.386 U	< 0.645 U	< 1.95 U
Tentatively Identified Compounds	TICS	NL	NL	NL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other SVOCs	*CALC-SVOC*	*NL*	*NL*	*NL*	*6.2678*	*ND*	*ND*	*1.9178*	*5.358*	*ND*	*ND*	*47.755*	*5167.3*	*0.1224*	*227*	*2.5241*	*255.79*	*0.1126*	*41.47*	*0.2838*	*ND*	*610.43*	*1.3939*	*0.0877*	*328.84*	*3621.3*

Notes:
mg/Kg - milligrams per kilogram
J = The associated numerical value is an estimated quantity.
R = The associated data is rejected.
U = The analyte was analyzed for but not detected at, or above, the Method Detection
UJ = The analyte was not detected at or above the PQL. However, the reported PQL
Bold indicates the analyte detected at a concentration greater than the MDL.
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Unrestricted Use Soil Cleanup Objective
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Commercial Use Soil Cleanup Objective Commercial value.
Green highlight indicates result is above the NYSDEC CP-51 Alternate Criteria of 500 mg/Kg for Total PAHs.
NA = Not Analyzed
ND = Not Detected
NL = Not Listed

Table 2-2
Remedial Investigation Soil Sample Exceedances Continued
Former Metropolitan MGP, Brooklyn, New York

Sample Location	CAS Number	NYSDEC PART 375-6 Unrestricted	NYSDEC Part 375-6 Commercial	CP-51	SB-01	SB-01	SB-01	SB-01	SB-02	SB-02	SB-02	SB-03	SB-03	SB-03	SB-04 DUP	SB-04	SB-04	SB-04	SB-05	SB-05	SB-05	SB-06	SB-06	SB-06	SB-07	SB-07
Sample Date					4/5/2010	4/5/2010	4/5/2010	4/8/2010	4/8/2010	4/9/2010	4/9/2010	4/13/2010	4/13/2010	4/13/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/21/2010	4/22/2010	4/22/2010	4/20/2010	4/20/2010	4/21/2010	4/28/2010	4/28/2010
Sample Interval (feet)					4-5	40-45	71-72	5-7	1-2	40-45	71-72	4-5	30-35	59-60	32-34	4-5	32-34	58-60	4-5	39-40	70-72	4-5	26-28	49-50	4-5	10-12
Inorganic Compounds (mg/Kg)																										
Aluminum	7429-90-5	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2880 J	2500 J	2440 J	6210 J	3300 J	2200 J	NS	NS
Antimony	7440-36-0	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 5.98 U	< 5.72 U	< 5.12 U	0.979 J	< 5.31 U	< 5.78 U	NS	NS
Arsenic	7440-38-2	13	16	NL	4.77 J	4.29 J	3.33 J	< 4.64 U	5.45	< 5.10 UJ	< 4.83 U	1.62 J	2.82 J	66.8	1.02 J	4.22	0.850 J	4.19	8.41	2.33	8.17	7.5	4.4	0.885 J	24.2	5.73
Barium	7440-39-3	350	400	NL	37.3 J	37.2 J	58.3 J	33.5	62.8	15.9	20.1	18.7	17	11.9	23.9 J	148 J	22.3 J	50.1 J	82.9 J	11.8 J	21.8 J	134 J	10.1 J	19.9 J	45.4 J	34.0 J
Beryllium	7440-41-7	7.2	590	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.871	< 0.572 U	< 0.512 U	< 0.671 U	< 0.531 U	< 0.578 U	NS	NS
Cadmium	7440-43-9	2.5	9.3	NL	0.508 J	0.715	0.318 J	0.227 J	0.724	0.142 J	0.193 J	0.349 J	0.319 J	0.765	0.285 J	0.325 J	0.259 J	0.632	0.380 J	0.158 J	0.423 J	1.3	0.191 J	0.160 J	0.67	0.534 J
Calcium	7440-70-2	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	8300 J	330 J	777 J	54900 J	382 J	2570 J	NS	NS
Chromium	7440-47-3	30	1500	NL	16.2 J	16.4 J	11.7 J	14.3 J	26.8 J	6.66 J	7.36 J	7.18	6.74	17.7	7.99	6.66	7.24	9.38	7.39	6.01	9.78	9.7	6.66	4.65	11.1 J	8.62 J
Cobalt	7440-48-4	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.97	3.36	3.35	6.82	2.23	2.2	NS	NS
Copper	7440-50-8	50	270	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	39	4.92	6.38	52.5	2.96	6.13	NS	NS
Iron	7439-89-6	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	10200 J	6010 J	17700 J	16500 J	7670 J	6010 J	NS	NS
Lead	7439-92-1	63	1000	NL	17.2	6.22	5.96	12.9	114	2.35	3.95	20.9 J	2.86 J	3.62 J	4.59	264	4.27	3.41	34.1	3.31	2.84	333	2.19	2.83	241 J	123 J
Magnesium	7439-95-4	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1580	1270	1460	3000	1370	1810	NS	NS
Manganese	7439-96-5	1600	10000	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	119	50.4	210	205	54.8	85.2	NS	NS
Mercury	7439-97-6	0.18	2.8	NL	0.0536	0.0071 J	< 0.0328 U	0.0243 J	0.558	< 0.0339 U	0.0058 J	0.272	< 0.0336 U	0.0050 J	< 0.0340 UJ	0.776	< 0.0342 UJ	0.0076 J	0.167	< 0.0361 U	0.0053 J	0.614	< 0.0328 U	< 0.0338 U	0.688 J	0.442 J
Nickel	7440-02-0	30	310	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	12.1 J	9.69 J	6.79 J	20.9 J	5.95 J	4.80 J	NS	NS
Potassium	7440-09-7	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	482	441	429	871	523	369	NS	NS
Selenium	7782-49-2	3.9	1500	NL	< 1.64 U	< 1.87 U	< 1.56 U	< 1.55 U	0.355 J	< 1.70 U	< 1.61 U	< 1.56 U	< 1.68 U	< 1.50 U	0.282 J	0.641 J	0.376 J	0.826 J	0.532 J	0.320 J	0.675 J	2.76	0.393 J	< 1.73 U	2.99 J	2.24 J
Silver	7440-22-4	2	1500	NL	0.508 J	< 1.87 U	0.396 J	< 1.55 U	< 1.42 U	< 1.70 U	< 1.61 U	0.416 J	< 1.68 U	< 1.50 U	< 1.63 UJ	< 1.78 UJ	< 1.55 UJ	< 1.68 UJ	< 1.79 U	< 1.72 U	< 1.53 U	< 2.01 U	< 1.59 U	< 1.73 U	< 1.65 U	< 1.91 U
Sodium	7440-23-5	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	168	49.7	76.4	633	322	132	NS	NS
Thallium	7440-28-0	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 3.59 U	< 3.43 U	< 3.07 U	< 4.02 U	< 3.18 U	< 3.47 U	NS	NS
Vanadium	7440-62-2	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	8.23	11.8	14.4	26.5	7.26	7.75	NS	NS
Zinc	7440-66-6	109	10000	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	69.8	15.2	16.4	136	14.4	12.9	NS	NS
Cyanide, Free	57-12-5-Free	NL	NL	NL	< 1.20 U	< 1.18 U	< 1.08 U	< 1.05 U	< 1.19 U	< 1.07 U	< 1.14 U	< 1.05 U	0.395 J	< 1.12 U	< 1.28 U	< 1.31 U	< 1.08 U	< 1.05 U	< 1.15 U	< 1.32 U	< 1.03 U	0.939 J	< 1.12 U	< 1.19 U	< 2.07 UJ	7.36 J
Total Cyanide	57-12-5	27	27	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Available cyanide	57-12-5-A	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PCBs (mg/Kg)																										
Aroclor 1254	11097-69-1	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.0240 U	< 0.0245 U	< 0.0229 U	< 0.0273 U	< 0.0229 U	< 0.0238 U	NS	NS
PCB (Total) (ppm)	*CALC-PCBs*	*0.1*	*1*	*NL*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*< 0.0240*	*< 0.0245*	*< 0.0229*	*< 0.0273*	*< 0.0229*	*< 0.0238*	*NS*	*NS*
Pesticides (mg/Kg)																										
Pesticides					NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	NS	NS
Herbicides (mg/Kg)																										
2,4,5-TP (Silvex)	93-72-1	3.8	500	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.00800 U	< 0.00800 U	< 0.00767 U	< 0.00976 U	< 0.00796 U	< 0.00750 U	NS	NS
2,4-D	94-75-7	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.00800 U	< 0.00800 U	< 0.00767 U	< 0.00976 U	< 0.00796 U	< 0.00750 U	NS	NS
2,4-DB	94-82-6	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.00800 U	< 0.00800 U	< 0.00767 U	< 0.00976 U	< 0.00796 U	< 0.00750 U	NS	NS
T,2,4,5-	93-76-5	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.00800 U	< 0.00800 U	< 0.00767 U	< 0.00976 U	< 0.00796 U	< 0.00750 U	NS	NS
Percent Solids/Moisture																										
Moisture, percent	MOIST	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Percent Solids	SOLIDS	NL	NL	NL	86.4	77.7	89	84.7	88.3	82.3	83.1	91.2	84.6	89.7	84.1	76.5	83.8	88.6	83.1	78.6	85.5	67.2	81.4	84	77.4	73

Notes:
mg/Kg - milligrams per kilogram
J = The associated numerical value is an estimated quantity.
R = The associated data is rejected.
U = The analyte was analyzed for but not detected at, or above, the Method Detection
UJ = The analyte was not detected at or above the PQL. However, the reported PQL
Bold indicates the analyte detected at a concentration greater than the MDL.
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Unrestricted Use Soil Cleanup Objective
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Commercial Use Soil Cleanup Objective Commercial value.
Green highlight indicates result is above the NYSDEC CP-51 Alternate Criteria of 500 mg/Kg for Total PAHs.
NA = Not Analyzed
ND = Not Detected
NL = Not Listed

Table 2-2
Remedial Investigation Soil Sample Exceedances Continued
Former Metropolitan MGP, Brooklyn, New York

Sample Location / Sample Date / Sample Interval (feet)	CAS Number	NYSDEC PART 375-6 Unrestricted	NYSDEC Part 375-6 Commercial	CP-51	SB-07 4/29/2010 37-40	SB-07 4/29/2010 48-50	SB-08 5/5/2010 3-4	SB-08 5/5/2010 34-35	SB-08 5/5/2010 48-50	SB-09 9/14/2010 4.5-5	SB-09 9/15/2010 40-45	SB-09 9/15/2010 55-60	SB-09 9/16/2010 75-80	SB-10 4/15/2010 4-5	SB-10 4/15/2010 35-40	SB-10 4/15/2010 49-50	SB-11 4/19/2010 4-5	SB-11 4/19/2010 30-33	SB-11 4/19/2010 59-60	SB-12 4/12/2010 2-3.5	SB-12 4/12/2010 30-35	SB-12 4/12/2010 49-50	SB-13 4/14/2010 4-5	SB-13 4/14/2010 35-40	SB-13 4/15/2010 69-70	SB-14 4/1/2010 4-5
BTEX (mg/Kg)																										
Benzene	71-43-2	0.06	44	NL	< 0.0083 U	< 0.0066 U	< 3.17 U	**21.5**	**0.0166**	< 0.0054 U	**1.1**	< 0.011 U	< 0.0051 U	< 0.0052 U	**0.0371**	< 0.0058 U	**2.12**	**0.164**	**0.181**	**0.0150 J**	**0.163**	**0.0157**	**6.93 J**	**311**	< 0.0045 U	< 0.38 U
Ethylbenzene	100-41-4	1	390	NL	< 0.0083 U	< 0.0066 U	< 3.17 U	**2.36**	< 0.0078 U	< 0.0054 U	**34**	**0.0046 J**	< 0.0051 U	< 0.0052 U	**0.066**	< 0.0058 U	**4.05**	< 0.0761 U	< 0.0065 U	**0.0070 J**	**1.18**	**0.0313**	NS	**206**	< 0.0045 U	**1.33**
m+p-Xylene	1330-20-7-M,P	NL	NL	NL	< 0.0165 U	< 0.0132 U	< 6.34 U	**0.676**	< 0.0157 U	**0.0031 J**	**37**	< 0.011 U	< 0.0051 U	< 0.0105 U	**0.0087 J**	< 0.0116 U	**2.96 J**	< 0.152 UJ	< 0.0130 U	**0.0235 J**	**0.884 J**	**0.122**	**108 J**	**360 J**	< 0.0090 U	**1.8 J**
o-Xylene	95-47-6	NL	NL	NL	< 0.0083 U	< 0.0066 U	< 3.17 U	**0.36**	< 0.0078 U	**0.0017 J**	**18 J**	**0.0025 J**	< 0.0051 U	< 0.0052 U	**0.0143**	< 0.0058 U	**1.39 J**	< 0.0761 UJ	< 0.0065 U	**0.0150 J**	**0.475 J**	**0.0734**	**49.6 J**	**161 J**	< 0.0045 U	**0.859 J**
Toluene	108-88-3	0.7	500	NL	< 0.0083 U	< 0.0066 U	< 3.17 U	< 0.0745 U	< 0.0078 U	**0.0018 J**	**0.95**	< 0.011 U	< 0.0051 U	< 0.0052 U	**0.0096**	< 0.0058 U	**0.287**	< 0.0761 U	< 0.0065 U	**0.0801 J**	**0.357**	**0.167**	**10.8**	**601**	< 0.0045 U	< 0.38 U
Total Xylenes	Calc-Xylenes	NL	500	NL	< 0.0083	< 0.0066	< 6.34	**1.036**	< 0.0078	**0.0048 J**	**56**	**0.0050 J**	< 0.0051 U	< 0.0052	**0.023**	< 0.0058	**4.35**	< 0.0761	< 0.0065	**0.0385**	**1.359**	**0.1954**	**157.6**	**521**	< 0.0090	**2.659**
Total BTEX	*CALC-BTEX*	*NL*	*NL*	*NL*	***ND***	***ND***	***ND***	***24.896***	***0.0166***	***0.0066***	***92.05***	***0.0096***	***ND***	***ND***	***0.1357***	***ND***	***10.807***	***0.164***	***0.181***	***0.1406***	***3.059***	***0.4094***	***175.33***	***1639***	***ND***	***3.989***
Volatile Organic Compounds (VOCs)(mg/Kg)																										
1,1,1-Trichloroethane	71-55-6	0.68	500	NL	< 0.0083 U	< 0.0066 U	< 3.17 UJ	< 0.0745 UJ	< 0.0078 U	< 0.0054 U	< 0.049 U	< 0.011 U	< 0.0051 U	< 0.0052 U	< 0.0050 U	< 0.0058 U	< 0.0631 U	< 0.0761 U	< 0.0065 U	< 0.0077 U	< 0.131 U	< 0.0065 U	< 7.29 U	< 6.43 U	< 0.0045 U	< 0.38 U
1,1-Dichloroethane	75-34-3	0.27	240	NL	< 0.0083 U	< 0.0066 U	< 3.17 U	< 0.0745 U	< 0.0078 U	< 0.0054 U	< 0.049 U	< 0.011 U	< 0.0051 U	< 0.0052 U	< 0.0050 U	< 0.0058 U	< 0.0631 U	< 0.0761 U	< 0.0065 U	< 0.0077 U	< 0.131 U	< 0.0065 U	< 7.29 U	< 6.43 U	< 0.0045 U	< 0.38 U
1,2,4-Trimethylbenzene	95-63-6	3.6	190	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.0077	**0.649**	**0.023**	NS	NS	NS	NS
1,2-Dichlorobenzene	95-50-1	1.1	500	NL	< 0.0083 U	< 0.0066 U	< 3.17 U	< 0.0745 U	< 0.0078 U	< 0.0054 U	< 0.049 U	< 0.011 U	< 0.0051 U	< 0.0052 U	< 0.0050 U	< 0.0058 U	< 0.0631 U	< 0.0761 U	< 0.0065 U	< 0.0077 U	< 0.131 U	< 0.0065 U	< 7.29 U	< 6.43 U	< 0.0045 U	< 0.38 U
1,2-Dichloroethane	107-06-2	0.02	30	NL	< 0.0083 U	< 0.0066 U	< 3.17 U	< 0.0745 U	< 0.0078 U	< 0.0054 U	**0.027 J**	< 0.011 U	< 0.0051 U	< 0.0052 U	< 0.0050 U	< 0.0058 U	< 0.0631 U	< 0.0761 U	< 0.0065 U	< 0.0077 U	< 0.131 U	< 0.0065 U	< 7.29 U	< 6.43 U	< 0.0045 U	< 0.38 U
1,3,5-Trimethylbenzene	108-67-8	8.4	190	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.0077	**0.228**	**0.0079**	NS	NS	NS	NS
1,4-Dichlorobenzene	106-46-7	1.8	130	NL	< 0.0083 U	< 0.0066 U	< 3.17 U	< 0.0745 U	< 0.0078 U	< 0.0054 U	< 0.049 U	< 0.011 U	< 0.0051 U	< 0.0052 U	< 0.0050 U	< 0.0058 U	< 0.0631 U	< 0.0761 U	< 0.0065 U	< 0.0077 U	< 0.131 U	< 0.0065 U	< 7.29 U	< 6.43 U	< 0.0045 U	< 0.38 U
Acetone	67-64-1	0.05	500	NL	R	R	R	R	R	R	**0.023 J**	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Carbon disulfide	75-15-0	NL	NL	NL	< 0.0165 U	< 0.0132 U	< 6.34 U	< 0.149 U	< 0.0157 U	< 0.0054 U	< 0.049 U	< 0.011 U	< 0.0051 U	< 0.0105 U	< 0.0101 U	< 0.0116 U	< 0.126 UJ	< 0.152 UJ	< 0.0130 U	< 0.0153 U	< 0.262 UJ	< 0.0130 U	< 14.6 UJ	< 12.9 UJ	< 0.0090 U	< 0.761 UJ
cis-1,2-Dichloroethene	156-59-2	0.25	500	NL	**0.0127**	< 0.0066 U	< 3.17 U	< 0.0745 U	< 0.0078 U	< 0.0054 U	< 0.049 U	< 0.011 U	< 0.0051 U	< 0.0052 U	< 0.0050 U	< 0.0058 U	< 0.0631 U	< 0.0761 U	< 0.0065 U	< 0.0077 U	< 0.131 U	< 0.0065 U	< 7.29 U	< 6.43 U	< 0.0045 U	< 0.38 U
Cyclohexane	110-82-7	NL	NL	NL	NS	NS	NS	NS	NS	< 0.0054 U	< 0.049 U	< 0.011 U	< 0.0051 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Isopropylbenzene	98-82-8	NL	NL	NL	< 0.0083 U	< 0.0066 U	< 3.17 U	< 0.0745 U	< 0.0078 U	< 0.0054 U	**1.8**	< 0.011 U	< 0.0051 U	< 0.0052 U	**0.0086**	< 0.0058 U	**2.98**	< 0.0761 UJ	< 0.0065 U	< 0.0077 U	**0.136 J**	< 0.0065 U	**25.5 J**	**5.78 J**	< 0.0045 U	**0.749**
Methylcyclohexane	108-87-2	NL	NL	NL	NS	NS	NS	NS	NS	< 0.0054 U	< 0.049 U	< 0.011 U	< 0.0051 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Methylene chloride	75-09-2	0.05	500	NL	< 0.0165 U	< 0.0132 U	< 6.34 U	< 0.149 U	< 0.0157 U	< 0.0054 U	< 0.049 U	< 0.011 U	< 0.0051 U	< 0.0105 U	< 0.0101 U	< 0.0116 U	< 0.126 UJ	< 0.152 U	< 0.0130 U	< 0.0153 U	< 0.262 U	< 0.0130 U	< 14.6 U	< 12.9 UJ	< 0.0090 U	< 0.761 U
n-Butylbenzene	104-51-8	12	500	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.0077	**0.123**	< 0.0065	NS	NS	NS	NS
n-Propylbenzene	103-65-1	3.9	500	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.0077	**0.144**	< 0.0065	NS	NS	NS	NS
p-Isopropyltoluene	99-87-6	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.0077	**0.434**	< 0.0065	NS	NS	NS	NS
sec-Butylbenzene	135-98-8	11	500	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.0077	< 0.131	< 0.0065	NS	NS	NS	NS
Styrene	100-42-5	NL	NL	NL	< 0.0083 U	< 0.0066 U	< 3.17 U	< 0.0745 U	< 0.0078 U	< 0.0054 U	**0.62**	< 0.011 U	< 0.0051 U	< 0.0052 U	< 0.0050 U	< 0.0058 U	**0.0568 J**	< 0.0761 UJ	< 0.0065 U	**0.0282 J**	**0.553 J**	**0.0859**	< 7.29 UJ	**288 J**	< 0.0045 U	**0.373 J**
Tentatively Identified Compounds	TICS	NL	NL	NL	**0**	**0**	**0**	**0**	**0**	NS	NS	NS	NS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Tetrachloroethene	127-18-4	1.3	150	NL	< 0.0083 U	< 0.0066 U	< 3.17 U	< 0.0745 U	< 0.0078 U	**0.0012 J**	< 0.049 U	< 0.011 U	< 0.0051 U	< 0.0052 U	< 0.0050 U	< 0.0058 U	< 0.0631 U	< 0.0761 U	< 0.0065 U	< 0.0077 U	< 0.131 U	< 0.0065 U	< 7.29 U	< 6.43 U	< 0.0045 U	< 0.38 U
trans-1,2-Dichloroethene	156-60-5	0.19	500	NL	< 0.0083 U	< 0.0066 U	< 3.17 U	< 0.0745 U	< 0.0078 U	< 0.0054 U	< 0.049 U	< 0.011 U	< 0.0051 U	< 0.0052 U	< 0.0050 U	< 0.0058 U	< 0.0631 U	< 0.0761 U	< 0.0065 U	< 0.0077 U	< 0.131 U	< 0.0065 U	< 7.29 U	< 6.43 U	< 0.0045 U	< 0.38 U
Trichloroethene	79-01-6	0.47	200	NL	**0.0291**	< 0.0066 U	< 3.17 U	< 0.0745 U	< 0.0078 U	< 0.0054 U	< 0.049 U	< 0.011 U	< 0.0051 U	< 0.0052 U	< 0.0050 U	< 0.0058 U	< 0.0631 U	< 0.0761 U	< 0.0065 U	< 0.0077 U	< 0.131 U	< 0.0065 U	< 7.29 U	< 6.43 U	< 0.0045 U	< 0.38 U
Total VOCs	*CALC-VOC*	*NL*	*NL*	*NL*	***0.0418***	***ND***	***ND***	***24.896***	***0.0166***	***0.0078***	***94.52***	***0.0096***	***ND***	***ND***	***0.1443***	***ND***	***13.8438***	***0.164***	***0.181***	***0.1688***	***5.326***	***0.5262***	***200.83***	***1932.78***	***ND***	***5.111***
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)																										
2-Methylnaphthalene	91-57-6	NL	NL	NL	< 0.0113 U	**0.0334 J**	**50.6**	< 0.0120 U	< 0.0114 U	**4.7**	**130**	**0.15 J**	< 0.19 U	**0.142 J**	**0.0231 J**	**0.0387 J**	**4.73**	**0.0208 J**	< 0.204 U	**0.176 J**	**4.59**	< 0.195 U	**18.6**	**2490**	**0.0255 J**	**6.68**
Acenaphthene	83-32-9	20	500	NL	< 0.0123 U	< 0.0107 U	**30.1**	< 0.0131 U	< 0.0125 U	< 1.8 U	< 0.19 U	**0.19 J**	< 0.19 U	**0.0867 J**	**0.0223 J**	< 0.208 U	**2.87**	< 0.202 U	< 0.204 U	**0.198 J**	**3.37**	< 0.195 U	< 13.1 U	< 507 U	< 0.185 U	< 3.26 U
Acenaphthylene	208-96-8	100	500	NL	< 0.0154 U	< 0.0134 U	**10.4**	< 0.0164 U	< 0.0156 U	**20**	**25**	**0.11 J**	< 0.19 U	**0.0742 J**	< 0.187 U	< 0.208 U	**3.92**	< 0.202 U	< 0.204 U	**0.0896 J**	**0.242 J**	< 0.195 U	< 13.1 U	**1050**	< 0.185 U	< 3.26 U
Anthracene	120-12-7	100	500	NL	< 0.0154 U	< 0.0134 U	**19.1**	< 0.0164 U	< 0.0156 U	**9.1**	**39**	**0.14 J**	< 0.19 U	**0.195 J**	< 0.187 U	< 0.208 U	**4.62**	< 0.202 U	< 0.204 U	**0.275 J**	**1.99**	< 0.195 U	< 13.1 U	**430 J**	< 0.185 U	< 3.26 U
Benzo(a)anthracene	56-55-3	1	5.6	NL	< 0.0329 U	< 0.0285 U	**22.6**	< 0.0350 U	< 0.0332 U	**5.5**	**20**	**0.081 J**	< 0.19 U	**0.403**	< 0.187 U	< 0.208 U	**6.41**	< 0.202 U	< 0.204 U	**0.46**	**1.25 J**	< 0.195 U	< 13.1 U	**233 J**	< 0.185 U	< 3.26 U
Benzo(a)pyrene	50-32-8	1	1	NL	< 0.0174 U	< 0.0151 U	**21.4**	< 0.0186 U	< 0.0176 U	**9.6**	**16**	**0.063 J**	< 0.19 U	**0.402**	< 0.187 U	< 0.208 U	**6.11**	< 0.202 U	< 0.204 U	**0.432 J**	**0.752 J**	< 0.195 U	< 13.1 U	**192 J**	< 0.185 U	< 3.26 U
Benzo(b)fluoranthene	205-99-2	1	5.6	NL	< 0.0679 U	< 0.0588 U	**13.4**	< 0.0723 U	< 0.0686 U	**8**	**12 J**	**0.049 J**	< 0.19 U	**0.362 J**	< 0.187 U	< 0.208 U	**4.47**	< 0.202 U	< 0.204 U	**0.373 J**	**0.375 J**	< 0.195 U	< 13.1 U	< 507 U	< 0.185 U	< 3.26 U
Benzo(ghi)perylene	191-24-2	100	500	NL	< 0.0144 UJ	< 0.0124 UJ	**6.07**	< 0.0153 U	< 0.0145 U	**15**	**6.4 J**	**0.032 J**	< 0.19 U	**0.225 J**	< 0.187 U	< 0.208 U	**2.63**	< 0.202 UJ	< 0.204 UJ	**0.136 J**	**0.217 J**	< 0.195 U	< 13.1 U	< 507 U	< 0.185 U	< 3.26 U
Benzo(k)fluoranthene	207-08-9	0.8	56	NL	< 0.0205 U	< 0.0178 U	**17.6**	< 0.0219 U	< 0.0207 U	**4.2**	**6.1 J**	**0.027 J**	< 0.19 U	**0.279 J**	< 0.187 U	< 0.208 U	**2.84**	< 0.202 U	< 0.204 U	**0.269 J**	**0.375 J**	< 0.195 U	< 13.1 U	**91.2 J**	< 0.185 U	< 3.26 U
Chrysene	218-01-9	1	56	NL	< 0.00726 U	< 0.00629 U	**21.8**	< 0.00772 U	< 0.00733 U	**6.5**	**19**	**0.074 J**	< 0.19 U	**0.405**	< 0.187 U	< 0.208 U	**5.87**	< 0.202 U	< 0.204 U	**0.54**	**1.27 J**	< 0.195 U	**1.35 J**	**235 J**	< 0.185 U	< 3.26 U
Dibenz(a,h)anthracene	53-70-3	0.33	0.56	NL	< 0.00818 U	< 0.00709 U	**1.72 J**	< 0.00871 U	< 0.00827 U	**4.1**	**2.3**	< 0.19 U	< 0.19 U	**0.0633 J**	< 0.187 U	< 0.208 U	**0.835 J**	< 0.202 U	< 0.204 U	< 0.452 U	< 1.34 U	< 0.195 U	< 13.1 U	< 507 U	< 0.185 U	< 3.26 U
Fluoranthene	206-44-0	100	500	NL	< 0.0123 U	< 0.0107 U	**36.4**	< 0.0131 U	< 0.0125 U	**4.2**	**42**	**0.15 J**	< 0.19 U	**0.982**	< 0.187 U	< 0.208 U	**11**	< 0.202 U	< 0.204 U	**0.801**	**2.04**	< 0.195 U	**2.55 J**	**532**	< 0.185 U	< 3.26 U
Fluorene	86-73-7	30	500	NL	< 0.0123 U	< 0.0107 U	**23.2**	< 0.0131 U	< 0.0125 U	**5.5**	**44**	**0.16 J**	< 0.19 U	**0.127 J**	< 0.187 U	< 0.208 U	**6.4**	< 0.202 U	< 0.204 U	**0.239 J**	**2.51**	< 0.195 U	< 13.1 U	**715**	< 0.185 U	< 3.26 U
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	5.6	NL	< 0.0236 U	< 0.0205 U	**6.51**	< 0.0251 U	< 0.0239 U	**8.7**	**5.2 J**	**0.023 J**	< 0.19 U	**0.249 J**	< 0.187 U	< 0.208 U	**2.42**	< 0.202 U	< 0.204 U	**0.146 J**	**0.198 J**	< 0.195 U	< 13.1 U	< 507 U	< 0.185 U	< 3.26 U
Naphthalene	91-20-3	12	500	NL	< 0.0196 U	< 0.0170 U	**83.6 J**	< 0.0209 U	< 0.0198 U	**1.2 J**	**180**	**0.37**	< 0.19 U	**0.332 J**	**0.146 J**	**0.0914 J**	**5.5**	**0.11 J**	< 0.204 U	**0.151 J**	**3.09**	< 0.195 U	**112**	**5730**	**0.0872 J**	**61**
Phenanthrene	85-01-8	100	500	NL	< 0.0236 U	**0.0432 J**	**61.6**	< 0.0251 U	**0.0286 J**	**2.2**	**120**	**0.45**	< 0.19 U	**0.755**	< 0.187 U	**0.0253 J**	**18.2**	**0.0216 J**	< 0.204 U	**0.974**	**6.61**	< 0.195 U	**3.4 J**	**1700**	**0.0243 J**	< 3.26 U
Pyrene	129-00-0	100	500	NL	< 0.0361 U	< 0.0313 U	**46.5**	< 0.0384 U	< 0.0365 U	**11**	**51**	**0.21**	< 0.19 U	**0.829**	< 0.187 U	< 0.208 U	**16.6**	< 0.202 U	< 0.204 U	**0.992**	**2.76**	< 0.195 U	**2.36 J**	**708**	< 0.185 U	< 3.26 U
Total PAHs	*CALC-PAH*	*NL*	*NL*	*500*	***ND***	***0.0766***	***472.6***	***ND***	***0.0286***	***119.5***	***718***	***2.279***	***ND***	***5.9112***	***0.1914***	***0.1554***	***105.425***	***0.1524***	***ND***	***6.2516***	***31.639***	***ND***	***140.26***	***14106.2***	***0.137***	***67.68***
Other Semivolatile Organic Compounds (SVOCs) (mg/Kg)																										
1,1'-Biphenyl	92-52-4	NL	NL	NL	NS	NS	NS	NS	NS	< 1.8 U	**15 J**	**0.04 J**	< 0.19 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1-Methylnaphthalene	90-12-0	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.25**	**3.5**	< 0.195	NS	NS	NS	NS
Acetophenone	98-86-2	NL	500	NL	NS	NS	NS	NS	NS	**0.37 J**	< 0.19 U	< 0.19 U	< 0.19 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Benzaldehyde	100-52-7	NL	NL	NL	NS	NS	NS	NS	NS	**1.2 J**	< 0.19 UJ	< 0.19 UJ	< 0.19 UJ	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
bis(2-Ethylhexyl) phthalate	117-81-7	NL	NL	NL	< 0.0979 U	< 0.0848 U	< 1.69 U	< 0.104 U	< 0.0989 U	< 1.8 U	< 0.19 UJ	< 0.19 U	< 0.19 U	< 0.773 U	< 0.374 U	< 0.417 U	< 3.55 U	< 0.404 U	< 0.408 U	< 0.905 U	< 2.69 U	< 0.39 U	< 26.3 U	< 1010 U	< 0.371 U	< 6.52 U
Carbazole	86-74-8	NL	NL	NL	< 0.0185 U	< 0.0160 U	**0.783 J**	< 0.0197 U	< 0.0187 U	< 1.8 U	**2.8 J**	< 0.19 U	< 0.19 U	**0.0555 J**	< 0.374 U	< 0.417 U	< 3.55 U	< 0.404 U	< 0.408 U	< 0.905 U	< 2.69 U	< 0.39 U	< 26.3 U	< 1010 U	< 0.371 U	< 6.52 U
Dibenzofuran	132-64-9	7	350	NL	< 0.00617 U	< 0.00535 U	**2.43 J**	< 0.00657 U	< 0.00624 U	< 1.8 U	**3.1**	< 0.19 U	< 0.19 U	**0.0516 J**	< 0.374 U	< 0.417 U	**0.688 J**	< 0.404 U	< 0.408 U	< 0.905 U	**0.198 J**	< 0.39 U	< 26.3 U	**62.5 J**	< 0.371 U	< 6.52 U
Phenol	108-95-2	0.33	500	NL	< 0.0103 U	< 0.00892 U	< 0.178 U	< 0.0110 U	< 0.0104 U	< 1.8 U	**0.025 J**	< 0.19 U	< 0.19 U	< 0.773 U	< 0.374 U	< 0.417 U	< 3.55 U	< 0.404 U	< 0.408 U	< 0.905 U	< 2.69 U	< 0.39 U	< 26.3 U	< 1010 UJ	< 0.371 U	< 6.52 U
Tentatively Identified Compounds	TICS	NL	NL	NL	**0**	**0**	**0**	**0**	**0**	NS	NS	NS	NS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total Other SVOCs	*CALC-SVOC*	*NL*	*NL*	*NL*	***ND***	***0.0766***	***475.813***	***ND***	***0.0286***	***121.07***	***738.925***	***2.319***	***ND***	***6.0183***	***0.1914***	***0.1554***	***106.113***	***0.1524***	***ND***	***6.5016***	***35.337***	***ND***	***140.26***	***14168.7***	***0.137***	***67.68***

Notes:
mg/Kg - milligrams per kilogram
J = The associated numerical value is an estimated quantity.
R = The associated data is rejected.
U = The analyte was analyzed for but not detected at, or above, the Method Detection
UJ = The analyte was not detected at or above the PQL. However, the reported PQL
Bold indicates the analyte detected at a concentration greater than the MDL.
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Unrestricted Use Soil Cleanup Objective
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Commercial Use Soil Cleanup Objective Commercial va
Green highlight indicates result is above the NYSDEC CP-51 Alternate Criteria of 500 mg/Kg for Total PAHs.
NA = Not Analyzed
ND = Not Detected
NL = Not Listed

Table 2-2
Remedial Investigation Soil Sample Exceedances Continued
Former Metropolitan MGP, Brooklyn, New York

Sample Location Sample Date Sample Interval (feet)	CAS Number	NYSDEC PART 375-6 Unrestricted	NYSDEC Part 375-6 Commercial	CP-51	SB-07 4/29/2010 37-40	SB-07 4/29/2010 48-50	SB-08 5/5/2010 3-4	SB-08 5/5/2010 34-35	SB-08 5/5/2010 48-50	SB-09 9/14/2010 4.5-5	SB-09 9/15/2010 40-45	SB-09 9/15/2010 55-60	SB-09 9/16/2010 75-80	SB-10 4/15/2010 4-5	SB-10 4/15/2010 35-40	SB-10 4/15/2010 49-50	SB-11 4/19/2010 4-5	SB-11 4/19/2010 30-33	SB-11 4/19/2010 59-60	SB-12 4/12/2010 2-3.5	SB-12 4/12/2010 30-35	SB-12 4/12/2010 49-50	SB-13 4/14/2010 4-5	SB-13 4/14/2010 35-40	SB-13 4/15/2010 69-70	SB-14 4/1/2010 4-5
Inorganic Compounds (mg/Kg)																										
Aluminum	7429-90-5	NL	NL	NL	NS	NS	**4480 J**	**3400 J**	**2460 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	**2420 J**	NS	NS	NS	NS	NS	NS	**13600**
Antimony	7440-36-0	NL	NL	NL	NS	NS	**0.949 J**	< 6.35 UJ	< 5.57 UJ	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 5.33 U	NS	NS	NS	NS	NS	NS	< 5.46 U
Arsenic	7440-38-2	13	16	NL	**2.41**	**1.96**	**10.2**	**16.9**	**1.28 J**	**8.9**	**2.2**	**4.6**	**0.76**	**6.39**	**0.402 J**	**2.97**	**6.64**	**1.8**	**0.853 J**	**8.04**	**2.00 J**	**6.1**	**13**	**2.65**	**2.89**	**3.41**
Barium	7440-39-3	350	400	NL	**14.1 J**	**11.1 J**	**118 J**	**26.2 J**	**12.5 J**	**109**	**18.4**	**55.1**	**17.9**	**179 J**	**12.6 J**	**28.2 J**	**102 J**	**17.5 J**	**11.8 J**	**201**	**17.2**	**16.5**	**424**	**15.6**	**33.5**	**69.8**
Beryllium	7440-41-7	7.2	590	NL	NS	NS	**0.694**	**0.287 J**	**0.171 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.584**
Cadmium	7440-43-9	2.5	9.3	NL	**0.360 J**	**0.221 J**	**1.35**	**0.367 J**	**0.263 J**	**0.91**	**0.18**	**0.26**	**0.096 J**	**1.24**	**0.193 J**	**0.284 J**	**1.04**	**0.211 J**	**0.153 J**	**1.83**	**0.200 J**	**0.339 J**	**1.31**	**0.202 J**	**0.156 J**	**0.284 J**
Calcium	7440-70-2	NL	NL	NL	NS	NS	**10500 J**	**593 J**	**300 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**1570**
Chromium	7440-47-3	30	1500	NL	**9.51 J**	**5.57 J**	**13.0 J**	**7.88 J**	**4.65 J**	**21**	**6.9**	**11.1**	**5.6**	**38.9 J**	**6.62 J**	**6.81 J**	**19.0 J**	**5.73**	**4.5**	**95.7**	**11**	**7.14**	**27.8 J**	**6.89 J**	**12.4 J**	**16.3 J**
Cobalt	7440-48-4	NL	NL	NL	NS	NS	**5.81 J**	**12.5 J**	**3.57 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	**3.51**	NS	NS	NS	NS	NS	NS	**6.33 J**
Copper	7440-50-8	50	270	NL	NS	NS	**73.9**	**4.79**	**4.65**	NS	NS	NS	NS	NS	NS	NS	NS	NS	**4.12**	NS	NS	NS	NS	NS	NS	**12.1**
Iron	7439-89-6	NL	NL	NL	NS	NS	**14000 J**	**9390 J**	**6860 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	**5900 J**	NS	NS	NS	NS	NS	NS	**13700**
Lead	7439-92-1	63	1000	NL	**6.16 J**	**2.63 J**	**454 J**	**3.52 J**	**2.90 J**	**268**	**4.2**	**3**	**2.9**	**354 J**	**3.69 J**	**3.37 J**	**159 J**	**2.69**	**2.84**	**383 J**	**3.91 J**	**4.48 J**	**1230**	**4.19**	**3.19**	**42**
Magnesium	7439-95-4	NL	NL	NL	NS	NS	**3400 J**	**1210 J**	**1190 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**2850**
Manganese	7439-96-5	1600	10000	NL	NS	NS	**150 J**	**43.4 J**	**67.0 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	**59.2**	NS	NS	NS	NS	NS	NS	**258**
Mercury	7439-97-6	0.18	2.8	NL	**0.0107 J**	< 0.0367 U	**0.536 J**	**0.0084 J**	< 0.0334 U	**0.72**	**0.0032 J**	< 0.043 U	< 0.046 U	**0.428**	< 0.0343 U	< 0.0343 U	**0.276**	< 0.0332 U	**0.0088 J**	**0.358**	**0.0057 J**	< 0.0351 U	**0.61**	< 0.0342 U	< 0.0302 U	**0.271 J**
Nickel	7440-02-0	30	310	NL	NS	NS	**20.6 J**	**15.2 J**	**7.44 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	**6.44 J**	NS	NS	NS	NS	NS	NS	**21.5 J**
Potassium	7440-09-7	NL	NL	NL	NS	NS	**669 J**	**418 J**	**384 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	**370**	NS	NS	NS	NS	NS	NS	R
Selenium	7782-49-2	3.9	1500	NL	**0.440 J**	< 3.54 U	**1.12 J**	**0.533 J**	< 3.34 U	< 1.1 U	< 0.88 U	< 0.91 U	< 1.1 U	**2.07**	**0.318 J**	**0.330 J**	**1.33 J**	< 1.77 U	**0.293 J**	**0.468 J**	**0.331 J**	< 1.67 U	**0.907 J**	< 1.55 U	< 1.61 U	**3.54**
Silver	7440-22-4	2	1500	NL	< 1.78 U	< 1.77 U	< 1.68 U	< 1.90 U	< 1.67 U	**0.12 J**	< 0.88 U	< 0.91 U	< 1.1 U	< 3.04 U	< 2.98 U	< 3.73 U	< 3.50 U	< 1.77 U	< 1.60 U	**0.585 J**	< 1.46 U	< 1.67 U	**0.778 J**	< 1.55 U	**0.799 J**	< 1.64 U
Sodium	7440-23-5	NL	NL	NL	NS	NS	**1350 J**	**227 J**	**72.4 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	**30.5**	NS	NS	NS	NS	NS	NS	**555 J**
Thallium	7440-28-0	NL	NL	NL	NS	NS	< 3.37 U	< 3.81 U	< 3.34 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 3.20 U	NS	NS	NS	NS	NS	NS	< 3.28 U
Vanadium	7440-62-2	NL	NL	NL	NS	NS	**18.1**	**11**	**6.16**	NS	NS	NS	NS	NS	NS	NS	NS	NS	**4.63**	NS	NS	NS	NS	NS	NS	**21.2**
Zinc	7440-66-6	109	10000	NL	NS	NS	**332 J**	**23.2 J**	**17.9 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**46.6 J**
Cyanide, Free	57-12-5-Free	NL	NL	NL	< 1.28 UJ	< 1.13 UJ	< 1.15 U	< 1.28 U	< 1.23 U	NS	NS	NS	NS	< 1.06 U	< 1.10 U	< 1.20 U	**1.12 J**	< 1.18 U	< 1.05 U	< 1.38 U	< 1.13 U	< 1.17 U	**0.391 J**	< 1.14 U	< 1.08 U	< 1.21 U
Total Cyanide	57-12-5	27	27	NL	NS	NS	NS	NS	NS	**0.530 J**	< 0.227 U	< 0.216 U	< 0.237 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Available cyanide	57-12-5-A	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PCBs (mg/Kg)																										
Aroclor 1254	11097-69-1	NL	NL	NL	NS	NS	< 0.0134 U	< 0.0149 U	< 0.0145 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.0233 U
PCB (Total) (ppm)	***CALC-PCBs***	*0.1*	*1*	*NL*	*NS*	*NS*	*< 0.00967*	*< 0.00835*	*< 0.00988*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*< 0.0233*
Pesticides (mg/Kg)																										
Pesticides					NS	NS	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
Herbicides (mg/Kg)																										
2,4,5-TP (Silvex)	93-72-1	3.8	500	NL	NS	NS	< 0.00393 U	< 0.00429 U	< 0.00422 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.00789 U
2,4-D	94-75-7	NL	NL	NL	NS	NS	< 0.00425 U	< 0.00465 U	< 0.00456 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.00789 U
2,4-DB	94-82-6	NL	NL	NL	NS	NS	< 0.00598 U	< 0.00654 U	< 0.00642 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.00789 U
T,2,4,5-	93-76-5	NL	NL	NL	NS	NS	< 0.00567 U	< 0.00620 U	< 0.00609 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.00789 U
Percent Solids/Moisture																										
Moisture, percent	MOIST	NL	NL	NL	NS	NS	NS	NS	NS	**12**	**15**	**13**	**16**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Percent Solids	SOLIDS	NL	NL	NL	**74.1**	**80**	**86.1**	**76.4**	**80.5**	**88**	**85**	**87**	**84**	**84.6**	**85.7**	**78.2**	**83.8**	**79.6**	**80**	**72.3**	**87.3**	**83.2**	**80**	**81.8**	**87.8**	**81**

Notes:
mg/Kg - milligrams per kilogram
J = The associated numerical value is an estimated quantity.
R = The associated data is rejected.
U = The analyte was analyzed for but not detected at, or above, the Method Detection
UJ = The analyte was not detected at or above the PQL. However, the reported PQL
Bold indicates the analyte detected at a concentration greater than the MDL.
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Unrestricted Use Soil Cleanup Objective
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Commercial Use Soil Cleanup Objective Commercial va
Green highlight indicates result is above the NYSDEC CP-51 Alternate Criteria of 500 mg/Kg for Total PAHs.
NA = Not Analyzed
ND = Not Detected
NL = Not Listed

Table 2-2
Remedial Investigation Soil Sample Exceedances Continued
Former Metropolitan MGP, Brooklyn, New York

Sample Location / Sample Date / Sample Interval (feet)	CAS Number	NYSDEC PART 375-6 Unrestricted	NYSDEC Part 375-6 Commercial	CP-51	SB-14 4/1/2010 5-6	SB-14 4/1/2010 9-10	SB-14 4/2/2010 69-70	SB-15 4/14/2010 4-5	SB-15 DUP 4/14/2010 37-39	SB-15 4/14/2010 37-39	SB-15 4/14/2010 69-70	SB-16 5/5/2010 4-5	SB-16 5/6/2010 10-13	SB-16 5/6/2010 68-70	SB-17 5/3/2010 4-5	SB-17 5/4/2010 30-32	SB-17 5/4/2010 48-50	SB-18 4/20/2010 1-2	SB-18 4/20/2010 28-30	SB-18 4/20/2010 69-70	SB-19 10/2/2011 37-37.5	SB-19 10/2/2011 72.5-75	SB-20 10/16/2011 9-10	SB-20 10/16/2011 82.5-85	SB-21 10/18/2011 25-27.5	SB-21 10/18/2011 87.5-90
BTEX (mg/Kg)																										
Benzene	71-43-2	0.06	44	NL	< 1.59 U	0.0095	< 0.0067 U	< 7.26 U	108 J	195 J	< 0.0760 U	0.267	< 6.55 U	0.122	0.877 J	< 0.0059 U	< 0.0062 U	1.34	245	< 0.0070 U	1.3	< 0.0011 U	< 0.11 U	< 0.0011 U	< 0.0011 U	< 0.00099 U
Ethylbenzene	100-41-4	1	390	NL	75.9	0.019	< 0.0067 U	56.1	121	131	< 0.0760 U	0.337	221 J	0.0676 J	30.6	< 0.0059 U	< 0.0062 U	27.2	437	< 0.0070 U	19	0.00082 J	< 0.11 U	< 0.0011 U	< 0.0011 U	< 0.00099 U
m+p-Xylene	1330-20-7-M,P	NL	NL	NL	138 J	0.0319	< 0.0133 U	207 J	172 J	220 J	< 0.152 UJ	< 0.137 U	186 J	< 0.133 UJ	16.6	< 0.0118 U	< 0.0124 U	2.86 J	327 J	< 0.0140 U	27	0.0012 J	0.23	< 0.0022 U	< 0.0022 U	< 0.0020 U
o-Xylene	95-47-6	NL	NL	NL	63 J	0.0204	< 0.0067 U	89.5 J	79.7 J	113 J	< 0.0760 UJ	< 0.0686 U	81.6 J	0.0431 J	13.1	< 0.0059 U	< 0.0062 U	1.68 J	138 J	< 0.0070 U	12	0.00097 J	0.038 J	< 0.0011 U	< 0.0011 U	< 0.00099 U
Toluene	108-88-3	0.7	500	NL	6.91	< 0.0066 U	< 0.0067 U	< 7.26 U	248	374	< 0.0760 U	< 0.0686 U	6.29 J	< 0.0663 U	2.12	< 0.0059 U	< 0.0062 U	1.41	471	< 0.0070 U	2.1	< 0.0011 U	< 0.11 U	< 0.0011 U	< 0.0011 U	< 0.00099 U
Total Xylenes	Calc-Xylenes	NL	500	NL	201	0.0523	< 0.0067	296.5	251.7	333	< 0.0760	< 0.0686	267.6	0.0431	29.7	< 0.0059	< 0.0062	4.54	465	< 0.0070	39	0.00217	0.268	< 0.0022	< 0.0022	< 0.0020
Total BTEX	*CALC-BTEX*	*NL*	*NL*	*NL*	*283.81*	*0.0808*	*ND*	*352.6*	*728.7*	*1033*	*ND*	*0.604*	*494.89*	*0.2327*	*63.297*	*ND*	*ND*	*34.49*	*1618*	*ND*	*61.4*	*0.00299*	*0.268*	*ND*	*ND*	*ND*
Volatile Organic Compounds (VOCs)(mg/Kg)																										
1,1,1-Trichloroethane	71-55-6	0.68	500	NL	< 1.59 U	< 0.0066 U	< 0.0067 U	< 7.26 U	< 6.94 U	< 0.678 U	< 0.0760 U	< 0.0686 UJ	< 6.55 UJ	< 0.0663 U	< 1.46 UJ	< 0.0059 U	< 0.0062 U	< 0.988 U	< 63 U	< 0.0070 U	< 1.2 U	< 0.0011 U	< 0.11 U	< 0.0011 U	< 0.0011 U	< 0.00099 U
1,1-Dichloroethane	75-34-3	0.27	240	NL	< 1.59 U	< 0.0066 U	< 0.0067 U	< 7.26 U	< 6.94 U	< 0.678 U	< 0.0760 U	< 0.0686 U	< 6.55 U	< 0.0663 U	< 1.46 U	< 0.0059 U	< 0.0062 U	< 0.988 U	< 63 U	< 0.0070 U	< 1.2 U	< 0.0011 U	< 0.11 U	< 0.0011 U	< 0.0011 U	< 0.00099 U
1,2,4-Trimethylbenzene	95-63-6	3.6	190	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1,2-Dichlorobenzene	95-50-1	1.1	500	NL	< 1.59 U	< 0.0066 U	< 0.0067 U	< 7.26 U	< 6.94 U	< 0.678 U	< 0.0760 U	< 0.0686 U	< 6.55 U	< 0.0663 U	< 1.46 U	< 0.0059 U	< 0.0062 U	< 0.988 U	< 63 U	< 0.0070 U	< 1.2 U	< 0.0011 U	< 0.11 U	< 0.0011 U	< 0.0011 U	< 0.00099 U
1,2-Dichloroethane	107-06-2	0.02	30	NL	< 1.59 U	< 0.0066 U	< 0.0067 U	< 7.26 U	< 6.94 U	< 0.678 U	< 0.0760 U	< 0.0686 U	< 6.55 U	< 0.0663 U	< 1.46 U	< 0.0059 U	< 0.0062 U	< 0.988 U	< 63 U	< 0.0070 U	< 1.2 U	< 0.0011 U	< 0.11 U	< 0.0011 U	< 0.0011 U	< 0.00099 U
1,3,5-Trimethylbenzene	108-67-8	8.4	190	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1,4-Dichlorobenzene	106-46-7	1.8	130	NL	< 1.59 U	< 0.0066 U	< 0.0067 U	< 7.26 U	< 6.94 U	< 0.678 U	< 0.0760 U	< 0.0686 U	< 6.55 U	< 0.0663 U	< 1.46 U	< 0.0059 U	< 0.0062 U	< 0.988 U	< 63 U	< 0.0070 U	< 1.2 U	< 0.0011 U	< 0.11 U	< 0.0011 U	< 0.0011 U	< 0.00099 U
Acetone	67-64-1	0.05	500	NL	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	< 0.011 U	R	0.0043 J	0.011 J	0.0049 J
Carbon disulfide	75-15-0	NL	NL	NL	< 3.18 UJ	< 0.0132 U	< 0.0133 U	< 14.5 UJ	< 13.9 UJ	< 1.36 UJ	< 0.152 U	< 0.137 U	< 13.1 UJ	< 0.133 U	< 2.92 U	< 0.0118 U	< 0.0124 U	< 1.98 UJ	< 126 UJ	< 0.0140 U	< 1.2 U	< 0.0011 U	< 0.11 U	< 0.0011 U	0.00077 J	< 0.00099 U
cis-1,2-Dichloroethene	156-59-2	0.25	500	NL	< 1.59 U	< 0.0066 U	< 0.0067 U	< 7.26 U	< 6.94 U	< 0.678 U	< 0.0760 U	< 0.0686 U	< 6.55 U	< 0.0663 U	< 1.46 U	< 0.0059 U	< 0.0062 U	< 0.988 U	< 63 U	< 0.0070 U	< 1.2 U	< 0.0011 U	< 0.11 U	< 0.0011 U	< 0.0011 U	< 0.00099 U
Cyclohexane	110-82-7	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 1.2 UJ	< 0.0011 U	0.3	< 0.0011 U	< 0.0011 U	< 0.00099 U
Isopropylbenzene	98-82-8	NL	NL	NL	5.45	< 0.0066 U	< 0.0067 U	6.32 J	< 6.94 UJ	1.97 J	< 0.0760 UJ	0.104	23.3 J	< 0.0663 UJ	13.6	< 0.0059 U	< 0.0062 U	20.2 J	< 63 UJ	< 0.0070 U	0.54 J	< 0.0011 U	0.23	< 0.0011 U	< 0.0011 U	< 0.00099 U
Methylcyclohexane	108-87-2	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 1.2 UJ	< 0.0011 U	1.1	< 0.0011 U	< 0.0011 U	< 0.00099 U
Methylene chloride	75-09-2	0.05	500	NL	< 3.18 U	< 0.0132 U	< 0.0133 U	< 14.5 U	< 13.9 UJ	< 1.36 UJ	< 0.152 U	< 0.137 U	< 13.1 U	< 0.133 U	< 2.92 U	< 0.0118 U	< 0.0124 U	< 1.98 U	< 126 U	< 0.0140 U	< 1.2 U	< 0.0013 U	< 0.11 U	< 0.0011 U	< 0.0011 U	< 0.00099 U
n-Butylbenzene	104-51-8	12	500	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
n-Propylbenzene	103-65-1	3.9	500	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
p-Isopropyltoluene	99-87-6	NL	NL	NL	NS	NS	NS	< 7.26	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
sec-Butylbenzene	135-98-8	11	500	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Styrene	100-42-5	NL	NL	NL	17.9 J	0.0078	< 0.0067 U	8.93 J	104 J	156 J	< 0.0760 UJ	< 0.0686 U	< 6.55 U	< 0.0663 UJ	< 1.46 U	< 0.0059 U	< 0.0062 U	< 0.988 UJ	< 63 UJ	< 0.0070 U	9.2	< 0.0011 U	< 0.11 U	< 0.0011 U	< 0.0011 U	< 0.00099 U
Tentatively Identified Compounds	TICS	NL	NL	NL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	NS
Tetrachloroethene	127-18-4	1.3	150	NL	< 1.59 U	< 0.0066 U	< 0.0067 U	< 7.26 U	< 6.94 U	< 0.678 U	< 0.0760 U	< 0.0686 U	< 6.55 U	< 0.0663 UJ	< 1.46 U	< 0.0059 U	< 0.0062 U	< 0.988 U	< 63 U	< 0.0070 U	< 1.2 UJ	< 0.0011 U	< 0.11 U	< 0.0011 U	< 0.0011 U	< 0.00099 U
trans-1,2-Dichloroethene	156-60-5	0.19	500	NL	< 1.59 U	< 0.0066 U	< 0.0067 U	< 7.26 U	< 6.94 U	< 0.678 U	< 0.0760 U	< 0.0686 U	< 6.55 U	< 0.0663 U	< 1.46 U	< 0.0059 U	< 0.0062 U	< 0.988 U	< 63 U	< 0.0070 U	< 1.2 U	< 0.0011 U	< 0.11 U	< 0.0011 U	< 0.0011 U	< 0.00099 U
Trichloroethene	79-01-6	0.47	200	NL	< 1.59 U	< 0.0066 U	< 0.0067 U	< 7.26 U	< 6.94 U	< 0.678 U	< 0.0760 U	< 0.0686 U	< 6.55 U	< 0.0663 U	< 1.46 U	< 0.0059 U	< 0.0062 U	< 0.988 U	< 63 U	< 0.0070 U	< 1.2 U	< 0.0011 U	< 0.11 U	< 0.0011 U	< 0.0011 U	< 0.00099 U
Total VOCs	*CALC-VOC*	*NL*	*NL*	*NL*	*307.16*	*0.0886*	*ND*	*367.85*	*832.7*	*1190.97*	*ND*	*0.708*	*518.19*	*0.2327*	*76.897*	*ND*	*ND*	*54.69*	*1618*	*ND*	*71.14*	*0.00299*	*1.898*	*0.0043*	*0.01177*	*0.0049*
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)																										
2-Methylnaphthalene	91-57-6	NL	NL	NL	19.3	< 0.0983 U	< 0.0962 U	39.9 J	1120 J	1070	0.0554 J	0.0434 J	104	< 0.00886 U	139	0.0751 J	< 0.00935 U	30.6	1960 J	0.0930 J	20	0.093 J	< 0.4 U	< 0.4 U	< 0.37 U	< 0.37 U
Acenaphthene	83-32-9	20	500	NL	< 3.54 U	< 0.0983 U	< 0.0962 U	< 62.5 U	49.4 J	< 409 U	< 0.208 U	0.32	32.7	< 0.00971 U	39.9	0.0636 J	< 0.0102 U	7.56 J	523 J	< 0.198 U	4.9 J	< 0.36 U	0.083 J	< 0.4 U	< 0.37 U	< 0.37 U
Acenaphthylene	208-96-8	100	500	NL	< 3.54 U	< 0.0983 U	< 0.0962 U	< 62.5 U	489 J	481	< 0.208 U	0.0378 J	6.03 J	< 0.0121 U	5.66 J	< 0.0156 U	< 0.0128 U	5.99 J	555 J	0.0219 J	37	< 0.36 U	< 0.4 U	< 0.4 U	< 0.37 U	< 0.37 U
Anthracene	120-12-7	100	500	NL	< 3.54 U	< 0.0983 U	< 0.0962 U	< 62.5 U	206 J	201 J	< 0.208 U	0.583	16.9	< 0.0121 U	22.1 J	< 0.0156 U	< 0.0128 U	15.7 J	419 J	< 0.198 U	38	< 0.36 U	0.49	< 0.4 U	< 0.37 U	< 0.37 U
Benzo(a)anthracene	56-55-3	1	5.6	NL	< 3.54 U	< 0.0983 U	< 0.0962 U	< 62.5 U	112 J	111 J	< 0.208 U	1.09	11.1 J	< 0.0259 U	14.5 J	< 0.0333 U	< 0.0273 U	25.1	235 J	< 0.198 U	23	< 0.036 U	0.96	< 0.04 U	< 0.037 U	< 0.037 U
Benzo(a)pyrene	50-32-8	1	1	NL	< 3.54 U	< 0.0983 U	< 0.0962 U	< 62.5 U	88.2 J	86.8 J	< 0.208 U	1.16	8.72 J	< 0.0137 U	11.3 J	< 0.0177 U	< 0.0145 U	20.6 J	158 J	< 0.198 U	20	< 0.036 U	0.97	< 0.04 U	< 0.037 U	< 0.037 U
Benzo(b)fluoranthene	205-99-2	1	5.6	NL	< 3.54 U	< 0.0983 U	< 0.0962 U	< 62.5 U	< 400 UJ	< 409 U	< 0.208 U	0.854	< 4.28 U	< 0.0534 U	< 10.1 U	< 0.0688 U	< 0.0563 U	10.8 J	< 364 UJ	< 0.198 U	14	< 0.036 U	0.76	< 0.04 U	< 0.037 U	< 0.037 U
Benzo(ghi)perylene	191-24-2	100	500	NL	< 3.54 U	< 0.0983 U	< 0.0962 U	< 62.5 U	< 400 UJ	< 409 U	< 0.208 U	0.395	3.18 J	< 0.0113 U	4.36 J	< 0.0146 UJ	< 0.0119 UJ	8.1 J	47.9 J	< 0.198 UJ	8.5	< 0.36 U	0.71	< 0.4 U	< 0.37 U	< 0.37 U
Benzo(k)fluoranthene	207-08-9	0.8	56	NL	< 3.54 U	< 0.0983 U	< 0.0962 U	< 62.5 U	50.2 J	47.1 J	< 0.208 U	0.984	6.42 J	< 0.0161 U	6.2 J	< 0.0208 U	< 0.0170 U	14.3 J	120 J	< 0.198 U	5.2	< 0.036 U	0.32	< 0.04 U	< 0.037 U	< 0.037 U
Chrysene	218-01-9	1	56	NL	< 3.54 U	< 0.0983 U	< 0.0962 U	< 62.5 U	108 J	109 J	< 0.208 U	1.06	10.9 J	< 0.00570 U	14.7 J	< 0.00735 U	< 0.00602 U	29.5	248 J	< 0.198 U	24	< 0.36 U	1	< 0.4 U	< 0.37 U	< 0.37 U
Dibenz(a,h)anthracene	53-70-3	0.33	0.56	NL	< 3.54 U	< 0.0983 U	< 0.0962 U	< 62.5 U	< 400 UJ	< 409 U	< 0.208 U	0.0923 J	< 0.515 U	< 0.00643 U	< 1.22 U	< 0.00829 U	< 0.00679 U	< 24.3 U	< 364 UJ	< 0.198 U	1.8	< 0.036 U	0.17	< 0.04 U	< 0.037 U	< 0.037 U
Fluoranthene	206-44-0	100	500	NL	< 3.54 U	< 0.0983 U	< 0.0962 U	< 62.5 U	240 J	239 J	< 0.208 U	2.13	21.1	< 0.00971 U	27.2 J	< 0.0125 U	< 0.0102 U	26.4	438 J	< 0.198 U	38	< 0.36 U	1.4	< 0.4 U	< 0.37 U	< 0.37 U
Fluorene	86-73-7	30	500	NL	< 3.54 U	< 0.0983 U	< 0.0962 U	< 62.5 U	318 J	317 J	< 0.208 U	0.164 J	21.4	< 0.00971 U	29.1 J	< 0.0125 U	< 0.0102 U	14.6 J	516 J	< 0.198 U	37	< 0.36 U	0.15 J	< 0.4 U	< 0.37 U	< 0.37 U
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	5.6	NL	< 3.54 U	< 0.0983 U	< 0.0962 U	< 62.5 U	< 400 UJ	< 409 U	< 0.208 U	0.408	2.92 J	< 0.0186 U	4.67 J	< 0.0239 U	< 0.0196 U	6.43 J	41.2 J	< 0.198 U	8.2	< 0.036 U	0.6	< 0.04 U	< 0.037 U	< 0.037 U
Naphthalene	91-20-3	12	500	NL	122	< 0.0983 U	< 0.0962 U	525	2630 J	2560	0.385	0.358	234	< 0.0154 U	447	0.136 J	< 0.0163 U	244	3940 J	0.301	4.2 J	< 0.36 U	< 0.4 U	< 0.4 U	< 0.37 U	< 0.37 U
Phenanthrene	85-01-8	100	500	NL	1.03 J	< 0.0983 U	< 0.0962 U	< 62.5 U	779 J	775	< 0.208 U	1.05	57.2	< 0.0186 U	75.7	0.0522 J	< 0.0196 U	45.5	1420 J	0.0279 J	150	< 0.36 U	1.3	< 0.4 U	< 0.37 U	< 0.37 U
Pyrene	129-00-0	100	500	NL	< 3.54 U	< 0.0983 U	< 0.0962 U	< 62.5 U	326 J	327 J	< 0.208 U	2.13	27.5	< 0.0284 U	42.2	< 0.0366 U	< 0.0300 U	62.4	614 J	< 0.198 U	73	< 0.36 U	1.9	< 0.4 U	< 0.37 U	< 0.37 U
Total PAHs	*CALC-PAH*	*NL*	*NL*	*500*	*142.33*	*ND*	*ND*	*564.9*	*6515.8*	*6323.9*	*0.4404*	*12.8595*	*564.07*	*ND*	*883.59*	*0.3269*	*ND*	*567.58*	*11235.1*	*0.4438*	*506.8*	*0.093*	*10.813*	*ND*	*ND*	*ND*
Other Semivolatile Organic Compounds (SVOCs) (mg/Kg)																										
1,1'-Biphenyl	92-52-4	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	5.3 J	< 0.36 U	< 0.4 U	< 0.4 U	< 0.37 U	< 0.37 U
1-Methylnaphthalene	90-12-0	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Acetophenone	98-86-2	NL	500	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 7.8 U	< 0.36 U	< 0.4 U	< 0.4 U	< 0.37 U	< 0.37 U
Benzaldehyde	100-52-7	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 7.8 UJ	< 0.36 UJ	< 0.4 UJ	< 0.4 UJ	< 0.37 UJ	< 0.37 UJ
bis(2-Ethylhexyl) phthalate	117-81-7	NL	NL	NL	< 7.09 U	< 0.197 U	< 0.192 U	< 125 U	< 801 UJ	< 818 U	< 0.416 U	< 0.0959 U	< 6.16 U	< 0.0769 U	< 14.6 U	< 0.0992 U	< 0.0812 U	< 48.6 U	< 729 UJ	< 0.395 U	< 7.8 U	0.26 J	< 0.4 U	< 0.4 U	< 0.37 U	< 0.37 U
Carbazole	86-74-8	NL	NL	NL	< 7.09 U	< 0.197 U	< 0.192 U	< 125 U	< 801 UJ	< 818 U	< 0.416 U	< 0.0182 U	< 1.17 U	< 0.0146 U	< 2.75 U	< 0.0188 U	< 0.0154 U	< 48.6 U	< 729 UJ	< 0.395 U	< 7.8 U	< 0.36 U	0.063 J	< 0.4 U	< 0.37 U	< 0.37 U
Dibenzofuran	132-64-9	7	350	NL	< 7.09 U	< 0.197 U	< 0.192 U	< 125 U	< 801 UJ	< 818 U	< 0.416 U	0.0610 J	2.43 J	< 0.00485 U	< 0.918 U	< 0.00626 U	< 0.00512 U	< 48.6 U	50.8 J	< 0.395 U	3.1 J	< 0.36 U	0.072 J	< 0.4 U	< 0.37 U	< 0.37 U
Phenol	108-95-2	0.33	500	NL	< 7.09 U	< 0.197 U	< 0.192 U	< 125 U	< 801 UJ	< 818 U	< 0.416 U	< 0.0101 U	< 0.649 U	< 0.00809 U	< 1.53 U	< 0.0104 U	< 0.00854 U	< 48.6 U	< 729 U	< 0.395 U	< 7.8 U	< 0.36 U	< 0.4 U	< 0.4 U	< 0.37 U	< 0.37 U
Tentatively Identified Compounds	TICS	NL	NL	NL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	NS
Total Other SVOCs	*CALC-SVOC*	*NL*	*NL*	*NL*	*142.33*	*ND*	*ND*	*564.9*	*6515.8*	*6323.9*	*0.4404*	*12.9205*	*566.5*	*ND*	*883.59*	*0.3269*	*ND*	*567.58*	*11285.9*	*0.4438*	*515.2*	*0.353*	*10.948*	*ND*	*ND*	*ND*

Notes:
mg/Kg - milligrams per kilogram
J = The associated numerical value is an estimated quantity.
R = The associated data is rejected.
U = The analyte was analyzed for but not detected at, or above, the Method Detection
UJ = The analyte was not detected at or above the PQL. However, the reported PQL
Bold indicates the analyte detected at a concentration greater than the MDL.
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Unrestricted Use Soil Cleanup Objective
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Commercial Use Soil Cleanup Objective Commercial va
Green highlight indicates result is above the NYSDEC CP-51 Alternate Criteria of 500 mg/Kg for Total PAHs.
NA = Not Analyzed
ND = Not Detected
NL = Not Listed

Table 2-2
Remedial Investigation Soil Sample Exceedances Continued
Former Metropolitan MGP, Brooklyn, New York

Sample Location Sample Date Sample Interval (feet)	CAS Number	NYSDEC PART 375-6 Unrestricted	NYSDEC Part 375-6 Commercial	CP-51	SB-14 4/1/2010 5-6	SB-14 4/1/2010 9-10	SB-14 4/2/2010 69-70	SB-15 4/14/2010 4-5	SB-15 DUP 4/14/2010 37-39	SB-15 4/14/2010 37-39	SB-15 4/14/2010 69-70	SB-16 5/5/2010 4-5	SB-16 5/6/2010 10-13	SB-16 5/6/2010 68-70	SB-17 5/3/2010 4-5	SB-17 5/4/2010 30-32	SB-17 5/4/2010 48-50	SB-18 4/20/2010 1-2	SB-18 4/20/2010 28-30	SB-18 4/20/2010 69-70	SB-19 10/2/2011 37-37.5	SB-19 10/2/2011 72.5-75	SB-20 10/16/2011 9-10	SB-20 10/16/2011 82.5-85	SB-21 10/18/2011 25-27.5	SB-21 10/18/2011 87.5-90
Inorganic Compounds (mg/Kg)																										
Aluminum	7429-90-5	NL	NL	NL	**4620**	**9500**	**4500**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Antimony	7440-36-0	NL	NL	NL	< 5.79 U	**0.936 J**	**0.702 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	7440-38-2	13	16	NL	**5.17**	**3.27**	**1.99**	**5.27**	**1.55 J**	**1.57 J**	**4.59**	**3.24**	**4.3**	**4.08**	**6.97**	**2.68**	**7.37**	**9.29**	**1.97**	**1.29 J**	**4.2**	**1.9**	**4.9**	< 1.1 U	**2.4**	**1.4**
Barium	7440-39-3	350	400	NL	**83.9**	**46.3**	**41.2**	**62**	**16.7**	**18.7**	**42.8**	**39.3 J**	**22.7 J**	**40.0 J**	**57.8 J**	**9.93 J**	**21.8 J**	**37.3 J**	**10.9 J**	**38.4 J**	**21.3 J**	**18.9 J**	**90.8**	**29.0 J**	**9.9 J**	**31.0 J**
Beryllium	7440-41-7	7.2	590	NL	**0.255 J**	**0.341 J**	**0.197 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cadmium	7440-43-9	2.5	9.3	NL	**0.301 J**	**0.411 J**	**0.197 J**	**0.423 J**	**0.171 J**	**0.214 J**	**0.481 J**	**0.448 J**	**0.412 J**	**0.379 J**	**0.645**	**0.309 J**	**0.591**	**1.08**	**0.229 J**	**0.184 J**	< 1.1 U	< 1.1 U	< 1.2 U	< 1.1 U	< 1.0 U	< 1.1 U
Calcium	7440-70-2	NL	NL	NL	**5220**	**1060**	**7470**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Chromium	7440-47-3	30	1500	NL	**12.8 J**	**15.7 J**	**8.34 J**	**14.8 J**	**8.22 J**	**9.17 J**	**11.9 J**	**9.10 J**	**9.61 J**	**6.80 J**	**10.6 J**	**7.09 J**	**5.53 J**	**9.21**	**5.05**	**7**	**8.4**	**7.9**	**10.8**	**11.3**	**6.2**	**9.3**
Cobalt	7440-48-4	NL	NL	NL	**4.60 J**	**6.64 J**	**3.91 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Copper	7440-50-8	50	270	NL	**27.5**	**14.8**	**9.49**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Iron	7439-89-6	NL	NL	NL	**9250**	**13400**	**8120**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lead	7439-92-1	63	1000	NL	**560**	**11.4**	**5.8**	**124**	**3.98**	**4.5**	**9.18**	**63.5 J**	**40.6 J**	**3.09 J**	**875 J**	**2.48 J**	**2.99 J**	**98.9**	**2.15**	**4.15**	**3.5**	**4.1**	**185**	**3.7**	**3.5**	**5.7**
Magnesium	7439-95-4	NL	NL	NL	**1070**	**2880**	**3150**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Manganese	7439-96-5	1600	10000	NL	**132**	**161**	**191**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Mercury	7439-97-6	0.18	2.8	NL	**1.24 J**	**0.0090 J**	< 0.0330 U	**0.632**	< 0.0353 U	< 0.0353 U	**0.0097 J**	**0.440 J**	**0.187 J**	**0.0059 J**	**0.523 J**	**0.0059 J**	< 0.0324 U	**0.309**	< 0.0305 U	**0.0054 J**	< 0.038 U	< 0.035 U	**0.34**	< 0.039 U	< 0.036 U	< 0.035 U
Nickel	7440-02-0	30	310	NL	**11.1 J**	**20.3 J**	**8.17 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Potassium	7440-09-7	NL	NL	NL	R	R	R	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Selenium	7782-49-2	3.9	1500	NL	**1.96**	**2.37**	**1.23 J**	< 1.51 U	< 1.65 U	< 1.65 U	< 1.78 U	**0.573 J**	**0.637 J**	**0.447 J**	**1.20 J**	**0.292 J**	**0.624 J**	**5.16**	**0.386 J**	< 1.55 U	< 2.3 U	< 2.1 U	< 2.4 U	< 2.2 U	< 2.1 U	< 2.1 U
Silver	7440-22-4	2	1500	NL	< 1.74 U	< 1.62 U	< 1.69 U	**0.776 J**	< 1.65 U	< 1.65 U	**0.451 J**	< 1.67 U	< 1.53 U	< 1.74 U	< 1.57 U	< 1.65 U	< 1.63 U	< 2.17 U	< 1.59 U	< 1.55 U	< 2.3 U	< 2.1 U	< 2.4 U	< 2.2 U	< 2.1 U	< 2.1 U
Sodium	7440-23-5	NL	NL	NL	**442 J**	**280 J**	**164 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	7440-28-0	NL	NL	NL	< 3.47 U	< 3.24 U	< 3.37 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Vanadium	7440-62-2	NL	NL	NL	**15.9**	**23.9**	**13.3**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Zinc	7440-66-6	109	10000	NL	**71.6 J**	**39.2 J**	**27.4 J**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cyanide, Free	57-12-5-Free	NL	NL	NL	< 1.15 U	< 1.10 U	< 1.10 U	< 1.14 U	< 1.14 U	< 1.21 U	< 1.20 U	< 1.22 U	< 1.11 U	< 1.25 U	< 1.07 U	< 1.29 U	< 1.12 U	**1.9**	< 1.15 U	< 1.19 U	NS	NS	NS	NS	NS	NS
Total Cyanide	57-12-5	27	27	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Available cyanide	57-12-5-A	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.047 U	< 0.044 U	**0.024 J**	< 0.049 U	< 0.045 U	< 0.045 U
PCBs (mg/Kg)																										
Aroclor 1254	11097-69-1	NL	NL	NL	< 0.0239 U	< 0.0230 U	< 0.0228 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PCB (Total) (ppm)	***CALC-PCBs***	*0.1*	*1*	*NL*	*< 0.0239*	*< 0.0230*	*< 0.0228*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
Pesticides (mg/Kg)																										
Pesticides					ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Herbicides (mg/Kg)																										
2,4,5-TP (Silvex)	93-72-1	3.8	500	NL	< 0.00831 U	< 0.00801 U	< 0.00785 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
2,4-D	94-75-7	NL	NL	NL	< 0.00831 U	< 0.00801 U	< 0.00785 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
2,4-DB	94-82-6	NL	NL	NL	< 0.00831 U	< 0.00801 U	< 0.00785 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
T,2,4,5-	93-76-5	NL	NL	NL	< 0.00831 U	< 0.00801 U	< 0.00785 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Percent Solids/Moisture																										
Moisture, percent	MOIST	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Percent Solids	SOLIDS	NL	NL	NL	**77.6**	**81.6**	**84.3**	**82.9**	**82.5**	**80.9**	**78.4**	**79.7**	**82.8**	**81.9**	**81.8**	**76.5**	**81.3**	**67**	**88.2**	**81.5**	NS	NS	NS	NS	NS	NS

Notes:
mg/Kg - milligrams per kilogram
J = The associated numerical value is an estimated quantity.
R = The associated data is rejected.
U = The analyte was analyzed for but not detected at, or above, the Method Detection
UJ = The analyte was not detected at or above the PQL. However, the reported PQL
Bold indicates the analyte detected at a concentration greater than the MDL.
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Unrestricted Use Soil Cleanup Objective
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Commercial Use Soil Cleanup Objective Commercial v
Green highlight indicates result is above the NYSDEC CP-51 Alternate Criteria of 500 mg/Kg for Total PAHs.
NA = Not Analyzed
ND = Not Detected
NL = Not Listed

Table 2-2
Remedial Investigation Soil Sample Exceedances Continued
Former Metropolitan MGP, Brooklyn, New York

Sample Location	CAS Number	NYSDEC PART 375-6 Unrestricted	NYSDEC Part 375-6 Commercial	CP-51	SB-22	SB-22	SB-23	SB-23	SB-24	SB-24	SB-25	SB-25	SB-26	SB-26	SB-26	TP-01	TP-01	TP-02	MW-4D1	MW-4D2 DUP	MW-4D2
Sample Date					10/5/2011	10/6/2011	10/4/2011	10/4/2011	10/11/2011	10/12/2011	10/13/2011	10/13/2011	3/13/2012	3/13/2012	3/13/2012	5/19/2010	5/19/2010	5/20/2010	4/28/2011	4/27/2011	4/27/2011
Sample Interval (feet)					30-33	87.5-90	80-82.5	87-90	87.5-90	65-67.5	67.5-70	87.5-90	47-49	47-49	69-70	1.5-1.5	3.8-3.8	4-4.5	116-118	142-144	142-144
BTEX (mg/Kg)																					
Benzene	71-43-2	0.06	44	NL	**0.022**	< 0.0012 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0010 U	< 0.0012 U	< 0.0012 U	< 0.0011 U	< 0.0010 U	**0.0246**	**1.48**	< 0.0057 U	< 0.0049 U	< 0.0056 U	< 0.0057 U
Ethylbenzene	100-41-4	1	390	NL	**0.082**	**0.0014**	**0.00039 J**	**0.00025 J**	< 0.0011 U	< 0.0011 U	< 0.0010 U	< 0.0012 U	< 0.0012 U	< 0.0011 U	< 0.0010 U	**0.0237**	**10.3 J**	**0.0527**	< 0.0049 U	< 0.0056 U	< 0.0057 U
m+p-Xylene	1330-20-7-M,P	NL	NL	NL	**0.021**	< 0.0025 U	< 0.0021 U	< 0.0022 U	< 0.0021 U	< 0.0021 U	< 0.0021 U	< 0.0023 U	< 0.0024 U	< 0.0022 U	< 0.0021 U	**0.0918**	**3.72 J**	**0.0195**	< 0.0049 U	< 0.0056 U	< 0.0057 U
o-Xylene	95-47-6	NL	NL	NL	**0.01**	< 0.0012 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0010 U	< 0.0012 U	< 0.0012 U	< 0.0011 U	< 0.0010 U	**0.0347**	**1.3 J**	**0.0132**	< 0.0049 U	< 0.0056 U	< 0.0057 U
Toluene	108-88-3	0.7	500	NL	**0.0081**	< 0.0012 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0010 U	< 0.0012 U	**0.00027 J**	**0.00021 J**	**0.00015 J**	**0.0111**	**0.261**	< 0.0057 U	< 0.0049 U	< 0.0056 U	< 0.0057 U
Total Xylenes	Calc-Xylenes	NL	500	NL	**0.031**	< 0.0025	< 0.0021	< 0.0022	< 0.0021	< 0.0021	< 0.0021	< 0.0023	< 0.0024	< 0.0022	< 0.0021	**0.1265**	**5.02**	**0.0327**	< 0.0049 U	< 0.0056 U	< 0.0057 U
Total BTEX	*CALC-BTEX*	*NL*	*NL*	*NL*	***0.1431***	***0.0014***	***0.00039***	***0.00025***	*ND*	*ND*	*ND*	*ND*	***0.00027***	***0.00021***	***0.00015***	***0.1859***	***17.061***	***0.0854***	*ND*	*ND*	*ND*
Volatile Organic Compounds (VOCs)(mg/Kg)																					
1,1,1-Trichloroethane	71-55-6	0.68	500	NL	< 0.0011 U	< 0.0012 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0010 U	< 0.0012 U	< 0.0012 U	< 0.0011 U	< 0.0010 U	< 0.0063 U	< 0.162 U	< 0.0057 U	< 0.0049 U	< 0.0056 U	< 0.0057 U
1,1-Dichloroethane	75-34-3	0.27	240	NL	< 0.0011 U	< 0.0012 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0010 U	< 0.0012 U	< 0.0012 U	< 0.0011 U	< 0.0010 U	< 0.0063 U	< 0.162 U	< 0.0057 U	< 0.0049 U	< 0.0056 U	< 0.0057 U
1,2,4-Trimethylbenzene	95-63-6	3.6	190	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1,2-Dichlorobenzene	95-50-1	1.1	500	NL	< 0.0011 U	< 0.0012 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0010 U	< 0.0012 U	< 0.0012 U	< 0.0011 U	< 0.0010 U	< 0.0063 U	< 0.162 U	< 0.0057 U	< 0.0049 U	< 0.0056 U	< 0.0057 U
1,2-Dichloroethane	107-06-2	0.02	30	NL	< 0.0011 U	< 0.0012 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0010 U	< 0.0012 U	< 0.0012 U	< 0.0011 U	< 0.0010 U	< 0.0063 U	< 0.162 U	< 0.0057 U	< 0.0049 U	< 0.0056 U	< 0.0057 U
1,3,5-Trimethylbenzene	108-67-8	8.4	190	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1,4-Dichlorobenzene	106-46-7	1.8	130	NL	< 0.0011 U	< 0.0012 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0010 U	< 0.0012 U	< 0.0012 U	< 0.0011 U	< 0.0010 U	< 0.0063 U	< 0.162 U	< 0.0057 U	< 0.0049 U	< 0.0056 U	< 0.0057 U
Acetone	67-64-1	0.05	500	NL	**0.013 J**	< 0.012 U	< 0.013 U	< 0.011 U	< 0.012 UJ	< 0.011 UJ	< 0.016 UJ	< 0.012 UJ	**0.035**	**0.042**	< 0.013 U	R	R	**0.101 J**	R	R	R
Carbon disulfide	75-15-0	NL	NL	NL	< 0.0011 U	< 0.0012 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	**0.0019**	< 0.0012 U	**0.0014**	**0.00059 J**	< 0.0010 U	< 0.0125 U	< 0.324 UJ	< 0.0114 U	< 0.0049 U	< 0.0056 U	< 0.0057 U
cis-1,2-Dichloroethene	156-59-2	0.25	500	NL	**0.00029 J**	< 0.0012 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	**0.0086**	< 0.0012 U	**0.0012 J**	**0.0041 J**	< 0.0010 U	< 0.0063 U	< 0.162 U	< 0.0057 U	< 0.0049 U	< 0.0056 U	< 0.0057 U
Cyclohexane	110-82-7	NL	NL	NL	**0.00054 J**	< 0.0012 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0010 U	< 0.0012 U	< 0.0012 U	< 0.0011 U	< 0.0010 U	NS	NS	NS	< 0.0049 U	< 0.0056 U	< 0.0057 U
Isopropylbenzene	98-82-8	NL	NL	NL	**0.0016**	< 0.0012 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0010 U	< 0.0012 U	< 0.0012 U	< 0.0011 U	< 0.0010 U	**0.0293**	**2.45 J**	**0.0447**	< 0.0049 U	< 0.0056 U	< 0.0057 U
Methylcyclohexane	108-87-2	NL	NL	NL	**0.0013**	< 0.0012 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0010 U	< 0.0012 U	< 0.0012 U	< 0.0011 U	< 0.0010 U	NS	NS	NS	< 0.0049 U	< 0.0056 U	< 0.0057 U
Methylene chloride	75-09-2	0.05	500	NL	**0.00065 J**	**0.0047**	**0.011**	**0.00083 J**	< 0.0011 U	< 0.0011 U	**0.0034**	**0.0049**	**0.0084**	**0.0097**	**0.0043**	< 0.0125 U	< 0.324 U	< 0.0114 U	< 0.0049 U	< 0.0056 UJ	< 0.0057 UJ
n-Butylbenzene	104-51-8	12	500	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
n-Propylbenzene	103-65-1	3.9	500	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
p-Isopropyltoluene	99-87-6	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
sec-Butylbenzene	135-98-8	11	500	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Styrene	100-42-5	NL	NL	NL	**0.0021**	< 0.0012 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0010 U	< 0.0012 U	< 0.0012 U	< 0.0011 U	< 0.0010 U	< 0.0063 U	< 0.162 UJ	< 0.0057 U	< 0.0049 U	< 0.0056 U	< 0.0057 U
Tentatively Identified Compounds	TICS	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0**	**0**	**0**	NS	NS	NS
Tetrachloroethene	127-18-4	1.3	150	NL	< 0.0011 U	< 0.0012 U	**0.00036 J**	< 0.0011 U	**0.00051 J**	< 0.0011 U	**0.0027**	**0.0010 J**	< 0.0012 U	< 0.0011 U	< 0.0010 U	< 0.0063 U	< 0.162 UJ	< 0.0057 U	< 0.0049 U	< 0.0056 U	< 0.0057 U
trans-1,2-Dichloroethene	156-60-5	0.19	500	NL	< 0.0011 U	< 0.0012 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	< 0.0011 U	**0.00042 J**	< 0.0012 U	< 0.0012 U	< 0.0011 U	< 0.0010 U	< 0.0063 U	< 0.162 U	< 0.0057 U	< 0.0049 U	< 0.0056 U	< 0.0057 U
Trichloroethene	79-01-6	0.47	200	NL	< 0.0011 U	< 0.0012 U	< 0.0011 U	< 0.0011 U	**0.011**	< 0.0011 U	**0.009**	< 0.0012 U	< 0.0012 U	< 0.0011 U	< 0.0010 U	< 0.0063 U	< 0.162 U	< 0.0057 U	< 0.0049 U	< 0.0056 U	< 0.0057 U
Total VOCs	*CALC-VOC*	*NL*	*NL*	*NL*	***0.16258***	***0.0061***	***0.01175***	***0.00108***	***0.01151***	*ND*	***0.02602***	***0.0059***	***0.04627***	***0.0566***	***0.00445***	***0.2152***	***19.511***	***0.2311***	*ND*	*ND*	*ND*
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)																					
2-Methylnaphthalene	91-57-6	NL	NL	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	**0.351**	**1.61**	< 0.186	< 0.18 U	< 0.19 U	< 0.19 U
Acenaphthene	83-32-9	20	500	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	**0.328**	**0.2**	< 0.186	< 0.18 U	< 0.19 U	< 0.19 U
Acenaphthylene	208-96-8	100	500	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	**0.0968**	< 0.424	**0.0523**	< 0.18 U	< 0.19 U	< 0.19 U
Anthracene	120-12-7	100	500	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	**0.744**	**0.168**	**0.0407**	< 0.18 U	< 0.19 U	< 0.19 U
Benzo(a)anthracene	56-55-3	1	5.6	NL	< 0.04 U	< 0.041 U	< 0.039 U	< 0.039 U	< 0.039 U	< 0.039 U	< 0.037 U	< 0.04 U	< 0.041 U	< 0.042 U	< 0.041 U	**2.61**	**0.688**	**0.194**	< 0.18 U	< 0.19 U	< 0.19 U
Benzo(a)pyrene	50-32-8	1	1	NL	< 0.04 U	< 0.041 U	< 0.039 U	< 0.039 U	< 0.039 U	< 0.039 U	< 0.037 U	< 0.04 U	< 0.041 U	< 0.042 U	< 0.041 U	**2.92**	**0.829**	**0.294**	< 0.18 U	< 0.19 U	< 0.19 U
Benzo(b)fluoranthene	205-99-2	1	5.6	NL	< 0.04 U	< 0.041 U	< 0.039 U	< 0.039 U	< 0.039 U	< 0.039 U	< 0.037 U	< 0.04 U	< 0.041 U	< 0.042 U	< 0.041 U	**2.94**	**0.664**	**0.195**	< 0.18 U	< 0.19 U	< 0.19 U
Benzo(ghi)perylene	191-24-2	100	500	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	**1.33**	**0.445**	**0.209**	< 0.18 U	< 0.19 U	< 0.19 U
Benzo(k)fluoranthene	207-08-9	0.8	56	NL	< 0.04 U	< 0.041 U	< 0.039 U	< 0.039 U	< 0.039 U	< 0.039 U	< 0.037 U	< 0.04 U	< 0.041 U	< 0.042 U	< 0.041 U	**1.97**	**0.587**	**0.16**	< 0.18 U	< 0.19 U	< 0.19 U
Chrysene	218-01-9	1	56	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	**2.58**	**0.697**	**0.219**	< 0.18 U	< 0.19 U	< 0.19 U
Dibenz(a,h)anthracene	53-70-3	0.33	0.56	NL	< 0.04 U	< 0.041 U	< 0.039 U	< 0.039 U	< 0.039 U	< 0.039 U	< 0.037 U	< 0.04 U	< 0.041 U	< 0.042 U	< 0.041 U	**0.357**	**0.0882**	< 0.186	< 0.18 U	< 0.19 U	< 0.19 U
Fluoranthene	206-44-0	100	500	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	**5.4**	**1.15**	**0.237**	< 0.18 U	< 0.19 U	< 0.19 U
Fluorene	86-73-7	30	500	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	**0.494**	**0.141**	< 0.186	< 0.18 U	< 0.19 U	< 0.19 U
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	5.6	NL	< 0.04 U	< 0.041 U	< 0.039 U	< 0.039 U	< 0.039 U	< 0.039 U	< 0.037 U	< 0.04 U	< 0.041 U	< 0.042 U	< 0.041 U	**1.54**	**0.402**	**0.141**	< 0.18 U	< 0.19 U	< 0.19 U
Naphthalene	91-20-3	12	500	NL	**0.59**	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	**1.42**	**7.62**	< 0.186	< 0.18 U	< 0.19 U	< 0.19 U
Phenanthrene	85-01-8	100	500	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	**3.13**	**0.671**	**0.148**	< 0.18 U	< 0.19 U	< 0.19 U
Pyrene	129-00-0	100	500	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	**4.35**	**1.19**	**0.411**	< 0.18 U	< 0.19 U	< 0.19 U
Total PAHs	*CALC-PAH*	*NL*	*NL*	*500*	***0.59***	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	***32.5608***	***17.1502***	***2.301***	*ND*	*ND*	*ND*
Other Semivolatile Organic Compounds (SVOCs) (mg/Kg)																					
1,1'-Biphenyl	92-52-4	NL	NL	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	NS	NS	NS	< 0.18 U	< 0.19 U	< 0.19 U
1-Methylnaphthalene	90-12-0	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Acetophenone	98-86-2	NL	500	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	NS	NS	NS	< 0.18 U	< 0.19 U	< 0.19 U
Benzaldehyde	100-52-7	NL	NL	NL	< 0.4 UJ	< 0.41 UJ	< 0.39 UJ	< 0.39 UJ	< 0.39 UJ	< 0.39 UJ	< 0.37 UJ	< 0.4 UJ	< 0.41 UJ	< 0.42 UJ	< 0.41 UJ	NS	NS	NS	< 0.18 UJ	< 0.19 UJ	< 0.19 UJ
bis(2-Ethylhexyl) phthalate	117-81-7	NL	NL	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	**0.465**	< 0.848	< 0.373	**0.042 J**	**0.024 J**	**0.035 J**
Carbazole	86-74-8	NL	NL	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	**0.323**	< 0.848	< 0.373	< 0.18 U	< 0.19 U	< 0.19 U
Dibenzofuran	132-64-9	7	350	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	**0.169**	< 0.848	< 0.373	< 0.18 U	< 0.19 U	< 0.19 U
Phenol	108-95-2	0.33	500	NL	< 0.4 U	< 0.41 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.37 U	< 0.4 U	< 0.41 U	< 0.42 U	< 0.41 U	< 1.88	< 0.848	< 0.373	< 0.18 U	< 0.19 U	< 0.19 U
Tentatively Identified Compounds	TICS	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0**	**0**	**0**	NS	NS	NS
Total Other SVOCs	*CALC-SVOC*	*NL*	*NL*	*NL*	***0.59***	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	***33.5178***	***17.1502***	***2.301***	***0.042***	***0.024***	***0.035***

Notes:
mg/Kg - milligrams per kilogram
J = The associated numerical value is an estimated quantity.
R = The associated data is rejected.
U = The analyte was analyzed for but not detected at, or above, the Method Detection
UJ = The analyte was not detected at or above the PQL. However, the reported PQL
Bold indicates the analyte detected at a concentration greater than the MDL.
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Unrestricted Use Soil Cleanup Objective
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Commercial Use Soil Cleanup Objective Commercial va
Green highlight indicates result is above the NYSDEC CP-51 Alternate Criteria of 500 mg/Kg for Total PAHs.
NA = Not Analyzed
ND = Not Detected
NL = Not Listed

Table 2-2
Remedial Investigation Soil Sample Exceedances Continued
Former Metropolitan MGP, Brooklyn, New York

Sample Location / Sample Date / Sample Interval (feet)	CAS Number	NYSDEC PART 375-6 Unrestricted	NYSDEC Part 375-6 Commercial	CP-51	SB-22 10/5/2011 30-33	SB-22 10/6/2011 87.5-90	SB-23 10/4/2011 80-82.5	SB-23 10/4/2011 87-90	SB-24 10/11/2011 87.5-90	SB-24 10/12/2011 65-67.5	SB-25 10/13/2011 67.5-70	SB-25 10/13/2011 87.5-90	SB-26 3/13/2012 47-49	SB-26 3/13/2012 47-49	SB-26 3/13/2012 69-70	TP-01 5/19/2010 1.5-1.5	TP-01 5/19/2010 3.8-3.8	TP-02 5/20/2010 4-4.5	MW-4D1 4/28/2011 116-118	MW-4D2 DUP 4/27/2011 142-144	MW-4D2 4/27/2011 142-144
Inorganic Compounds (mg/Kg)																					
Aluminum	7429-90-5	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**5060**	**3780**	**4070**
Antimony	7440-36-0	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.67 UJ	< 0.61 UJ	< 0.71 UJ
Arsenic	7440-38-2	13	16	NL	**4**	**1.0 J**	**0.98 J**	**0.95 J**	**3.2**	< 1.1 U	**3**	< 1.1 U	**1.8**	**1.8**	< 1.2 U	**7.22**	**7.22**	**4.97**	**1.5**	**1.6**	**0.99**
Barium	7440-39-3	350	400	NL	**35.5 J**	**15.4 J**	**13.9 J**	**11.2 J**	**51.9**	**20.6 J**	**11.7 J**	**8.5 J**	**9.1 J**	**9.2 J**	**21.9 J**	**153 J**	**117 J**	**67.6 J**	**17.3**	**13.9**	**14.5**
Beryllium	7440-41-7	7.2	590	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.3**	**0.16**	**0.18**
Cadmium	7440-43-9	2.5	9.3	NL	< 1.1 U	**0.19 J**	**0.29 J**	**0.26 J**	< 1.2 U	< 1.1 U	< 1.1 U	< 1.1 U	< 1.2 U	< 1.2 U	< 1.2 U	**1.32**	**1.3**	**0.657**	**0.074 J**	< 0.15 U	< 0.18 U
Calcium	7440-70-2	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**5150 J**	**1940 J**	**3000 J**
Chromium	7440-47-3	30	1500	NL	**17.9**	**4.6**	**5.9**	**4.2**	**9.4**	**5.9**	**10.6**	**5.7**	**7**	**6.7**	**8.7**	**59.8 J**	**23.7 J**	**19.2 J**	**8.6**	**6.8**	**6.3**
Cobalt	7440-48-4	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**5.5**	**2.8**	**2.9**
Copper	7440-50-8	50	270	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**11.6**	**9.1**	**9.8**
Iron	7439-89-6	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**11600**	**7650**	**8820**
Lead	7439-92-1	63	1000	NL	**9.6**	**6.1**	**3.9**	**3.1**	**3.3**	**2.9**	**3.2**	**2**	**6.3**	**5.8**	**3**	**578 J**	**580 J**	**162 J**	**4.2**	**2.6**	**2.6**
Magnesium	7439-95-4	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**2980**	**2130**	**2730**
Manganese	7439-96-5	1600	10000	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**331**	**135**	**129**
Mercury	7439-97-6	0.18	2.8	NL	< 0.036 U	< 0.038 U	< 0.037 U	< 0.037 U	< 0.037 U	< 0.039 U	< 0.034 U	< 0.040 U	< 0.041 U	< 0.038 U	< 0.040 U	**0.478 J**	**0.776 J**	**0.424 J**	< 0.040 U	< 0.039 U	< 0.043 U
Nickel	7440-02-0	30	310	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**11.3**	**7.4**	**8.1**
Potassium	7440-09-7	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**677**	**335**	**425**
Selenium	7782-49-2	3.9	1500	NL	< 2.2 U	< 2.5 U	< 2.3 U	< 2.4 U	< 2.4 U	< 2.3 U	< 2.2 U	< 2.1 U	< 2.3 U	< 2.4 U	< 2.4 U	**1.05 J**	**1.30 J**	**1.01 J**	**0.52 J**	< 0.92 U	< 1.1 U
Silver	7440-22-4	2	1500	NL	< 2.2 U	< 2.5 U	< 2.3 U	< 2.4 U	< 2.4 U	< 2.3 U	< 2.2 U	< 2.1 U	< 2.3 U	< 2.4 U	< 2.4 U	< 1.58 U	< 1.87 U	< 1.67 U	**0.16 J**	**0.069 J**	**0.089 J**
Sodium	7440-23-5	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**854 J**	**155 J**	**99.3 J**
Thallium	7440-28-0	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.67 U	< 0.61 U	< 0.71 U
Vanadium	7440-62-2	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**9.6 J**	**7.1 J**	**10.0 J**
Zinc	7440-66-6	109	10000	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**28.6**	**16.7**	**19.4**
Cyanide, Free	57-12-5-Free	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.637 J**	**0.647 J**	< 1.16 U	NS	NS	NS
Total Cyanide	57-12-5	27	27	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Available cyanide	57-12-5-A	NL	NL	NL	< 0.048 UJ	< 0.050 U	< 0.047 U	< 0.048 U	< 0.047 U	< 0.047 U	< 0.045 U	< 0.049 U	NS	NS	NS	NS	NS	NS	NS	NS	NS
PCBs (mg/Kg)																					
Aroclor 1254	11097-69-1	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.018 U	**0.022 J**	< 0.019 UJ
PCB (Total) (ppm)	***CALC-PCBs***	*0.1*	*1*	*NL*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*< 0.018*	***0.022***	*< 0.019*
Pesticides (mg/Kg)																					
Pesticides					NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Herbicides (mg/Kg)																					
2,4,5-TP (Silvex)	93-72-1	3.8	500	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
2,4-D	94-75-7	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
2,4-DB	94-82-6	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
T,2,4,5-	93-76-5	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Percent Solids/Moisture																					
Moisture, percent	MOIST	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**9.3 J**	**16**	**12**
Percent Solids	SOLIDS	NL	NL	NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**86.9**	**76.2**	**86**	NS	NS	NS

Notes:
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UJ = The analyte was not detected at or above the PQL. However, the reported PQL
Bold indicates the analyte detected at a concentration greater than the MDL.
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Unrestricted Use Soil Cleanup Objective
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Commercial Use Soil Cleanup Objective Commercial va
Green highlight indicates result is above the NYSDEC CP-51 Alternate Criteria of 500 mg/Kg for Total PAHs.
NA = Not Analyzed
ND = Not Detected
NL = Not Listed

Table 2-3
Remedial Investigation Ground Water Sample Exceedances
Metropolitan Former MGP Site, Brooklyn, New York

Sample Location Sample Date Sample ID Laboratory Identification Sample Type	CAS Number	NYSDEC Groundwater Guidance or Standard Value[1]	MW-01S 10/4/2010 MW-1S (100410) J1926 Sample	MW-01I 10/4/2010 MW-1I (100410) J1926 Sample	MW-01D 10/4/2010 MW-1D (100410) J1926 Sample	MW-02D 10/5/2010 MW-2D(100510) J1926 Sample	MW-03S 10/5/2010 MW-3S(100510) J1926 Sample	MW-03I 10/5/2010 MW-3I(100510) J1926 Sample	MW-04S 10/5/2010 MW-4S (100510) J1926 Sample	MW-04I 10/5/2010 MW-4I (100510) J1926 Sample	MW-4D1 3/15/2012 MW-4D1-031512 460380151 Sample	MW-4D1 3/15/2012 DUP-1-031512 460380151 Duplicate	MW-4D2 3/15/2012 MW-4D2-031512 460380151 Sample	MW-05S 10/6/2010 MW-5S (100610) J1946 Sample	MW-05S 10/6/2010 MW-5S (100610) DUP J1946 Duplicate	MW-05I 10/6/2010 MW-5I (100610) J1946 Sample	MW-05D 10/6/2010 MW-5D (100610) J1946 Sample	MW-06S 10/5/2010 MW-6S(100510) J1946 Sample	MW-06I 10/5/2010 MW-6I(100510) J1946 Sample	MW-07S 10/4/2010 MW-7S(100410) J1926 Sample	MW-07I 10/4/2010 MW-7I(100410) J1926 Sample
BTEX (ug/L)																					
Benzene	71-43-2	1	**690**	<5.0 U	<5.0 U	<5.0 U	**710**	**1200**	<5.0 U	**1100**	<1.0 U	<1.0 U	<1.0 U	**3.7 J**	<5.0 U	**1600**	<5.0 U	**6100**	**1400**	**40**	**25**
Ethylbenzene	100-41-4	5	**120**	<5.0 U	<5.0 U	<5.0 U	**3400**	**6500**	<5.0 U	**630**	<1.0 U	<1.0 U	<1.0 U	**1.1 J**	<5.0 U	**200**	<5.0 U	**640**	**930**	**340**	**18**
m+p-Xylene	1330-20-7-M,P	NL	**210**	<5.0 U	<5.0 U	<5.0 U	**2000**	**3700**	<5.0 U	**51**	<2.0 U	<2.0 U	<2.0 U	<5.0 U	<5.0 U	**10 J**	<5.0 U	**19**	**210**	**53**	**7.9**
o-Xylene	95-47-6	NL	**100**	<5.0 U	<5.0 U	<5.0 U	**1500**	**2100**	<5.0 U	**240**	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	**50**	<5.0 U	**16**	**290**	**25 J**	**5.8**
Toluene	108-88-3	5	**71**	<5.0 U	<5.0 U	<5.0 U	**1500**	**1600**	<5.0 U	**12**	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	**5.2**	**30**	**14 J**	**3.5 J**
Xylenes (total)	1330-20-7	5	**320**	<5.0 U	<5.0 U	<5.0 U	**3500**	**5800**	<5.0 U	**290**	ND	ND	ND	<5.0 U	<5.0 U	**60**	<5.0 U	**35**	**500**	**78**	**14**
Total BTEX		NL	**1201**	ND	ND	ND	**9110**	**15100**	ND	**2032**	ND	ND	ND	**4.8**	ND	**1860**	ND	**6780.2**	**2860**	**472**	**60.5**
Volatile Organic Compounds (VOCs) (ug/L)																					
1,1,1-Trichloroethane	71-55-6	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
1,1,2,2-Tetrachloroethane	79-34-5	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
1,1,2-Trichloroethane	79-00-5	1	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
1,1-Dichloroethane	75-34-3	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
1,1-Dichloroethene	75-35-4	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
1,2,3-Trichlorobenzene	87-61-6	NL	NA	NA	NA	NA	NA	NA	NA	NA	<1.0 UJ	<1.0 UJ	<1.0 UJ	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	120-82-1	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
1,2-Dibromo-3-chloropropane	96-12-8	0.04	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
1,2-Dibromoethane	106-93-4	NL	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
1,2-Dichlorobenzene	95-50-1	3	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
1,2-Dichloroethane	107-06-2	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	**0.23 J**	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
1,2-Dichloropropane	78-87-5	1	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
1,3-Dichlorobenzene	541-73-1	3	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
1,4-Dichlorobenzene	106-46-7	3	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	**11 J**	<5.0 U
1,4-Dioxane	123-91-1	NL	NA	NA	NA	NA	NA	NA	NA	NA	<50 UJ	<50 UJ	<50 UJ	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	78-93-3	50	R	R	<5.0 U	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
2-Hexanone	591-78-6	50	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
4-Methyl-2-pentanone	108-10-1	NL	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
Acetone	67-64-1	50	R	**4.5 J**	**5.2 J**	R	R	R	R	R	<5.0 U	<5.0 U	<5.0 U	R	<5.0 U	<50 U	<5.0 U	R	R	R	**5.1 J**
Bromochloromethane	74-97-5	NL	NA	NA	NA	NA	NA	NA	NA	NA	<1.0 U	<1.0 U	<1.0 U	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	75-27-4	50	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
Bromoform	75-25-2	50	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 UJ	<1.0 UJ	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
Bromomethane	74-83-9	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
Carbon disulfide	75-15-0	60	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
Carbon tetrachloride	56-23-5	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 UJ	<5.0 U	<50 U	<5.0 U	<5.0 UJ	<5.0 U	<25 U	<5.0 U
Chlorobenzene	108-90-7	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	**84**	<5.0 U
Chloroethane	75-00-3	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
Chloroform	67-66-3	7	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	**0.11 J**	**0.11 J**	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
Chloromethane	74-87-3	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
cis-1,2-Dichloroethene	156-59-2	5	<25 U	<5.0 U	<5.0 U	**84**	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	**0.58 J**	<5.0 U	<5.0 U	**14 J**	**5.1**	<5.0 U	**3.2 J**	<25 U	<5.0 U
cis-1,3-Dichloropropene	10061-01-5	0.4	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
Cyclohexane	110-82-7	NL	NA	NA	NA	NA	NA	NA	NA	NA	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	NA	NA
Dibromochloromethane	124-48-1	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
Dichlorodifluoromethane	75-71-8	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 UJ	<50 UJ	<5.0 UJ	<5.0 U	<5.0 U	<25 U	<5.0 U
Isopropylbenzene	98-82-8	5	**18 J**	<5.0 U	<5.0 U	<5.0 U	**210**	**340**	<5.0 U	**65**	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	**13 J**	<5.0 U	**100**	**60**	**33**	<5.0 U
Methyl acetate	79-20-9	NL	NA	NA	NA	NA	NA	NA	NA	NA	<2.0 U	<2.0 U	<2.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	NA	NA
Methyl tert-butyl ether	1634-04-4	10	**51**	**1.2 J**	<5.0 U	<5.0 U	<200 U	<200 U	**6.0**	<5.0 U	<1.0 U	<1.0 U	**8.1**	**1.6 J**	**1.5 J**	<50 U	<5.0 U	**5.5**	**1.4 J**	<25 U	**3.5 J**
Methylcyclohexane	108-87-2	NL	NA	NA	NA	NA	NA	NA	NA	NA	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	NA	NA
Methylene chloride	75-09-2	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
Styrene	100-42-5	5	<25 U	<5.0 U	<5.0 U	<5.0 U	**120 J**	**410**	<5.0 U	<5.0 U	<1.0 UJ	<1.0 UJ	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
Tetrachloroethene	127-18-4	5	<25 U	<5.0 U	**2.1 J**	**11**	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 UJ	<5.0 U	<50 UJ	<5.0 U	<5.0 UJ	<5.0 U	<25 U	<5.0 U
trans-1,2-Dichloroethene	156-60-5	5	<25 U	<5.0 U	<5.0 U	**1.2 J**	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	**9.7**	<25 U	**3.2 J**
trans-1,3-Dichloropropene	10061-02-6	0.4	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
Trichloroethene	79-01-6	5	<25 U	<5.0 U	<5.0 U	**18**	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
Trichlorofluoromethane	75-69-4	5	<25 U	<5.0 U	<5.0 U	<5.0 U	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<25 U	<5.0 U
Vinyl chloride	75-01-4	2	<25 U	<5.0 U	**21**	**31**	<200 U	<200 U	<5.0 U	<5.0 U	<1.0 U	<1.0 U	<1.0 U	<5.0 U	<5.0 U	**12 J**	<5.0 U	<5.0 U	**12 J**	<25 U	**2.2 J**
Total VOCs		NL	**112.4**	**5.7**	**28.3**	**147.4**	**2650.1**	**5390.5**	**11.4**	**4645.4**	**0.11**	**0.11**	**8.91**	**8.5**	**8.4**	**343.9**	**5.1**	**714.9**	**1841.7**	**671.7**	**22**

Notes:

mg/Kg - milligrams per kilogram
µg/L - micrograms per liter
J = The associated data is an estimated quantity.
R = The associated data is rejected.

NA = Not Analyzed
ND = Not Detected
NL = Not Listed

U = The analyte was analyzed for but not detected at, or above, the Method Detection Limit (MDL). The associated numerical value is the Practical Quantitation Limit (PQL).
UJ = The analyte was not detected at or above the PQL. However, the reported PQL is approximate and may be inaccurate or imprecise.
Bold indicates the analyte detected at a concentration greater than the MDL.
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Restricted Use Soil Cleanup Objective Commercial value.
[1] Guidance or Standard Values - NYSDEC, Division of Water, TOGS (1.1.1) - 6 NYCRR 703.5 [NYSDEC, 1998].

Table 2-3 continued
Remedial Investigation Ground Water Sample Exceedances
Metropolitan Former MGP Site, Brooklyn, New York

Sample Location / Sample Date / Sample ID / Laboratory Identification / Sample Type	CAS Number	NYSDEC Groundwater Guidance or Standard Value[1]	MW-01S 10/4/2010 MW-1S (100410) J1926 Sample	MW-01I 10/4/2010 MW-1I (100410) J1926 Sample	MW-01D 10/4/2010 MW-1D (100410) J1926 Sample	MW-02D 10/5/2010 MW-2D(100510) J1926 Sample	MW-03S 10/5/2010 MW-3S(100510) J1926 Sample	MW-03I 10/5/2010 MW-3I(100510) J1926 Sample	MW-04S 10/5/2010 MW-4S (100510) J1926 Sample	MW-04I 10/5/2010 MW-4I (100510) J1926 Sample	MW-4D1 3/15/2012 MW-4D1-031512 460380151 Sample	MW-4D1 3/15/2012 DUP-1-031512 460380151 Duplicate	MW-4D2 3/15/2012 MW-4D2-031512 460380151 Sample	MW-05S 10/6/2010 MW-5S (100610) J1946 Sample	MW-05S 10/6/2010 MW-5S (100610) DUP J1946 Duplicate	MW-05I 10/6/2010 MW-5I (100610) J1946 Sample	MW-05D 10/6/2010 MW-5D (100610) J1946 Sample	MW-06S 10/5/2010 MW-6S(100510) J1946 Sample	MW-06I 10/5/2010 MW-6I(100510) J1946 Sample	MW-07S 10/4/2010 MW-7S(100410) J1926 Sample	MW-07I 10/4/2010 MW-7I(100410) J1926 Sample
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)																					
2-Methylnaphthalene	91-57-6	NL	**3.4 J**	<10 U	<10 U	<10 U	**160**	**270 J**	<10 U	**340 J**	<10 U	<10 U	<10 U	<10 U	<10 U	**6.6 J**	<10 U	**7.9 J**	**150**	**27**	<10 U
Acenaphthene	83-32-9	20	<10 U	<10 U	<10 U	<10 U	**21**	**32**	**1.6 J**	**130**	<10 U	<10 U	<10 U	**6.9 J**	**6.9 J**	**26**	<10 U	**1.5 J**	**59**	**26**	**1.7 J**
Acenaphthylene	208-96-8	NL	<10 U	<10 U	<10 U	<10 U	**5.5 J**	**5.7 J**	<10 U	**3.6 J**	<10 U	<10 U	<10 U	<10 U	<10 U	**2.3 J**	<10 U	<10 U	**11**	<10 U	<10 U
Anthracene	120-12-7	50	<10 U	<10 U	<10 U	<10 U	**3.2 J**	**3.1 J**	<10 U	**9.6 J**	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	**2.4 J**	**2.5 J**	<10 U
Benzo(a)anthracene	56-55-3	0.002	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Benzo(a)pyrene	50-32-8	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Benzo(b)fluoranthene	205-99-2	0.002	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Benzo(g,h,i)perylene	191-24-2	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Benzo(k)fluoranthene	207-08-9	0.002	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Chrysene	218-01-9	0.002	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Dibenz(a,h)anthracene	53-70-3	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Fluoranthene	206-44-0	50	<10 U	<10 U	<10 U	<10 U	**1.2 J**	**1.2 J**	<10 U	**2.2 J**	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	**1.0 J**	<10 U
Fluorene	86-73-7	50	<10 U	<10 U	<10 U	<10 U	**13 J**	**12 J**	<10 U	**49 J**	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	**19 J**	**8.9 J**	<10 U
Indeno(1,2,3-cd)pyrene	193-39-5	0.002	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 UJ	<1.0 UJ	<1.0 UJ	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Naphthalene	91-20-3	10	**40**	<10 U	<10 U	**2.2 J**	**2100**	**4300**	**2.0 J**	**4000**	<10 U	<10 U	<10 U	<10 U	<10 U	**270**	<10 U	**600**	**1500**	**480**	**6.3 J**
Phenanthrene	85-01-8	50	<10 U	<10 U	<10 U	<10 U	**15**	**15**	**1.8 J**	**44**	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	**14**	**7.8 J**	<10 U
Pyrene	129-00-0	50	<10 U	<10 U	<10 U	<10 U	**1.2 J**	**1.5 J**	<10 U	**2.0 J**	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	**1.5 J**	<10 U
Total PAHs		NL	**43.4**	ND	ND	**2.2**	**2320.1**	**4640.5**	**5.4**	**4580.4**	ND	ND	ND	**6.9**	**6.9**	**304.9**	ND	**609.4**	**1755.4**	**554.7**	**8**
Other Semivolatile Organic Compounds (SVOCs) (ug/L)																					
1,1'-Biphenyl	92-52-4	5	NA	NA	NA	NA	NA	NA	NA	NA	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	**14**	NA	NA
1,2,4,5-Tetrachlorobenzene	95-94-3	NL	NA	NA	NA	NA	NA	NA	NA	NA	<10 U	<10 U	<10 U	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-oxybis(1-Chloropropane)	108-60-1	NL	NA	NA	NA	NA	NA	NA	NA	NA	<10 U	<10 U	<10 U	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6-Tetrachlorophenol	58-90-2	NL	NA	NA	NA	NA	NA	NA	NA	NA	<10 U	<10 U	<10 U	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	95-95-4	NL	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<10 U	<10 U	<10 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U
2,4,6-Trichlorophenol	88-06-2	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2,4-Dichlorophenol	120-83-2	5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2,4-Dimethylphenol	105-67-9	50	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2,4-Dinitrophenol	51-28-5	10	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<31 U	<31 U	<31 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U
2,4-Dinitrotoluene	121-14-2	5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<2.0 U	<2.0 U	<2.0 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2,6-Dinitrotoluene	606-20-2	5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<2.0 U	<2.0 U	<2.0 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2-Chloronaphthalene	91-58-7	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2-Chlorophenol	95-57-8	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2-Methylphenol	95-48-7	NL	<10 U	<10 U	<10 U	<10 U	**2.6 J**	**6.2 J**	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2-Nitroaniline	88-74-4	5	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U
2-Nitrophenol	88-75-5	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
3,3'-Dichlorobenzidine	91-94-1	5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<20 U	<20 U	<20 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
3-Nitroaniline	99-09-2	5	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U
4,6-Dinitro-2-methylphenol	534-52-1	NL	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<31 U	<31 U	<31 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U
4-Bromophenyl phenyl ether	101-55-3	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
4-Chloro-3-methylphenol	59-50-7	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
4-Chloroaniline	106-47-8	5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
4-Chlorophenyl phenyl ether	7005-72-3	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
4-Methylphenol	106-44-5	NL	<10 U	<10 U	<10 U	<10 U	**1.6 J**	**5.8 J**	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
4-Nitroaniline	100-01-6	5	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U
4-Nitrophenol	100-02-7	NL	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<31 U	<31 U	<31 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U
Acetophenone	98-86-2	NL	NA	NA	NA	NA	NA	NA	NA	NA	<10 U	<10 U	<10 U	<10 U	<10 U	**1.5 J**	<10 U	**5.4 J**	**9.3 J**	NA	NA
Atrazine	1912-24-9	7.5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Benzaldehyde	100-52-7	NL	NA	NA	NA	NA	NA	NA	NA	NA	<10 UJ	<10 UJ	<10 UJ	<10 UJ	<10 UJ	<10 UJ	<10 UJ	<10 UJ	<10 UJ	NA	NA
bis(2-Chloroethoxy)methane	111-91-1	5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
bis(2-Chloroethyl) ether	111-44-4	1	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
bis(2-Ethylhexyl) phthalate	117-81-7	5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	**1.5 J**	<10 U	<10 U	<10 U	<10 U	<10 U
Butyl benzyl phthalate	85-68-7	50	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Caprolactam	105-60-2	NL	NA	NA	NA	NA	NA	NA	NA	NA	<10 U	<10 U	<10 U	<10 UJ	<10 UJ	<10 UJ	<10 UJ	<10 UJ	<10 UJ	NA	NA
Carbazole	86-74-8	NL	**1.3 J**	<10 U	<10 U	<10 U	<10 U	**4.2 J**	<10 U	**27**	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	**13**	<10 U	<10 U
Dibenzofuran	132-64-9	NL	<10 U	<10 U	<10 U	<10 U	**2.7 J**	**2.2 J**	<10 U	**9.5 J**	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	**2.7 J**	<10 U	<10 U
Diethyl phthalate	131-11-3	50	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Dimethyl phthalate	84-66-2	50	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	**1.0 J**	<10 U
Di-n-butyl phthalate	84-74-2	50	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Di-n-octyl phthalate	117-84-0	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	**1.2 J**
Hexachlorobenzene	118-74-1	0.4	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Hexachlorobutadiene	87-68-3	0.5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<2.0 U	<2.0 U	<2.0 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Hexachlorocyclopentadiene	77-47-4	5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Hexachloroethane	67-72-1	5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Isophorone	78-59-1	50	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Nitrobenzene	98-95-3	0.4	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
N-Nitrosodi-n-propylamine	621-64-7	50	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
N-Nitrosodiphenylamine	86-30-6	50	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Pentachlorophenol	87-86-5	1	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<31 U	<31 U	<31 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U
Phenol	108-95-2	1	**6.8 J**	<10 U	<10 U	<10 U	**2.4 J**	**7.6 J**	<10 U	**9.5 J**	<10 U	<10 U	<10 U	<10 U	<10 U	**21**	<10 U	**69**	**20**	<10 U	<10 U
Total Other SVOCs		NL	**8.1**	ND	ND	ND	**9.3**	**26**	ND	**46**	ND	ND	ND	ND	ND	**24**	ND	**74.4**	**59**	**1**	**1.2**

Notes:

mg/Kg - milligrams per kilogram
µg/L - micrograms per liter
J = The associated data is an estimated quantity.
R = The associated data is rejected.

NA = Not Analyzed
ND = Not Detected
NL = Not Listed

U = The analyte was analyzed for but not detected at, or above, the Method Detection Limit (MDL). The associated numerical value is the Practical Quantitation Limit (PQL).
UJ = The analyte was not detected at or above the PQL. However, the reported PQL is approximate and may be inaccurate or imprecise.
Bold indicates the analyte detected at a concentration greater than the MDL.
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Restricted Use Soil Cleanup Objective Commercial value.
[1] Guidance or Standard Values - NYSDEC, Division of Water, TOGS (1.1.1) - 6 NYCRR 703.5 [NYSDEC, 1998].

Table 2-3 continued
Remedial Investigation Ground Water Sample Exceedances
Metropolitan Former MGP Site, Brooklyn, New York

Sample Location Sample Date Sample ID Laboratory Identification Sample Type	CAS Number	NYSDEC Groundwater Guidance or Standard Value[1]	MW-01S 10/4/2010 MW-1S (100410) J1926 Sample	MW-01I 10/4/2010 MW-1I (100410) J1926 Sample	MW-01D 10/4/2010 MW-1D (100410) J1926 Sample	MW-02D 10/5/2010 MW-2D(100510) J1926 Sample	MW-03S 10/5/2010 MW-3S(100510) J1926 Sample	MW-03I 10/5/2010 MW-3I(100510) J1926 Sample	MW-04S 10/5/2010 MW-4S (100510) J1926 Sample	MW-04I 10/5/2010 MW-4I (100510) J1926 Sample	MW-4D1 3/15/2012 MW-4D1-031512 460380151 Sample	MW-4D1 3/15/2012 DUP-1-031512 460380151 Duplicate	MW-4D2 3/15/2012 MW-4D2-031512 460380151 Sample	MW-05S 10/6/2010 MW-5S (100610) J1946 Sample	MW-05S 10/6/2010 MW-5S (100610) DUP J1946 Duplicate	MW-05I 10/6/2010 MW-5I (100610) J1946 Sample	MW-05D 10/6/2010 MW-5D (100610) J1946 Sample	MW-06S 10/5/2010 MW-6S(100510) J1946 Sample	MW-06I 10/5/2010 MW-6I(100510) J1946 Sample	MW-07S 10/4/2010 MW-7S(100410) J1926 Sample	MW-07I 10/4/2010 MW-7I(100410) J1926 Sample
Inorganic Compounds (ug/L)																					
Aluminum	7429-90-5	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<200 U	<200 U	<200 U	<200 U	**314**	<200 U	NA	NA
Antimony	7440-36-0	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<20 U	<20 U	<20 U	<20 U	**11.4 J**	**14.6 J**	NA	NA
Arsenic	7440-38-2	25	**37.7**	<20 U	**4.9 J**	**6.2 J**	<20 U	**5.5 J**	<20 U	**4.4 J**	**13.6**	**10.6**	<5.0 U	<20 U	<20 U	<20 U	**7.4 J**	<20 U	**39.7**	**5.7 J**	<20 U
Barium	7440-39-3	1000	**1060**	**329**	**147 J**	**323**	**128 J**	**163 J**	**1140**	**254**	**276**	**268**	**70.5 J**	**99.3 J**	**95.7 J**	**475**	**901**	**585**	**869**	**129 J**	**354**
Beryllium	7440-41-7	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	NA	NA
Cadmium	7440-43-9	5	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U
Calcium	7440-70-2	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**254000**	**248000**	**106000**	**121000**	**180000**	**156000**	NA	NA
Chromium	7440-47-3	50	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	**7.8 J**	**8.6 J**	**4.6 J**	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U
Cobalt	7440-48-4	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	NA	NA
Copper	7440-50-8	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30 U	<30 U	<30 U	<30 U	<30 U	<30 U	NA	NA
Iron	7439-89-6	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**685**	**617**	**17000**	**2460**	**23000**	**64400**	NA	NA
Lead	7439-92-1	25	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<5.0 U	<5.0 U	<5.0 U	<10 U	<10 U	<10 U	<10 U	**9.3 J**	<10 U	<10 U	<10 U
Magnesium	7439-95-4	35000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**47500**	**47100**	**55300**	**64100**	**21100**	**133000**	NA	NA
Manganese	7439-96-5	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2950**	**2900**	**2300**	**3560**	**1430**	**836**	NA	NA
Mercury	7439-97-6	0.7	<0.20 U	**0.050 J**	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	**0.040 J**	<0.20 U	<0.20 U	<0.20 U
Nickel	7440-02-0	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	NA	NA
Potassium	7440-09-7	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**39200**	**37600**	**17600**	**11700**	**30900**	**60300**	NA	NA
Selenium	7782-49-2	10	<30.0 U	<30.0 U	<30.0 U	<30.0 U	<30.0 U	<30.0 U	<30.0 U	<30.0 U	<10.0 U	<10.0 U	<10.0 U	<30.0 U	<30.0 U	<30.0 U	<30.0 U	<30.0 U	<30.0 U	<30.0 U	<30.0 U
Silver	7440-22-4	50	<30 U	<30 U	<30 U	<30 U	<30 U	<30 U	<30 U	<30 U	<10.0 U	<10.0 U	<10.0 U	<30 U	<30 U	<30 U	<30 U	<30 U	<30 U	<30 U	<30 U
Sodium	7440-23-5	20000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1220000**	**1180000**	**150000**	**226000**	**262000**	**1000000**	NA	NA
Thallium	7440-28-0	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	NA	NA
Vanadium	7440-62-2	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	NA	NA
Zinc	7440-66-6	2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	NA	NA
Cyanide (ug/L)																					
Total Cyanide	57-12-5	200	**8.7 J**	<20 U	<20 U	<20 U	**94.8**	**156**	**279**	**18.1 J**	<10 U	**6.4 J**	<10 U	<20 U	<20 U	**47.1**	**28.6**	**79.7**	<20 U	**252**	**10 J**
Pesticides (ug/L)																					
Aldrin	309-00-2	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	NA	NA
Alpha-BHC	319-84-6	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	**R**	NA	NA
Beta-BHC	319-85-7	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.050 U	<0.050 U	**0.072 J**	<0.050 U	**0.51**	**R**	NA	NA
Chlordane, alpha	5103-71-9	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	NA	NA
Chlordane, trans-	5103-74-2	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	NA	NA
DDD,4,4-	72-54-8	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	NA	NA
DDE,4,4-	72-55-9	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	NA	NA
DDT,4,4-	50-29-3	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	NA	NA
Delta-BHC	319-86-8	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.050 U	<0.050 U	<0.050 U	<0.050 U	**0.078**	<0.050 U	NA	NA
Dieldrin	60-57-1	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	NA	NA
Endosulfan I	959-98-8	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	NA	NA
Endosulfan II	33213-65-9	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	NA	NA
Endosulfan sulfate	1031-07-8	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	NA	NA
Endrin	72-20-8	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	NA	NA
Endrin aldehyde	7421-93-4	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	NA	NA
Endrin ketone	53494-70-5	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	NA	NA
Gamma BHC (Lindane)	58-89-9	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.050 U	<0.050 U	<0.050 U	<0.050 U	**0.072**	<0.050 U	NA	NA
Heptachlor	76-44-8	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	NA	NA
Heptachlor Epoxide	1024-57-3	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	NA	NA
Methoxychlor	72-43-5	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.50 U	<0.50 U	<0.50 U	<0.50 U	<0.50 U	<0.50 U	NA	NA
Toxaphene	8001-35-2	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	NA	NA
Polychlorinated biphenyls (ug/L)																					
Aroclor 1016	12674-11-2	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	NA	NA
Aroclor 1221	11104-28-2	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	NA	NA
Aroclor 1232	11141-16-5	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	NA	NA
Aroclor 1242	53469-21-9	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	NA	NA
Aroclor 1248	12672-29-6	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	NA	NA
Aroclor 1254	11097-69-1	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	NA	NA
Aroclor 1260	11096-82-5	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	NA	NA
Herbicides (ug/L)																					
2,4-D	94-75-7	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	NA	NA
2,4-DB	94-82-6	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0 U	<1.0 U	**1.4**	<1.0 U	<1.0 U	<1.0 U	NA	NA
Silvex	93-72-1	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	**R**	NA	NA
2,4,5-T	93-76-5	NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	NA	NA

Notes:

mg/Kg - milligrams per kilogram
µg/L - micrograms per liter
J = The associated data is an estimated quantity.
R = The associated data is rejected.

NA = Not Analyzed
ND = Not Detected
NL = Not Listed

U = The analyte was analyzed for but not detected at, or above, the Method Detection Limit (MDL). The associated numerical value is the Practical Quantitation Limit (PQL).
UJ = The analyte was not detected at or above the PQL. However, the reported PQL is approximate and may be inaccurate or imprecise.
Bold indicates the analyte detected at a concentration greater than the MDL.
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Restricted Use Soil Cleanup Objective Commercial value.
[1] Guidance or Standard Values - NYSDEC, Division of Water, TOGS (1.1.1) - 6 NYCRR 703.5 [NYSDEC, 1998].

Table 2-3 continued
Remedial Investigation Ground Water Sample Exceedances
Metropolitan Former MGP Site, Brooklyn, New York

Sample Location Sample Date Sample ID Laboratory Identification Sample Type	CAS Number	NYSDEC Groundwater Guidance or Standard Value[1]	MW-08S 10/5/2010 MW-8S(100510) J1946 Sample	MW-08I 10/5/2010 MW-8I(100510) J1946 Sample	MW-09S 10/6/2010 MW-9S (100610) J1926 Sample	MW-09I 10/6/2010 MW-9I (100610) J1926 Sample	MW-09D 10/6/2010 MW-9D (100610) J1926 Sample	MW-19S 3/18/2012 MW-19S-031812 460380891 Sample	MW-19I 3/18/2012 MW-19I-031812 460380891 Sample	MW-19I 3/18/2012 DUP-3-031812 460380891 Duplicate	MW-20S 3/18/2012 MW-20S-031812 460380891 Sample	MW-20I 3/18/2012 MW-20I-031812 460380891 Sample	MW-21D 3/15/2012 MW-21D-031512 460380031 Sample	MW-22I 3/15/2012 MW-22I-031512 460380031 Sample	MW-22D 3/15/2012 MW-22D-031512 460380031 Sample	MW-22D 3/15/2012 DUP 1 GM-3/17/2012 460380031 Duplicate	MW-23D 3/14/2012 MW-23D-031412 460380031 Sample	MW-25S 3/14/2012 MW-25S-031412 460380031 Sample	MW-25I 3/14/2012 MW-25I-031412 460380031 Sample
BTEX (ug/L)																			
Benzene	71-43-2	1	**160**	**9900**	<5.0 U	**890**	**700**	**0.11 J**	**900**	**880**	**0.46 J**	**4.0**	**1.5**	**53**	**1.8**	**1.9**	**1.3**	**2.7**	**21**
Ethylbenzene	100-41-4	5	**130**	**570 J**	**1.4 J**	**1600**	**540**	<1.0 U	**460**	**450**	**0.16 J**	<1.0 U	**0.32 J**	**1.8**	<1.0 U	<1.0 U	<1.0 U	**0.11 J**	**0.16 J**
m+p-Xylene	1330-20-7-M,P	NL	**26**	**160 J**	<5.0 U	**850**	**200**	<2.0 U	**190**	**180**	**0.84 J**	<2.0 U	<2.0 U	**6.0**	<2.0 U	<2.0 U	<2.0 U	**0.45 J**	**0.58 J**
o-Xylene	95-47-6	NL	**29**	**79 J**	<5.0 U	**550**	**180**	<1.0 U	**170**	**160**	**0.28 J**	<1.0 U	**0.14 J**	**5.8**	**0.21 J**	**0.19 J**	<1.0 U	**0.20 J**	**0.30 J**
Toluene	108-88-3	5	**5.1**	**5.8 J**	<5.0 U	**36 J**	**33**	<1.0 U	**16**	**15**	**0.76 J**	<1.0 U	**0.77 J**	**0.93 J**	<1.0 U	<1.0 U	**0.87 J**	**0.31 J**	**0.36 J**
Xylenes (total)	1330-20-7	5	**55**	**240 J**	<5.0 U	**1400**	**380**	ND	**360**	**340**	**1.12**	ND	**0.14**	**11.8**	0.21	0.19	**0**	**0.65**	**0.88**
Total BTEX		NL	**350.1**	**10715.8**	**1.4**	**3926**	**1653**	**0.11**	**1736**	**1685**	**2.5**	**4.0**	**2.73**	**67.53**	**2.01**	**2.09**	**2.17**	**3.77**	**22.4**
Volatile Organic Compounds (VOCs) (ug/L)																			
1,1,1-Trichloroethane	71-55-6	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
1,1,2,2-Tetrachloroethane	79-34-5	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
1,1,2-Trichloroethane	79-00-5	1	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	**0.25 J**	<1.0 U	<1.0 U
1,1-Dichloroethane	75-34-3	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
1,1-Dichloroethene	75-35-4	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	**0.13 J**	**0.14 J**	**1.9**	<1.0 U	<1.0 U
1,2,3-Trichlorobenzene	87-61-6	NL	NA	NA	NA	NA	NA	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
1,2,4-Trichlorobenzene	120-82-1	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
1,2-Dibromo-3-chloropropane	96-12-8	0.04	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
1,2-Dibromoethane	106-93-4	NL	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
1,2-Dichlorobenzene	95-50-1	3	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
1,2-Dichloroethane	107-06-2	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
1,2-Dichloropropane	78-87-5	1	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
1,3-Dichlorobenzene	541-73-1	3	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	**0.15 J**	**0.14 J**	<1.0 U
1,4-Dichlorobenzene	106-46-7	3	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
1,4-Dioxane	123-91-1	NL	NA	NA	NA	NA	NA	<50 UJ	<500 UJ	<500 UJ	<50 UJ	<50 UJ	<50 UJ	<50 UJ	<50 UJ	<50 UJ	<50 UJ	<50 UJ	<50 UJ
2-Butanone	78-93-3	50	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
2-Hexanone	591-78-6	50	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<5.0 U	<50 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U
4-Methyl-2-pentanone	108-10-1	NL	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<5.0 U	<50 U	<50 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U
Acetone	67-64-1	50	R	R	R	R	R	<5.0 U	<50 U	<50 U	**19**	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U
Bromochloromethane	74-97-5	NL	NA	NA	NA	NA	NA	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Bromodichloromethane	75-27-4	50	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Bromoform	75-25-2	50	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Bromomethane	74-83-9	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	R	R	R	R	R	R	R
Carbon disulfide	75-15-0	60	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	**1.5**	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	**0.62 J**	<1.0 U	<1.0 U
Carbon tetrachloride	56-23-5	5	<5.0 UJ	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Chlorobenzene	108-90-7	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Chloroethane	75-00-3	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 UJ	<10 UJ	<10 UJ	<1.0 UJ	<1.0 UJ	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Chloroform	67-66-3	7	<5.0 U	<5.0 UJ	<5.0 U	<100 U	**5.5**	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	**0.41 J**	<1.0 U	**0.28 J**	**0.25 J**	**0.67 J**	<1.0 U	<1.0 U
Chloromethane	74-87-3	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
cis-1,2-Dichloroethene	156-59-2	5	<5.0 U	<5.0 UJ	<5.0 U	**26 J**	**35**	<1.0 U	<10 U	<10 U	<1.0 U	**2.1**	**4.2**	<1.0 U	**1.6**	**1.5**	**180**	<1.0 U	**1.7**
cis-1,3-Dichloropropene	10061-01-5	0.4	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Cyclohexane	110-82-7	NL	<5.0 U	<5.0 UJ	NA	NA	NA	**0.51 J**	<10 U	<10 U	**4.7**	<1.0 U	<1.0 U	**0.19 J**	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Dibromochloromethane	124-48-1	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Dichlorodifluoromethane	75-71-8	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Isopropylbenzene	98-82-8	5	**14**	**39 J**	<5.0 U	**53 J**	**39**	**0.27 J**	**18**	**19**	**1.5**	<1.0 U	<1.0 U	**0.92 J**	<1.0 U	<1.0 U	**0.13 J**	<1.0 U	**0.30 J**
Methyl acetate	79-20-9	NL	<5.0 U	<5.0 UJ	NA	NA	NA	<2.0 U	<20 U	<20 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U
Methyl tert-butyl ether	1634-04-4	10	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	**0.53 J**	**51**	**0.27 J**	**1.7**	<1.0 U	<1.0 U	<1.0 U	<1.0 U	**0.84 J**
Methylcyclohexane	108-87-2	NL	<5.0 U	<5.0 UJ	NA	NA	NA	<1.0 U	<10 U	<10 U	**4.0**	<1.0 U	<1.0 U	**0.21 J**	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Methylene chloride	75-09-2	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	**1.0 J**	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Styrene	100-42-5	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	**9.5 J**	**8.2 J**	<1.0 U	<1.0 U	<1.0 U	**0.18 J**	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Tetrachloroethene	127-18-4	5	<5.0 UJ	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
trans-1,2-Dichloroethene	156-60-5	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	**0.93 J**	<1.0 U	**0.21 J**
trans-1,3-Dichloropropene	10061-02-6	0.4	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Trichloroethene	79-01-6	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	**3.8 J**	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	**0.25 J**	<1.0 U	**19**	**19**	**2.4**	<1.0 U	<1.0 U
Trichlorofluoromethane	75-69-4	5	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Vinyl chloride	75-01-4	2	<5.0 U	<5.0 UJ	<5.0 U	<100 U	<5.0 U	<1.0 U	<10 U	<10 U	<1.0 U	**3.0**	<1.0 U	<1.0 U	<1.0 U	<1.0 U	**1.0**	<1.0 U	**0.36 J**
Total VOCs		NL	**563.4**	**2053.5**	**19.7**	**5964**	**2306.1**	**0.89**	**1763.5**	**1712.2**	**33.73**	**60.1**	**7.86**	**70.73**	**23.02**	**22.98**	**190.22**	**3.91**	**25.81**

Notes:

mg/Kg - milligrams per kilogram
µg/L - micrograms per liter
J = The associated data is an estimated quantity.
R = The associated data is rejected.

NA = Not Analyzed
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U = The analyte was analyzed for but not detected at, or above, the Method Detection Limit (MDL). The associated numerical value is the Practical Quantitation Limit (PQL).
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Bold indicates the analyte detected at a concentration greater than the MDL.
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Restricted Use Soil Cleanup Objective Commercial value.
[1] Guidance or Standard Values - NYSDEC, Division of Water, TOGS (1.1.1) - 6 NYCRR 703.5 [NYSDEC, 1998].

Table 2-3 continued
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Metropolitan Former MGP Site, Brooklyn, New York

Sample Location Sample Date Sample ID Laboratory Identification Sample Type	CAS Number	NYSDEC Groundwater Guidance or Standard Value[1]	MW-08S 10/5/2010 MW-8S(100510) J1946 Sample	MW-08I 10/5/2010 MW-8I(100510) J1946 Sample	MW-09S 10/6/2010 MW-9S (100610) J1926 Sample	MW-09I 10/6/2010 MW-9I (100610) J1926 Sample	MW-09D 10/6/2010 MW-9D (100610) J1926 Sample	MW-19S 3/18/2012 MW-19S-031812 460380891 Sample	MW-19I 3/18/2012 MW-19I-031812 460380891 Sample	MW-19I 3/18/2012 DUP-3-031812 460380891 Duplicate	MW-20S 3/18/2012 MW-20S-031812 460380891 Sample	MW-20I 3/18/2012 MW-20I-031812 460380891 Sample	MW-21D 3/15/2012 MW-21D-031512 460380031 Sample	MW-22I 3/15/2012 MW-22I-031512 460380031 Sample	MW-22D 3/15/2012 MW-22D-031512 460380031 Sample	MW-22D 3/15/2012 DUP 1 GM-3/17/2012 460380031 Duplicate	MW-23D 3/14/2012 MW-23D-031412 460380031 Sample	MW-25S 3/14/2012 MW-25S-031412 460380031 Sample	MW-25I 3/14/2012 MW-25I-031412 460380031 Sample
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)																			
2-Methylnaphthalene	91-57-6	NL	**49**	**150**	<10 U	**390 J**	**66**	<10 U	**350**	**300**	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Acenaphthene	83-32-9	20	**19**	**59**	**11**	**140**	**61**	<10 U	**110 J**	**80 J**	<10 U	<10 U	<10 U	**51**	<10 U	<10 U	<10 U	<10 U	<10 U
Acenaphthylene	208-96-8	NL	<10 U	<10 U	**1.7 J**	**24**	**50**	<10 U	**66 J**	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Anthracene	120-12-7	50	<10 U	<10 U	**1.4 J**	**12**	**3.8 J**	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Benzo(a)anthracene	56-55-3	0.002	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<20 U	<20 U	**0.53 J**	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Benzo(a)pyrene	50-32-8	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<20 U	<20 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 UJ	<1.0 UJ	<1.0 U	<1.0 U	<1.0 U
Benzo(b)fluoranthene	205-99-2	0.002	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 UJ	<20 U	<20 U	<1.0 UJ	<1.0 U	<1.0 U	<1.0 U	<1.0 UJ	<1.0 UJ	<1.0 U	<1.0 U	<1.0 U
Benzo(g,h,i)perylene	191-24-2	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Benzo(k)fluoranthene	207-08-9	0.002	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<20 U	<20 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 UJ	<1.0 UJ	<1.0 U	<1.0 U	<1.0 U
Chrysene	218-01-9	0.002	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Dibenz(a,h)anthracene	53-70-3	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 UJ	<20 U	<20 U	<1.0 UJ	<1.0 U	<1.0 U	<1.0 U	<1.0 UJ	<1.0 UJ	<1.0 U	<1.0 U	<1.0 U
Fluoranthene	206-44-0	50	<10 U	<10 U	**1.0 J**	**3.5 J**	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Fluorene	86-73-7	50	**6.2 J**	**5.5 J**	<10 U	**58 J**	**22 J**	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	**18**	<10 U	<10 U	<10 U	<10 U	<10 U
Indeno(1,2,3-cd)pyrene	193-39-5	0.002	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 UJ	<20 U	<20 U	<1.0 UJ	<1.0 U	<1.0 U	<1.0 U	<1.0 UJ	<1.0 UJ	<1.0 U	<1.0 U	<1.0 U
Naphthalene	91-20-3	10	**470**	**1800**	**3.5 J**	**5200**	**2000**	<10 U	**3100**	**2500**	<10 U	<10 U	<10 U	**3.8 J**	<10 U	<10 U	<10 U	<10 U	<10 U
Phenanthrene	85-01-8	50	**5.2 J**	<10 U	<10 U	**54**	**19**	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	**10**	<10 U	<10 U	<10 U	<10 U	<10 U
Pyrene	129-00-0	50	<10 U	<10 U	**1.1 J**	**3.5 J**	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Total PAHs		NL	**549.4**	**2014.5**	**19.7**	**5885**	**2221.8**	ND	**3626**	**2880**	**0.53**	ND	ND	**82.8**	ND	ND	ND	ND	ND
Other Semivolatile Organic Compounds (SVOCs) (ug/L)																			
1,1'-Biphenyl	92-52-4	5	**4.4 J**	**3.8 J**	NA	NA	NA	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
1,2,4,5-Tetrachlorobenzene	95-94-3	NL	NA	NA	NA	NA	NA	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 UJ	<10 UJ	<10 U	<10 U	<10 U
2,2'-oxybis(1-Chloropropane)	108-60-1	NL	NA	NA	NA	NA	NA	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2,3,4,6-Tetrachlorophenol	58-90-2	NL	NA	NA	NA	NA	NA	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2,4,5-Trichlorophenol	95-95-4	NL	<20 U	<20 U	<20 U	<20 U	<20 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2,4,6-Trichlorophenol	88-06-2	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2,4-Dichlorophenol	120-83-2	5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2,4-Dimethylphenol	105-67-9	50	<10 U	**11**	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 UJ	<10 UJ	<10 U	<10 U	<10 U
2,4-Dinitrophenol	51-28-5	10	<20 U	<20 U	<20 U	<20 U	<20 U	<31 UJ	<610 U	<610 U	<31 UJ	<30 UJ	<31 U	<31 U	<30 U	<30 U	<30 U	<30 U	<30 U
2,4-Dinitrotoluene	121-14-2	5	<10 U	<10 U	<10 U	<10 U	<10 U	<2.0 U	<40 U	<40 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U
2,6-Dinitrotoluene	606-20-2	5	<10 U	<10 U	<10 U	<10 U	<10 U	<2.0 U	<40 U	<40 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U
2-Chloronaphthalene	91-58-7	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2-Chlorophenol	95-57-8	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2-Methylphenol	95-48-7	NL	<10 U	<10 U	<10 U	**4.6 J**	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
2-Nitroaniline	88-74-4	5	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<400 U	<400 U	<20 U	<20 U	<20 U	<20 U	<20 UJ	<20 UJ	<20 U	<20 U	<20 U
2-Nitrophenol	88-75-5	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
3,3'-Dichlorobenzidine	91-94-1	5	<10 U	<10 U	<10 U	<10 U	<10 U	<20 U	<400 U	<400 U	<20 U	<20 U	<20 U	<20 U	R	R	<20 U	<20 U	<20 U
3-Nitroaniline	99-09-2	5	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<400 U	<400 U	<20 U	<20 U	<20 U	<20 U	<20 UJ	<20 UJ	<20 U	<20 U	<20 U
4,6-Dinitro-2-methylphenol	534-52-1	NL	<20 U	<20 U	<20 U	<20 U	<20 U	<31 U	<610 U	<610 U	<31 U	<30 U	<31 U	<31 U	<30 U	<30 U	<30 U	<30 U	<30 U
4-Bromophenyl phenyl ether	101-55-3	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
4-Chloro-3-methylphenol	59-50-7	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
4-Chloroaniline	106-47-8	5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
4-Chlorophenyl phenyl ether	7005-72-3	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
4-Methylphenol	106-44-5	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	**1.9 J**	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
4-Nitroaniline	100-01-6	5	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<400 U	<400 U	<20 U	<20 U	<20 U	<20 U	<20 UJ	<20 UJ	<20 U	<20 U	<20 U
4-Nitrophenol	100-02-7	NL	<20 U	<20 U	<20 U	<20 U	<20 U	<31 U	<610 U	<610 U	<31 U	<30 U	<31 U	<31 U	<30 U	<30 U	<30 U	<30 U	<30 U
Acetophenone	98-86-2	NL	**1.6 J**	**2.6 J**	NA	NA	NA	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Atrazine	1912-24-9	7.5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 UJ	<200 UJ	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Benzaldehyde	100-52-7	NL	<10 UJ	<10 UJ	NA	NA	NA	<10 UJ	<200 UJ	<200 UJ	<10 UJ	<10 UJ	<10 UJ	<10 UJ	<10 UJ	<10 UJ	<10 UJ	<10 UJ	<10 UJ
bis(2-Chloroethoxy)methane	111-91-1	5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
bis(2-Chloroethyl) ether	111-44-4	1	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<20 U	<20 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
bis(2-Ethylhexyl) phthalate	117-81-7	5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Butyl benzyl phthalate	85-68-7	50	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Caprolactam	105-60-2	NL	<10 UJ	<10 UJ	NA	NA	NA	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Carbazole	86-74-8	NL	**6.7 J**	**5.9 J**	<10 U	**52**	**14**	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	**11**	<10 U	<10 U	<10 U	<10 U	<10 U
Dibenzofuran	132-64-9	NL	**1.7 J**	**1.9 J**	<10 U	**16**	**4.5 J**	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Diethyl phthalate	131-11-3	50	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Dimethyl phthalate	84-66-2	50	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Di-n-butyl phthalate	84-74-2	50	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Di-n-octyl phthalate	117-84-0	NL	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Hexachlorobenzene	118-74-1	0.4	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<20 U	<20 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Hexachlorobutadiene	87-68-3	0.5	<10 U	<10 U	<10 U	<10 U	<10 U	<2.0 U	<40 U	<40 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U
Hexachlorocyclopentadiene	77-47-4	5	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Hexachloroethane	67-72-1	5	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<20 U	<20 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Isophorone	78-59-1	50	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Nitrobenzene	98-95-3	0.4	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<20 U	<20 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
N-Nitrosodi-n-propylamine	621-64-7	50	<10 U	<10 U	<10 U	<10 U	<10 U	<1.0 U	<20 U	<20 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
N-Nitrosodiphenylamine	86-30-6	50	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<200 U	<200 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Pentachlorophenol	87-86-5	1	<20 U	<20 U	<20 U	<20 U	<20 U	<31 U	<610 U	<610 U	<31 U	<30 U	<31 U	<31 U	<30 U	<30 U	<30 U	<30 U	<30 U
Phenol	108-95-2	1	**2.4 J**	**86**	<10 U	**5.7 J**	<10 U	<10 U	<200 U	<200 U	**2.6 J**	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U
Total Other SVOCs		NL	**16.8**	**111.2**	ND	**78.3**	**18.5**	ND	**3626**	**2880**	**5.03**	ND	ND	**93.8**	ND	ND	ND	ND	ND

Notes:

mg/Kg - milligrams per kilogram
µg/L - micrograms per liter
J = The associated data is an estimated quantity.
R = The associated data is rejected.

NA = Not Analyzed
ND = Not Detected
NL = Not Listed

U = The analyte was analyzed for but not detected at, or above, the Method Detection Limit (MDL). The associated numerical value is the Practical Quantitation Limit (PQL).
UJ = The analyte was not detected at or above the PQL. However, the reported PQL is approximate and may be inaccurate or imprecise.
Bold indicates the analyte detected at a concentration greater than the MDL.
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Restricted Use Soil Cleanup Objective Commercial value.
[1] Guidance or Standard Values - NYSDEC, Division of Water, TOGS (1.1.1) - 6 NYCRR 703.5 [NYSDEC, 1998].

Table 2-3 continued
Remedial Investigation Ground Water Sample Exceedances
Metropolitan Former MGP Site, Brooklyn, New York

Sample Location Sample Date Sample ID Laboratory Identification Sample Type	CAS Number	NYSDEC Groundwater Guidance or Standard Value[1]	MW-08S 10/5/2010 MW-8S(100510) J1946 Sample	MW-08I 10/5/2010 MW-8I(100510) J1946 Sample	MW-09S 10/6/2010 MW-9S (100610) J1926 Sample	MW-09I 10/6/2010 MW-9I (100610) J1926 Sample	MW-09D 10/6/2010 MW-9D (100610) J1926 Sample	MW-19S 3/18/2012 MW-19S-031812 460380891 Sample	MW-19I 3/18/2012 MW-19I-031812 460380891 Sample	MW-19I 3/18/2012 DUP-3-031812 460380891 Duplicate	MW-20S 3/18/2012 MW-20S-031812 460380891 Sample	MW-20I 3/18/2012 MW-20I-031812 460380891 Sample	MW-21D 3/15/2012 MW-21D-031512 460380031 Sample	MW-22I 3/15/2012 MW-22I-031512 460380031 Sample	MW-22D 3/15/2012 MW-22D-031512 460380031 Sample	MW-22D 3/15/2012 DUP 1 GM-3/17/2012 460380031 Duplicate	MW-23D 3/14/2012 MW-23D-031412 460380031 Sample	MW-25S 3/14/2012 MW-25S-031412 460380031 Sample	MW-25I 3/14/2012 MW-25I-031412 460380031 Sample
Inorganic Compounds (ug/L)																			
Aluminum	7429-90-5	NL	<200 U	<200 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	3	**24.3**	**12.2 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	7440-38-2	25	**5.1 J**	**8.3 J**	<20 U	**26.7**	<20 U	**11.3**	<5.0 U	**3.9 J**	**12.6**	**34.9**	<5.0 U	**55.6**	**5.2**	<5.0 U	**9.6**	**124**	**110**
Barium	7440-39-3	1000	**739**	**883**	**100 J**	**2510**	**507**	**84.4 J**	**861**	**876**	**144 J**	**108 J**	**176 J**	**800**	**116 J**	**120 J**	**326**	**608**	**568**
Beryllium	7440-41-7	3	<5.0 U	<5.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	7440-43-9	5	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U
Calcium	7440-70-2	NL	**593000**	**216000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	50	<20 U	<20 U	<20 U	<20 U	<20 U	<10.0 U	**36.6**	**34.9**	**12.9**	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U
Cobalt	7440-48-4	NL	<50 U	<50 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	200	<30 U	<30 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	300	**5220**	**21200**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	25	<10 U	<10 U	**6.9 J**	<10 U	<10 U	<5.0 U	<10.0 U	<10.0 U	**39.6**	<5.0 U	<5.0 U	**4.9 J**	<5.0 U	<5.0 U	<5.0 U	**8.2**	**9.2**
Magnesium	7439-95-4	35000	**48300**	**95500**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	300	**491**	**1720**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	0.7	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U
Nickel	7440-02-0	100	<50 U	<50 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	7440-09-7	NL	**87800**	**35700**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	10	<30.0 U	<30.0 U	**13.8 J**	<30.0 U	<30.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U
Silver	7440-22-4	50	<30 U	<30 U	<30 U	<30 U	<30 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U
Sodium	7440-23-5	20000	**2510000**	**711000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	0.5	**10.2 J**	<20 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NL	<50 U	<50 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	2000	<50 U	<50 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide (ug/L)																			
Total Cyanide	57-12-5	200	**26.7**	**120**	**72.3**	<20 U	**15.8 J**	**14**	<10 U	<10 U	**24**	**12**	<10 U	**130**	**7.8 J**	**7.2 J**	**29**	**12**	**9.9 J**
Pesticides (ug/L)																			
Aldrin	309-00-2	NL	<0.050 U	<0.050 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alpha-BHC	319-84-6	NL	<0.050 U	**R**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beta-BHC	319-85-7	NL	<0.050 U	**R**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane, alpha	5103-71-9	NL	<0.050 U	<0.050 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane, trans-	5103-74-2	NL	<0.050 U	<0.050 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DDD,4,4-	72-54-8	NL	<0.10 U	<0.10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DDE,4,4-	72-55-9	NL	<0.10 U	<0.10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DDT,4,4-	50-29-3	NL	<0.10 U	<0.10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Delta-BHC	319-86-8	NL	<0.050 U	<0.050 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	60-57-1	NL	<0.10 U	<0.10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	959-98-8	NL	<0.050 U	<0.050 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	33213-65-9	NL	<0.10 U	<0.10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1031-07-8	NL	<0.10 U	<0.10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	72-20-8	NL	<0.10 U	<0.10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	7421-93-4	NL	<0.10 U	<0.10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	53494-70-5	NL	<0.10 U	<0.10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gamma BHC (Lindane)	58-89-9	NL	<0.050 U	<0.050 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	76-44-8	NL	<0.050 U	<0.050 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor Epoxide	1024-57-3	NL	<0.050 U	<0.050 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	72-43-5	NL	<0.50 U	<0.50 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toxaphene	8001-35-2	NL	<5.0 U	<5.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated biphenyls (ug/L)																			
Aroclor 1016	12674-11-2	NL	<1.0 U	<1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1221	11104-28-2	NL	<1.0 U	<1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1232	11141-16-5	NL	<1.0 U	<1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	53469-21-9	NL	<1.0 U	<1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	12672-29-6	NL	<1.0 U	<1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	11097-69-1	NL	<1.0 U	<1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	11096-82-5	NL	<1.0 U	<1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Herbicides (ug/L)																			
2,4-D	94-75-7	NL	<1.0 U	<1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DB	94-82-6	NL	<1.0 U	<1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silvex	93-72-1	NL	<0.10 U	<0.10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-T	93-76-5	NL	<0.10 U	<0.10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

mg/Kg - milligrams per kilogram
µg/L - micrograms per liter
J = The associated data is an estimated quantity.
R = The associated data is rejected.

NA = Not Analyzed
ND = Not Detected
NL = Not Listed

U = The analyte was analyzed for but not detected at, or above, the Method Detection Limit (MDL). The associated numerical value is the Practical Quantitation Limit (PQL).
UJ = The analyte was not detected at or above the PQL. However, the reported PQL is approximate and may be inaccurate or imprecise.
Bold indicates the analyte detected at a concentration greater than the MDL.
Yellow highlight indicates result is above the NYSDEC Part 375-6.8(b) Restricted Use Soil Cleanup Objective Commercial value.
[1] Guidance or Standard Values - NYSDEC, Division of Water, TOGS (1.1.1) - 6 NYCRR 703.5 [NYSDEC, 1998].

Table 2-4
Soil Vapor Intrusion Evaluation Results
Metropolitan Former MGP Site, Brooklyn, New York

Type of Sample	CAS No.	Typical Background Indoor Air Concentrations (Non-Residential)[3]	Ambient	Indoor Air	Sub-Slab Soil Vapor	Indoor Air	Indoor Air	Sub-Slab Soil Vapor	Ambient	Indoor Air	Sub-Slab Soil Vapor	Ambient	Indoor Air	Sub-Slab Soil Vapor
Sample ID			AMB-1	IA-1	SV-1	IA-2	IA-2 Dup	SV-2	AMB-3	IA-3	SV-3	AMB-2	IA-4	SV-4
Sampling Date			3/31/2010	3/31/2010	3/31/2010	3/31/2010	3/31/2010	3/31/2010	4/2/2011	4/2/2011	4/2/2011	3/19/2011	3/19/2011	3/19/2011
Compound (µg/m³)														
Possibly MGP Related or Other Sources [1]														
1,2,4-Trimethylbenzene	95-63-6	9.5	0.75 U	**0.88**	0.76 U	**0.82**	**1.0**	0.79 U	0.787 U	**2.85**	**1.43**	0.787 U	**2.16**	**2.90**
1,3,5-Trimethylbenzene	108-67-8	3.7	0.75 U	0.78 U	0.76 U	0.79 U	0.78 U	0.79 U	0.787 U	**0.885**	0.787 U	0.787 U	0.787 U	**0.787**
2,2,4-Trimethylpentane	540-84-1	NL	3.6 U	3.7 U	3.6 U	3.8 U	3.7 U	3.8 U	3.74 U	**5.56**	3.74 U	3.74 U	3.74 U	3.74 U
2,3-Dimethylpentane	565-59-3	NL	3.1 U	3.2 U	3.2 U	3.3 U	3.2 U	3.3 U	3.28 U	**0.820 J**	3.28 U	3.28 U	3.28 U	3.28 U
2-Methylpentane	107-83-5	NL	2.7 U	2.8 U	2.7 U	2.8 U	2.8 U	2.8 U	**0.634 J**	**3.52**	2.82 U	2.82 U	**0.881 J**	2.82 U
4-Ethyltoluene	622-96-8	3.6	0.75 U	0.78 U	0.76 U	0.79 U	**0.88**	0.79 U	3.93 U	**0.787 J**	3.93 U	3.93 U	**0.836 J**	**1.18 J**
Benzene	71-43-2	9.4	**0.57**	**1.0**	**3.9**	**0.88**	**0.84**	**0.60**	**0.671**	**4.82**	0.511 U	**0.543**	**0.703**	0.511 U
Carbon Disulfide	75-15-0	4.2	2.4 U	2.5 U	**6.3**	2.5 U	2.5 U	2.5 U	2.49 U	2.49 U	2.49 U	2.49 U	2.49 U	**0.934 J**
Cyclohexane	110-82-7	NL	0.52 U	0.54 U	1.2	0.55 U	0.54 U	**0.75**	2.75 U	**0.688**	2.75 U	2.75 U	2.75 U	2.75 U
Ethylbenzene	100-41-4	5.7	0.66 U	0.69 U	0.67 U	0.70 U	0.69 U	0.70 U	0.695 U	**6.56**	**0.956**	0.695 U	**0.782**	0.695 U
Heptane	142-82-5	NL	0.62 U	**0.80**	0.64 U	0.66 U	**0.67**	**1.0**	3.28 U	**1.48 J**	3.28 U	3.28 U	**0.820 J**	3.28 U
Hexane	110-54-3	10.2	0.54 U	**0.66**	0.55 U	**1.0**	**0.88**	**1.6**	**0.634 J**	**2.26 J**	2.82 U	2.82 U	**0.811 J**	2.82 U
Indan	496-11-7	NL	3.7 U	3.8 U	3.7 U	3.9 U	3.8 U	3.9 U	3.87 U	3.87 U	3.87 U	3.87 U	3.87 U	3.87 U
Indene	95-13-6	NL	3.6 U	3.8 U	3.7 U	3.8 U	3.8 U	3.8 U	3.80 U	3.80 U	3.80 U	3.80 U	3.80 U	3.80 U
Isopentane	78-784	NL	2.2 U	**40**	2.3 U	**45**	**54**	2.4 U	**12.1**	**31.8**	**1.56 J**	**4.07**	**10.1**	**1.83 J**
Naphthalene	91-20-3	5.1	4.0 U	4.1 U	4.1 U	4.2 U	4.1 U	4.2 U	4.19 U	4.19 U	4.19 U	4.19 U	4.19 U	**1.42 J**
Styrene	100-42-5	1.9	0.65 U	0.67 U	0.66 U	0.68 U	0.67 U	0.68 U	0.682 U	**1.32**	0.682 U	0.682 U	0.682 U	0.682 U
Thiophene	110-02-1	NL	2.6 U	2.7 U	2.7 U	2.8 U	2.7 U	2.8 U	2.75 U	2.75 U	2.75 U	2.75 U	2.75 U	2.75 U
Toluene	108-88-3	43	**1.9**	**3.0**	**1.8**	**3.7**	**3.2**	**4.0**	**1.09**	**16.1**	**4.18**	**0.64**	**10.6**	**5.24**
m/p-Xylenes	136777-61-2	22.2	**0.94**	**1.4**	0.67 U	**2.0**	**1.7**	0.70 U	0.695 U	**12.2**	**3.87**	0.695 U	**2.08**	**2.48**
o-Xylene	95-47-6	7.9	0.66 U	0.69 U	0.67 U	0.70 U	0.69 U	0.70 U	0.695 U	**5.52**	0.912	1.912	**0.869**	**0.869**
1,2,3-Trimethylbenzene	526-73-8	NL	3.7 U	3.9 U	3.8 U	4.0 U	3.9 U	4.0 U	3.93 U	3.93 U	3.93 U	3.93 U	3.93 U	3.93 U
1,2,4,5-Tetramethylbenzene	95-93-2	NL	(TIC) U	(TIC) U	(TIC) U	(TIC) U	(TIC) U	U	4.39 U	4.39 U	4.39 U	4.39 U	4.39 U	4.39 U
1-Methylnaphthalene	90-12-0	NL	(TIC) U	(TIC) U	(TIC) U	(TIC) U	(TIC) U	U	11.6 UJ	11.6 UJ	11.6 UJ	11.6 UJ	11.6 UJ	11.6 UJ
2-Chlorotoluene	95-49-8	NL	(TIC) U	(TIC) U	(TIC) U	(TIC) U	(TIC) U	U	NS	NS	NS	NS	NS	NS
2-Methylnaphthalene	91-57-6	NL	(TIC) U	(TIC) U	(TIC) U	(TIC) U	(TIC) U	U	11.6 UJ	11.6 UJ	11.6 UJ	11.6 UJ	11.6 UJ	11.6 UJ
Not MGP Related [2]														
1,1,1-Trichloroethane (1,1,1-TCA)	71-55-6	20.6	0.83 U	0.86 U	**3.6**	0.88 U	0.86 U	**4.4**	0.873 U	0.873 U	**1.75**	0.873 U	0.873 U	0.873 U
1,1,2,2-Tetrachloroethane	79-34-5	NL	1.0 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.10 U	1.10 U	1.10 U	1.10 U	1.10 U	1.10 U
1,1,2-Trichloroethane	79-00-5	<1.5	0.83 U	0.86 U	0.84 U	0.88 U	0.86 U	0.88 U	0.873 U	0.873 U	0.873 U	0.873 U	0.873 U	0.873 U
1,1-Dichloroethane	75-34-3	<0.7	0.62 U	0.64 U	0.63 U	0.65 U	0.64 U	0.65 U	0.648 U	0.648 U	**0.648**	0.648 U	0.648 U	0.648 U
1,1-Dichloroethene	75-35-4	<1.4	0.60 U	0.63 U	0.61 U	0.64 U	0.63 U	0.64 U	0.634 U	0.634 U	**1.18**	0.634 U	0.634 U	0.634 U
1,2,4-Trichlorobenzene	120-82-1	<6.8	5.6 U	5.9 U	5.8 U	6.0 U	5.9 U	6.0 U	5.94 U	5.94 U	5.94 U	5.94 U	5.94 U	5.94 U
1,2-Dibromoethane (EDB)	106-93-4	<1.5	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.23 U	1.23 U	1.23 U	1.23 U	1.23 U	1.23 U
1,2-Dichlorobenzene	95-50-1	<1.2	0.91 U	0.95 U	0.93 U	0.97 U	0.95 U	**2.1**	0.962 U	0.962 U	0.962 U	0.962 U	0.962 U	0.962 U
1,2-Dichloroethane	107-06-2	<0.9	0.62 U	0.64 U	0.63 U	0.65 U	0.64 U	0.65 U	0.648 U	**0.809**	0.648 U	0.648 U	0.648 U	0.648 U
1,2-Dichloropropane	78-87-5	<1.6	0.70 U	0.73 U	0.72 U	0.74 U	0.73 U	0.74 U	0.739 U	**4.76**	0.739 U	0.739 U	0.739 U	0.739 U
1,3-Butadiene	106-99-0	<3.0	0.34 U	0.35 U	0.34 U	0.36 U	0.35 U	0.36 U	1.77 U	1.77 U	1.77 U	1.77 U	1.77 U	1.77 U
1,3-Dichlorobenzene	541-73-1	<2.4	0.91 U	0.95 U	0.93 U	0.97 U	0.95 U	0.97 U	0.962 U	0.962 U	0.962 U	0.962 U	0.962 U	0.962 U
1,4-Dichlorobenzene	106-46-7	5.5	0.91 U	**5.8**	0.93 U	**2.5**	**2.6**	0.97 U	0.962 U	0.962 U	0.962 U	0.962 U	0.962 U	0.962 U
1,4-Dioxane	123-91-1	NL	0.55 U	0.57 U	0.56 U	0.58 U	0.57 U	0.58 U	2.88 U	2.88 U	2.88 U	2.88 U	2.88 U	2.88 U

Notes:

µg/Kg - micrograms per kilogram

[1] These compounds may be related to either MGP sources or non-MGP sources, or both. MGP sources include MGP tars and petroleum feedstocks used in MGP processes, such as the carburetted water gas process. Non-MGP sources include cleaning products, floor wax and polish, vehicle exhaust, construction materials, and cigarette smoke.

[2] These compounds are not related to MGP sources and are present due to non-MGP sources, such as vehicle exhaust, heating and air conditioning systems, cleaning agents, art supplies, paints, etc.

[3] Typical non-residential background indoor air concentrations are equal to the 90th percentile values observed by the USEPA in a 2001 study which are the values recommended for comparison in the NYSDOH "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" (NYSDOH, October

ND = Not Detected

NL = Not Listed

NS = Analyte was not measured because it was not part of the QAPP target compound list.

J = The associated numerical value is an estimated quantity.

TIC - Compound was analyzed using a GC/MS library search.

U = The analyte was analyzed for but not detected at, or above, the Method Detection Limit (MDL). The associated numerical value is the Practical Quantitation Limit (PQL).

UJ = The analyte was not detected at or above the PQL. However, the reported PQL is approximate and may be inaccurate or imprecise.

Bold indicates the analyte detected at a concentration greater than the MDL.

Bold and Green Highlighting indicate that the ambient air and/or indoor air result is above the NYSDOH Background Indoor Air Concentrations. Soil Vapor results are not highlighted based on a comparison to these background concentrations.

Table 2-4 continued
Soil Vapor Intrusion Evaluation Results
Metropolitan Former MGP Site, Brooklyn, New York

Type of Sample	CAS No.	Typical Background Indoor Air Concentrations (Non-Residential)[3]	Ambient	Indoor Air	Sub-Slab Soil Vapor	Indoor Air	Indoor Air	Sub-Slab Soil Vapor	Ambient	Indoor Air	Sub-Slab Soil Vapor	Ambient	Indoor Air	Sub-Slab Soil Vapor
Sample ID			AMB-1	IA-1	SV-1	IA-2	IA-2 Dup	SV-2	AMB-3	IA-3	SV-3	AMB-2	IA-4	SV-4
Sampling Date			3/31/2010	3/31/2010	3/31/2010	3/31/2010	3/31/2010	3/31/2010	4/2/2011	4/2/2011	4/2/2011	3/19/2011	3/19/2011	3/19/2011
Compound (µg/m³)														
2-Butanone (MEK)	78-93-3	12	**1.3**	**0.97**	**2.3**	**2.3**	**1.0**	**3.4**	**0.649 J**	**3.98**	**1.30 J**	**0.531 J**	**1.33 J**	**2.27 J**
2-Hexanone	591-78-6	NL	3.1 U	3.2 U	3.2 U	3.3 U	3.2 U	3.3 U	3.28 U	3.28 U	3.28 U	3.28 U	3.28 U	3.28 U
4-Methyl-2-pentanone (MIBK)	108-10-1	6	0.62 U	0.65 U	0.63 U	0.66 U	0.65 U	0.66 U	3.28 U	3.28 U	3.28 U	3.28 U	3.28 U	3.28 U
Acetone	67-64-1	98.9	**6.4**	**16**	**18**	**20**	**15**	**120**	**6.37**	**73.0**	**3.68**	**4.66**	**31.5**	**6.89**
Benzyl chloride	100-44-7	NL	0.79 U	0.82 U	0.80 U	0.83 U	0.82 U	0.83 U	0.828 U	0.828 U	0.828 U	0.828 U	0.828 U	0.828 U
Bromodichloromethane	75-27-4	NL	1.0 U	1.0 U	1.0 U	1.1 U	1.0 U	**1.3**	5.36 U	5.36 U	5.36 U	5.36 U	5.36 U	5.36 U
Bromoform	75-25-2	NL	1.6 U	1.6 U	1.6 U	1.7 U	1.6 U	1.7 U	8.27 U	8.27 U	8.27 U	8.27 U	8.27 U	8.27 U
Bromomethane	74-83-9	<1.7	0.59 U	0.61 U	0.60 U	0.62 U	0.61 U	0.62 U	0.622 U	0.622 U	0.622 U	0.622 U	0.622 U	0.622 U
Carbon Tetrachloride	56-23-5	<1.3	0.96 U	0.99 U	0.98 U	1.0 U	0.99 U	1.0 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Chlorobenzene	108-90-7	<0.9	0.70 U	0.73 U	0.71 U	0.74 U	0.73 U	0.74 U	0.737 U	0.737 U	0.737 U	0.737 U	0.737 U	0.737 U
Chloroethane	75-00-3	<1.1	0.40 U	0.42 U	0.41 U	0.42 U	0.42 U	0.42 U	0.422 U	0.422 U	0.422 U	0.422 U	0.422 U	0.422 U
Chloroform	67-66-3	1.1	0.74 U	**2.0**	**6.8**	**1.1**	**1.1**	**36**	0.781 U	**0.830**	**1.12**	0.781 U	**0.826**	**1.42**
Chloromethane	74-87-3	3.7	**1.2**	0.33 U	0.32 U	**1.3**	**1.5**	0.33 U	**0.929**	**0.909**	0.330 U	**0.950**	0.330 U	0.330 U
cis-1,2-Dichloroethene	156-59-2	<1.9	0.60 U	0.63 U	0.61 U	0.64 U	0.63 U	0.64 U	0.634 U	0.634 U	0.634 U	0.634 U	0.634 U	0.634 U
cis-1,3-Dichloropropene	10061-01-5	<2.3	0.69 U	0.72 U	0.70 U	0.73 U	0.72 U	0.73 U	0.726 U	0.726 U	0.726 U	0.726 U	0.726 U	0.726 U
Dibromochloromethane	124-48-1	NL	1.3 U	1.3 U	1.3 U	1.4 U	1.3 U	1.4 U	6.81 U	6.81 U	6.81 U	6.81 U	6.81 U	6.81 U
Ethanol	64-17-5	NL	**13 J**	**330 J**	**4.4 J**	**230 J**	**260 J**	**5.4 J**	**4.88**	**60.2**	**1.66**	**5.99**	**48.1**	**10.6**
Trichlorofluoromethane (Freon 11)	75-69-4	18.1	**7.3**	**16**	**7.5**	**19**	**21**	**20**	**1.57**	**5.23**	**3.88**	**1.63**	**2.3**	**41.5**
1,1,2-Trichlorotrifluoroethane (Freon 113)	76-13-1	NL	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.23 U	1.23 U	1.23 U	1.23 U	1.23 U	1.23 U
1,2-Dichlorotetrafluoroethane	76-14-2	NL	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U
Dichlorodifluoromethane (Freon 12)	75-71-8	16.5	**6.2**	**5.1**	**18**	**7.4**	**8.2**	**43**	**2.52**	**2.27**	**2.67**	**2.52**	**2.08**	**2.13**
Hexachlorobutadiene (C-46)	87-68-3	<6.8	8.1 U	8.4 U	8.3 U	8.6 U	8.4 U	8.6 U	8.53 U	8.53 U	8.53 U	8.53 U	8.53 U	8.53 U
Methyl tert-Butyl Ether (MTBE)	1634-04-4	11.5	0.55 U	0.57 U	0.56 U	0.58 U	0.57 U	0.58 U	2.88 U	2.88 U	2.88 U	2.88 U	2.88 U	2.88 U
Methylene Chloride (Dichloromethane)	75-09-2	10	**1.0**	1.1 U	1.1 U	**1.7**	**1.6**	1.1 U	6.95 U	9.98 U	6.95 U	6.95 U	6.95 U	6.95 U
2-Propanol	67-63-0	NL	**2.8**	**40**	1.9 U	**26**	**29**	**14**	**2.46**	**3.96**	**1.30 J**	**4.01**	**4.25**	**2.16**
Propene	115-07-1	NL	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.38 U	**3.53**	1.38 U	1.38 U	1.38 U	1.38 U
Tetrachloroethene (PCE)	127-18-4	15.9	1.0 U	1.1 U	**3.5**	1.1 U	1.1 U	**21**	1.09 U	**1.22**	**12.3**	1.09 U	1.09 U	**11.5**
Tetrahydrofuran	109-99-9	NL	2.2 U	2.3 U	2.3 U	2.4 U	2.3 U	2.4 U	2.36 U	2.36 U	2.36 U	2.36 U	2.36 U	2.36 U
trans-1,2-Dichloroethene	156-60-5	NL	0.60 U	0.63 U	0.61 U	0.64 U	0.63 U	0.64 U	3.17 U	3.17 U	3.17 U	3.17 U	3.17 U	3.17 U
trans-1,3-Dichloropropene	10061-02-6	<1.3	0.69 U	0.72 U	0.70 U	0.73 U	0.72 U	0.73 U	0.726 U	0.726 U	0.726 U	0.726 U	0.726 U	0.726 U
Trichloroethene (TCE)	79-01-6	4.2	0.82 U	0.85 U	**0.84**	0.86 U	0.85 U	0.86 U	0.860 U	0.860 U	0.860 U	0.860 U	0.860 U	0.860 U
Vinyl Chloride	75-01-4	<1.9	0.39 U	0.40 U	0.40 U	0.41 U	0.40 U	0.41 U	0.409 U	0.409 U	0.409 U	0.409 U	0.409 U	0.409 U
Helium (percent)	7440-59-7	NA			0.078 U			0.080 U			0.12			0.15

Notes:
µg/Kg - micrograms per kilogram
1 These compounds may be related to either MGP sources or non-MGP sources, or both. MGP sources include MGP tars and petroleum feedstocks used in MGP processes, such as the carburetted water gas process. Non-MGP sources include cleaning products, floor wax and polish, vehicle exhaust, construction materials, and cigarette smoke.
2 These compounds are not related to MGP sources and are present due to non-MGP sources, such as vehicle exhaust, heating and air conditioning systems, cleaning agents, art supplies, paints, etc.
3 Typical non-residential background indoor air concentrations are equal to the 90th percentile values observed by the USEPA in a 2001 study which are the values recommended for comparison in the NYSDOH "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" (NYSDOH, October
ND = Not Detected
NL = Not Listed
NS = Analyte was not measured because it was not part of the QAPP target compound list.
J = The associated numerical value is an estimated quantity.
TIC - Compound was analyzed using a GC/MS library search.
U = The analyte was analyzed for but not detected at, or above, the Method Detection Limit (MDL). The associated numerical value is the Practical Quantitation Limit (PQL).
UJ = The analyte was not detected at or above the PQL. However, the reported PQL is approximate and may be inaccurate or imprecise.
Bold indicates the analyte detected at a concentration greater than the MDL.
Bold and Green Highlighting indicate that the ambient air and/or indoor air result is above the NYSDOH Background Indoor Air Concentrations. Soil Vapor results are not highlighted based on a comparison to these background concentrations.

Table 4-1
Monitoring Well Construction Details
Metropolitan Former MGP Site, Brooklyn, New York

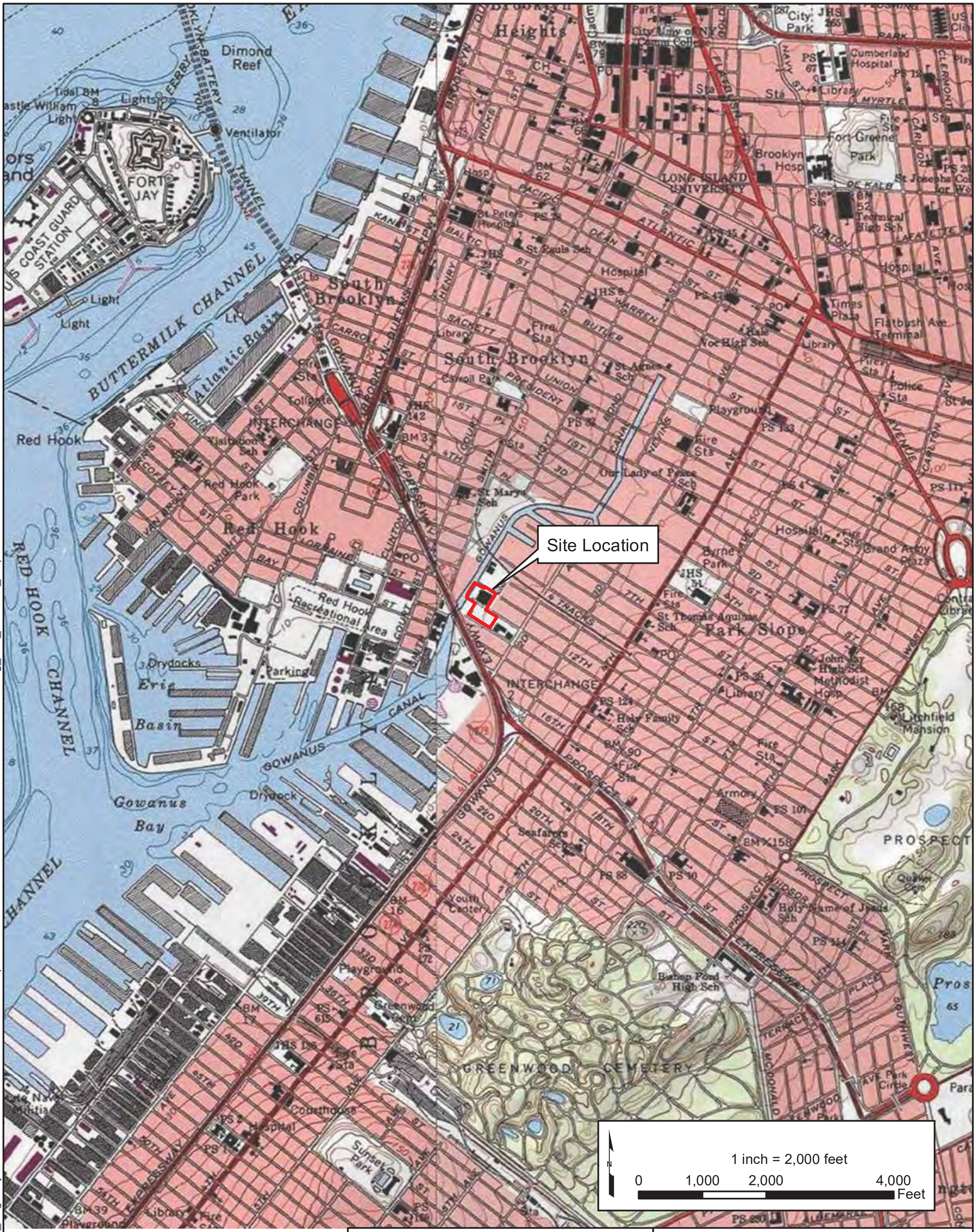
Well ID	Date Installed	Coordinates				Ground Surface Elevation (ft)	Top of Casing Elevation (ft)	Well Diameter (inches)	Screened Interval (ft btoc)	Total Depth (ft btoc)	1-Jun-10		26-Jul-10		23-Aug-10		29-Sep-10		4-Oct-10		8-Oct-10		22-Oct-10		22-Nov-10		29-Apr-11		14-Mar-12	
		Northing	Easting	Latitude	Longitude						Depth to Water (ft btoc)	Groundwater Elevation (ft datum)	Depth to Water (ft btoc)	Groundwater Elevation (ft datum)	Depth to Water (ft btoc)	Groundwater Elevation (ft datum)	Depth to Water (ft btoc)	Groundwater Elevation (ft datum)	Depth to Water (ft btoc)	Groundwater Elevation (ft datum)	Depth to Water (ft btoc)	Groundwater Elevation (ft datum)	Depth to Water (ft btoc)	Groundwater Elevation (ft datum)	Depth to Water (ft btoc)	Groundwater Elevation (ft datum)	Depth to Water (ft btoc)	Groundwater Elevation (ft datum)	Depth to Water (ft btoc)	Groundwater Elevation (ft datum)
										Tide Occurrence >	Mid-Tide (Incoming)		High Tide		High Tide		High Tide		Mid-Tide (Outgoing)		Mid-Tide (Incoming)		Low Tide		Low Tide		Mid-Tide (Outgoing)		Low Tide (Incoming)	
										Activity >	Initital Groundwater Well Development		Monthly Gowanus Gauging (1st)		Monthly Gowanus Gauging (2nd)		Monthly Gowanus Gauging (3rd)		Initial Groundwater Sampling		Initial Aquifer Testing		Monthly Gowanus Gauging (4th)		Monthly Gowanus Gauging (4th)		Initital Groundwater Well Development (MW-4D1 & MW-4D2 only)		Initital Groundwater Sampling for new wells (MW-19S/I, MW-20S/I, MW21D, MW-22I/D, MW-23D, MW-25S/I)	
Canal Surface	8/24/2010	184286.64	984929.73	NA	NA	9.11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14.05	-4.94	9.65	-0.54	N/A	N/A	16.3	-7.19	17.05	-7.94	12.04	-2.93	NM	NM	13.75	-4.64
Shallow Wells																														
MW-1S	4/8/2010	183754.21	985753.83	40-40-15.742	73-59-40.484	11.99	11.62	2	3 to 13	15.0	3.45	8.17	4.00	7.62	3.97	7.65	4.14	7.48	3.83	7.79	N/M	N/M	3.96	7.66	4.22	7.40	NM	NM	5.00	6.62
MW-3S	4/13/2010	183865.47	985269.49	40-40-16.842	73-59-46.769	8.61	8.05	2	3 to 13	15.0	2.49	5.56	2.95	5.10	3.01	5.04	2.57	5.48	1.9	6.15	2.16	5.89	2.53	5.52	2.92	5.13	NM	NM	3.11	4.94
MW-4S	4/28/2010	184145.24	984868.25	40-40-19.606	73-59-51.977	6.86	6.45	2	3 to 13	15.0	4.94	1.51	5.00	1.45	4.71	1.74	4.88	1.57	4.26	2.19	4.68	1.77	5.07	1.38	4.78	1.67	NM	NM	5.32	1.13
MW-5S	4/27/2010	183938.46	984811.01	40-40-17.563	73-59-52.719	9.79	9.44	2	3 to 13	15.0	7.43	2.01	7.40	2.04	7.29	2.15	7.30	2.14	6.9	2.54	7.30	2.14	7.5	1.94	7.55	1.89	NM	NM	8.00	1.44
MW-6S	4/21/2010	183755.76	985095.95	40-40-15.758	73-59-49.0216	9.81	9.59	2	3 to 13	15.0	5.62	3.97	5.80	3.79	5.78	3.81	5.79	3.80	5.35	4.24	5.38	4.21	5.59	4.00	5.72	3.87	NM	NM	6.13	3.46
MW-7S	4/29/2010	183682.08	985205.99	40-40-15.030	73-59-47.594	10.36	9.94	2	3 to 13	15.0	5.39	4.55	5.63	4.31	5.52	4.42	5.51	4.43	4.44	5.50	4.69	5.25	4.92	5.02	5.46	4.48	NM	NM	5.95	3.99
MW-8S	5/5/2010	184072.81	985056.75	40-40-18.890	73-59-49.530	7.46	7.23	2	3 to 13	15.0	3.08	4.15	4.65	2.58	4.74	2.49	4.63	2.60	4.51	2.72	4.10	3.13	4.68	2.55	4.53	2.70	NM	NM	5.12	2.11
MW-9S	9/17/2010	184284.23	984942.57	40-40-20.980	73-59-51.012	9.36	8.98	2	5 to 15	17.0	NS	NS	NS	NS	NS	NS	6.62	2.36	8.19	0.79	N/M	NM	10.93	-1.95	8.91	0.07	NM	NM	9.65	-0.67
MW-19S	10/2/2011	184233.97	984729.73	40-40-20.48	73-59-53.77	10.91	10.6	2	4 to 14	16.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	11.00	-0.40
MW-20S	10/16/2011	184310.69	984687.19	40-40-21.24	73-59-54.33	11.69	11.36	2	4 to 14	16.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	8.78	2.58
MW-25S	10/13/2011	184592.24	985262.07	40-40-24.023	73-59-46.865	6.51	6.10	2	18 to 28	30.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.85	2.25
Intermediate Wells																														
MW-1I	4/8/2010	183751.96	985757.21	40-40-15.720	73-59-40.440	12.09	11.58	2	30 to 40	42.0	6.27	5.31	7.30	4.28	7.11	4.47	7.35	4.23	7.10	4.48	N/M	N/M	7.84	3.74	7.21	4.37	NM	NM	7.24	4.34
MW-3I	4/13/2010	183865.47	985269.49	40-40-16.842	73-59-46.769	8.61	8.07	2	25 to 50	52.0	3.99	4.08	4.44	3.63	4.35	3.72	4.39	3.68	4.03	4.04	4.23	3.84	4.44	3.63	4.49	3.58	NM	NM	4.76	3.31
MW-4I	4/28/2010	184145.24	984868.25	40-40-19.606	73-59-51.977	6.86	6.31	2	25 to 35	37.0	3.95	2.36	3.88	2.43	3.91	2.40	4.78	1.53	3.74	2.57	4.55	1.76	4.39	1.92	4.02	2.29	NM	NM	4.85	1.46
MW-5I	4/22/2010	183936.22	984812.02	40-40-17.541	73-59-52.706	9.79	9.5	2	38 to 48	50.0	7.09	2.41	7.05	2.45	7.18	2.32	6.91	2.59	6.68	2.82	7.64	1.86	7.5	2	7.21	2.29	NM	NM	7.77	1.73
MW-6I	4/21/2010	183755.76	985095.95	40-40-15.758	73-59-49.0216	9.81	9.21	2	30 to 40	42.0	6.72	2.49	6.78	2.43	6.77	2.44	6.66	2.55	6.45	2.76	7.32	1.89	7.14	2.07	6.78	2.43	NM	NM	7.33	1.88
MW-7I	4/29/2010	183682.08	985205.99	40-40-15.030	73-59-47.594	10.36	9.81	2	30 to 40	42.0	6.98	2.83	7.20	2.61	7.15	2.66	7.07	2.74	6.78	3.03	7.73	2.08	7.48	2.33	7.13	2.68	NM	NM	7.66	2.15
MW-8I	5/5/2010	184072.81	985056.75	40-40-18.890	73-59-49.530	7.46	7.12	2	30 to 40	42.0	4.51	2.61	4.70	2.42	4.68	2.44	4.52	2.60	4.41	2.71	5.22	1.90	5.04	2.08	4.77	2.35	NM	NM	5.12	2.00
MW-9I	9/17/2010	184280.34	984939.39	40-40-20.941	73-59-51.053	9.29	8.81	2	30 to 45	47.0	NS	NS	NS	NS	NS	NS	7.22	1.59	6.07	2.74	N/M	N/M	6.76	2.05	6.5	2.31	NM	NM	6.90	1.91
MW-19I	10/2/2011	184233.97	984729.73	40-40-20.48	73-59-53.77	10.91	10.54	2	28 to 38	40.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	9.18	1.36
MW-20I	10/16/2011	184310.69	984687.19	40-40-21.24	73-59-54.33	11.69	11.34	2	28 to 38	40.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	10.09	1.25
MW-22I	10/6/2011	184316.19	985224.90	40-40-21.295	73-59-47.348	8.12	7.68	2	25 to 35	37.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	5.30	2.38
MW-25I	10/13/2011	184592.24	985262.07	40-40-24.023	73-59-46.865	6.51	6.10	2	34 to 44	46.5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.86	2.24
Deep Wells																														
MW-1D	4/8/2010	183751.96	985757.21	40-40-15.720	73-59-40.440	12.09	11.46	2	60 to 70	72.0	7.42	4.04	7.83	3.63	7.75	3.71	7.88	3.58	7.69	3.77	N/M	N/M	7.11	4.35	7.77	3.69	NM	NM	7.69	3.77
MW-2D	4/9/2010	183753.85	985474.32	40-40-15.739	73-59-44.111	10.26	9.97	2	60 to 70	72.0	7.17	2.80	7.22	2.75	7.12	2.85	7.15	2.82	6.80	3.17	7.70	2.27	7.45	2.52	7.16	2.81	NM	NM	7.61	2.36
MW-4D1	4/28/2011	184130.65	984874.52	40-40-19.462	73-59-51.895	6.85	6.40	2	115 to 120	120.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.20	3.20	5.49	0.91
MW-4D2	4/27/2011	184145.26	984879.53	40-40-19.606	73-59-51.830	6.80	6.07	2	142 to 147	150.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.20	2.87	2.18	3.89
MW-5D	4/22/2010	183936.22	984812.02	40-40-17.541	73-59-52.706	9.79	9.42	2	60 to 70	72.0	7.01	2.41	6.95	2.47	7.10	2.32	6.79	2.63	6.58	2.84	7.54	1.88	7.41	2.01	7.13	2.29	NM	NM	7.67	1.75
MW-9D	9/17/2010	184280.34	984939.39	40-40-20.941	73-59-51.053	9.29	8.83	2	60 to 70	72.0	NS	NS	NS	NS	NS	NS	6.21	2.62	6.08	2.75	N/M	N/M	6.74	2.09	6.50	2.33	NM	NM	6.89	1.94
MW-21D	10/18/2011	184246.62	985321.01	40-40-20.608	73-59-46.101	10.07	9.73	2	60 to 70	72.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	7.09	2.64
MW-22D	10/6/2011	184316.19	985224.90	40-40-21.295	73-59-47.348	8.12	7.68	2	60 to 70	72.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	5.51	2.17
MW-23D	10/4/2011	184572.54	985157.21	40-40-23.83	73-59-48.23	5.22	4.64	2	60 to 70	72.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.54	2.10

Notes:

NA - Not Applicable
NS - Not Sampled due to well not installed.
NM - Not Measured

ft btoc - feet below top of casing
Top of casing elevations in feet above North American Vertical Datum of 1988 (NAVD-88).
Canal surface reference adjacent to MW-9 location.

Figures



National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

Site Location Map

DATE: 9/5/2016	DRWN: HKM	60277889	FIGURE 1-1

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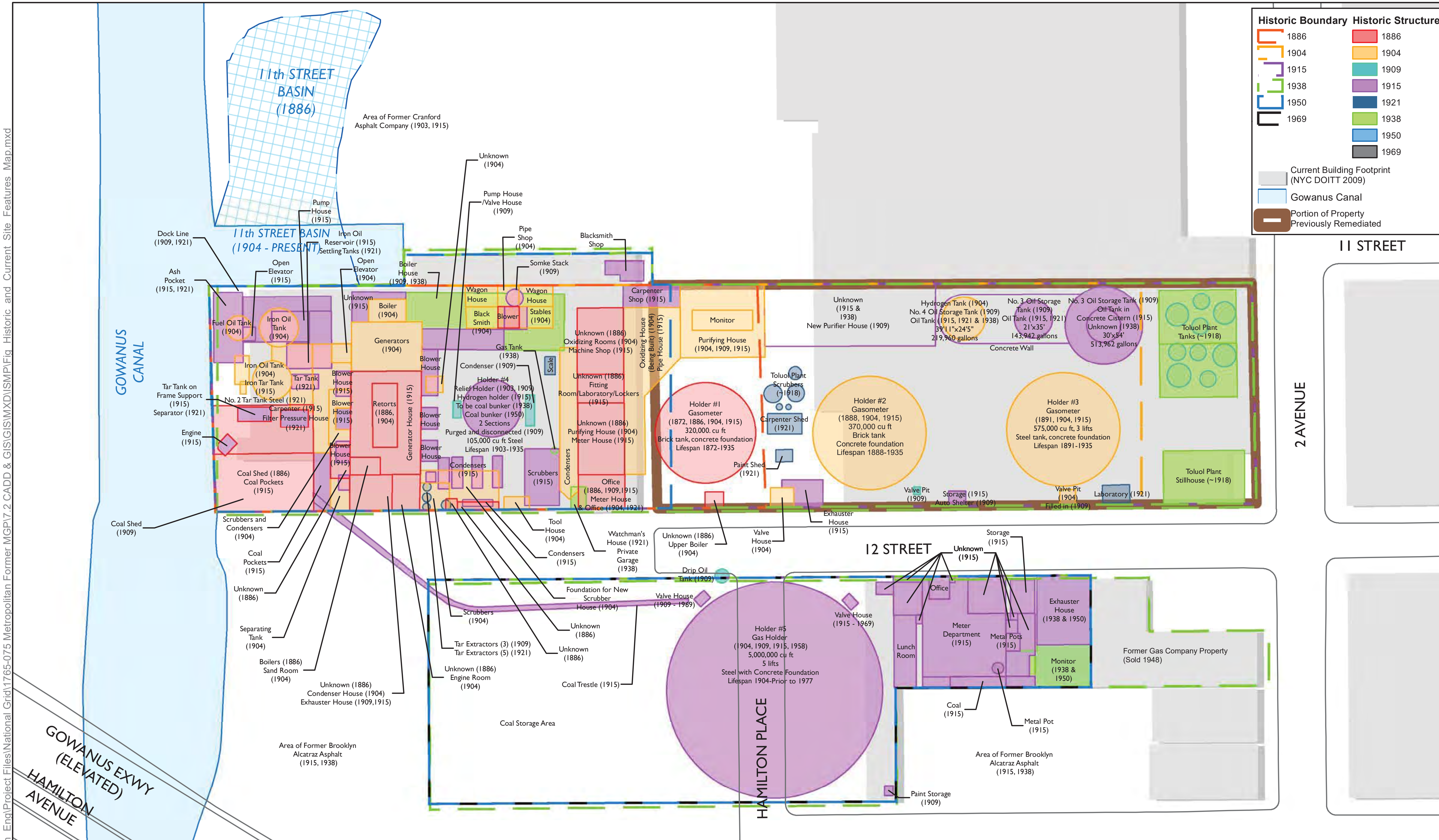

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AECOM

Notes/Information Sources:
Dates represent first and subsequent appearances on Sanborn maps dated 1886, 1904, 1915, 1938, 1950, 1969 and are summarized for the feature if shown on multiple Sanborn maps.
BUG Drawing #1G120 Metropolian Works Small Property Plan dated June 25, 1909.
BUG Drawing #2G126 Metropolian Works Small Property Plan dated June 29, 1921.

1 inch = 80 feet
0 40 80 160 Feet

National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

Historical Site Conditions

DATE: 9/5/2016 | DRWN: HKM | FIGURE 1-2

Path: P:\Jobs\Rem_Eng\Project Files\National Grid\1765-075 Metropolitan Former MGP\7.2 CADD & GIS\GIS\MXD\ISMP\Fig_Current_Site_Conditions.mxd

AECOM

1 inch = 100 feet

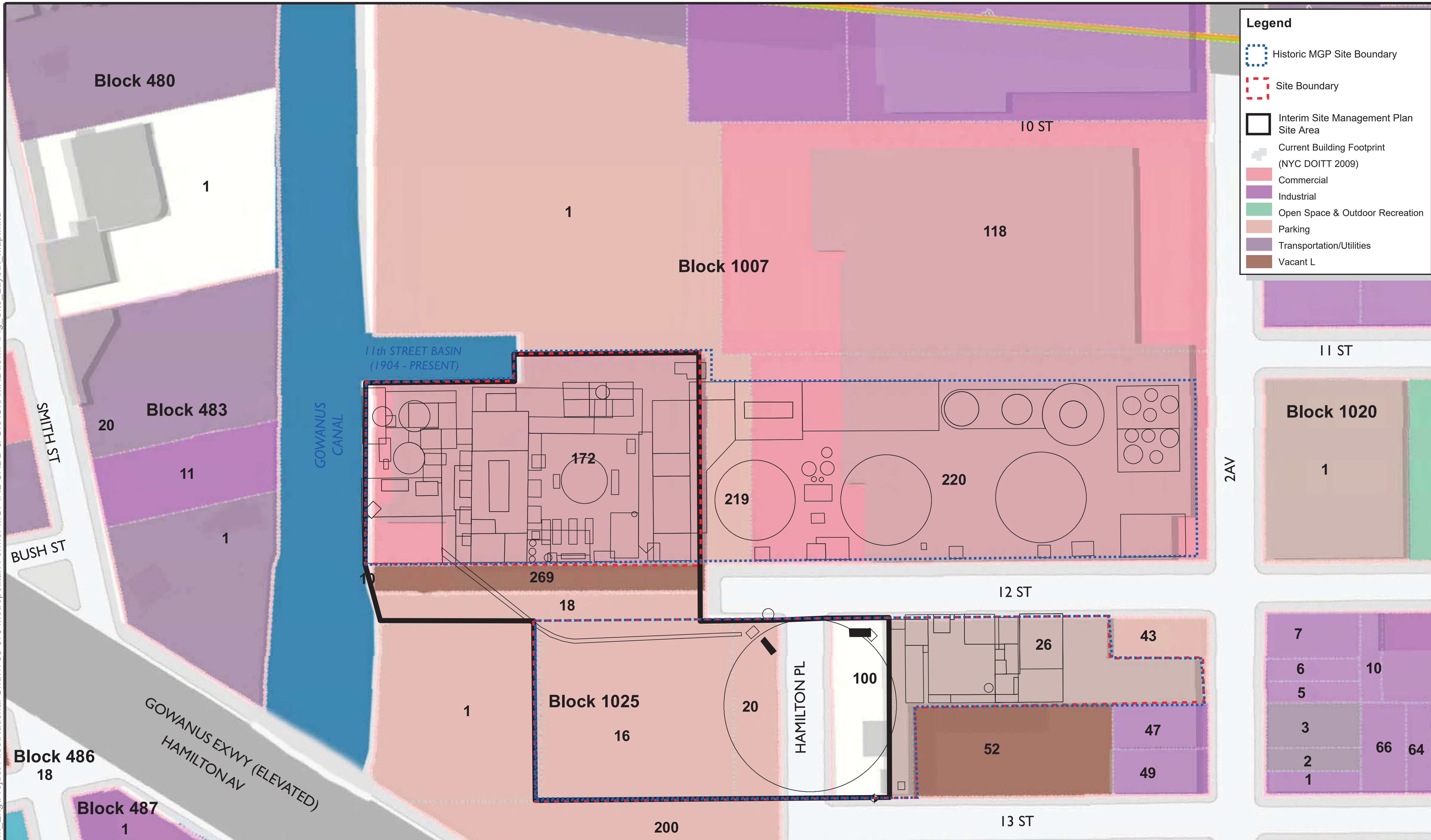
0 50 100 200 Feet

Source: Bing Maps Aerial 2010 Microsoft

National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

Site Layout Map

DATE: 9/5/2016 | DRWN: HKM | FIGURE 1-3



Data Source: NYC OASIS 2011

1 inch = 100 feet

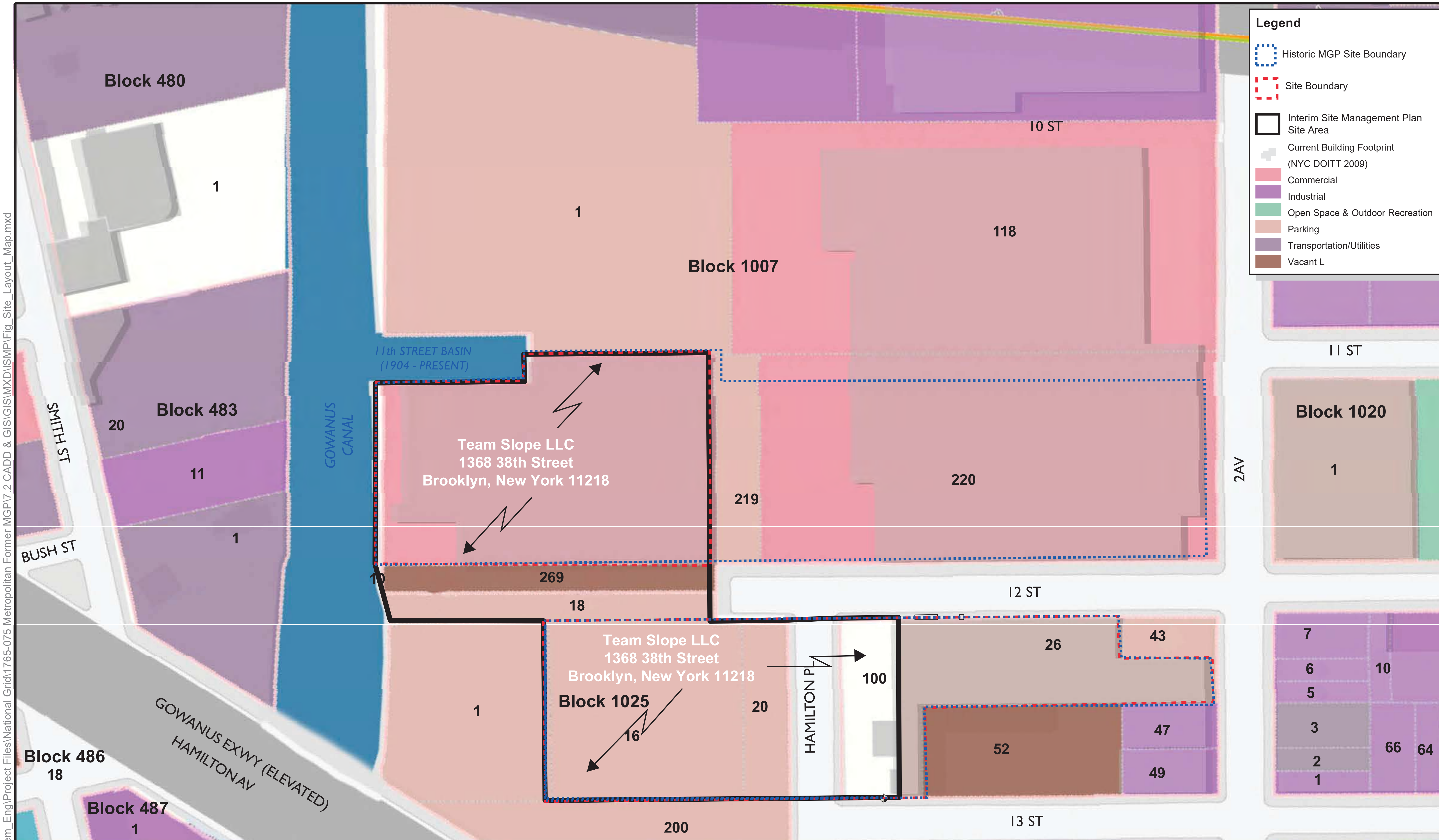
0 50 100 200 Feet

National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

Site Tax Map

DATE: 9/5/2016 | DRWN: HKM | FIGURE 2-1

Path: P:\Jobs\Rem_Eng\Project Files\National Grid\1765-075 Metropolitan Former MGP\7.2 CADD & GIS\GIS\MXD\ISMP\Fig_Site_Layout_Map.mxd



Path: P:\Jobs\Rem_Eng\Project Files\National Grid\1765-075 Metropolitan Former MGP\7.2 CADD & GIS\GIS\MXD\ISMP\Fig_Site_Layout_Map.mxd

AECOM

Data Source: NYC OASIS 2011

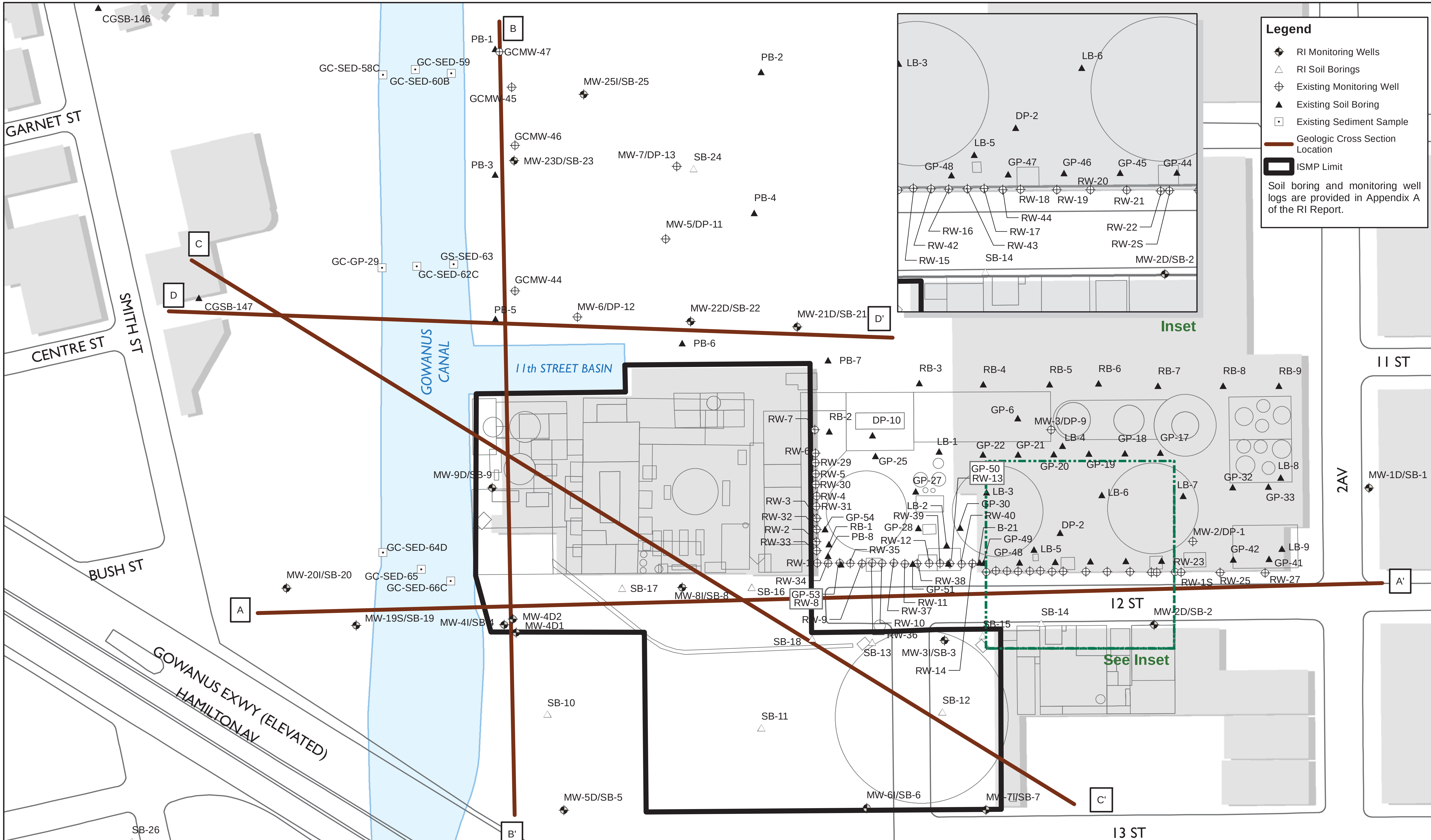
1 inch = 100 feet

0 50 100 200 Feet

National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

Parcel Included in the Interim Site Management Plan Site Area by Owner

DATE: 9/5/2016 | DRWN: HKM | FIGURE 2-2



AECOM

1 inch = 100 feet

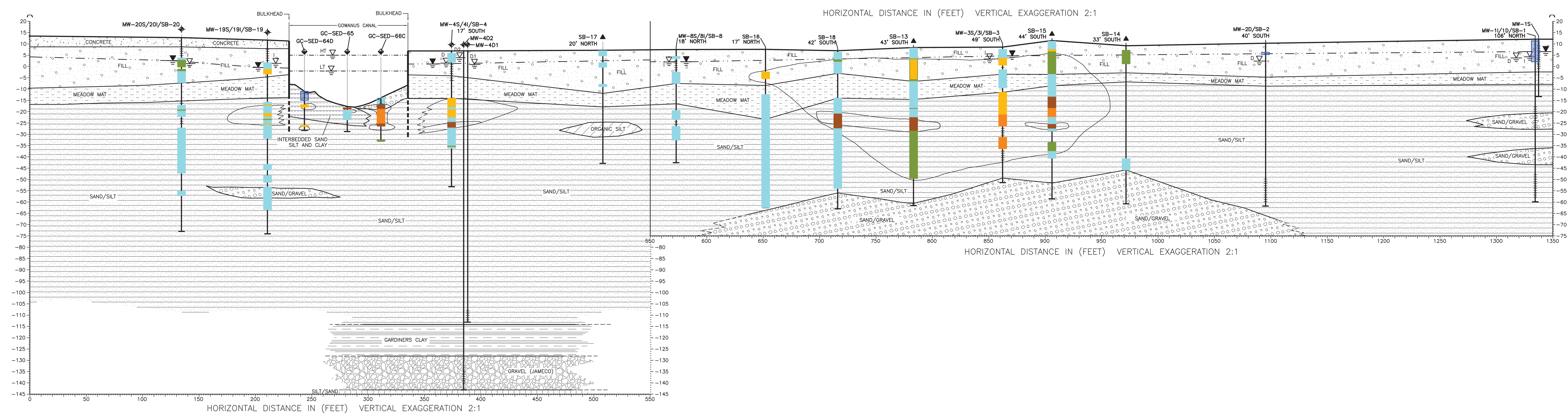
0 50 100 200 Feet

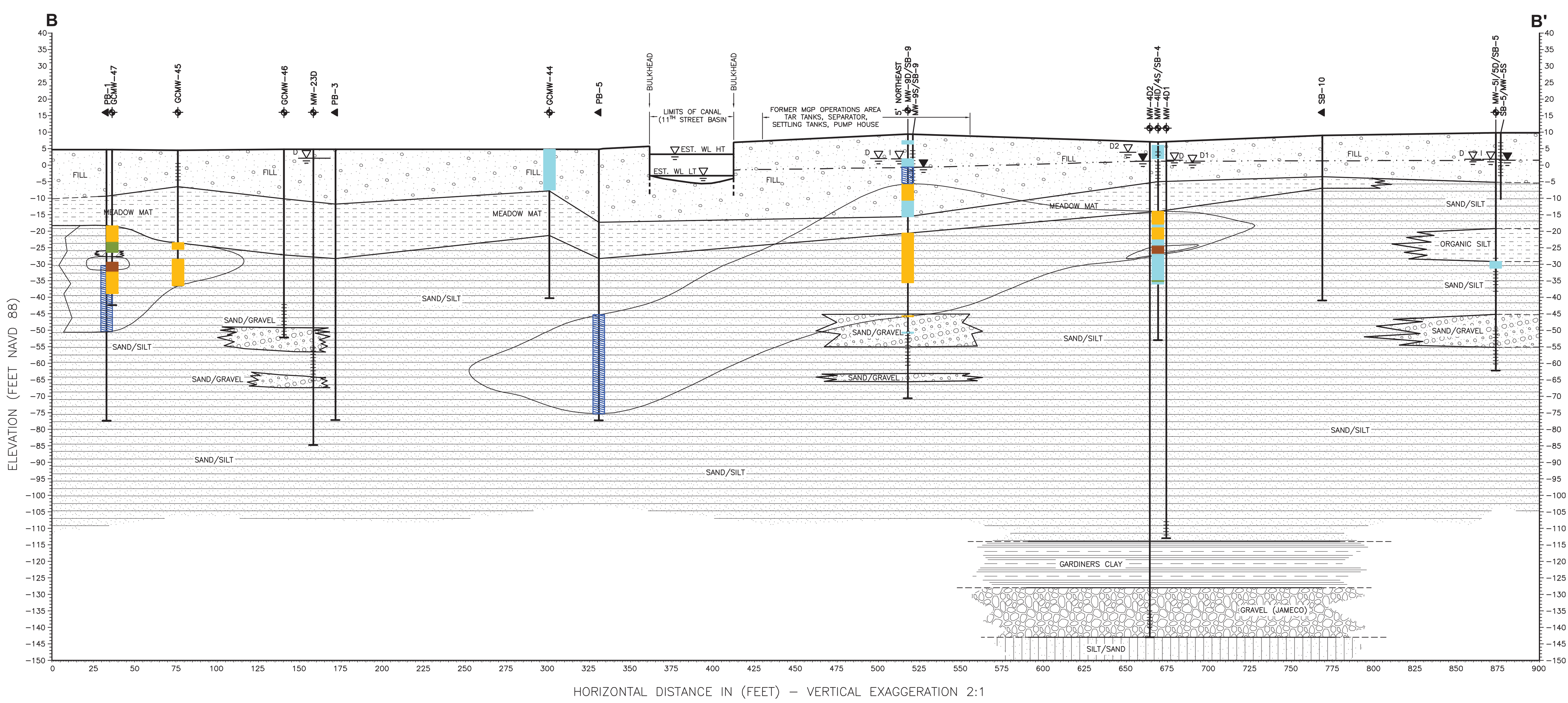
National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

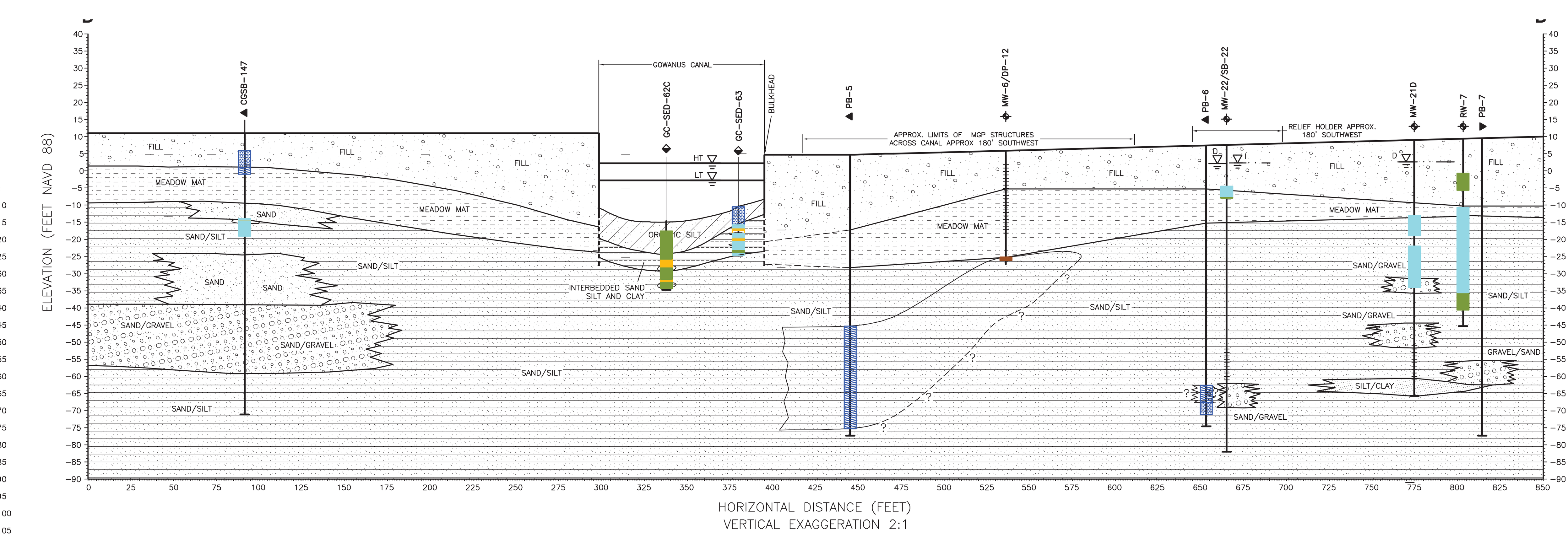
Geologic Cross Section Plan

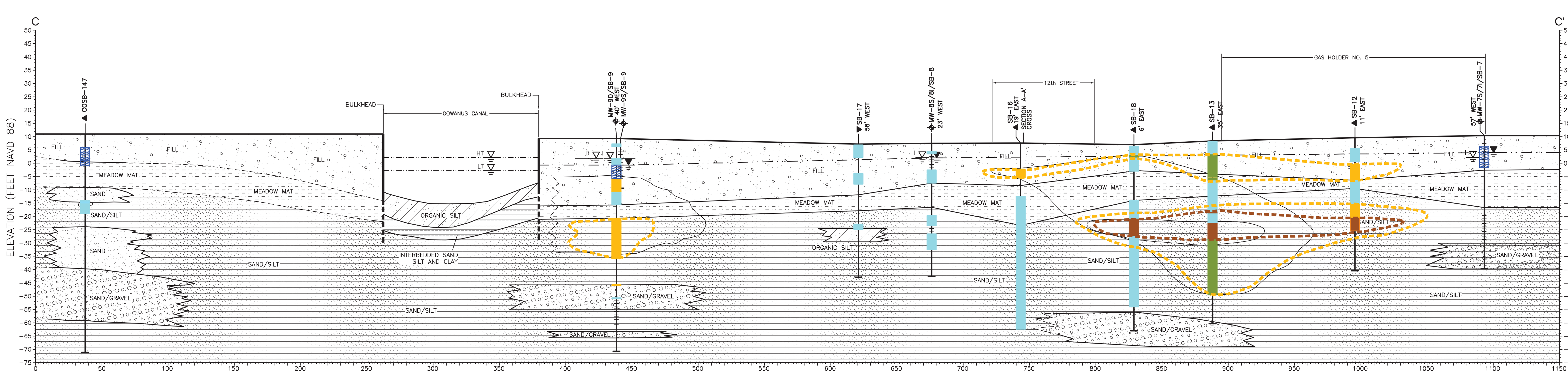
DATE: 9/6/2016 | DRWN: HKM

FIGURE 2-3









LEGEND

FILL	SILT/CLAY
MEADOW MAT	GRAVEL (JAMECO)
WELL GRADED SAND	TAR SATURATED
GARDINERS CLAY	LENSES WITH TAR SATURATION AND TAR/NAPHTHALENE ODORS
ORGANIC SILT	BLEBS, GLOBS, LENSES, COATINGS AND TAR/NAPHTHALENE ODORS
SAND/GRAVEL	TAR STAINING, SHEEN AND TAR/NAPHTHALENE ODORS
SAND/SILT	TAR/ NAPHTHALENE–LIKE ODORS
SILT/SAND	SHEEN/STAINING PETROLEUM ODORS
INTERBEDDED SAND SILT AND CLAY	PETROLEUM ODORS
CANAL SURFACE WATER ELEVATION	GROUNDWATER TABLE ELEVATION (3–14–12)
HT AVERAGE HIGH TIDE	I, D, D1, D2 PIEZOMETRIC SURFACE MEASURED IN INTERMEDIATE, DEEP, AND DEEP 1, AND DEEP 2 WELLS
LT AVERAGE LOW TIDE	

NOTES:

1. THIS FIGURE PROVIDES A COMPREHENSIVE VISUAL SUMMARY OF THE VISIBLE IMPACTS OBSERVED IN THE SITE SUBSURFACE BY AECOM DURING THE REMIDIAL INVESTIGATION AND BY OTHERS PERFORMING GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATIONS WITHIN AND OUTSIDE OF THE SITE BOUNDARY. THE ONLY IMPACTS OBSERVED DIRECTLY BY AECOM INCLUDE THE BORINGS ADVANCED DURING THE RI. LOGS FOR ALL THE BORINGS PRESENTED ON THIS FIGURE ARE INCLUDED IN APPENDIX C OF THE RI REPORT.
2. SEDIMENT BORINGS AND GOWANUS CANAL DETAIL WERE INCLUDED BASED ON CROSS SECTION V–V' PRESENTED IN THE APRIL 2007 GEI REMEDIAL INVESTIGATION TECHNICAL REPORT, GOWANUS CANAL, BROOKLYN, NY. CROSS SECTION V–V' IS INCLUDED IN APPENDIX C OF THE RI REPORT.
3. ELEVATIONS IN FEET NAVD 88.

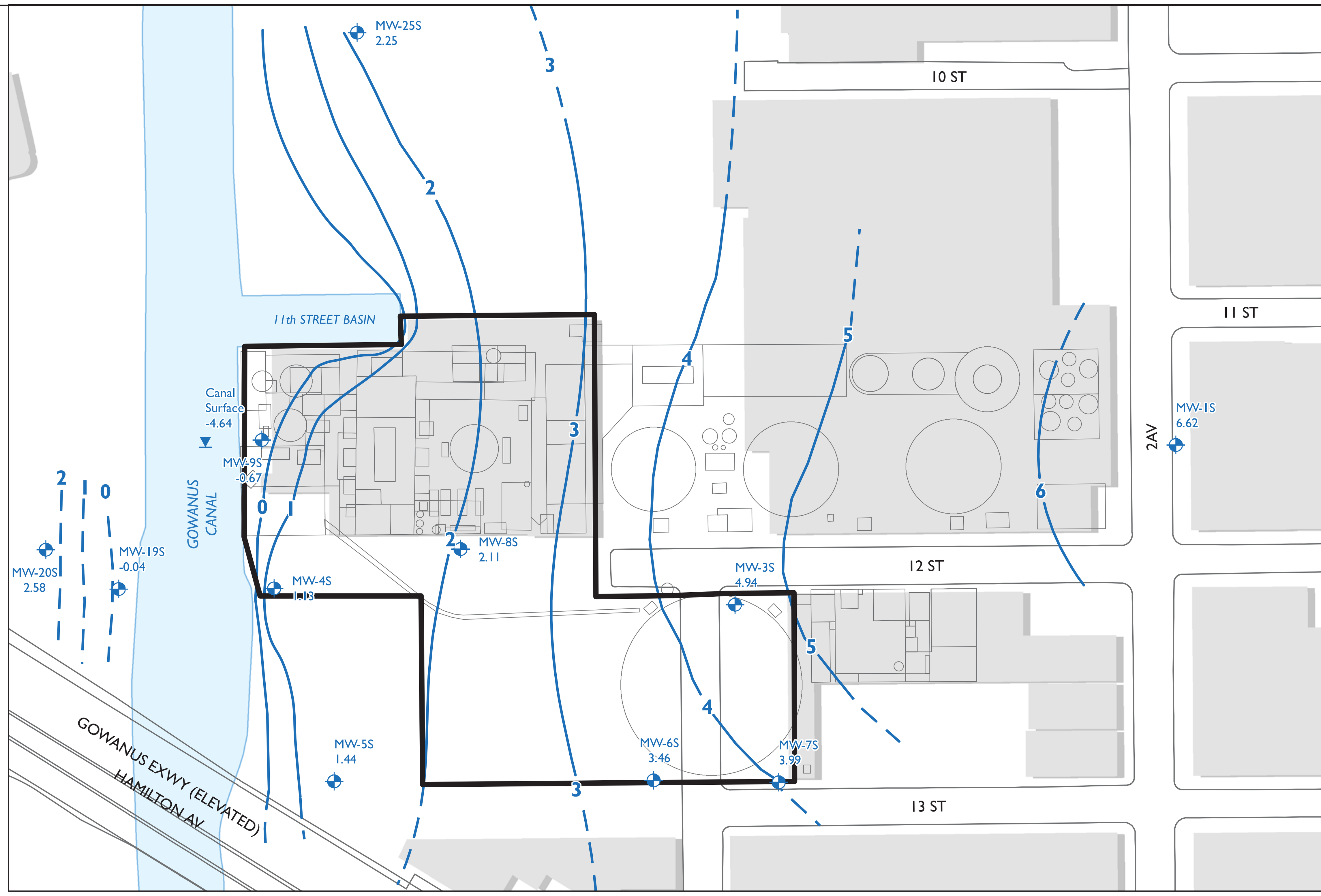
AECOM

NATIONAL GRID
METROPOLITAN FORMER MGP SITE
BROOKLYN, NEW YORK

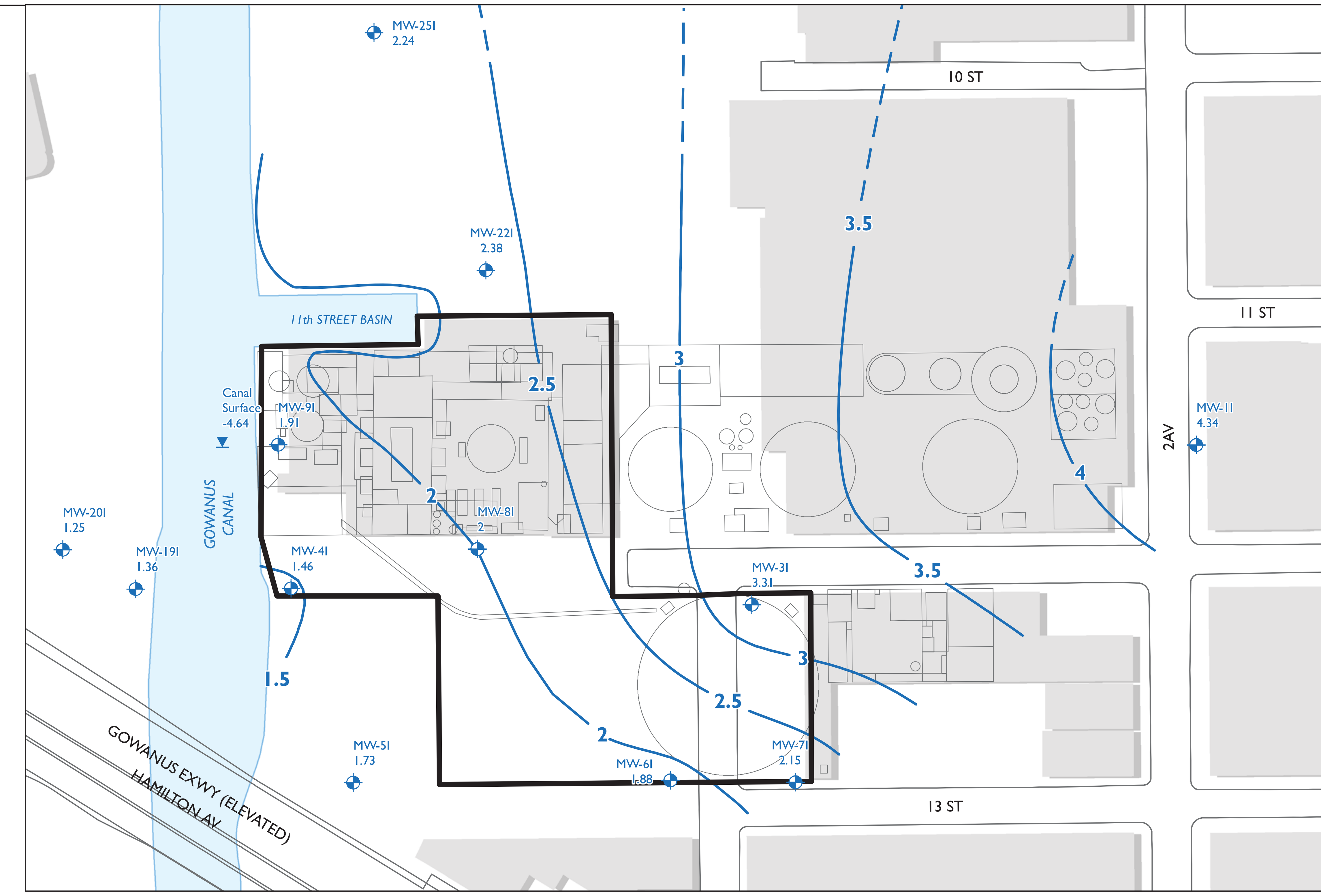
DATE: 09/06/16 | DRWN: RCW

GEOLOGIC CROSS SECTIONS A-A', B-B', C-C' & D-D'

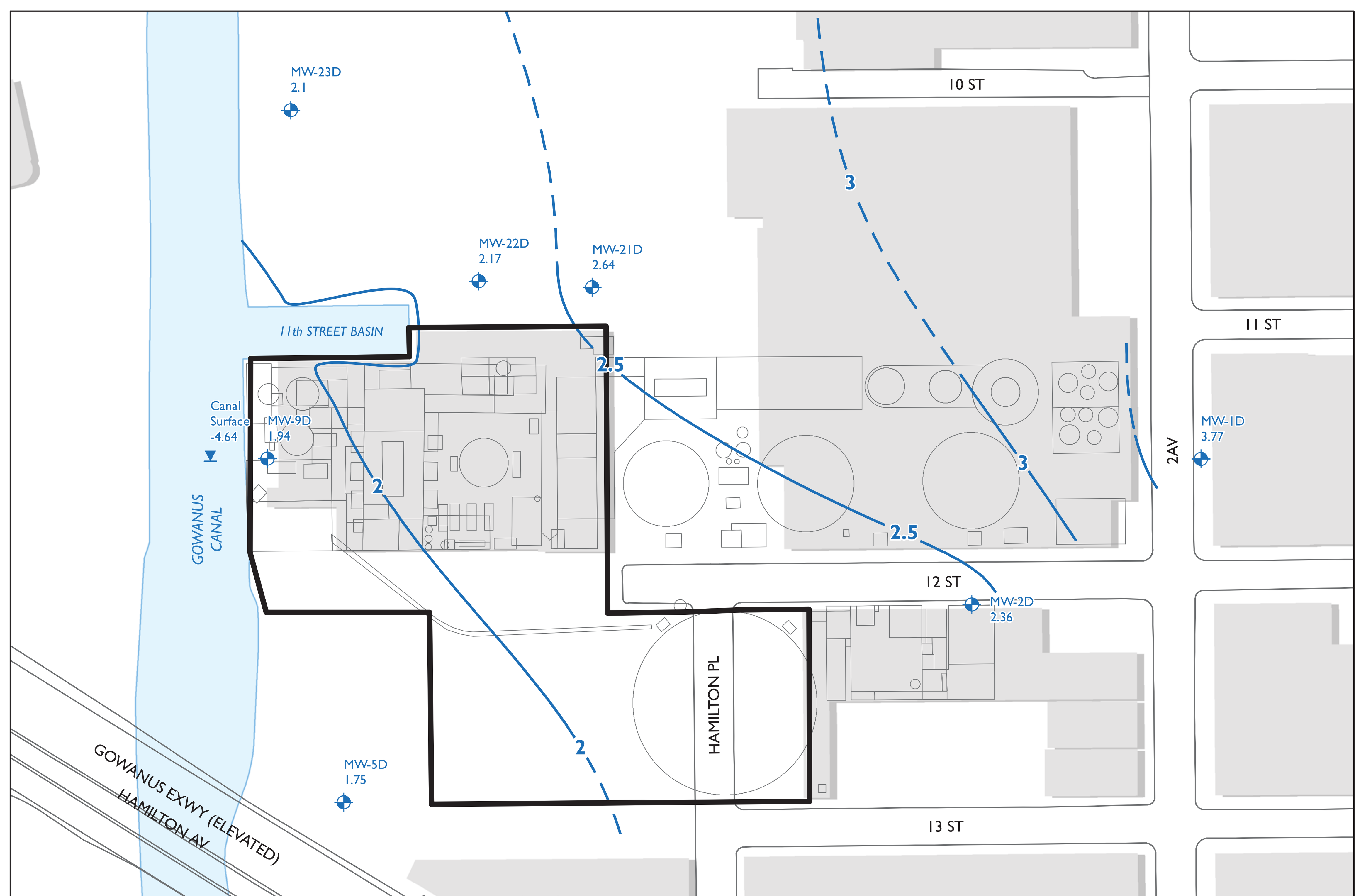
FIGURE 2-4



Shallow Wells



Intermediate Wells



Deep Wells

Current Building Footprint (NYC DOITT 2009)
Gowanus Canal
Canal Surface
Monitoring Well
Groundwater Elevation Contour (ft NAVD88)
Inferred Groundwater Contour
Historic Structure
ISMP Site Area

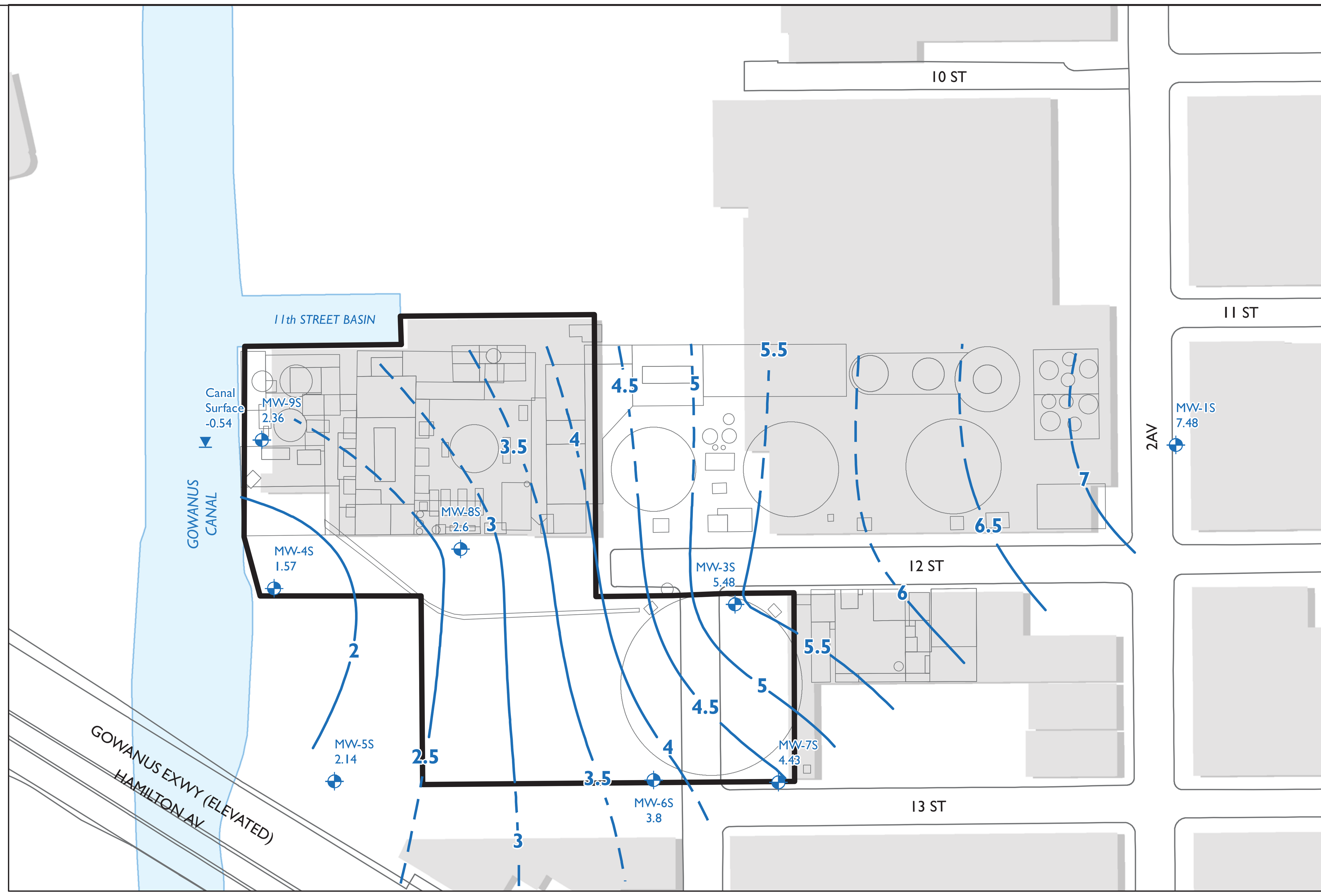
Notes:
Groundwater elevations are relative to NAVD88.
(Ground surface elevation is approximately 10 ft NAVD88 at the Site)
Monitoring well logs are provided in Appendices A and C of the RI Report.

1 inch = 100 feet
0 50 100 200 Feet

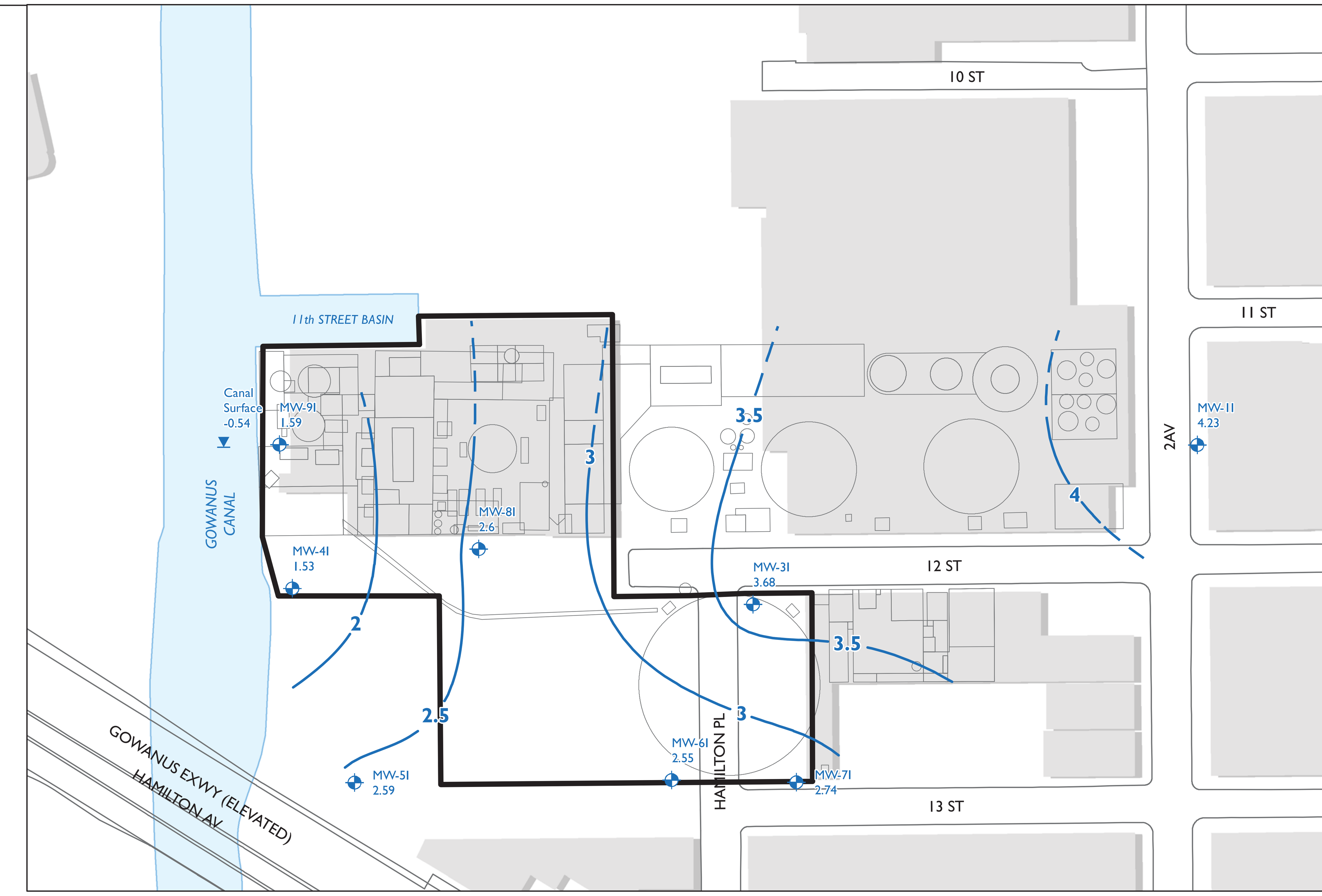
Path: P:\Jobs\Rem_Eng\Project Files\National Grid\1765-075 Metropolitan Former MGP\7.2 CADD & GIS\GIS\MXD\ISMP\Fig_Low_Tide_Shallow_Intermediate_Deep.mxd

AECOM

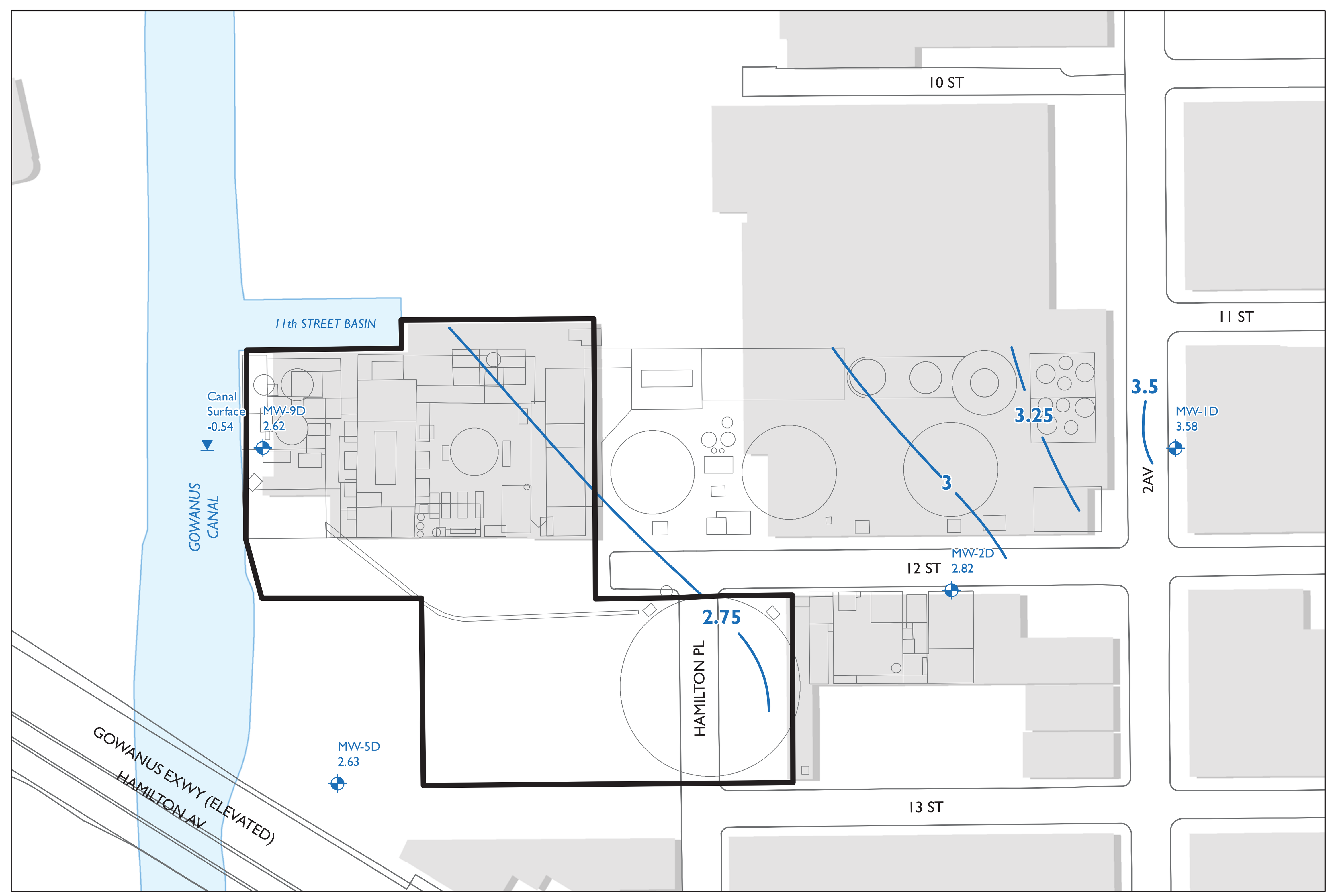
National Grid Former Metropolitan Works MGP Site Brooklyn, NY	March 14, 2012 Low Tide Groundwater Contours
DATE: 09/06/2016 DRWN: JB	FIGURE 2-5A



Shallow Wells



Intermediate Wells



Deep Wells

- Current Building Footprint (NYC DOITT 2009)
- Gowanus Canal
- Canal Surface
- Monitoring Well
- Groundwater Elevation Contour (ft NAVD88)
- Inferred Groundwater Contour
- Historic Structure
- ISMP Site Area

Notes:
Groundwater elevations are relative to NAVD88.
(Ground surface elevation is approximately 10 ft NAVD88 at the Site)
Monitoring well logs are provided in Appendices A and C of the RI Report.

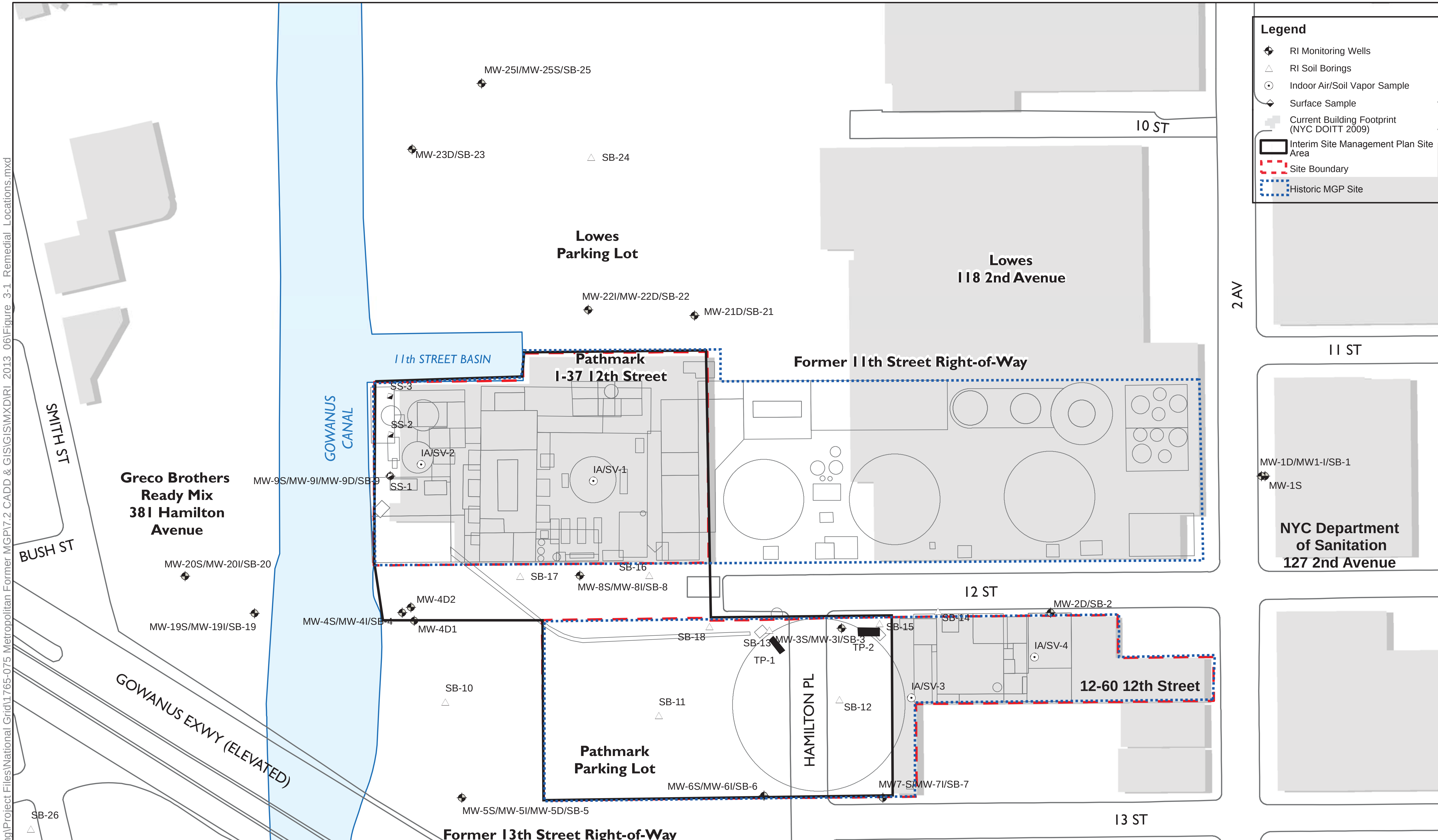
1 inch = 100 feet

0 50 100 200 Feet

National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

September 29, 2010 High Tide
Groundwater Contours

DATE: 09/06/2016 | DRWN: JB | FIGURE 2-5B



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AECOM

1 inch = 100 feet

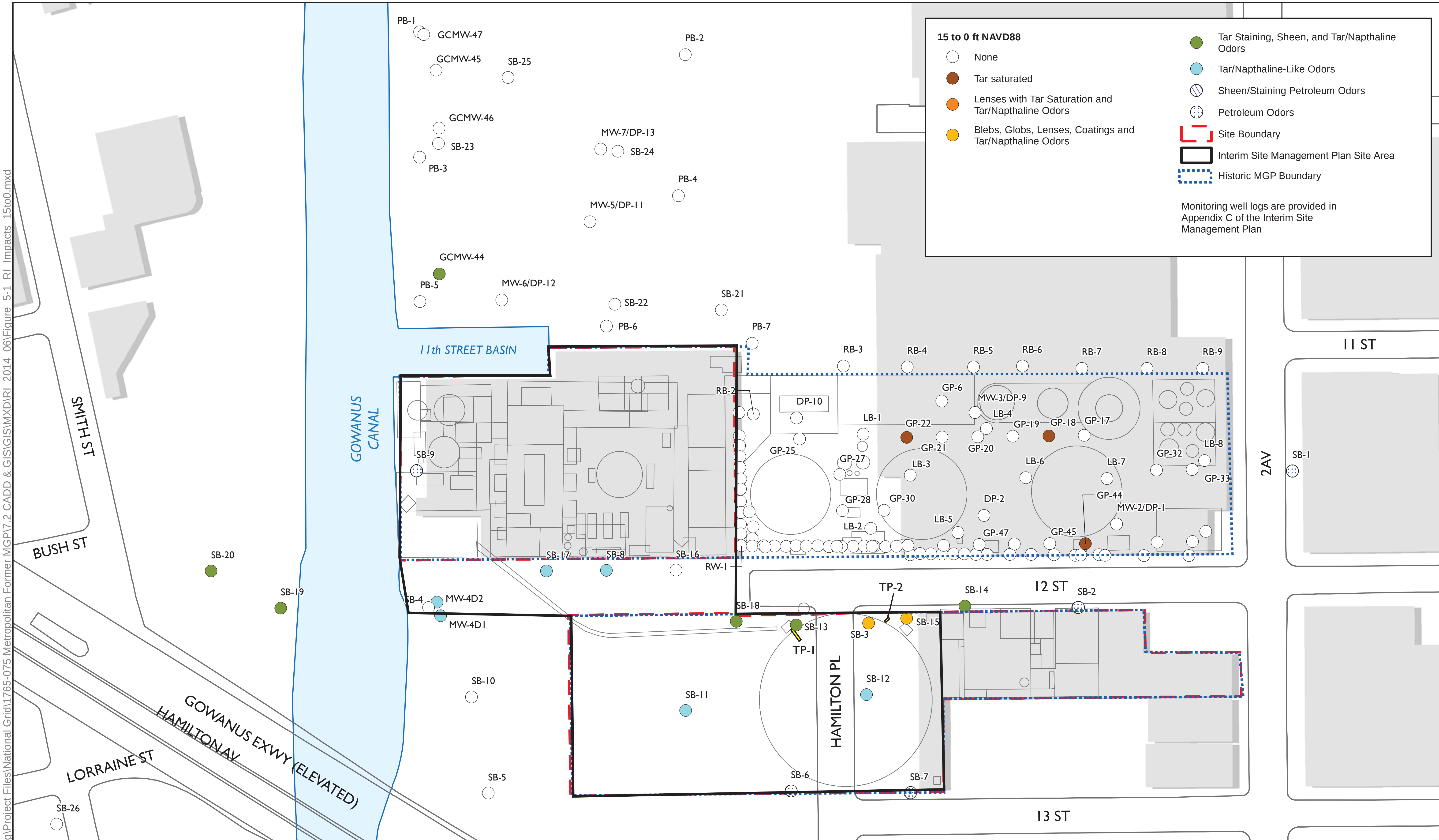
0 50 100 200 Feet

National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

Remedial Investigation Locations

DATE: 11/7/2013 DRWN: HKM

FIGURE 2-6



Notes:
1. In general, only tar saturated impacts are illustrated for historic investigation locations.
2. Ground surface elevation is approximately 10 ft NAVD88 at the Site.

1 inch = 100 feet

0 50 100 200 Feet

National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

Visible Impacts Observed During Remedial Investigation
(Between Ground Surface and 0 ft NAVD88/0 - 15 feet below ground surface)

DATE: 9/4/2014 | DRWN: HKM | FIGURE 2-7

Path: J:\Rem_Eng\Project Files\National Grid\1765-075 Metropolitan Former MGP\7.2 CADD & GIS\GIS\MXD\RI_2014_06\Figure_5-1_RI_Impacts_15to0.mxd

Current Building Footprint (NYC DOITT 2009)

Gowanus Canal

Historic Structure

ISMP Site Area

Soil Boring

Notes:
mg/Kg - milligrams per kilogram

ND = Not Detected

J = The associated numerical value is an estimated quantity.

U = The material was analyzed for but not detected at, or above, the reporting limit. The associated numerical value is the sample quantitation limit.

Bold indicates compound detected at a concentration greater than the reporting limit.
Yellow highlight indicates above the NYSDEC Part 375-6.8(b) Restricted Use Soil Cleanup Objective Commercial value.

Green highlight indicates above the NYSDEC CP-51 Alternate Criteria of 500 mg/Kg for Total PAHs.

Monitoring well logs are provided in Appendices A and C of the RI Report.

SAMPLE	NYSDEC Part 375-6 Commercial
BTEX (mg/Kg)	
Benzene	44
Toluene	500
Ethyl Benzene	390
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)	
Acenaphthene	500
Acenaphthylene	50
Benzo(a)anthracene	5.6
Benzo(a)pyrene	1
Benzo(b)fluoranthene	5.6
Benzo(k)fluoranthene	56
Chrysene	56
Dibenz(a,h)anthracene	0.56
Fluoranthene	500
Fluorene	500
Indeno(1,2,3-cd)pyrene	5.6
Naphthalene	500
Phenanthrene	500
Pyrene	500
Total PAHs	500^{A}
Inorganic Compounds (mg/Kg)	
Arsenic	16
Barium	400
Lead	1000

Sample Location	SB-18	SB-18	SB-18
Sample Date	4/20/2010	4/20/2010	4/20/2010
Sample ID	SB-18(1-2)042010	SB-18(28-30)042010	SB-18(69-70)042010
Sample Interval (feet)	1-2	28-30	69-70
BTEX (mg/Kg)			
Benzene	**1.34**	**245**	0.0070 U
Ethyl Benzene	**27.2**	**437**	0.0070 U
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)			
Acenaphthene	**7.56 J**	**523 J**	0.198 U
Acenaphthylene	**5.99 J**	**555 J**	**0.0219 J**
Benzo(a)anthracene	**25.1**	**235 J**	0.198 U
Benzo(a)pyrene	**20.6 J**	**158 J**	0.198 U
Benzo(b)fluoranthene	**10.8 J**	364 UJ	0.198 U
Benzo(k)fluoranthene	**14.3 J**	**120 J**	0.198 U
Chrysene	**29.5**	**248 J**	0.198 U
Fluorene	**14.6 J**	**516 J**	0.198 U
Indeno(1,2,3-cd)pyrene	**6.43 J**	**41.2 J**	0.198 U
Naphthalene	**244**	**3940 J**	**0.301**
Phenanthrene	**45.5**	**1420 J**	**0.0279 J**
Pyrene	**62.4**	**614 J**	0.198 U
Total PAHs	**567.58**	**11235.1**	**0.4438**

Sample Location	SB-17	SB-17	SB-17
Sample Date	5/3/2010	5/4/2010	5/4/2010
Sample ID	SB-17(4-5)050310	SB-17(30-32)050410	SB-17(48-50)050410
Sample Interval (feet)	4-5	30-32	48-50
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)			
Benzo(a)anthracene	**14.5 J**	0.0333 U	0.0273 U
Benzo(a)pyrene	**11.3 J**	0.0177 U	0.0145 U
Total PAHs	**883.59**	**0.3269**	ND

Sample Location	SB-16	SB-16	SB-16
Sample Date	5/5/2010	5/6/2010	5/6/2010
Sample ID	SB-16(4-5)050510	SB-16(10-13)050610	SB-16(68-70)050610
Sample Interval (feet)	4-5	10-13	68-70
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)			
Benzo(a)anthracene	**1.09**	**11.1 J**	0.0259 U
Benzo(a)pyrene	**1.16**	**8.72 J**	0.0137 U
Total PAHs	**12.8595**	**564.07**	ND

Sample Location	SB-13	SB-13	SB-13
Sample Date	4/14/2010	4/14/2010	4/15/2010
Sample ID	SB-13(4-5)041410	SB-13(35-40)041410	SB-13(69-70)041510
Sample Interval (feet)	4-5	35-40	69-70
BTEX (mg/Kg)			
Benzene	**6.93 J**	**311**	0.0045 U
Toluene	**10.8**	**601**	0.0045 U
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)			
Acenaphthylene	13.1 U	**1050**	0.185 U
Benzo(a)anthracene	13.1 U	**233 J**	0.185 U
Benzo(a)pyrene	13.1 U	**192 J**	0.185 U
Benzo(k)fluoranthene	13.1 U	**91.2 J**	0.185 U
Chrysene	**1.35 J**	**235 J**	0.185 U
Fluoranthene	**2.55 J**	**532**	0.185 U
Fluorene	13.1 U	**715**	0.185 U
Naphthalene	**112**	**5730**	**0.0872 J**
Phenanthrene	**3.4 J**	**1700**	**0.0243 J**
Pyrene	**2.36 J**	**708**	0.185 U
Total PAHs	**140.26**	**14106.2**	**0.137**
Inorganic Compounds (mg/Kg)			
Barium	**424**	**15.6**	**33.5**
Lead	**1230**	**4.19**	**3.19**

Sample Location	SB-15	SB-15 DUP	SB-15	SB-15
Sample Date	4/14/2010	4/14/2010	4/14/2010	4/14/2010
Sample ID	SB-15(4-5)041410	DUPE-1-041410	SB-15(37-39)041410	SB-15(69-70)041410
Sample Interval (feet)	4-5	37-39	37-39	69-70
BTEX (mg/Kg)				
Benzene	7.26 U	**108 J**	**195 J**	0.0760 U
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)				
Benzo(a)anthracene	62.5 U	**112 J**	**111 J**	0.208 U
Benzo(a)pyrene	62.5 U	**88.2 J**	**86.8 J**	0.208 U
Chrysene	62.5 U	**108 J**	**109 J**	0.208 U
Naphthalene	**525**	**2630 J**	**2560**	**0.385**
Phenanthrene	62.5 U	**779 J**	**775**	0.208 U
Total PAHs	**564.9**	**6515.8**	**6323.9**	**0.4404**

Sample Location	SB-09	SB-09	SB-09	SB-09
Sample Date	9/14/2010	9/15/2010	9/15/2010	9/16/2010
Sample ID	SB-9(4.5-5.0)091410	SB-9(40-45)091510	SB-9(55-60)091510	SB-9(75-80)091610
Sample Interval (feet)	4.5-5.0	40-50	55-60	75-80
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)				
Benzo(a)anthracene	**5.5**	**20**	**0.081 J**	<0.19 U
Benzo(a)pyrene	**9.6**	**16**	**0.063 J**	<0.19 U
Benzo(b)fluoranthene	**8**	**12 J**	**0.049 J**	<0.19 U
Dibenz(a,h)anthracene	**4.1**	**2.3**	<0.19 U	<0.19 U
Indeno(1,2,3-cd)pyrene	**8.7**	**5.2 J**	**0.023 J**	<0.19 U
Total PAHs	**119.5**	**718**	**2.279**	ND

Sample Location	SB-19	SB-19
Sample Date	10/2/2011	10/2/2011
Sample ID	SB-19 (37-37.5)	SB-19 (72.5-75)
Sample Interval (feet)	37-37.5	72.5-75
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)		
Benzo(a)anthracene	**23**	<0.036 U
Benzo(a)pyrene	**20**	<0.036 U
Benzo(b)fluoranthene	**14**	<0.036 U
Dibenz(a,h)anthracene	**1.8**	<0.036 U
Indeno(1,2,3-cd)pyrene	**8.2**	<0.036 U
Total PAHs	**506.8**	**0.093**

Sample Location	SB-04	SB-04	SB-04 DUP	SB-04
Sample Date	4/27/2010	4/27/2010	4/27/2010	4/27/2010
Sample ID	SB-4(4-5)042710	SB-4(32-34)042710	DUPE-2-042710	SB-4(58-60)042710
Sample Interval (feet)	4-5	32-34	32-34	58-60
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)				
Benzo(a)anthracene	**0.192 J**	**6.67 J**	**5.56 J**	0.18 U

Sample Location	SB-08	SB-08	SB-08
Sample Date	5/5/2010	5/5/2010	5/5/2010
Sample ID	SB-8(3-4)050510	SB-8(34-35)050510	SB-8(48-50)050510
Sample Interval	3-4	34-35	48-50
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)			
Benzo(a)anthracene	**22.6**	0.0350 U	0.0332 U
Benzo(a)pyrene	**21.4**	0.0186 U	0.0176 U
Benzo(b)fluoranthene	**13.4**	0.0723 U	0.0686 U
Dibenz(a,h)anthracene	**1.72 J**	0.00871 U	0.00827 U
Indeno(1,2,3-cd)pyrene	**6.51**	0.0251 U	0.0239 U
Inorganic Compounds (mg/Kg)			
Arsenic	**10.2**	**16.9**	**1.28 J**

Sample Location	SB-11	SB-11	SB-11
Sample Date	4/19/2010	4/19/2010	4/19/2010
Sample ID	SB-11(4-5)041910	SB-11(30-33)041910	SB-11(59-60)041910
Sample Interval (feet)	4-5	30-33	59-60
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)			
Benzo(a)anthracene	**6.41**	0.202 U	0.204 U
Benzo(a)pyrene	**6.11**	0.202 U	0.204 U
Dibenz(a,h)anthracene	**0.835 J**	0.202 U	0.204 U

Sample Location	SB-05	SB-05	SB-05
Sample Date	4/21/2010	4/22/2010	4/22/2010
Sample ID	SB-5(4-5)042110	SB-5(39-40)042210	SB-5(70-72)042210
Sample Interval (feet)	4-5	39-40	70-72
Laboratory Identification	SB11001	SB11001	SB11001
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)			
Benzo(a)pyrene	**3.7 J**	0.205 U	0.192 U

Sample Location	SB-06	SB-06	SB-06
Sample Date	4/20/2010	4/20/2010	4/21/2010
Sample ID	SB-6(4-5)042010	SB-6(26-28)042010	SB-6(49-50)042110
Sample Interval (feet)	4-5	26-28	49-50
Laboratory Identification	SB11001	SB11001	SB11001
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)			
Benzo(a)anthracene	**37.4 J**	0.202 U	0.193 U
Benzo(a)pyrene	**49.1 J**	0.202 U	0.193 U
Benzo(b)fluoranthene	**27.3 J**	0.202 U	0.193 U
Dibenz(a,h)anthracene	**3.33 J**	0.202 U	0.193 U
Indeno(1,2,3-cd)pyrene	**16.4 J**	0.202 U	0.193 U
Total PAHs	**610.43**	1.3939	0.0877

Sample Location	TP-01	TP-01
Sample Date	5/19/2010	5/19/2010
Sample ID	TP-1(1.5)051910	TP-1(3.8)051910
Sample Interval (feet)	1.5-1.5	3.8-3.8
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)		
Benzo(a)pyrene	2.92	0.829

Sample Location	SB-07	SB-07	SB-07	SB-07
Sample Date	4/28/2010	4/28/2010	4/29/2010	4/29/2010
Sample ID	SB-7(4-5)042810	SB-7(10-12)042810	SB-7(37-40)042910	SB-7(48-50)042910
Sample Interval (feet)	4-5	10-12	37-40	48-50
Laboratory Identification	SB11817	SB11817	SB11817	SB11817
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)				
Benzo(a)anthracene	**22.5**	**96.7**	0.0329 U	0.0285 U
Benzo(a)pyrene	**22.3**	**81.2**	0.0174 U	0.0151 U
Benzo(b)fluoranthene	**10.8 J**	**35.6 J**	0.0679 U	0.0588 U
Chrysene	**20.1**	**96.5**	0.00726 U	0.00629 U
Indeno(1,2,3-cd)pyrene	**7.77 J**	**24.1 J**	0.0236 U	0.0205 U
Naphthalene	1.23 U	**949**	0.0196 U	0.0170 U
Phenanthrene	**4.09 J**	**518**	0.0236 U	**0.0432 J**
Total PAHs	**328.84**	**3621.3**	ND	**0.0766**

Sample Location	SB-03	SB-03	SB-03
Sample Date	4/13/2010	4/13/2010	4/13/2010
Sample ID	SB-3(4-5)041310	SB-3(30-35)041310	SB-3(59-60)041310
Sample Interval (feet)	4-5	30-35	59-60
Polynuclear Aromatic Hydrocarbons (PAHs) (mg/Kg)			
Benzo(a)anthracene	**0.733 J**	**100 J**	0.26 U
Benzo(a)pyrene	**0.661 J**	**74.1 J**	0.26 U
Benzo(b)fluoranthene	2.95 U	**38.3 J**	0.26 U
Chrysene	**0.762 J**	**97.5 J**	0.26 U
Indeno(1,2,3-cd)pyrene	**0.381 J**	**22.3 J**	0.26 U
Naphthalene	**30.1**	**1720**	**0.0951 J**
Phenanthrene	**2.18 J**	**690**	0.26 U
Total PAHs	**47.755**	**5142.8**	**0.1224**
Inorganic Compounds (mg/Kg)			
Arsenic	**1.62 J**	**2.82 J**	**66.8**

AECOM

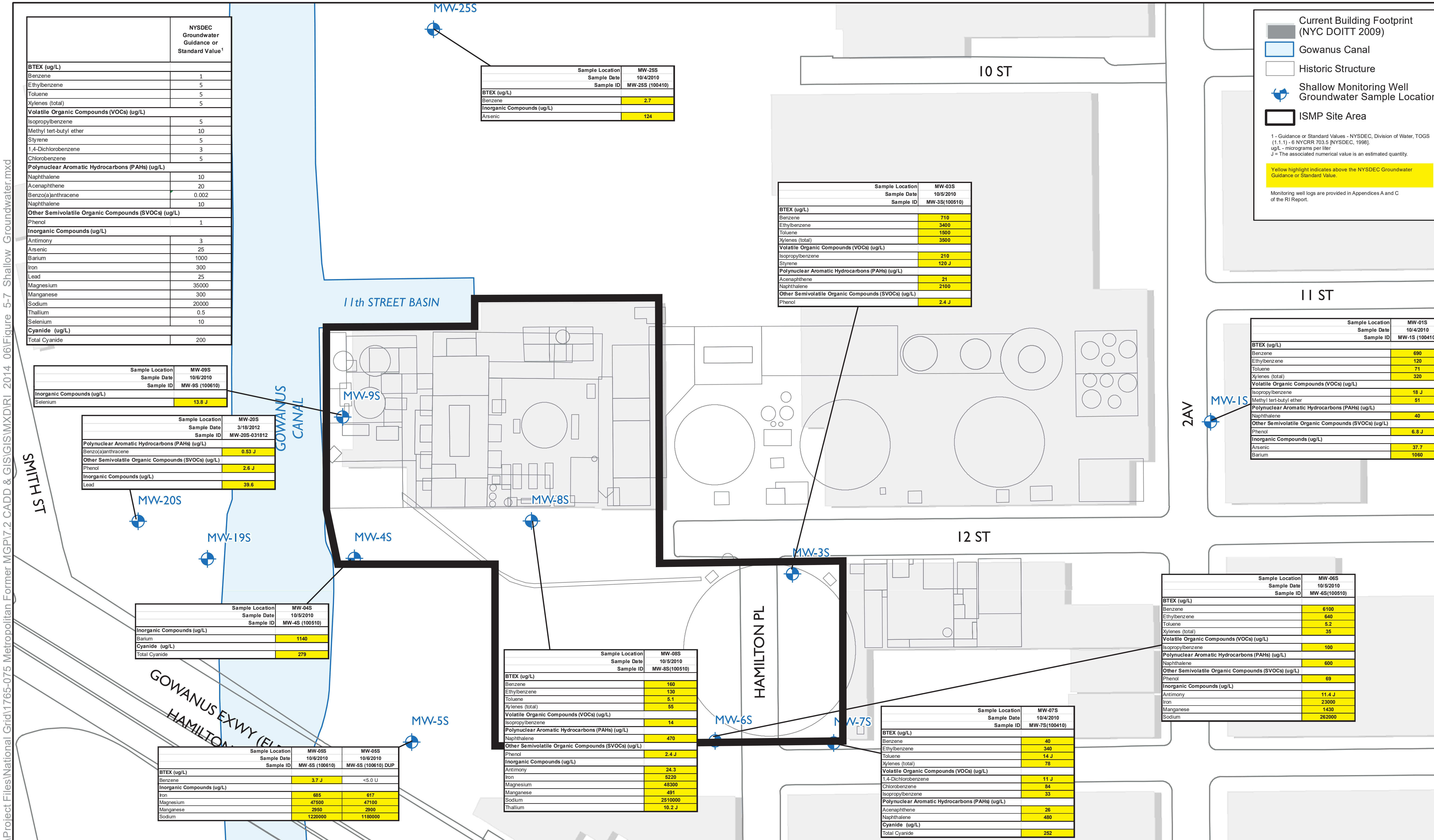
1 inch = 50 feet

0 25 50 100 Feet

National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

Analytical Detections Summary
Subsurface Soil Samples

DATE: 7/21/2014 | DRWN: HKM | FIGURE 2-8



	NYSDEC Groundwater Guidance or Standard Value[1]
BTEX (ug/L)	
Benzene	1
Ethylbenzene	5
Toluene	5
Xylenes (total)	5
Volatile Organic Compounds (VOCs) (ug/L)	
Isopropylbenzene	5
Methyl tert-butyl ether	10
Styrene	5
1,4-Dichlorobenzene	3
Chlorobenzene	5
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Naphthalene	10
Acenaphthene	20
Benzo(a)anthracene	0.002
Naphthalene	10
Other Semivolatile Organic Compounds (SVOCs) (ug/L)	
Phenol	1
Inorganic Compounds (ug/L)	
Antimony	3
Arsenic	25
Barium	1000
Iron	300
Lead	25
Magnesium	35000
Manganese	300
Sodium	20000
Thallium	0.5
Selenium	10
Cyanide (ug/L)	
Total Cyanide	200

Sample Location	MW-25S
Sample Date	10/4/2010
Sample ID	MW-25S (100410)
BTEX (ug/L)	
Benzene	2.7
Inorganic Compounds (ug/L)	
Arsenic	124

Sample Location	MW-03S
Sample Date	10/5/2010
Sample ID	MW-3S(100510)
BTEX (ug/L)	
Benzene	710
Ethylbenzene	3400
Toluene	1500
Xylenes (total)	3500
Volatile Organic Compounds (VOCs) (ug/L)	
Isopropylbenzene	210
Styrene	120 J
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Acenaphthene	21
Naphthalene	2100
Other Semivolatile Organic Compounds (SVOCs) (ug/L)	
Phenol	2.4 J

Sample Location	MW-01S
Sample Date	10/4/2010
Sample ID	MW-1S (100410)
BTEX (ug/L)	
Benzene	690
Ethylbenzene	120
Toluene	71
Xylenes (total)	320
Volatile Organic Compounds (VOCs) (ug/L)	
Isopropylbenzene	18 J
Methyl tert-butyl ether	51
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Naphthalene	40
Other Semivolatile Organic Compounds (SVOCs) (ug/L)	
Phenol	6.8 J
Inorganic Compounds (ug/L)	
Arsenic	37.7
Barium	1060

Sample Location	MW-09S
Sample Date	10/6/2010
Sample ID	MW-9S (100610)
Inorganic Compounds (ug/L)	
Selenium	13.8 J

Sample Location	MW-20S
Sample Date	3/18/2012
Sample ID	MW-20S-031812
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Benzo(a)anthracene	0.53 J
Other Semivolatile Organic Compounds (SVOCs) (ug/L)	
Phenol	2.6 J
Inorganic Compounds (ug/L)	
Lead	39.6

Sample Location	MW-04S
Sample Date	10/5/2010
Sample ID	MW-4S (100510)
Inorganic Compounds (ug/L)	
Barium	1140
Cyanide (ug/L)	
Total Cyanide	279

Sample Location	MW-06S
Sample Date	10/5/2010
Sample ID	MW-6S(100510)
BTEX (ug/L)	
Benzene	6100
Ethylbenzene	640
Toluene	5.2
Xylenes (total)	35
Volatile Organic Compounds (VOCs) (ug/L)	
Isopropylbenzene	100
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Naphthalene	600
Other Semivolatile Organic Compounds (SVOCs) (ug/L)	
Phenol	69
Inorganic Compounds (ug/L)	
Antimony	11.4 J
Iron	23000
Manganese	1430
Sodium	262000

Sample Location	MW-08S
Sample Date	10/5/2010
Sample ID	MW-8S(100510)
BTEX (ug/L)	
Benzene	160
Ethylbenzene	130
Toluene	5.1
Xylenes (total)	55
Volatile Organic Compounds (VOCs) (ug/L)	
Isopropylbenzene	14
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Naphthalene	470
Other Semivolatile Organic Compounds (SVOCs) (ug/L)	
Phenol	2.4 J
Inorganic Compounds (ug/L)	
Antimony	24.3
Iron	5220
Magnesium	48300
Manganese	491
Sodium	2510000
Thallium	10.2 J

Sample Location	MW-05S	MW-05S
Sample Date	10/6/2010	10/6/2010
Sample ID	MW-5S (100610)	MW-5S (100610) DUP
BTEX (ug/L)		
Benzene	3.7 J	<5.0 U
Inorganic Compounds (ug/L)		
Iron	685	617
Magnesium	47500	47100
Manganese	2950	2900
Sodium	1220000	1180000

Sample Location	MW-07S
Sample Date	10/4/2010
Sample ID	MW-7S(100410)
BTEX (ug/L)	
Benzene	40
Ethylbenzene	340
Toluene	14 J
Xylenes (total)	78
Volatile Organic Compounds (VOCs) (ug/L)	
1,4-Dichlorobenzene	11 J
Chlorobenzene	84
Isopropylbenzene	33
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Acenaphthene	26
Naphthalene	480
Cyanide (ug/L)	
Total Cyanide	252

1 - Guidance or Standard Values - NYSDEC, Division of Water, TOGS (1.1.1) - 6 NYCRR 703.5 [NYSDEC, 1998].
ug/L - micrograms per liter
J = The associated numerical value is an estimated quantity.

Yellow highlight indicates above the NYSDEC Groundwater Guidance or Standard Value.

Monitoring well logs are provided in Appendices A and C of the RI Report.

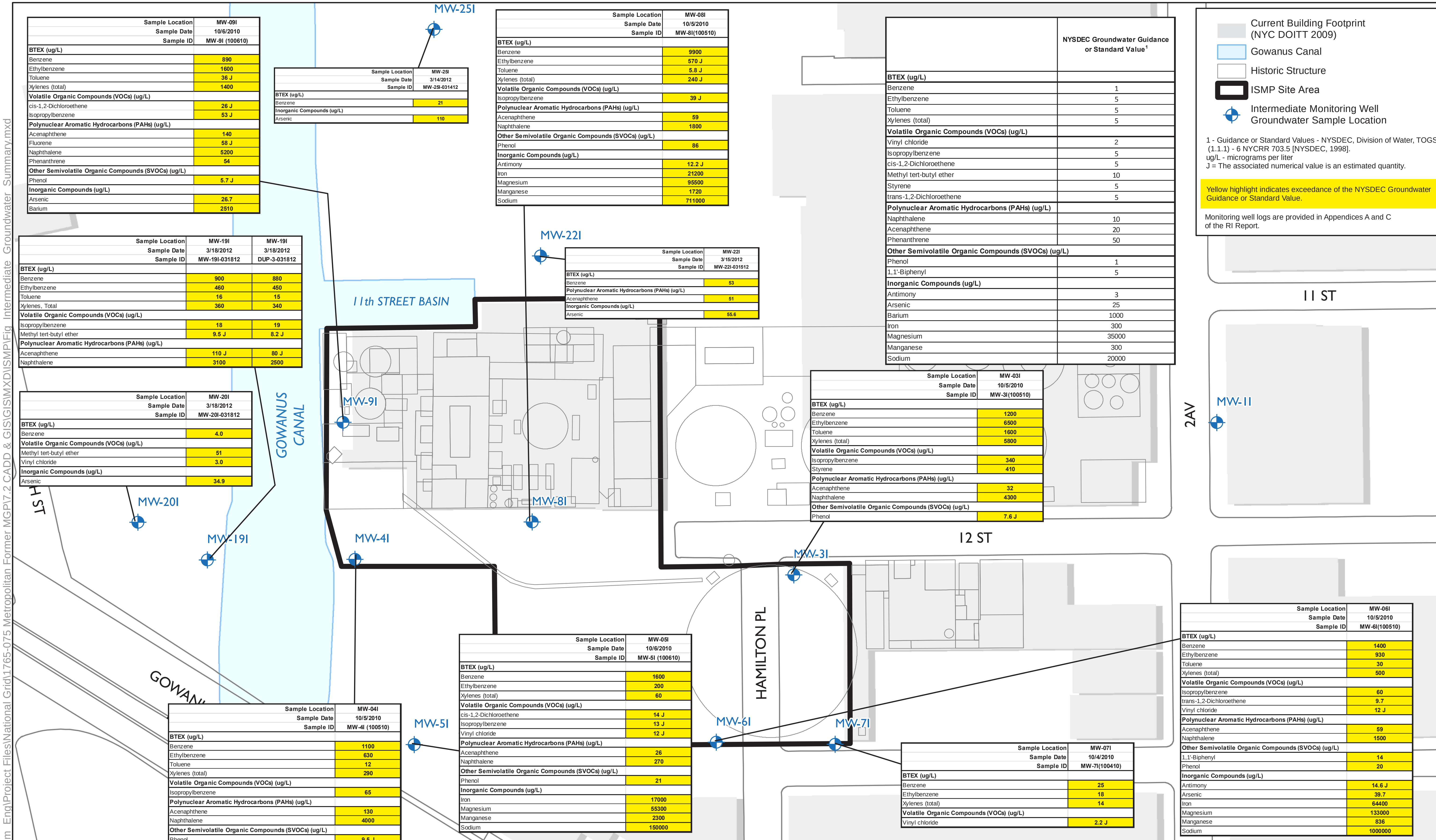
AECOM

National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

Groundwater Analytical Detections Summary Shallow Wells

DATE: 7/21/2014 | DRWN: HKM | FIGURE 2-9A

Path: J:\Rem Eng\Project Files\National Grid\1765-075 Metropolitan Former MGP\7.2 CADD & GIS\GIS\MXD\RI 2014 06\Figure 5-7 Shallow Groundwater.mxd



Sample Location	MW-09I
Sample Date	10/6/2010
Sample ID	MW-9I (100610)
BTEX (ug/L)	
Benzene	890
Ethylbenzene	1600
Toluene	36 J
Xylenes (total)	1400
Volatile Organic Compounds (VOCs) (ug/L)	
cis-1,2-Dichloroethene	26 J
Isopropylbenzene	53 J
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Acenaphthene	140
Fluorene	58 J
Naphthalene	5200
Phenanthrene	54
Other Semivolatile Organic Compounds (SVOCs) (ug/L)	
Phenol	5.7 J
Inorganic Compounds (ug/L)	
Arsenic	26.7
Barium	2510

Sample Location	MW-25I
Sample Date	3/14/2012
Sample ID	MW-25I-031412
BTEX (ug/L)	
Benzene	21
Inorganic Compounds (ug/L)	
Arsenic	110

Sample Location	MW-08I
Sample Date	10/5/2010
Sample ID	MW-8I(100510)
BTEX (ug/L)	
Benzene	9900
Ethylbenzene	570 J
Toluene	5.8 J
Xylenes (total)	240 J
Volatile Organic Compounds (VOCs) (ug/L)	
Isopropylbenzene	39 J
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Acenaphthene	59
Naphthalene	1800
Other Semivolatile Organic Compounds (SVOCs) (ug/L)	
Phenol	86
Inorganic Compounds (ug/L)	
Antimony	12.2 J
Iron	21200
Magnesium	95500
Manganese	1720
Sodium	711000

	NYSDEC Groundwater Guidance or Standard Value[1]
BTEX (ug/L)	
Benzene	1
Ethylbenzene	5
Toluene	5
Xylenes (total)	5
Volatile Organic Compounds (VOCs) (ug/L)	
Vinyl chloride	2
Isopropylbenzene	5
cis-1,2-Dichloroethene	5
Methyl tert-butyl ether	10
Styrene	5
trans-1,2-Dichloroethene	5
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Naphthalene	10
Acenaphthene	20
Phenanthrene	50
Other Semivolatile Organic Compounds (SVOCs) (ug/L)	
Phenol	1
1,1'-Biphenyl	5
Inorganic Compounds (ug/L)	
Antimony	3
Arsenic	25
Barium	1000
Iron	300
Magnesium	35000
Manganese	300
Sodium	20000

Sample Location	MW-19I	MW-19I
Sample Date	3/18/2012	3/18/2012
Sample ID	MW-19I-031812	DUP-3-031812
BTEX (ug/L)		
Benzene	900	880
Ethylbenzene	460	450
Toluene	16	15
Xylenes, Total	360	340
Volatile Organic Compounds (VOCs) (ug/L)		
Isopropylbenzene	18	19
Methyl tert-butyl ether	9.5 J	8.2 J
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)		
Acenaphthene	110 J	80 J
Naphthalene	3100	2500

Sample Location	MW-22I
Sample Date	3/15/2012
Sample ID	MW-22I-031512
BTEX (ug/L)	
Benzene	53
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Acenaphthene	51
Inorganic Compounds (ug/L)	
Arsenic	55.6

Sample Location	MW-20I
Sample Date	3/18/2012
Sample ID	MW-20I-031812
BTEX (ug/L)	
Benzene	4.0
Volatile Organic Compounds (VOCs) (ug/L)	
Methyl tert-butyl ether	51
Vinyl chloride	3.0
Inorganic Compounds (ug/L)	
Arsenic	34.9

Sample Location	MW-03I
Sample Date	10/5/2010
Sample ID	MW-3I(100510)
BTEX (ug/L)	
Benzene	1200
Ethylbenzene	6500
Toluene	1600
Xylenes (total)	5800
Volatile Organic Compounds (VOCs) (ug/L)	
Isopropylbenzene	340
Styrene	410
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Acenaphthene	32
Naphthalene	4300
Other Semivolatile Organic Compounds (SVOCs) (ug/L)	
Phenol	7.6 J

Sample Location	MW-05I
Sample Date	10/6/2010
Sample ID	MW-5I (100610)
BTEX (ug/L)	
Benzene	1600
Ethylbenzene	200
Xylenes (total)	60
Volatile Organic Compounds (VOCs) (ug/L)	
cis-1,2-Dichloroethene	14 J
Isopropylbenzene	13 J
Vinyl chloride	12 J
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Acenaphthene	26
Naphthalene	270
Other Semivolatile Organic Compounds (SVOCs) (ug/L)	
Phenol	21
Inorganic Compounds (ug/L)	
Iron	17000
Magnesium	55300
Manganese	2300
Sodium	150000

Sample Location	MW-04I
Sample Date	10/5/2010
Sample ID	MW-4I (100510)
BTEX (ug/L)	
Benzene	1100
Ethylbenzene	630
Toluene	12
Xylenes (total)	290
Volatile Organic Compounds (VOCs) (ug/L)	
Isopropylbenzene	65
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Acenaphthene	130
Naphthalene	4000
Other Semivolatile Organic Compounds (SVOCs) (ug/L)	
Phenol	9.5 J

Sample Location	MW-07I
Sample Date	10/4/2010
Sample ID	MW-7I(100410)
BTEX (ug/L)	
Benzene	25
Ethylbenzene	18
Xylenes (total)	14
Volatile Organic Compounds (VOCs) (ug/L)	
Vinyl chloride	2.2 J

Sample Location	MW-06I
Sample Date	10/5/2010
Sample ID	MW-6I(100510)
BTEX (ug/L)	
Benzene	1400
Ethylbenzene	930
Toluene	30
Xylenes (total)	500
Volatile Organic Compounds (VOCs) (ug/L)	
Isopropylbenzene	60
trans-1,2-Dichloroethene	9.7
Vinyl chloride	12 J
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Acenaphthene	59
Naphthalene	1500
Other Semivolatile Organic Compounds (SVOCs) (ug/L)	
1,1'-Biphenyl	14
Phenol	20
Inorganic Compounds (ug/L)	
Antimony	14.6 J
Arsenic	39.7
Iron	64400
Magnesium	133000
Manganese	836
Sodium	1000000

Current Building Footprint (NYC DOITT 2009)
Gowanus Canal
Historic Structure
ISMP Site Area
Intermediate Monitoring Well Groundwater Sample Location

1 - Guidance or Standard Values - NYSDEC, Division of Water, TOGS (1.1.1) - 6 NYCRR 703.5 [NYSDEC, 1998].
ug/L - micrograms per liter
J = The associated numerical value is an estimated quantity.

Yellow highlight indicates exceedance of the NYSDEC Groundwater Guidance or Standard Value.

Monitoring well logs are provided in Appendices A and C of the RI Report.

1 inch = 100 feet

0 50 100 200 Feet

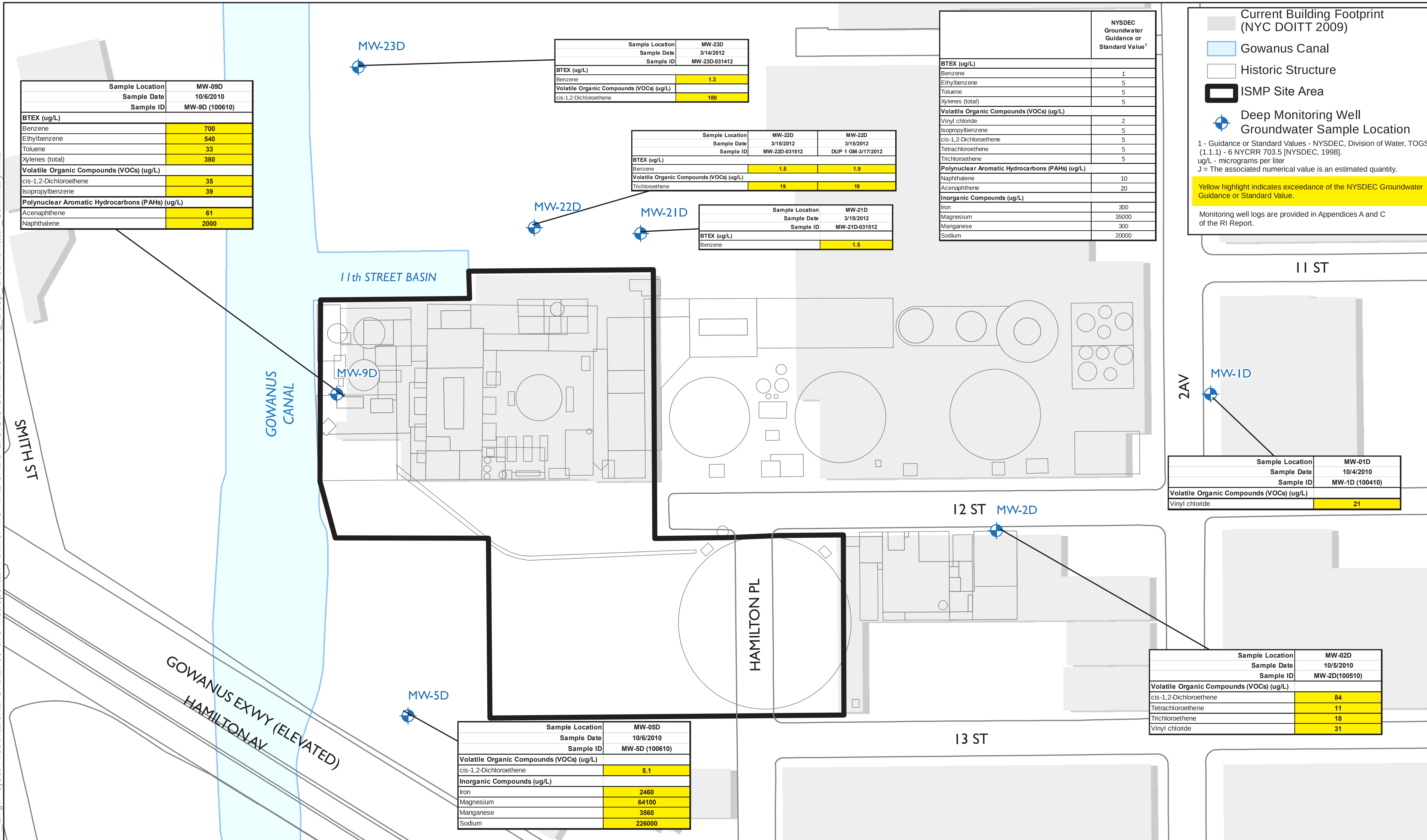
AECOM

National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

Groundwater Analytical Detections Summary Intermediate Zone

DATE: 9/6/2016 | DRWN: HKM | FIGURE 2-9B

Path: P:\Jobs\Rem_Eng\Project Files\National Grid\1765-075 Metropolitan Former MGP\7.2 CADD & GIS\GIS\MXD\ISMP\Fig_Intermediate_Groundwater_Summary.mxd



1 - Guidance or Standard Values - NYSDEC, Division of Water, TOGS (1.1.1) - 6 NYCRR 703.5 [NYSDEC, 1998].
ug/L - micrograms per liter
J = The associated numerical value is an estimated quantity.

Yellow highlight indicates exceedance of the NYSDEC Groundwater Guidance or Standard Value.

Monitoring well logs are provided in Appendices A and C of the RI Report.

	NYSDEC Groundwater Guidance or Standard Value[1]
BTEX (ug/L)	
Benzene	1
Ethylbenzene	5
Toluene	5
Xylenes (total)	5
Volatile Organic Compounds (VOCs) (ug/L)	
Vinyl chloride	2
Isopropylbenzene	5
cis-1,2-Dichloroethene	5
Tetrachloroethene	5
Trichloroethene	5
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Naphthalene	10
Acenaphthene	20
Inorganic Compounds (ug/L)	
Iron	300
Magnesium	35000
Manganese	300
Sodium	20000

Sample Location	MW-23D
Sample Date	3/14/2012
Sample ID	MW-23D-031412
BTEX (ug/L)	
Benzene	1.3
Volatile Organic Compounds (VOCs) (ug/L)	
cis-1,2-Dichloroethene	180

Sample Location	MW-09D
Sample Date	10/6/2010
Sample ID	MW-9D (100610)
BTEX (ug/L)	
Benzene	700
Ethylbenzene	540
Toluene	33
Xylenes (total)	380
Volatile Organic Compounds (VOCs) (ug/L)	
cis-1,2-Dichloroethene	35
Isopropylbenzene	39
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)	
Acenaphthene	61
Naphthalene	2000

Sample Location	MW-22D	MW-22D
Sample Date	3/15/2012	3/15/2012
Sample ID	MW-22D-031512	DUP 1 GM-3/17/2012
BTEX (ug/L)		
Benzene	1.8	1.9
Volatile Organic Compounds (VOCs) (ug/L)		
Trichloroethene	19	19

Sample Location	MW-21D
Sample Date	3/15/2012
Sample ID	MW-21D-031512
BTEX (ug/L)	
Benzene	1.5

Sample Location	MW-01D
Sample Date	10/4/2010
Sample ID	MW-1D (100410)
Volatile Organic Compounds (VOCs) (ug/L)	
Vinyl chloride	21

Sample Location	MW-02D
Sample Date	10/5/2010
Sample ID	MW-2D(100510)
Volatile Organic Compounds (VOCs) (ug/L)	
cis-1,2-Dichloroethene	84
Tetrachloroethene	11
Trichloroethene	18
Vinyl chloride	31

Sample Location	MW-05D
Sample Date	10/6/2010
Sample ID	MW-5D (100610)
Volatile Organic Compounds (VOCs) (ug/L)	
cis-1,2-Dichloroethene	5.1
Inorganic Compounds (ug/L)	
Iron	2460
Magnesium	64100
Manganese	3560
Sodium	226000

AECOM

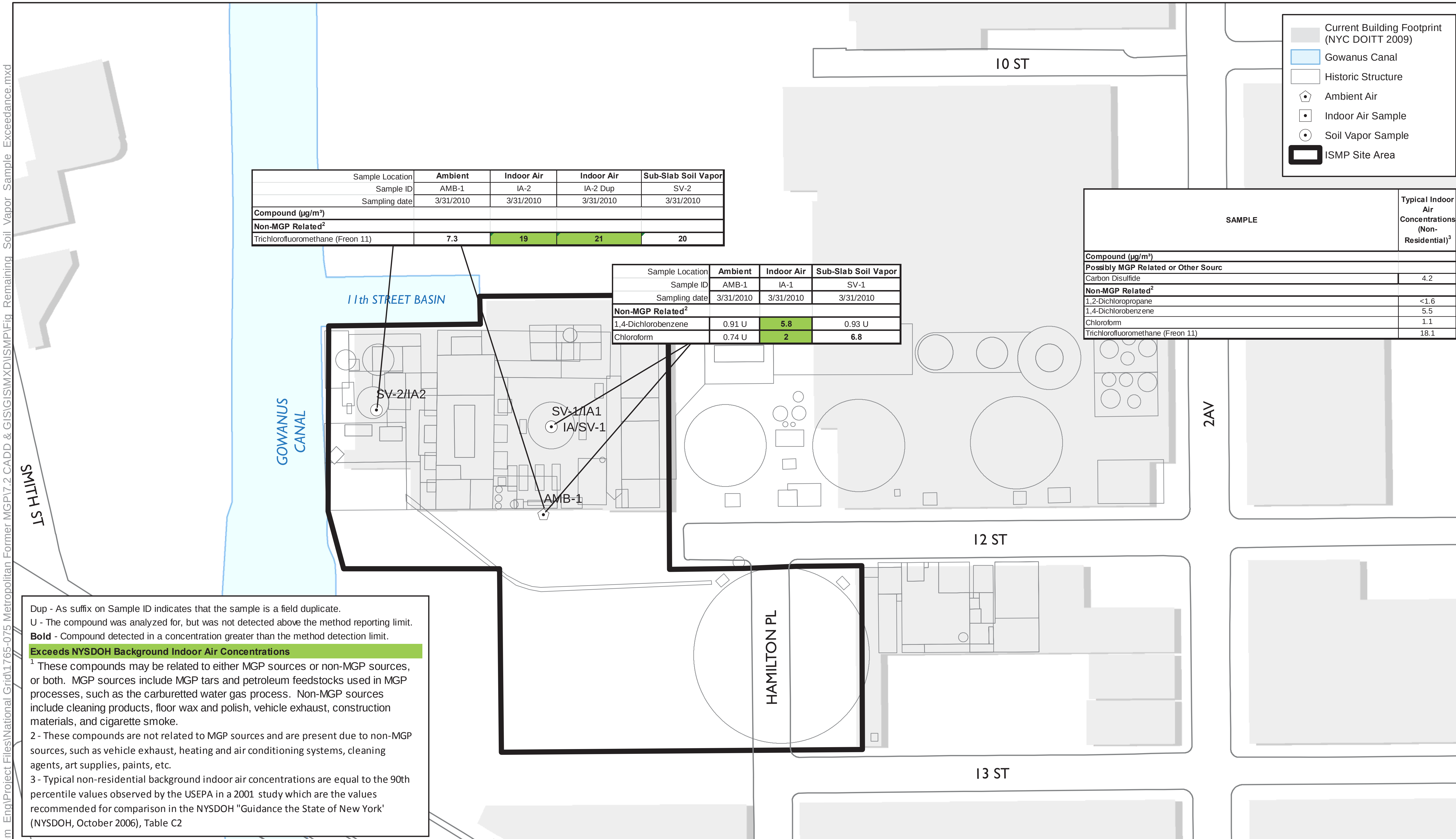
National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

DATE: 9/6/2016 DRWN: HKM

Groundwater Analytical Detections Summary Deep Zone

FIGURE 2-9C

Path: P:\Jobs\Rem_Eng\Project Files\National Grid\1765-075 Metropolitan Former MGP\7.2 CADD & GIS\GIS\MXD\ISMP\Fig_Deep_Groundwater_Summary.mxd



Sample Location	Ambient	Indoor Air	Indoor Air	Sub-Slab Soil Vapor
Sample ID	AMB-1	IA-2	IA-2 Dup	SV-2
Sampling date	3/31/2010	3/31/2010	3/31/2010	3/31/2010
Compound (µg/m³)				
Non-MGP Related[2]				
Trichlorofluoromethane (Freon 11)	**7.3**	**19**	**21**	**20**

Sample Location	Ambient	Indoor Air	Sub-Slab Soil Vapor
Sample ID	AMB-1	IA-1	SV-1
Sampling date	3/31/2010	3/31/2010	3/31/2010
Non-MGP Related[2]			
1,4-Dichlorobenzene	0.91 U	**5.8**	0.93 U
Chloroform	0.74 U	**2**	**6.8**

SAMPLE	Typical Indoor Air Concentrations (Non-Residential)[3]
Compound (µg/m³)	
Possibly MGP Related or Other Sourc	
Carbon Disulfide	4.2
Non-MGP Related[2]	
1,2-Dichloropropane	<1.6
1,4-Dichlorobenzene	5.5
Chloroform	1.1
Trichlorofluoromethane (Freon 11)	18.1

Dup - As suffix on Sample ID indicates that the sample is a field duplicate.
U - The compound was analyzed for, but was not detected above the method reporting limit.
Bold - Compound detected in a concentration greater than the method detection limit.
Exceeds NYSDOH Background Indoor Air Concentrations

1 These compounds may be related to either MGP sources or non-MGP sources, or both. MGP sources include MGP tars and petroleum feedstocks used in MGP processes, such as the carburetted water gas process. Non-MGP sources include cleaning products, floor wax and polish, vehicle exhaust, construction materials, and cigarette smoke.

2 - These compounds are not related to MGP sources and are present due to non-MGP sources, such as vehicle exhaust, heating and air conditioning systems, cleaning agents, art supplies, paints, etc.

3 - Typical non-residential background indoor air concentrations are equal to the 90th percentile values observed by the USEPA in a 2001 study which are the values recommended for comparison in the NYSDOH "Guidance the State of New York' (NYSDOH, October 2006), Table C2

AECOM

National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

Analytical Detections Summary for Ambient Air, Indoor Air, and Sub Slab Soil Vapor

DATE: 9/6/2016 | DRWN: HKM | FIGURE 2-10

Path: J:\Rem_Eng\Project Files\National Grid\1765-075 Metropolitan Former MGP\7.2 CADD & GIS\GIS\MXD\IRI_2013_06\Figure_2-1_Aerial_Site_Locus.mxd

AECOM

Source: Bing Maps Aerial 2010 Microsoft

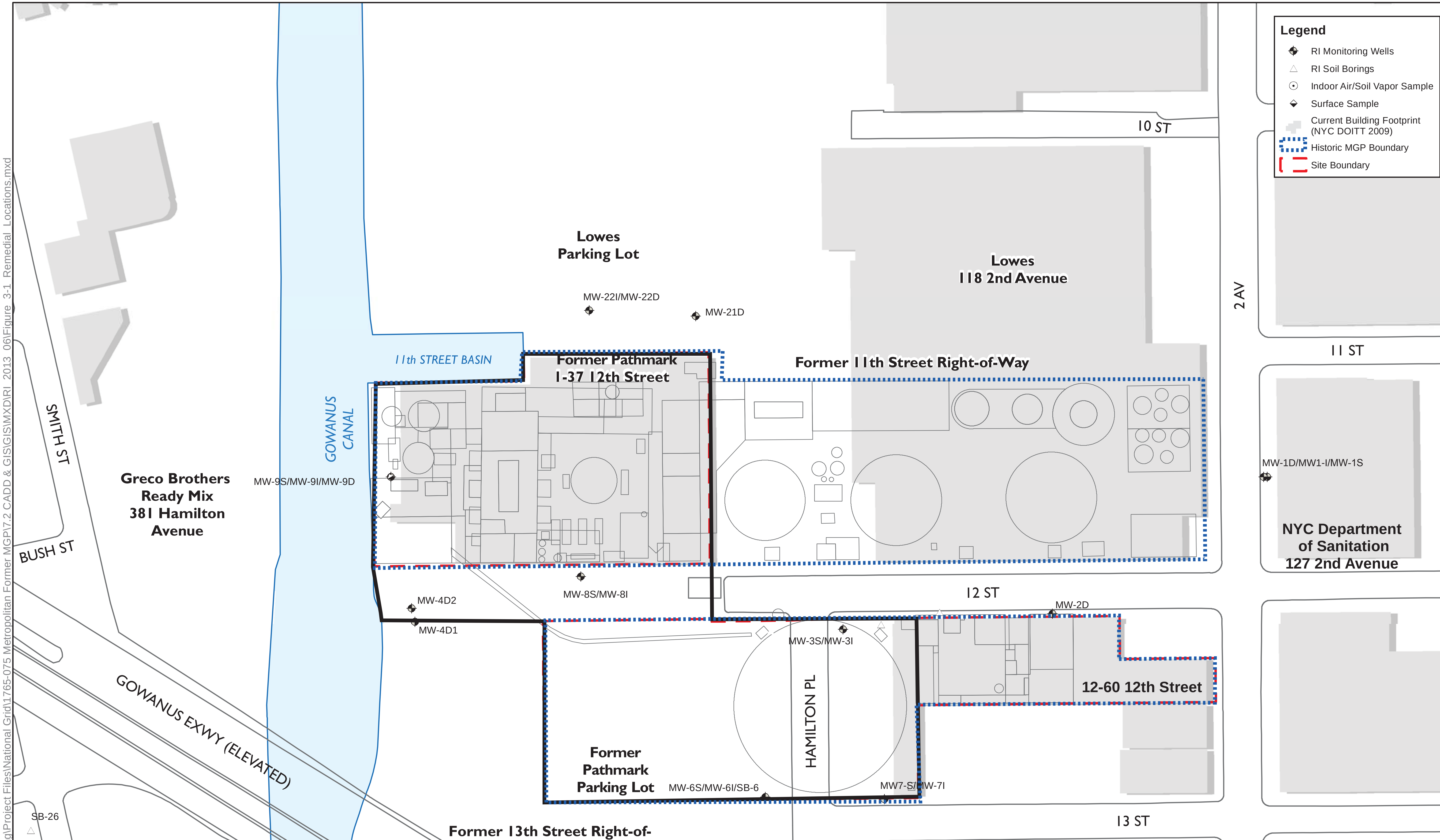
1 inch = 100 feet

0 50 100 200 Feet

National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

Engineering Control Locations

DATE: 11/7/2013 | DRWN: HKM | FIGURE 3-1



Path: J:\Rem_Eng\Project Files\National Grid\1765-075 Metropolitan Former MGP\7.2 CADD & GIS\GIS\MXD\RI_2013_06\Figure_3-1_Remedial_Locations.mxd

AECOM

1 inch = 100 feet

0 50 100 200 Feet

National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

Monitoring Well Network

DATE: 11/7/2013 | DRWN: HKM | FIGURE 4-1

Appendices

Appendix A

Environmental Easement/Notice

(Blank -To Be Inserted Following Execution)

Appendix B

List of Site Contacts

Appendix B
Site Contacts
Interim Site Management Plan
Former Metropolitan Works Site
Brooklyn, New York

Company/Role	Contact	Phone/Email Address
National Grid/Remedial Party	Brian Bermingham, PE	(347) 227-3668, Brian.Bermingham@nationalgrid.com
AECOM/Qualified Environmental Professional	Pete Cox, PG	(978) 905-2168, pete.cox@aecom.com
NYSDEC DER/Regulatory Agency	Hank Willems	518-402-9473, htwillem@gw.dec.state.ny.us

Appendix C

Monitoring Well Boring and Construction Logs

Appendix C

Soil Boring Logs and Well Construction Logs

RI Boring Logs - AECOM 2010-2012

NOTES:

1. USE ONLY THE COLOR KEYS FOR THE CONDITIONS THAT ARE ENCOUNTERED AT A GIVEN SITE. IF CONDITIONS DESCRIBED ABOVE DO NOT EXIST, DO NOT USE IN LEGEND.
2. THE COLOR DESCRIPTORS ABOVE ARE TO BE USED IN CONJUNCTION WITH THE "ENVIRONMENTAL TERMINOLOGY FOR SOIL DESCRIPTIONS" BY M. PASTER OF GEI CONSULTANTS, INC.

NATIONAL GRID IMPACT COLORS	**COLORS FOR NATIONAL GRID IMPACTS**
nationalgrid	February 2011

I:\Project\National Grid\All Sites\KeySpan & National Grid COLORS\ Nat Grid Impact Colors_2010-08-25.dwg \Feb 15, 2011

Boring ID: SB-1 / MW-1

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 72 ft bgs
Client: National Grid	**Sampling Method:** 5 ft disposable plastic liner	**Ground Elevation:** 12.09'(I/D)11.99'(S)NAVD88
Date Pre-Cleared: 4-5-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-6-2010/4-8-2010	**Logged By:** Stephen Wright	**Well ID:** MW-1D/ MW-1I/ MW-1S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Sample ID	U.S.C.S	Geologic Description
12	0	5.0/ 5.0	NA			0.0-0.75 ft bgs: REINFORCED CONCRETE SIDEWALK.
11	-1		263		FILL	0.75-2.0 ft bgs: WELL GRADED SAND, SILT, GRAVEL (Fill): fine to coarse grained sand, 25% silt, 25% fine to coarse grained gravel, cobbles, dry, black/dark brown, brick and concrete fragments, strong gasoline-like odor.
10	-2		1,601			2.0-3.0 ft bgs: SAA, dry, strong gasoline-like odor.
9	-3		2,300			3.0-4.0 ft bgs: SANDY SILT (Fill): silt, 25% fine to coarse grained sand, 15% fine to coarse grained gravel, moist, brown, strong-gasoline-like odor.
8	-4		2,775	SB-1 (4-5)		4.0-5.0 ft bgs: SAA, moist, strong gasoline-like odor.
7	-5	2.0/ 5.0	646	SB-1 (5-7)		5.0-7.0 ft bgs: SAA, wet, strong gasoline-like odor.
5	-7		23.6			7.0-10 ft bgs: SANDY SILT (Fill): silt, 15% fine to coarse grained sand, wet, moderate gasoline-like odor.
2	-10	3.0/ 5.0	76			10.0-14.5 ft bgs: SAA, 15% fine to coarse grained gravel.
-2.5	-14.5		2.6		PT	14.5-15.0 ft bgs: FIBROUS AND FRIABLE PEAT (PT): peat, 15% silt, dark brown.
-3	-15	3.0/ 5.0	3.4			15.0-17.0 ft bgs: PEAT (PT): thin layers of dark brown peat within brown silt.
-5	-17		2.2			17.0-20.0 ft bgs:FIBROUS AND FRIABLE PEAT (PT): brown peat, 15% silt, 5-10% clay.
-8	-20				ML	20.0-25.0 ft bgs: SANDY SILT (ML): silt and very fine grained sand.

Well Construction

MW-1D: CEMENT, BENTONITE, SAND PACK, BEN

MW-1I: CEMENT, BENTONITE, SAND PACK, BEN, PVC RISER

MW-1S: CEMENT, BENTONITE, SAND PACK, PVC RISER, PVC SCREEN, SUMP

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Boring was converted into Monitoring Well: MW-1D/1I/1S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid
10) NR- no recovery

AECOM

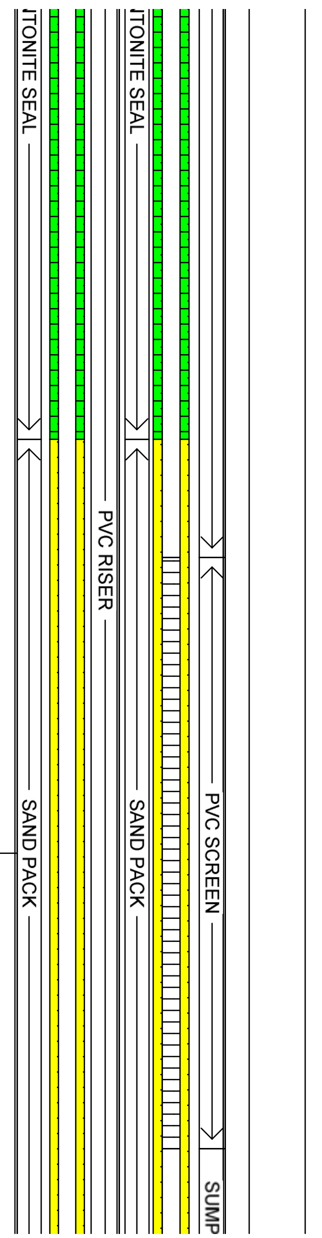
Boring ID: SB-1 / MW-1

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 72 ft bgs
Client: National Grid	**Sampling Method:** 5 ft disposable plastic liner	**Ground Elevation:** 12.09'(I/D)11.99'(S)NAVD88
Date Pre-Cleared: 4-5-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-6-2010/4-8-2010	**Logged By:** Stephen Wright	**Well ID:** MW-1D/ MW-1I/ MW-1S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-9	-21								
-10	-22	3.0/ 5.0	2.5						
-11	-23								
-12	-24								
-13	-25								25.0-30.0 ft bgs: SAA.
-14	-26								
-15	-27	3.0/ 5.0	2.1						
-16	-28								
-17	-29								
-18	-30								30.0-35.0 ft bgs: SAA: with 0.5 ft of silt, grey, with 25% very fine grained sand at 34.5 ft bgs.
-19	-31								
-20	-32	4.0/ 5.0	1.2						
-21	-33								
-22	-34								
-23	-35						SM		35.0-36.0 ft bgs: SILTY SAND (SM): silt and very fine grained sand, cobbles, thin lenses (<1inch) of very fine grained sand with 15% silt, grey.
-24	-36								36.0-40.0 ft bgs: SAA.
-25	-37	4.0/ 5.0	2.3						
-26	-38								
-27	-39								
-28	-40								40.0-45.0 ft bgs: SANDY SILT (SM): silt and very fine to fine grained sand, grey.
-29	-41								

Well Construction

MW-1D MW-1I MW-1S



Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Boring was converted into Monitoring Well: MW-1D/1I/1S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid
10) NR- no recovery

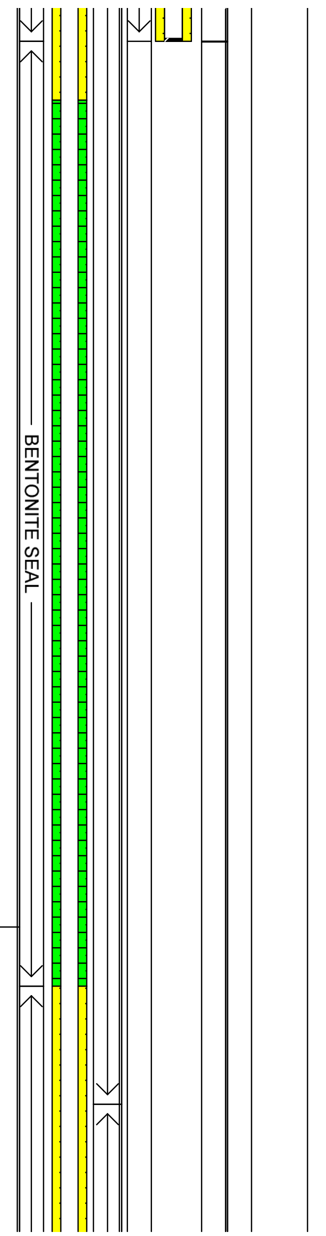
AECOM

Boring ID: SB-1 / MW-1

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 72 ft bgs
Client: National Grid	**Sampling Method:** 5 ft disposable plastic liner	**Ground Elevation:** 12.09'(I/D)11.99'(S)NAVD88
Date Pre-Cleared: 4-5-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-6-2010/4-8-2010	**Logged By:** Stephen Wright	**Well ID:** MW-1D/ MW-1I/ MW-1S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-30 to -33	-42 to -45	5.0/ 5.0	2.2		40-45	SB-1 (40-45)			
-33 to -38	-45 to -50	5.0/ 5.0	2.1						45.0-50.0 ft bgs: SAA.
-38 to -43	-50 to -55	5.0/ 5.0	3.1						50.0-55.0 ft bgs: SILTY SAND (SM): sand, 25% silt, 15% fine to coarse grained gravel, grey.
-43 to -45	-55 to -57		2.9						55.0-57.0 ft bgs: SAA.
-45 to -48	-57 to -60	5.0/ 5.0	3.0				SP		57.0-60.0 ft bgs: POORLY GRADED SAND (SP): fine to coarse grained sand and silt, 15% fine to coarse grained gravel, brown.
-48 to -50	-60 to -62								60.0-65.0 ft bgs: POORLY GRADED SAND (SP): fine to coarse grained sand, 25% silt, 15% cobbles.

Well Construction: MW-1D, MW-1I, MW-1S



Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Boring was converted into Monitoring Well: MW-1D/1I/1S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid
10) NR- no recovery

AECOM

Boring ID: SB-1 / MW-1

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 72 ft bgs
Client: National Grid	**Sampling Method:** 5 ft disposable plastic liner	**Ground Elevation:** 12.09'(I/D)11.99'(S)NAVD88
Date Pre-Cleared: 4-5-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-6-2010/4-8-2010	**Logged By:** Stephen Wright	**Well ID:** MW-1D/ MW-1I/ MW-1S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-50	-62		2.8						
-51	-63								
-52	-64								
-53	-65								65.0-72.0 ft bgs: SAA, fine grained sand and silt layer at 67-68 ft bgs.
-54	-66								
-55	-67	5.0/ 5.0							
-56	-68		2.1						
-57	-69								
-58	-70								
-59	-71	2.0/ 5.0				SB-1 (71-72)			End of boring at 72 ft bgs
	-72								

Well Construction: MW-1D, MW-1I, MW-1S

SAND PACK

PVC SCREEN

SUMP

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Boring was converted into Monitoring Well: MW-1D/1I/1S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid
10) NR- no recovery

Boring ID: SB-2 / MW-2

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~2 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 72 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.26' NAVD88
Date Pre-Cleared: 4-2-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-8-2010/4-9-2010	**Logged By:** Stephen Wright	**Well ID:** MW-2D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
10	0	5.0/ 5.0	NA						0-0.75 ft bgs: REINFORCED CONCRETE SIDEWALK.	CEMENT
9	-1		0.5			SB-2 (1-2)	FILL		0.75-2.0 ft bgs: SILTY SAND (Fill): fine to coarse grained sand, 25% silt, 15% fine to coarse grained gravel, dry, no odor	
8	-2		0.4						2.0-3.0 ft bgs: SILTY SAND (Fill): fine to coarse grained sand, 25% fine to coarse grained gravel, 15% silt, cobbles, bricks, concrete, wet	
7	-3		0.4						3.0-4.0 ft bgs: SAA	
6	-4		0.4						4.0-5.0 ft bgs: SAA: moist, strong gasoline-like odor. 5.0-7.0 ft bgs: SANDY SILT (Fill): silt, 15% very fine grained sand, concrete fragments, cobbles, grey, wet, no odor.	
5	-5	3.75/ 5								
4	-6		2.5							
3	-7								7.0-10 ft bgs: SANDY SILT (Fill): fine grained sand and silt, little fine grained gravel, brown.	
2	-8		2.4							
1	-9									
0	-10	2.0/ 5.0							10.0-14.0 ft bgs: SAA.	
-1	-11									
-2	-12		1.7							
-3	-13									
-4	-14		1.8						14.0-15.0: SANDY SILT (Fill): silt, 25% very fine grained sand, little fine to coarse grained gravel.	
-5	-15	5.0/ 5.0					PT		15.0-17.5 ft bgs: FIBROUS AND FRIABLE PEAT (PT): peat, 15% silt, dark brown.	
-6	-16		4.4							
-7	-17		1.8				CL		17.5-19.0 ft bgs: ORGANIC SILT/CLAY (CL): very fine grained sand and silt, 5 - 10% clay, trace organic matter.	
-8	-18									
-9	-19		2.1				SM		19.0-20.0 ft bgs: SILTY SAND (SM): very fine grained sand, 15% silt, grey.	
-10	-20								20.0-25.0 ft bgs: SAA.	

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-2D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-2 / MW-2

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~2 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 72 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.26' NAVD88
Date Pre-Cleared: 4-2-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-8-2010/4-9-2010	**Logged By:** Stephen Wright	**Well ID:** MW-2D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-10 to -15	-20 to -25	5.0/ 5.0	1.9							BENTONITE SEAL; PVC RISER
-15 to -17	-25 to -27	5.0/ 5.0	1.9						25.0-27.0 ft bgs: SAA.	
-17 to -20	-27 to -30		1.7				ML		27.0-30.0 ft bgs: SANDY SILT (ML): silt, 25% very fine grained sand, brown.	
-20 to -25	-30 to -35	5.0/ 5.0	1.8						30.0-35.0 ft bgs: SAA, grades to almost 100% silt with depth.	
-25 to -30	-35 to -40	0.0/ 5.0	NA				NR		35.0-40.0 ft bgs: No recovery.	
-30	-40 to -41						ML		40'-45': SANDY SILT (ML): very fine grained sand and silt, brown, appears to be same as 30-35 ft bgs.	

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-2D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-2 / MW-2

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~2 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 72 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.26' NAVD88
Date Pre-Cleared: 4-2-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-8-2010/4-9-2010	**Logged By:** Stephen Wright	**Well ID:** MW-2D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-31 to -35	-41 to -45	2.0/ 5.0	1.3			SB-2 (40-45)				
-35 to -40	-45 to -50	5.0/ 5.0	2.1						45.0-50.0 ft bgs: SAA.	
-40 to -45	-50 to -55	5.0/ 5.0	1.2						50.0-55.0 ft bgs: SAA.	
-45 to -50	-55 to -60		1.0						55.0-60.0 ft bgs: SAA.	
-50 to -51	-60 to -61	5.0/ 5.0					SM		60.0-62.0 ft bgs: SILTY SAND (SM): fine grained sand, 15% silt, brown.	

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-2D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-2 / MW-2

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~2 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 72 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.26' NAVD88
Date Pre-Cleared: 4-2-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-8-2010/4-9-2010	**Logged By:** Stephen Wright	**Well ID:** MW-2D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-51										
-52	-62		1.3						62.0-67.0 ft bgs: SAA.	
-53	-63									
-54	-64	5.0/ 5.0	1.4							SAND PACK; PVC SCREEN
-55	-65									
-56	-66									
-57	-67								67.0-72.0 ft bgs: SAA, grades to very fine grained sand, grey.	
-58	-68									
-59	-69	5.0/ 5.0	1.5							
-60	-70									SUMP
-61	-71					SB-2 (71-72)			End of boring at 72 ft bgs	
	-72									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-2D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

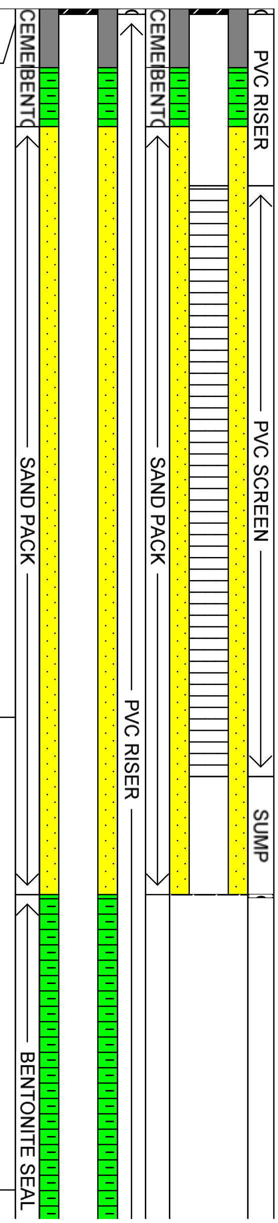
Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-3/MW-3

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 60 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.61' NAVD88
Date Pre-Cleared: 4-13-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-13-2010/4-13-2010	**Logged By:** Stephen Wright	**Well ID:** MW-3I / MW-3S

Depth (ft)	Recovery (ft)	PID (ppm)	Interval Sampled / Sample ID	U.S.C.S	Geologic Description
0-0.25	5.0/ 5.0	NA		FILL	0.0-0.25 ft bgs: ASPHALT.
0.25-2.0		2.2; 13			0.25-2.0 ft bgs: (Fill): fine to coarsegrained sand, 25% silt, 25% fine to coarse grained gravel and cobbles, dark brown, brick and concrete fragments, trace naphthalene-like odor from 1-2 ft bgs.
2.0-2.5		NA			2.0-2.5 ft bgs: CONCRETE SLAB (Fill)
2.5-5.0		>2,000	SB-3 (4-5)		2.5-5.0 ft bgs: POORLY GRADED SAND (Fill): fine to coarse grained sand, 25% gravel, <10% silt, strong tar-like odor.
5.0-8.0	2.4/ 3.0	381			5.0-8.0ft bgs: SAA, strong naphthalene-like odor and sheen, slight tar coating on sand grains, black.
8.0-10.0	NA	NA			8.0-10.0 ft bgs: WOODEN PLANKS.
10.0-12.0	1.0/ 2.0	263			10.0-12.0 ft bgs: (Fill): fine to coarse grained sand, 10% silt, 10% fine to coarse grained gravel, brick fragments, strong tar-like odor, black.
12.0-15.0	1.0/ 2.0	67		CL	12.0-15.0 ft bgs: ORGANIC SILT (OH): silt, 5-10% clay, some organic material, grey, tar-like odor.
15.0-18.0	1.5/ 3.0	67			15.0-18.0 ft bgs: SAA.
18.0-20.0	1.0/ 2.0	3.9			18.0-20.0 ft bgs: SAA, trace organic material, grey, no odor.
20.0-				SM	20.0-25.0 ft bgs: SILTY SAND (SM): fine grained sand, 20%

Well Construction



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-3I/3S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

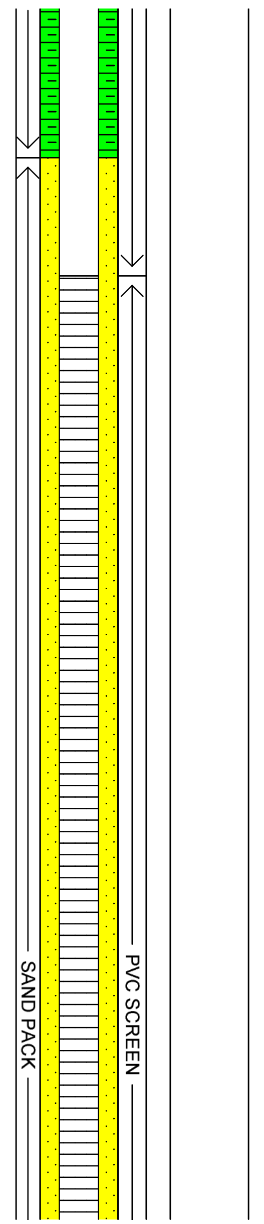
Boring ID: SB-3/MW-3

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 60 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.61' NAVD88
Date Pre-Cleared: 4-13-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-13-2010/4-13-2010	**Logged By:** Stephen Wright	**Well ID:** MW-3I / MW-3S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-12 to -16	-21 to -25	4.0/ 5.0	312						silt, grey, strong naphthalene-like odor and heavy sheen, pockets of tar saturated sand.
-16 to -21	-25 to -30	4.0/ 5.0	388						25.0-30.0 ft bgs: SILTY SAND (SM): very fine to fine grained sand, 20% silt, strong tar-like odor and sheen, pockets of tar saturated sand.
-21 to -26	-30 to -35	4.0/ 5.0	1,887			SB-3 (30-35)			30.0-35.0 ft bgs: SAA, interbedded very fine to fine grained sand (brown) and silt (grey/black), tar saturated in sand lenses, strong tar-like odor.
-26 to -31	-35 to -40	NA	NA				NR		35'-40': No recovery
-31 to -32	-40 to -41						SM		40.0-45.0 ft bgs: SILTY SAND (SM): very fine to fine grained sand, 10% silt, tar saturated in sand lenses, strong tar-like odor.

Well Construction

MW-3I MW-3S



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-3I/3S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
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6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-3/MW-3

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 60 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.61' NAVD88
Date Pre-Cleared: 4-13-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-13-2010/4-13-2010	**Logged By:** Stephen Wright	**Well ID:** MW-3I / MW-3S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction MW-3I / MW-3S
-33 to -36	-41 to -45	4.0/ 5.0	1,787							
-37 to -41	-45 to -50	5.0/ 5.0	23						45.0-50.0 ft bgs: SAA, no odor, no visible or olfactory impacts observed/detected.	
-42 to -46	-50 to -55	5.0/ 5.0	31						50.0-55.0 ft bgs: SAA, grey, no odor.	SUMP
-47 to -49	-55 to -58	3.0/ 3.0	4.1						55.0-58.0 ft bgs: SAA,has 5% fine grained gravel, no odor.	BENTONITE SEAL
-50 to -51	-58 to -60	2.0/ 2.0	3.2 5.4			SB-3 (59-60)	SP		58.0-60.0 ft bgs: POORLY GRADED SAND (SP): fine to coarse grained sand, 20% fine to coarse grained gravel, 10% silt, black/brown. End of boring at 60 ft bgs	

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-3I/3S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

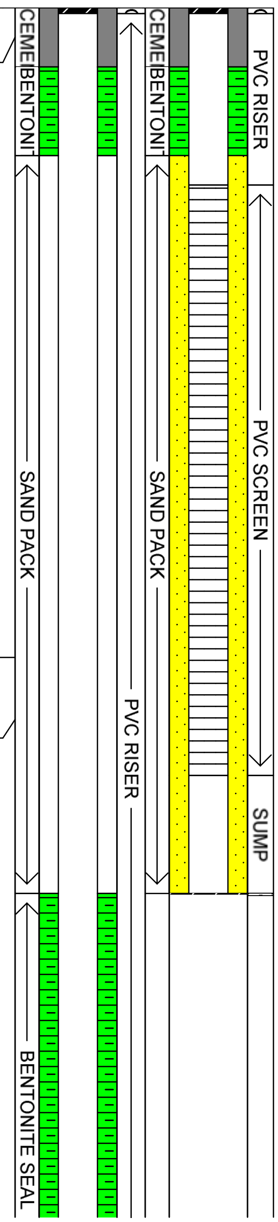
Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-4 / MW-4

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 60 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.86' NAVD88
Date Pre-Cleared: 4-27-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-27-2010/4-27-2010	**Logged By:** Stephen Wright	**Well ID:** MW-4I/MW-4S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
	0		NA						0.0-0.5 ft bgs: ASPHALT.
6	-1		1.2				FILL		0.5-2.0 ft bgs: POORLY GRADED SAND (Fill): fine to coarse grained sand, 20% silt, 20% fine to coarse gravel, cobbles, brick fragments, dry, dark brown.
5 / 4	-2 / -3	5.0/ 5.0	1.1						2.0-3.0 ft bgs: SAA, dry. 3.0-4.0 ft bgs: SAA, more brick fragments.
3	-4		0.9						
2	-5		1.3		4-5	SB-4 (4-5)			4.0-5.0 ft bgs: ASH (Fill): ash, cinders, grey, glass fragments, wet, no odor.
1 to -3	-6 to -10	2.0/ 5.0	0.6						5.0-10 ft bgs: SAA.
-4	-11		NA						10.0-11.0 ft bgs: SAA.
-5	-12		0.9				SM		11.0-12.0 ft bgs: SILTY SAND (SM): very fine grained sand, 30% silt, dark grey, no odor.
-6 to -8	-13 to -15	5.0/ 5.0	0.8				OH		12.0-15.0: ORGANIC SILT (OH): silt, 10% very fine grained sand, 5-10% clay, organics, shells, grey.
-9 to -13	-16 to -20	5.0/ 5.0	0.8						15'-21': SAA.

Well Construction: MW-4I, MW-4S



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4I/4S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

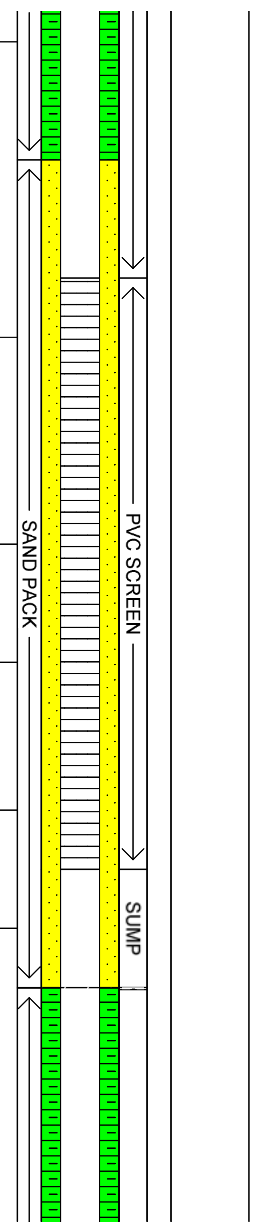
Boring ID: SB-4 / MW-4

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 60 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.86' NAVD88
Date Pre-Cleared: 4-27-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-27-2010/4-27-2010	**Logged By:** Stephen Wright	**Well ID:** MW-4I/MW-4S

Elevation (ft): -14 to -34; Depth (ft): -21 to -41

Depth (ft)	Recovery (ft)	PID (ppm)	Interval Sampled / Sample ID	U.S.C.S	Geologic Description
21-25	2.0/ 5.0	81		ML	21.0-26.0 ft bgs: SANDY SILT (ML): silt, very fine grained sand, grey, moderate tar-like odor and sheen, tar b lebs. Moderate tar-like odor from 25-26 ft bgs.
25-30	5.0/ 5.0	346		SM	26.0-29.5 ft bgs: SILTY SAND (SM): fine grained sand, 10% silt, grey, strong tar-like odor, grains coated with tar, weeping tar.
30-35	5.0/ 5.0	67		ML	29.5-31.5 ft bgs: SANDY SILT (ML): silt, 10% very fine grained sand, grey, slight tar-like odor, strong odor from 30-31.5 ft bgs.
		404	SB-4 (32-34)	SM	31.5-34.0 ft bgs: SILTY SAND (SM): fine grained sand, 10% silt, grey, tar saturated.
		26		ML	34-36.0 ft bgs: SANDY SILT (ML): silt, 10% very fine grained sand, slight tar-like odor.
35-40	4.0/ 5.0	NA		SM	36-40.0 ft bgs: SILTY SAND (SM): sand, 10% silt, brown, slight tar-like odor.
		44			40.0-43.0 ft bgs: SAA: 10% fine to coarse grained gravel, faint tar-like odor, slight tar-like staining at 42 ft bgs.

Well Construction



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4I/4S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-4 / MW-4

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 60 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.86' NAVD88
Date Pre-Cleared: 4-27-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-27-2010/4-27-2010	**Logged By:** Stephen Wright	**Well ID:** MW-4I/MW-4S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-36 to -38	-43 to -45	4.0/ 5.0	18; 10						43.0-45.0 ft bgs: SAA, no odor.
-38 to -43	-45 to -50	0.0/ 5.0	NA				NR		45.0-50.0 ft bgs: No recovery.
-43 to -48	-50 to -55	2.5/ 5.0	8.2				SM		50.0 - 55.0 ft bgs: SAA, (43-45 ft bgs), no odor.
-48 to -53	-55 to -60	2.5/ 5.0	5.4		58-60	SB-4 (58-60)			55.0 - 60.0: SAA, no odor, 10% fine to coarse grained gravel.
									End of Boring at 60 ft bgs

Well Construction: MW-4I, MW-4S — BENTONITE SEAL

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4I/4S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: MW-4D1

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** See MW-4
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 120 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.85 ft NAVD88
Date Pre-Cleared: Apr. 25, 2011	**Boring Diameter:** 6 Inches	**Converted To Well (Y/N):** YES
Date Started/Completed: 4/25/2011-4/28/2011	**Logged By:** Rita Papagian	**Well ID:** MW-4D1

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
	0	5.0'/ 5.0'	0.2				FILL		0-0.67 ft bgs: ASPHALT 0.67-1 ft bgs: FILL: coarse to fine grained sand, ~35% gravel, ~5-10% brick fragments, dry, dark brown. 1-2 ft bgs: SAA, slight napthalene-like odor. 2-2.67 ft bgs: FILL: boulder. 2.67-3 ft bgs: FILL: coarse to fine grained sand, ~35% gravel, ~5-10% brick fragments, slight napthalene-like odor, dry. 3-3.42 ft bgs: FILL: cinder block. 3.42-4 ft bgs: SAA (2.67-3 ft bgs interval). 4-5 ft bgs: SAA.	
6	-1		0.2							
5	-2		0.1							
4	-3		0.4							
3	-4		0.3							
2	-5								See boring log SB-4/MW-4 for lithology description from 5-60 ft bgs. See boring log MW-4D2 for lithology descriptions from 60-110 ft bgs.	
1	-6									
0	-7									
-1	-8									
-2	-9									
-3	-10									
-4	-11									
-5	-12									
-6	-13									
-7	-14									
-8	-15									
-9	-16									
-10	-17									
-11	-18									
-12	-19									
-13	-20									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4D1
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: MW-4D1

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** See MW-4
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 120 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.85 ft NAVD88
Date Pre-Cleared: Apr. 25, 2011	**Boring Diameter:** 6 Inches	**Converted To Well (Y/N):** YES
Date Started/Completed: 4/25/2011-4/28/2011	**Logged By:** Rita Papagian	**Well ID:** MW-4D1

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-14	-21									
-15	-22									
-16	-23									
-17	-24									
-18	-25									
-19	-26									
-20	-27									
-21	-28									
-22	-29									
-23	-30									
-24	-31									
-25	-32									
-26	-33									
-27	-34									
-28	-35									
-29	-36									
-30	-37									
-31	-38									
-32	-39									
-33	-40									
-34	-41									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4D1
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: MW-4D1

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** See MW-4
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 120 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.85 ft NAVD88
Date Pre-Cleared: Apr. 25, 2011	**Boring Diameter:** 6 Inches	**Converted To Well (Y/N):** YES
Date Started/Completed: 4/25/2011-4/28/2011	**Logged By:** Rita Papagian	**Well ID:** MW-4D1

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-34	-41									
-35	-42									
-36	-43									
-37	-44									
-38	-45									
-39	-46									
-40	-47									
-41	-48									
-42	-49									
-43	-50									
-44	-51									
-45	-52									
-46	-53									
-47	-54									
-48	-55									
-49	-56									GROUT
-50	-57									
-51	-58									
-52	-59									
-53	-60									
-54	-61									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4D1
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: MW-4D1

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** See MW-4
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 120 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.85 ft NAVD88
Date Pre-Cleared: Apr. 25, 2011	**Boring Diameter:** 6 Inches	**Converted To Well (Y/N):** YES
Date Started/Completed: 4/25/2011-4/28/2011	**Logged By:** Rita Papagian	**Well ID:** MW-4D1

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-55	-62									
-56	-63									
-57	-64									
-58	-65									
-59	-66									
-60	-67									
-61	-68									
-62	-69									
-63	-70									
-64	-71									
-65	-72									
-66	-73									
-67	-74									
-68	-75									
-69	-76									
-70	-77									
-71	-78									
-72	-79									
-73	-80									
-74	-81									
-75	-82									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4D1
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: MW-4D1

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** See MW-4
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 120 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.85 ft NAVD88
Date Pre-Cleared: Apr. 25, 2011	**Boring Diameter:** 6 Inches	**Converted To Well (Y/N):** YES
Date Started/Completed: 4/25/2011-4/28/2011	**Logged By:** Rita Papagian	**Well ID:** MW-4D1

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-75	-82									
-76	-83									
-77	-84									
-78	-85									
-79	-86									
-80	-87									
-81	-88									
-82	-89									
-83	-90									
-84	-91									
-85	-92									
-86	-93									
-87	-94									
-88	-95									
-89	-96									
-90	-97									
-91	-98									
-92	-99									
-93	-100									
-94	-101									
-95	-102									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4D1
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: MW-4D1

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** See MW-4
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 120 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.85 ft NAVD88
Date Pre-Cleared: Apr. 25, 2011	**Boring Diameter:** 6 Inches	**Converted To Well (Y/N):** YES
Date Started/Completed: 4/25/2011-4/28/2011	**Logged By:** Rita Papagian	**Well ID:** MW-4D1

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-96	-103									
-97	-104									
-98	-105									
-99	-106									
-100	-107									
-101	-108									
-102	-109									
-103	-110	4.5'/ 5.0'	ND				SP		110-115 ft bgs: POORLY GRADED SAND (SP): fine grained sand, moist, reddish brown.	
-104	-111									
-105	-112									BENTONITE
-106	-113									
-107	-114									
-108	-115	4.5'/ 5.0'	ND							SAND PACK
-109	-116					MW-4D1 (116-118)	SM		116-120 ft bgs: SILTY SAND (SM): fine grained sand and silt, moist, grey.	
-110	-117									
-111	-118									
-112	-119									
-113	-120									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4D1
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: MW-4D2

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** See MW-4
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 150 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.80 ft bgs
Date Pre-Cleared: Apr. 25, 2011	**Boring Diameter:** 6 Inches	**Converted To Well (Y/N):** YES
Date Started/Completed: Apr. 25, 2011/Apr. 27, 2011	**Logged By:** Rita Papagian	**Well ID:** MW-4D2

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
	0	5.0'/ 5.0'	0.1				FILL		0-0.67 ft bgs: ASPHALT	
6	-1		0.8						0.67-1 ft bgs: FILL: dark brown coarse to fine grained sand, ~35% gravel, ~5-10% cobbles.	
5	-2		1.1						1-2 ft bgs: FILL: SAA, slight napthalene-like odor. 2-3 ft bgs: FILL: SAA, ~5-10% brick fragments.	
4	-3		0.4						3-4 ft bgs: FILL: SAA, no odor.	
3	-4		0.4						4-5 ft bgs: SAA.	
2	-5								See log SB-4/MW-4 for lithology descriptions from 5-60 ft bgs.	
1	-6									
0	-7									
-1	-8									
-2	-9									
-3	-10									
-4	-11									
-5	-12									
-6	-13									
-7	-14									
-8	-15									
-9	-16									
-10	-17									
-11	-18									
-12	-19									
-13	-20									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4D2
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: MW-4D2

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** See MW-4
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 150 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.80 ft bgs
Date Pre-Cleared: Apr. 25, 2011	**Boring Diameter:** 6 Inches	**Converted To Well (Y/N):** YES
Date Started/Completed: Apr. 25, 2011/Apr. 27, 2011	**Logged By:** Rita Papagian	**Well ID:** MW-4D2

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-14	-21									
-15	-22									
-16	-23									
-17	-24									
-18	-25									
-19	-26									
-20	-27									
-21	-28									
-22	-29									
-23	-30									
-24	-31									
-25	-32									
-26	-33									
-27	-34									
-28	-35									
-29	-36									
-30	-37									
-31	-38									
-32	-39									
-33	-40									
-34	-41									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4D2
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: MW-4D2

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** See MW-4
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 150 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.80 ft bgs
Date Pre-Cleared: Apr. 25, 2011	**Boring Diameter:** 6 Inches	**Converted To Well (Y/N):** YES
Date Started/Completed: Apr. 25, 2011/Apr. 27, 2011	**Logged By:** Rita Papagian	**Well ID:** MW-4D2

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-34	-41									
-35	-42									
-36	-43									
-37	-44									
-38	-45									
-39	-46									
-40	-47									
-41	-48									
-42	-49									
-43	-50									
-44	-51									
-45	-52									
-46	-53									
-47	-54									
-48	-55									
-49	-56									
-50	-57									
-51	-58									
-52	-59									
-53	-60	3.5'/ 5.0'	0.5				SP		60-65 ft bgs: POORLY GRADED SAND (SP): medium to fine grained sand, wet to moist, brown.	
-54	-61									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4D2
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
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5) NAVD 88 - North American Vertical Datum of 1988
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9) NAPL - Non-Aqueous Phase Liquid

Boring ID: MW-4D2

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** See MW-4
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 150 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.80 ft bgs
Date Pre-Cleared: Apr. 25, 2011	**Boring Diameter:** 6 Inches	**Converted To Well (Y/N):** YES
Date Started/Completed: Apr. 25, 2011/Apr. 27, 2011	**Logged By:** Rita Papagian	**Well ID:** MW-4D2

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-55	-62									GROUT
-56	-63		0.6							
-57	-64									
-58	-65	4.0'/5.0'	0.8				SW		65-68.5 ft bgs: WELL GRADED SAND (SW): coarse to fine grained sand, ~20% gravel, wet, brown.	
-59	-66									
-60	-67									
-61	-68		0.9							
-62	-69						SP		68.5-70 ft bgs: POORLY GRADED SAND (SP): medium to fine grained sand, wet, brown.	
-63	-70	4.5'/5.0'	0.7							
-64	-71									
-65	-72									
-66	-73		0.8							
-67	-74									
-68	-75	4.5'/5.0'	0.8				SW		75-76 ft bgs WELL GRADED SAND (SW): medium to fine grained sand, ~35% gravel, wet, reddish brown.	
-69	-76						SP		76-80 ft bgs: POORLY GRADED SAND (SP): medium to fine grained sand, moist, reddish brown.	
-70	-77									
-71	-78		1.1							
-72	-79									
-73	-80	4.0'/5.0'	0.5							
-74	-81									
-75	-82									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4D2
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
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5) NAVD 88 - North American Vertical Datum of 1988
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9) NAPL - Non-Aqueous Phase Liquid

Boring ID: MW-4D2

Project Name: Metropolitan Former MGP
Project Number: 60137361
Client: National Grid
Date Pre-Cleared: Apr. 25, 2011
Date Started/Completed: Apr. 25, 2011/Apr. 27, 2011

Drilling Company: Boart Longyear
Drilling Method: Sonic
Sampling Method: 5' disposable plastic liner
Boring Diameter: 6 Inches
Logged By: Rita Papagian

Water Level: See MW-4
Total Depth: 150 ft bgs
Ground Elevation: 6.80 ft bgs
Converted To Well (Y/N): YES
Well ID: MW-4D2

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-75	-82									
-76	-83		1.5							
-77	-84									
-78	-85	ND	0.5							
-79	-86									
-80	-87									
-81	-88		1.0							
-82	-89									
-83	-90	4.5'/ 5.0'	1.3				SW		90-93 ft bgs: WELL GRADED SAND (SW): medium to coarse grained sand, wet, light brown.	
-84	-91									
-85	-92									
-86	-93		1.0				SP		93-95 ft bgs: POORLY GRADED SAND (SP): medium to fine grained sand, wet, light brown.	
-87	-94									
-88	-95	4.0'/ 5.0'	1.4							
-89	-96									
-90	-97									
-91	-98		1.8							
-92	-99									
-93	-100	4.5'/ 5.0'	0.7							
-94	-101									
-95	-102									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4D2
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
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7) PID - Photo Ionization Detector
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9) NAPL - Non-Aqueous Phase Liquid

Boring ID: MW-4D2

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** See MW-4
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 150 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.80 ft bgs
Date Pre-Cleared: Apr. 25, 2011	**Boring Diameter:** 6 Inches	**Converted To Well (Y/N):** YES
Date Started/Completed: Apr. 25, 2011/Apr. 27, 2011	**Logged By:** Rita Papagian	**Well ID:** MW-4D2

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-96	-103		0.8							
-97	-104									
-98	-105	4.5'/ 5.0'	1.2							
-99	-106									
-100	-107									
-101	-108		1.2				SM		107.5-110 ft bgs: SILTY SAND (SM): fine grained sand, ~35% silt, moist, light brown.	
-102	-109									
-103	-110	4.0'/ 5.0'	0.5				SP		110-115 ft bgs: POORLY GRADED SAND (SP): fine grained sand, moist, brown.	
-104	-111									
-105	-112									
-106	-113		0.4							
-107	-114									
-108	-115	3.0'/ 5.0'	0.4							
-109	-116									
-110	-117									
-111	-118		0.4							
-112	-119									
-113	-120	5.0'/ 5.0'	0.3				SW		120-121 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand, ~20% gravel, grey.	
-114	-121						CH		121-125 ft bgs: CLAY AND SILTY CLAY OF HIGH PLASTICITY (CH): clay, <5% silt, firm, grey.	
-115	-122									
-116	-123		0.1							

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4D2
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
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AECOM

Boring ID: MW-4D2

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** See MW-4
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 150 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.80 ft bgs
Date Pre-Cleared: Apr. 25, 2011	**Boring Diameter:** 6 Inches	**Converted To Well (Y/N):** YES
Date Started/Completed: Apr. 25, 2011/Apr. 27, 2011	**Logged By:** Rita Papagian	**Well ID:** MW-4D2

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-116	-123									
-117	-124									
-118	-125	4.5'/ 5.0'	0.1							
-119	-126									
-120	-127									
-121	-128		0.1							
-122	-129									
-123	-130	5.0'/ 5.0'	0.3							
-124	-131									
-125	-132									
-126	-133		0.3							
-127	-134									
-128	-135	4.5'/ 5.0'	0.2				GW		135-136 ft bgs: WELL GRADED GRAVEL (GW): large angular gravel and coarse grained sand, brown.	
-129	-136						SW		136-140 ft bgs: WELL GRADED SAND (SW): medium to coarse grained sand, brown, ~35% gravel.	
-130	-137									
-131	-138		0.3							BENTONITE
-132	-139									
-133	-140	5.0'/ 5.0'	ND							
-134	-141									
-135	-142					MW-4D2 (142-144)				
-136	-143		ND				GW		143-145 ft bgs: WELL GRADED GRAVEL (GW): sandy gravel, brown, wet,	

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4D2
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
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Boring ID: MW-4D2

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** See MW-4
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 150 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.80 ft bgs
Date Pre-Cleared: Apr. 25, 2011	**Boring Diameter:** 6 Inches	**Converted To Well (Y/N):** YES
Date Started/Completed: Apr. 25, 2011/Apr. 27, 2011	**Logged By:** Rita Papagian	**Well ID:** MW-4D2

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-137	-144								gravel is multicolored.	SAND PACK
-138	-145	5.0'/ 5.0'	ND							
-139	-146									
-140	-147						SM		147-150 ft bgs: SILTY SAND (SM): silty sand, ~35% medium to large gravel, brown, wet.	
-141	-148		ND							
-142	-149									
-143	-150									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-4D2
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

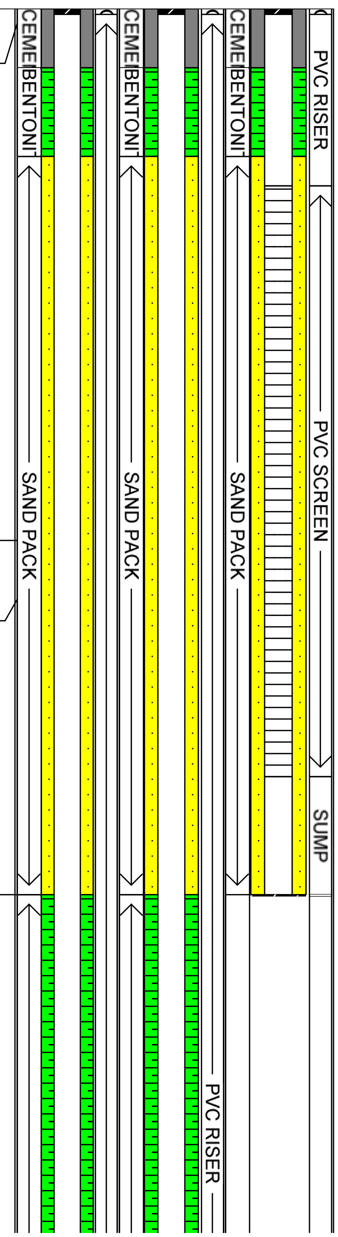
Boring ID: SB-5 / MW-5

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 72 ft bgs
Client: National Grid	**Sampling Method:** 5 ft disposable plastic liner	**Ground Elevation:** 9.79' (D/I/S) NAVD88
Date Pre-Cleared: 4-21-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-21-2010/4-22-2010	**Logged By:** Stephen Wright	**Well ID:** MW-5D/MW-5I/MW-5S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Geologic Description
9.79	0	5.0/ 5.0	NA				FILL	0-0.25 ft bgs: ASPHALT
			1.7					0.25-1.0 ft bgs: SANDY SILT (FILL): silt, 30% sand, 20% fine to coarse gravel, cobbles, dry, dark brown, brick, glass.
	-1		1.8					1.0-2.0 ft bgs: SAA.
	-2		2.0					2.0-3.5 ft bgs: SAA.
	-3		NA					3.5-4.0 ft bgs: GRANITE SLAB (Fill)
	-4		3.1		4-5	SB-5 (4-5)		4.0 - 6.0 ft bgs: SAA.
	-5	3.0/ 5.0	1.5					
	-6							6.0-9.0 ft bgs: SILTY SAND (Fill): silt, 20% fine to coarse grained sand, 20% fine to coarse gravel, cobbles, brown.
	-8		2.2					
	-9		1.4				SM	9.0-10 ft bgs: SILTY SAND (SM): fine grained sand, 10% silt, grey.
	-10	0.0/ 5.0	NA				NR	10-15 ft bgs: No recovery.
	-15	4.0/ 5.0	3.8				SM	15.0-20.0 ft bgs: SILTY SAND (SM): fine grained sand, 10% silt, grey, no odor.
	-20							20.0-25.0 ft bgs: SAA, 5% fine grained gravel, no odor.

Elevation scale (ft): 9, 8, 7, 6, 5, 4, 3, 2, 1, 0, -1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11
Depth scale (ft): 0, -1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -20

Well Construction: MW-5D, MW-5I, MW-5S



Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Boring was converted into Monitoring Well: MW-5D/5I/5S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

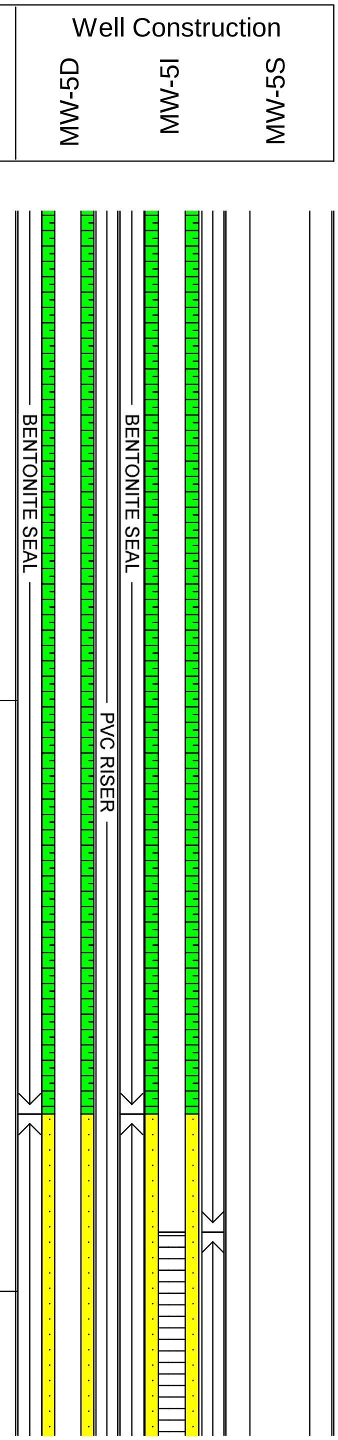
Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid
10) NR- no recovery

Boring ID: SB-5 / MW-5

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 72 ft bgs
Client: National Grid	**Sampling Method:** 5 ft disposable plastic liner	**Ground Elevation:** 9.79' (D/I/S) NAVD88
Date Pre-Cleared: 4-21-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-21-2010/4-22-2010	**Logged By:** Stephen Wright	**Well ID:** MW-5D/MW-5I/MW-5S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Geologic Description
-11 to -15	-21 to -25	4.0/ 5.0	3.7					
-15 to -19	-25 to -29	4.0/ 5.0	1.3					25.0-29.0 ft bgs: SAA
-19 to -20	-29 to -30		1.3				OH	29.0-39.0 ft bgs: ORGANIC SILT (OH): silt, 5 - 10% clay, organics, shell fragments, grey, no odor.
-20 to -25	-30 to -35	3.0/ 5.0	2.4					
-25 to -29	-35 to -39	5.0/ 5.0	2.6					
-29 to -30	-39 to -40		38	Yes	Yes	SB-5 (39-40)	SM	39.0-40.0 ft bgs: SILTY SAND (SM): very fine grained sand, 20% silt, brown, faint tar-like odor.
-30 to -31	-40 to -41		36	Yes				40.0-41.0 ft bgs: SAA, faint tar-like odor.

Well Construction



Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Boring was converted into Monitoring Well: MW-5D/5I/5S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
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6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid
10) NR- no recovery

AECOM

Boring ID: SB-5 / MW-5

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 72 ft bgs
Client: National Grid	**Sampling Method:** 5 ft disposable plastic liner	**Ground Elevation:** 9.79' (D/I/S) NAVD88
Date Pre-Cleared: 4-21-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-21-2010/4-22-2010	**Logged By:** Stephen Wright	**Well ID:** MW-5D/MW-5I/MW-5S

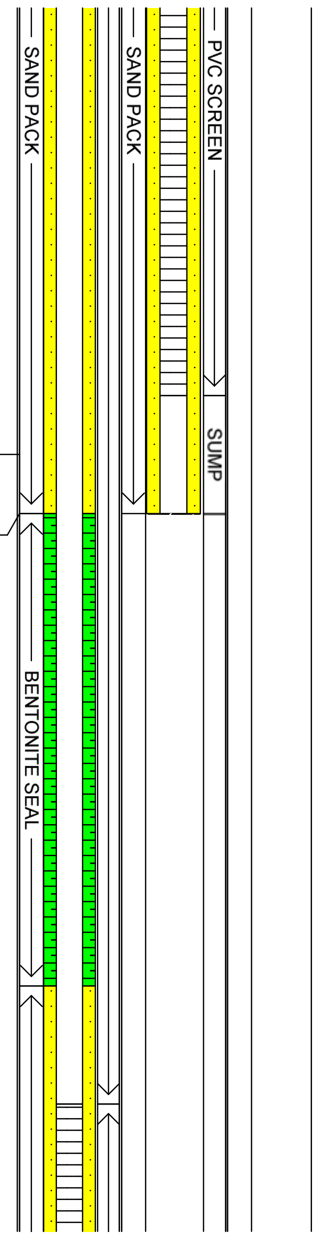
Elevation (ft): -32, -33, -34, -35, -36, -37, -38, -39, -40, -41, -42, -43, -44, -45, -46, -47, -48, -49, -50, -51, -52

Depth (ft): -42, -43, -44, -45, -46, -47, -48, -49, -50, -51, -52, -53, -54, -55, -56, -57, -58, -59, -60, -61, -62

Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
5.0/ 5.0	2.3						41.0-45 ft bgs: SILTY SAND (SM): fine grained sand, 10% silt, grey/brown.
5.0/ 5.0	1.9						45.0-49.0 ft bgs: SAA, grades to very fine grained sand, brown, no odor.
					ML		49.0-50.0 ft bgs: SANDY SILT (ML): silt and very fine grained sand, brown, no odor.
4.0/ 5.0	1.6				SP		50.0-55.0 ft bgs: POORLY GRADED SAND (SP): fine to coarse grained sand, 10% silt, 10% gravel, brown.
5.0/ 5.0	1.3						55.0-60.0 ft bgs: SAA, 20% fine gravel, no odor.
							60.0-65.0 ft bgs: SAA

Well Construction

MW-5D MW-5I MW-5S



Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Boring was converted into Monitoring Well: MW-5D/5I/5S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid
10) NR- no recovery

Boring ID: SB-5 / MW-5

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 72 ft bgs
Client: National Grid	**Sampling Method:** 5 ft disposable plastic liner	**Ground Elevation:** 9.79' (D/I/S) NAVD88
Date Pre-Cleared: 4-21-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-21-2010/4-22-2010	**Logged By:** Stephen Wright	**Well ID:** MW-5D/MW-5I/MW-5S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
	-62	3.0/ 5.0	1.2						
-53	-63								
-54	-64								
-55	-65								65.0-72.0 ft bgs: SAA, 5% gravel.
-56	-66								
-57	-67								
-58	-68	5.6/ 7.0	1.8						
-59	-69								
-60	-70								
-61	-71					SB-5 (70-72)			End of boring at 72 ft bgs
-62	-72								

Well Construction

MW-5D MW-5I MW-5S

SAND PACK

PVC SCREEN

SUMP

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Boring was converted into Monitoring Well: MW-5D/5I/5S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid
10) NR- no recovery

AECOM

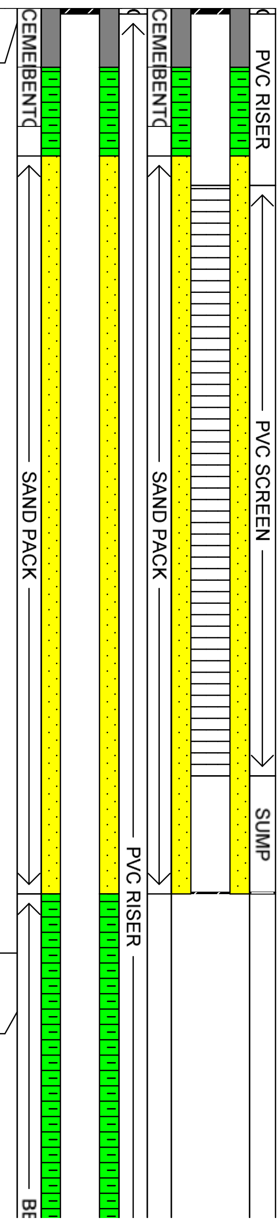
Boring ID: SB-6 / MW-6

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.81' NAVD88
Date Pre-Cleared: 4-20-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-20-2010/4-21-2010	**Logged By:** Stephen Wright	**Well ID:** MW-6I/MW-6S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
9.81	0	5.0'/ 5.0'	NA				FILL		0-0.25 ft bgs: ASPHALT
9	-1		22						0.25-1.0 ft bgs: POORLY GRADED SAND (Fill): fine to coarse grained sand, 30% silt, 20% gravel, cobbles, moist, black, wood, slight petroleum-like odor.
8	-2		21						1.0'-2.0': SAA, moist, slight petroleum-like odor.
7	-3		24						2.0'-3.0': SAA, wet, moderate to strong petroleum-like odor.
6	-4		36		4-5	SB-6 (4-5)			3.0 - 5.0 ft bgs: SAA.
5	-5		47						
4	-6	4.0'/ 5.0'							5.0-10 ft bgs: SAA, glass fragments, slight petroleum-like odor.
2	-8		69						
0	-10	1.0'/ 5.0'							
-1	-11								10.0-16.0 ft bgs: SAA.
-3	-13		20						
-5	-15	5.0'/ 5.0'	NA						
-6	-16		11				PT		16.0-17.0 ft bgs: FIBROUS AND FRIABLE PEAT (PT): peat, dark brown, organic-like odor.
-7	-17						OH		17.0- 26.5 ft bgs: ORGANIC SILT (OH): silt, 5 - 10% clay, organics and shell fragments, grey, no odor.
-8	-18		1.8						
-10	-20								

Well Construction

MW-6I MW-6S



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-6I/6S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

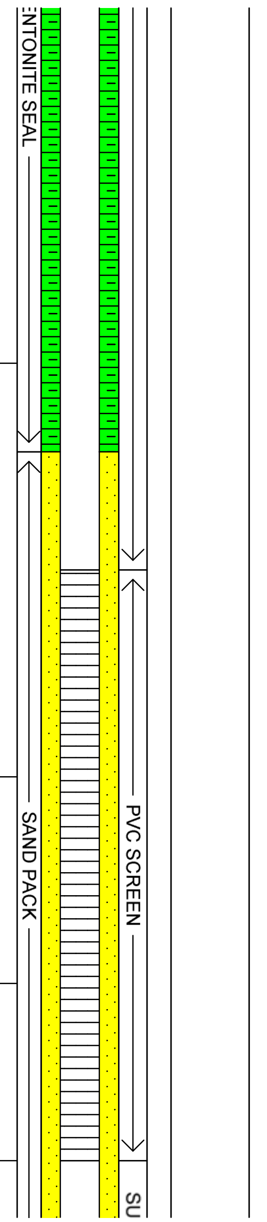
Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-6 / MW-6

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.81' NAVD88
Date Pre-Cleared: 4-20-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-20-2010/4-21-2010	**Logged By:** Stephen Wright	**Well ID:** MW-6I/MW-6S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-11 to -15	-21 to -25	5.0/ 5.0	1.8						
-16 to -17	-26 to -27	5.0'/ 5.0'	1.9						
-17 to -18	-27 to -28		53			SB-6 (26-28)	SM		26.5-28.0 ft bgs: SILTY SAND (SM): fine grained sand, 10% silt, grey, ~2" layer black organics at 27 ft bgs, PEAT, fibrous, woody,slight tar-like odor.
-19 to -20	-29 to -30		16						28.0-30.5.0 ft bgs: SILTY SAND (SM): silt, 10% very fine grained sand, brown.
-20 to -23	-30 to -33	5.0'/ 5.0'	NA 45						30.5-33.5 ft bgs: SILTY SAND (SM): fine grained sand, 10% silt, brown, slight tar-like odor.
-24 to -27	-34 to -37		34 12				ML		33.5-37.0 ft bgs: SILT (ML): silt, 10% very fine grained sand, brown, slight tar-like odor.
-27 to -30	-37 to -40	5.0'/ 5.0'	13				SM		37.0-40.0 ft bgs: SILTY SAND (SM): fine grained sand, 20% silt, grey.
-30 to -31	-40 to -41						ML		40.0-46.0 ft bgs: SANDY SILT (ML): silt, 20% fine to coarse grained sand, 20% fine to coarse grained gravel, cobbles, brown,

Well Construction



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-6I/6S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-6 / MW-6

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.81' NAVD88
Date Pre-Cleared: 4-20-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-20-2010/4-21-2010	**Logged By:** Stephen Wright	**Well ID:** MW-6I/MW-6S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction MW-6I / MW-6S
-31 to -36	-41 to -46	5.0'/ 5.0'	1.9						no odor.	BENTONITE SEAL; MP
-36 to -40	-46 to -50	5.0/ 5.0	NA; 1.8		49-50	SB-6 (49-50)	SM		46.0-50.0 ft bgs: SAND (SM): fine grained sand, 10% silt, brown, no odor. End of boring at 50 ft bgs	BENTONITE SEAL

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-6I/6S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-7 / MW-7

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.36' NAVD88
Date Pre-Cleared: 4-28-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-28-2010/4-29-2010	**Logged By:** Stephen Wright	**Well ID:** MW-7I/MW-7S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
10	0	5.0'/ 5.0'	NA				FILL		0.0-0.25.0 ft bgs: CONCRETE
9	-1		2.4						0.25-2.0 ft bgs: SILTY SAND (Fill): fine to coarse grained sand, 30% silt, 20% gravel, cobbles, very moist, dark brown.
8	-2		2.8						2.0-3.0 ft bgs: SANDY SILT (Fill): silt, 20% fine to coarse grained sand, 10% fine to coarse grained gravel, very moist, red-brown.
7	-3		5.0						3.0-4.0 ft bgs: SAA, wet.
6	-4		59			SB7 (4-5)			4.0-5.0 ft bgs: SANDY SILT (Fill): silt, 30% fine to coarse grained sand, 10% fine to coarse gravel, black, coal fragments, strong petroleum-like odor.
5	-5	5.0'/ 5.0'							5.0-10.0 ft bgs: SAA, coal fragments, strong petroleum-like odor.
4	-6								
3	-7		36						
2	-8								
1	-9								
0	-10	5.0'/ 5.0'							10'-12': SAA, strong petroleum-like odor and sheen.
-1	-11		451			SB7 (10-12)			
-2	-12		12						12'-13': SANDY SILT (Fill): silt, 30% fine to coarse sand, 20% fine to coarse gravel, brown, no odor.
-3	-13						OH		13.0-15.0 ft bgs: ORGANIC SILT (OH): silt, 10% very fine grained sand, 5 - 10% clay, organic material and shell fragments, grey.
-4	-14		1.9						
-5	-15	5.0/ 5.0							15.0-20.0 ft bgs: SAA, no odor.
-6	-16								
-7	-17		1.3						
-8	-18								
-9	-19								
-10	-20								20.0-25.0 ft bgs: SAA.

Well Construction

MW-7I: CEMENT; BENTONITE; SAND PACK; PVC RISER; BENT

MW-7S: CEMENT; BENTONITE; SAND PACK; PVC RISER; PVC SCREEN; SUMP

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-7I/7S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

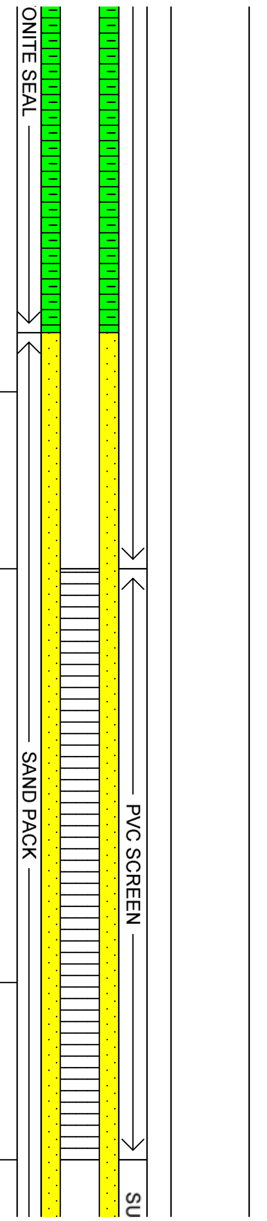
AECOM

Boring ID: SB-7 / MW-7

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.36' NAVD88
Date Pre-Cleared: 4-28-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-28-2010/4-29-2010	**Logged By:** Stephen Wright	**Well ID:** MW-7I/MW-7S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-10 to -15	-20 to -25	2.0'/ 5.0'	1.3						
-15 to -17	-25 to -27	5.0'/ 5.0'	4.5						25.0-27.0 ft bgs: SAA, trace organics, no odor.
-17 to -20	-27 to -30		2.9				SM		27.0 -30.0 ft bgs: SILTY SAND (SM): very fine grained sand, 10% silt, grey/brown.
-20 to -27	-30 to -37	5.0'/ 5.0'	5.1, 2.1				ML		30.0-37.0 ft bgs: SANDY SILT (ML): silt, 20% very fine grainedsand, grey, no odor.
-27 to -30	-37 to -40	5.0'/ 5.0'	2.9		37-40	SB7 (37-40)	SM		37.0-40.0 ft bgs: SILTY SAND (SM): very fine grained sand, 20% silt, grey, no odor.
-30 to -31	-40 to -41						ML		40.0-48.0 ft bgs: SANDY SILT (ML): silt, 20% fine to coarse grained sand, 20% fine to coarse gravel, cobbles, brown, no

Well Construction



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-7I/7S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

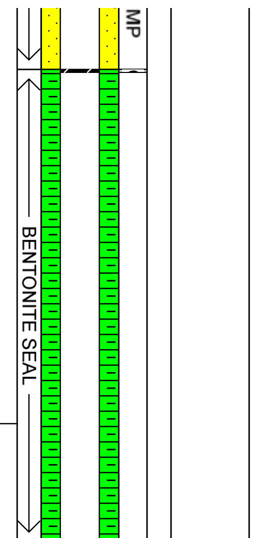
Boring ID: SB-7 / MW-7

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.36' NAVD88
Date Pre-Cleared: 4-28-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 4-28-2010/4-29-2010	**Logged By:** Stephen Wright	**Well ID:** MW-7I/MW-7S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-31	-41								odor.
-32	-42	2.0/ 5.0	3.5						
-33	-43								
-34	-44								
-35	-45								
-36	-46		3.9						
-37	-47	4.0'/ 5.0'							
-38	-48		3.8			SB7 (48-50)	SP		48.0-50.0 ft bgs: POORLY GRADED SAND (SP): fine grained sand, 10% silt, 10% fine to coarse gravel, brown, no odor.
-39	-49								
	-50								End of boring at 50 ft bgs

Well Construction

MW-7I MW-7S



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-7I/7S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-8 / MW-8

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 7.46' NAVD88
Date Pre-Cleared: 5-4-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 5-4-2010/5-5- 2010	**Logged By:** Stephen Wright	**Well ID:** MW-8I/MW-8S

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Geologic Description
0 - 0.5	5.0'/ 5.0'	NA				FILL	0.0'-0.5 ft bgs: ASPHALT
0.5 - 1.5		4.6					0.5-1.5 ft gs: POORLY GRADED SAND (Fill): fine to coarse grained sand, 30% silt, 20% fine to coarse grained gravel, cobbles, dry, dark brown, no odor detected.
1.5 - 2.5		NA					1.5-2.5 ft bgs: REINFORCED CONCRETE
2.5 - 4		123	2.5 - 5	3 - 4	SB-8 (3-4)		2.5-4 ft bgs: SILT (Fill): silt, 20% fine to coarse grained sand, 20% fine to coarse gravel, coal fragments, dry, strong tar-like odor.
4 - 5		37					4.0-5.0 ft bgs: SAA
5 - 10	0.0'/ 5.0'	NA					5.0-10.0 ft bgs: No recovery
10 - 15	4.0'/ 5.0'	102	10 - 15				10.0 - 15.0 ft bgs: SILT (Fill): silt, 20% fine to coarse grained sand, 20% fine to coarse gravel, cobbles, dark brown, strong tar-like odor.
15 - 20	5.0'/ 5.0	1.2				OH	15.0-20.0 ft bgs: ORGANIC SILT (OH): silt, 10% very fine grained sand, gray, organics, shell fragments, no odor detected.

Elevation (ft): 7, 6, 5, 4, 3, 2, 1, 0, -1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, -12, -13

Well Construction: MW-8I — CEMENT, BENTONITE, SAND PACK, BENTONITE, PVC RISER; MW-8S — CEMENT, BENTONITE, SAND PACK, PVC RISER, PVC SCREEN, SUMP

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-8I/8S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-8 / MW-8

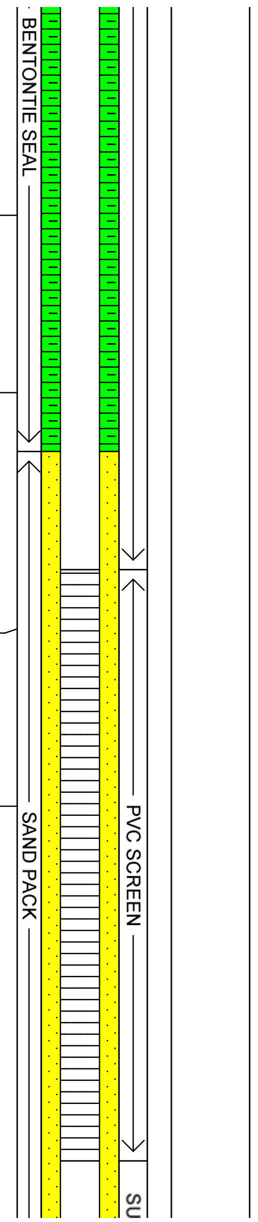
Project Name: Metropolitan Former MGP
Project Number: 60137361
Client: National Grid
Date Pre-Cleared: 5-4-2010
Date Started/Completed: 5-4-2010/5-5- 2010

Drilling Company: Boart Longyear
Drilling Method: Sonic
Sampling Method: 5' disposable plastic liner
Boring Diameter: 8"
Logged By: Stephen Wright

Water Level: ~4 ft bgs
Total Depth: 50 ft bgs
Ground Elevation: 7.46' NAVD88
Converted To Well (Y/N): Yes
Well ID: MW-8I/MW-8S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Geologic Description
-13 to -17	-21 to -24	5.0'/ 5.0	1.8					20.0 - 24.0 ft bgs: SAA, 20% very fine grained sand, no shells, no odor detected.
-17 to -19	-24 to -27		NA				ML	24.0-25.0 ft bgs: SILT and SAND (ML): 50% silt, 50% very fine grained sand, gray, no odor detected.
			2.1					25.0-27.0 ft bgs: SAA, no odor.
-19 to -23	-27 to -30	5.0'/ 5.0'	113				SM	27.0-30.0 ft bgs: SILTY SAND (SM): fine grained sand, 10% silt, gray, moderate tar-like odor.
	-30 to -31		96					30.0-31.0 ft bgs: SAA
-24 to -26	-31 to -34	5.0'/ 5.0'	11				ML	31.0-34.0 ft bgs: SANDY SILT (ML): silt, 10% sand, brown, organics, no odor detected.
-27	-34 to -35		202			SB-8 (34-35)	SM	34.0-35.0 ft bgs: SILTY SAND (SM): fine grained sand, 10% silt, gray, strong tar-like odor.
-28 to -33	-35 to -40	4.0'/ 5.0'	84					35.0-40.0 ft bgs: SAA, grades to brown fine grained sand; moderate tar-like odor.
	-40 to -41							40'-45': SAA, no odor.

Well Construction: MW-8I, MW-8S



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-8I/8S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

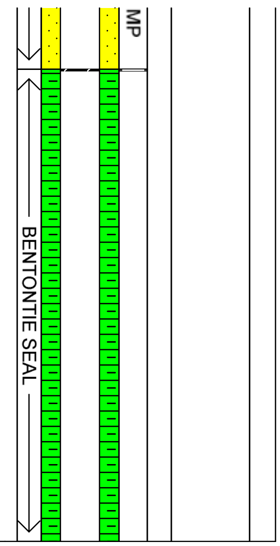
Boring ID: SB-8 / MW-8

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 7.46' NAVD88
Date Pre-Cleared: 5-4-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 5-4-2010/5-5- 2010	**Logged By:** Stephen Wright	**Well ID:** MW-8I/MW-8S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-34 to -37	-41 to -45	4.0'/ 5.0'	9.6						
-37 to -42	-45 to -50	4.0'/ 5.0'	3.5		48-50	SB-8 (48-50)			45.0-50.0 ft bgs: SAA, no odor. End of boring at 50 ft bgs

Well Construction

MW-8I MW-8S



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-8I/8S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

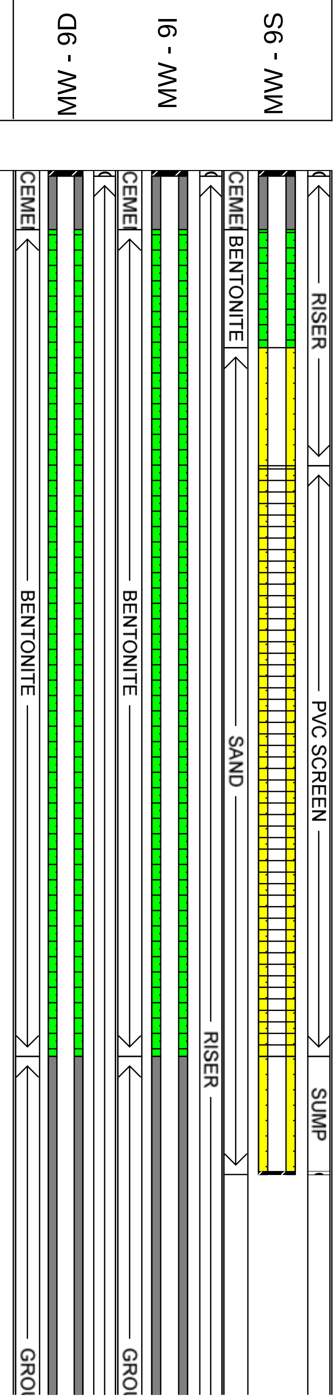
AECOM

Boring ID: SB-9 / MW-9

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~9 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 80 ft bgs
Client: National Grid	**Sampling Method:** 5 ft disposable plastic liner	**Ground Elevation:** 9.29'(I/D) 9.36'(S) NAVD88
Date Pre-Cleared: 9-14-10	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 9-15-2010/9-17-2010	**Logged By:** Jennifer Pfieffer/Jessica Ehlen	**Well ID:** MW-9D/MW-9I/MW-9S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
9	0	5.0'/ 5.0'	1.4				FILL		0.0-0.4 ft bgs: SAND and SILT (FILL): fine to medium grained sand, brown, moist, 50% rounded gravel, 1/2" in diameter, fine roots, moss on surface, black plastic layer at 0.4' bgs.
8	-1		0.8						0.4-2.0 ft bgs: SAND and SILT (FILL): fine to medium grained sand, light brown, dry, 50% gravel 1/8 - 1/4" diameter, half of the 50% gravel is 1/2" - 1" diameter, brick bits 1" diameter, rounded and angular gravel, 2 brick debris >4" diameter.
7	-2		0.8						
6	-3		1.1						2.0-4.5 ft bgs: SAND (FILL): fine grained sand, grey, dry, very faint hydrocarbon/petroleum-like odor, no staining, no sheen.
5	-4		1						
4	-5		0.8			SB-9 (4.5-5)			4.5-5.0 ft bgs: SAND, SILT, and GRAVEL (FILL): fine to medium grained sand, moist, slight hydrocarbon/petroleum-like odor detected, no staining observed.
3	-6	3.0'/ 5.0'	8.8						5.0-7.5 ft bgs: SAND and GRAVEL (FILL): 50% of gravel ranges from 1/4" - 1.5" diameter, grey to brown sand, dry, no odor, no staining.
2	-7		2.4						
1	-8								7.5-10.0 ft bgs: SAND and GRAVEL (FILL): coarse grained sand, brown and black, fine shale fragment observed, gravel rounded up to 3" in diameter, gravel pieces at bottom, (schist-like, rich in mica), faint hydrocarbon/petroleum-like odor, no staining, moist to wet at bottom .
0	-9		11.2						
-1	-10	3.0'/ 5.0'							10.0-15.0 ft bgs: SAND and SILT (FILL): large cobbles throughout and small ~50% brick bits, dry to wet, sand and silt, slight sheen, no staining, slight hydrocarbon/petroleum-like odor and sewer-like odor.
-2	-11								
-3	-12		18.7						
-4	-13								
-5	-14								
-6	-15	2.0'/ 5.0'							15.0-20.0 ft bgs: SAND, SILT and GRAVEL (FILL): gravel is roughly 1/2" diameter, top 2/3 of sample saturated with water and strong hydrocarbon/petroleum-like odors, bottom 1/3 of sample less wet, no odors, 2 rocks 4" diameter, angular, sand/silt/mica, no staining, small tar blebs observed on sides of sample bag.
-7	-16								
-8	-17		13.8						
-9	-18								
-10	-19								
-11	-20								20.0-25.0 ft bgs: GRAVELLY SAND and COBBLES

Well Construction



Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Boring was converted into Monitoring Well: MW-9D/9I/9S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid
10) NR- no recovery

Boring ID: SB-9 / MW-9

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~9 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 80 ft bgs
Client: National Grid	**Sampling Method:** 5 ft disposable plastic liner	**Ground Elevation:** 9.29'(I/D) 9.36'(S) NAVD88
Date Pre-Cleared: 9-14-10	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 9-15-2010/9-17-2010	**Logged By:** Jennifer Pfieffer/Jessica Ehlen	**Well ID:** MW-9D/MW-9I/MW-9S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-12 to -16	-21 to -25	1.6'/ 5.0'	16.2						(FILL): water has NAPL tar blebs, strong tar-like odor, cobbles are mix of schist and small boulders make up ~40% of sample.
-16 to -21	-25 to -30	1.0'/ 5.0'	11.3				OH		25.0-30.0 ft bgs: ORGANIC SILT (OH): silt, 5 - 10% clay, <1% fibers, 1 shell fragment @ 25 ft bgs, NAPL blebs on outer sides of sample bag from borehole advancment.
-21 to -24	-30 to -33	3.0'/ 5.0'	330				SP		30.0-33.0 ft bgs: POORLY GRADED SAND (SP): sand, moist, grains coated with tar, strong tar-like odor.
-24 to -26	-33 to -35		525				ML		33.0-35.0 ft bgs: SANDY SILT (ML): 25% fine grained sand and silt interbedded, brown, coated NAPL in black (organic) material, strong tar-like odor.
-26 to -31	-35 to -40	3.0'/ 5.0'	190				SP		35.0-40.0 ft bgs: POORLY GRADED SAND (SP): fine grained sand, grey, wet, coated with NAPL, strong tar-like odor.
-31 to -32	-40 to -41						ML		40.0-45.0 ft bgs: SANDY SILT (ML): silt is brown and black from organics, sand is coated with NAPL, silt is dense, <10% clay.

Well Construction: MW - 9D, MW - 9I, MW - 9S

GROUT, BENTONITE, SAND, RISER, GROUT, BENTONITE, SAND, PVC SCREEN

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Boring was converted into Monitoring Well: MW-9D/9I/9S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
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6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid
10) NR- no recovery

Boring ID: SB-9 / MW-9

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~9 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 80 ft bgs
Client: National Grid	**Sampling Method:** 5 ft disposable plastic liner	**Ground Elevation:** 9.29'(I/D) 9.36'(S) NAVD88
Date Pre-Cleared: 9-14-10	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 9-15-2010/9-17-2010	**Logged By:** Jennifer Pfieffer/Jessica Ehlen	**Well ID:** MW-9D/MW-9I/MW-9S

Depth (ft)	Recovery (ft)	PID (ppm)	Sample ID	U.S.C.S	Geologic Description
40-45	1.0'/ 5.0'	723	SB-9 (40-45)		
45-50	5.0'/ 5.0	33		SP	45'-50': POORLY GRADED SAND (SP): fine grained sand, brown, wet, loose, uniform, no odor, no visible impacts.
50-55	4.0'/ 5.0'	40.8		SW	50.0-55.0 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand, moist, loose, @ 55 ft bgs coated NAPL globual 2" by 2", sheen, moderate NAPL-like odor at spot.
55-60	5.0'/ 5.0'	11.3	SB-9 (55-60)		55.0 - 60.0 ft bgs: WELL GRADED SAND (SW): medium to coarse grained sand, brown, wet on top 2.5 ft, 15% rounded gravel ~10 mm in size, very faint tar-like odor at 60', no staining/sheen.
60-65				NR	60.0-65.0 ft bgs: No recovery

Elevation (ft): -32 to -53; Depth (ft): -42 to -62

Well Construction: MW - 9D, MW - 9I, MW - 9S

BENTONITE

SUMP

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Boring was converted into Monitoring Well: MW-9D/9I/9S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
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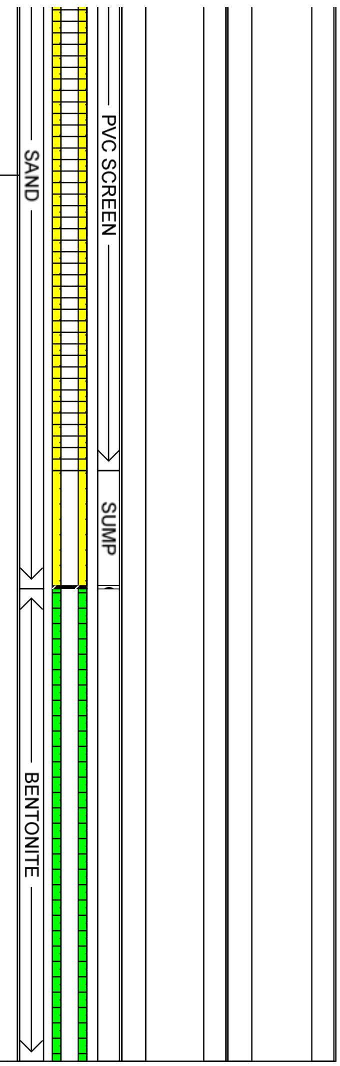
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid
10) NR- no recovery

Boring ID: SB-9 / MW-9

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~9 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 80 ft bgs
Client: National Grid	**Sampling Method:** 5 ft disposable plastic liner	**Ground Elevation:** 9.29'(I/D) 9.36'(S) NAVD88
Date Pre-Cleared: 9-14-10	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 9-15-2010/9-17-2010	**Logged By:** Jennifer Pfieffer/Jessica Ehlen	**Well ID:** MW-9D/MW-9I/MW-9S

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-53 to -56	-62 to -65	0.0'/ 5.0'	NA						
-56 to -61	-65 to -70	5.0'/ 5.0'	26				SP		65.0-70.0 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand, no gravel, wet, loose, brown, no staining or odors detected.
-61 to -66	-70 to -75	5.0'/ 5.0'	2.5				SW		70.0-72.5 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand, wet, brown, no odor or visible impacts. 72.5-75.0 ft bgs: WELL GRADED SAND (SW): medium to fine sand, 30% gravel 10 mm to 1inch diameter, wet, loose, no odors or visible impacts.
-66 to -71	-75 to -80	5.0'/ 5.0	1.5		75-80	SB-9 (75-80)			75.0 ft bgs-76.0 ft bgs: SAA 76.0-80.0 ft bgs: WELL GRADED SAND (SW): sand, loose, wet, reddish-color, no odor, no visible impacts. End of Boring at 80' bgs

Well Construction



Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Boring was converted into Monitoring Well: MW-9D/9I/9S
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid
10) NR- no recovery

Boring ID: SB-10

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.27' NAVD88
Date Pre-Cleared: 4-15-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-15-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
0	5.0'/ 5.0'	NA 1.4				FILL		0' - 0.25': ASPHALT
-1								0.25'-1.0: GRAVELY SAND (Fill): coarse grained sand, 30% coarse gravel, 20% silt, dry, black.
-2		NA						1.0'-4.0': CONCRETE (Fill)
-4		3.1		4-5	SB-10 (4-5)			4.0'-5.0': GRAVELY SAND (Fill): coarse sand, 30% coarse gravel, 20% silt, wet, black, brick fragments and glass.
-5	5.0'/ 5.0'	2.1						5.0'-10': SAA, no gravel.
-10	4.0'/ 5.0'	2.2						10'-12.5': SANDY SILT (Fill): silt, 10% fine sand, black wood (lumber) fragments.
-12.5		2.4				OH		12.5'-16': ORGANIC SILT (OH): silt with organic matter, 20% clay, grey.
-15	4.0'/ 5.0'							
-16		2.2				SM		16'-20': SAND (SM): fine sand, 10% silt, 10% organic matter, grey.
-20								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-10

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.27' NAVD88
Date Pre-Cleared: 4-15-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-15-2010	**Logged By:** Stephen Wright	**Well ID: NA**

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-21		2.8						20'-23': SAA, < 5% gravel, no organic matter.
-22								
-23	5.0'/ 5.0'					ML		23-26': SILT (ML): silt, 10% very fine sand, < 5% fine gravel, < 5% shells, grey.
-24		2.1						
-25								
-26						SM		26'-30.5': SILTY SAND (SM): very fine sand, 20% silt, grey.
-27								
-28	5.0'/ 5.0'	3.0						
-29								
-30								
-31		4.1				ML		30.5'-32': SILT (ML): silt, 10% very fine sand, <10% clay, grey.
-32						SM		32'-35.5': SILTY SAND (SM): very fine sand, 30% silt, grey.
-33	5.0'/ 5.0'							
-34		6.4						
-35								
-36				35-40		ML		35.5'-38': SILT (ML): silt, 10% very fine sand, grey.
-37		3.3			SB-10 (35-40)			
-38	5.0'/ 5.0'					SM		38'-40': SAND (SM): fine sand, 10% silt, brown.
-39		3.2						
-40								40'-50': SAA, 10% gravel.
-41								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-10

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.27' NAVD88
Date Pre-Cleared: 4-15-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-15-2010	**Logged By:** Stephen Wright	**Well ID: NA**

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-41 to -45	5.0'/ 5.0'	2.2						
-45 to -50	5.0'/ 5.0'	4.1		49-50	SB-10 (49-50)			End of boring at 50 ft bgs

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-11

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 60 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.44' NAVD88
Date Pre-Cleared: 4-19-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-19-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
0	5.0/ 5.0	NA				FILL		0' - 0.25': ASPHALT
-0.5		90						
-1		214						0.25'-1.0': SANDY SILT and GRAVEL (Fill): silt, 20% fine to coarse sand, 20% fine to coarse gravel, cobbles, dry, black, moderate naphthalene-like odor.
-2		100						1.0'-2.0': SAA, dry, wood fragments, strong naphthalene-like odor.
-3		155						2.0'-3.0': SAA, dry, strong naphthalene-like odor. 3.0'-4.0': SAA, dry, coal, strong naphthalene-like odor.
-4		229		4-5	SB-11 (4-5)			4.0'-5.0': SAA, dry, coal and coal slag, strong naphthalene-like odor.
-5	3.0/ 5.0	280						5.0-8.0': SAA, moist, strong naphthalene-like odor.
-8		NA						8.0'-9.0': CONCRETE PAD (Fill)
-9		60						9.0'-10': SANDY SILT (Fill): silt, 30% fine to coarse sand, 20% fine to coarse gravel, wet, brown.
-10	3.0/ 5.0	3.1						10'-15': SANDY SILT (Fill): silt, 30% fine to coarse sand, 20% fine to coarse gravel, cobbles, brown/reddish brown, brick fragments, wire at 15 ft bgs.
-15	5.0/ 5.0	1.8				OH		15'-26.5': ORGANIC SILT (OH): silt, 10% very fine grained sand, 5 - 10% clay, 15% inorganic matter and shells, dark grey.
-20								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-11

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 60 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.44' NAVD88
Date Pre-Cleared: 4-19-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-19-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-21 to -25	5.0/ 5.0	5.1						
-25 to -30	5.0/ 5.0	3.2, 5.6, 478				SM		26.5'-29': SILTY SAND (SM): very fine to fine grained sand and silt, brown.
								29'-33': SILTY SAND (SM): fine grained sand, 10% silt, brown, strong naphthalene-like odor.
-30 to -35	5.0/ 5.0	608, 207			SB-11 (30-33)	ML		33'-40': SANDY SILT (ML): silt, 10% very fine grained sand, brown, strong naphthalene-like odor.
-35 to -40	5.0/ 5.0	425						
-40 to -41		25						40'-42': SANDY SILT (ML): silt, 20% very fine grained sand, brown, slight naphthalene-like odor.

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
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Boring ID: SB-11

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 60 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.44' NAVD88
Date Pre-Cleared: 4-19-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-19-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-41								
-42	4.0/ 5.0	227				SM		42'-47': SILTY SAND (SM): fine sand, 10% silt, brown, strong naphthalene-like odor.
-45		201						
-47	4.0/ 5.0	32				ML		47'-48': SANDY SILT (ML): silt, 20% very fine grained sand, brown, slight naphthalene-like odor.
-48		219				SM		48'-50': SILTY SAND (SM): fine grained sand, 10% silt, grery, strong naphthalene-like odor.
-50	5.0/ 5.0	18.4						50'-60': SAA, no odor.
-55	5.0/ 5.0	3.5						
-59					SB-11 (59-60)			End of boring at 60 ft bgs
-60								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-12

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.56' NAVD88
Date Pre-Cleared: 4-14-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-14-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
0 to -5	5.0/ 5.0	NA, 2.6, 2.5, 4.6, NA		2-3.5	SB-12 (2-3.5)	FILL		0' - 0.25': ASPHALT
								0.25'-3.5': SILTY SAND (Fill): fine to coarse sand, 30% silt, 15% fine to coarse gravel, cobbles, dry, brown, brick and concrete fragments. Moist at 2.0 ft bgs.
								3.5'-4.0': CONCRETE PAD (Fill).
								4.0'-7.0': SANDY SILT and GRAVEL (Fill): silt, 30% fine to coarse sand, 20% fine to coarse gravel, very moist, grey, strong naphthalene-like odor.
-5 to -10	4.0/ 5.0	320, NA, >2,000, NA						7.0'-8.0': CONCRETE SLAB (Fill).
								8.0'-9.0': GRAVELY SAND (Fill): fine to coarse sand, 30% fine to coarse gravel, moist, brown, strong naphthalene-like odor.
								9.0'-10': CONCRETE SLAB (Fill).
-10 to -15	3.0/ 5.0	>2,000						10'-15': GRAVELY SAND (Fill): fine to coarse sand and fine to coarse gravel, 15% silt, wet, dark brown, tar blebs, strong naphthalene-like odor.
-15 to -20	4.0/ 5.0	>2,000, 656						15'-16': SAA, wood in tip.
						OH		16'-19': ORGANIC SILT (OH): silt, 5 - 10% clay, organic matter, grey, strong naphthalene-like odor.
						ML		19'-25': SILT (ML): silt, <10% very fine sand, grey, moderate naphthalene-like odor.

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-12

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.56' NAVD88
Date Pre-Cleared: 4-14-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-14-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-21 to -25	1.0/ 5.0	55						
-25 to -30	4.0/ 5.0	118.4				SM		25'-30': SILTY SAND (SM): very fine sand, 30% silt, brown, tar blebs, strong naphthalene-like odor and sheen.
-30 to -35	4.0/ 5.0	98			SB-12 (30-35)			30'-35': SAA, 30% silt, tar saturated sand lenses.
-35 to -40	3.0/ 5.0	25						35'-40': SAA, no odor.
-40 to -41		28						40'-50': SILTY SAND (SM): interbedded very fine grained sand and silt, brown, no odor.

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-12

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.56' NAVD88
Date Pre-Cleared: 4-14-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-14-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-41								
-42	5.0/ 5.0	3.6						
-43								
-44		11						
-45								
-46	5.0/ 5.0	10						
-47								
-48		4.1						
-49					SB-12 (49-50)			End of boring at 50 ft bgs
-50								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-13

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 3 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.42' NAVD88
Date Pre-Cleared: 4-14-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-14-2010/4-15-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Sample ID	U.S.C.S	Geologic Description
0	5.0/ 5.0	NA		FILL	0' - 0.25': ASPHALT
-0.25 to -1		18			0.25' - 1: SAND: (Fill) fine to coarse grained sand, 20% coarse gravel, 20% silt, cobbles, brick fragments, black, moderate tar-like odor, dry.
-1 to -2		54			1' - 2': SAA: moderate tar-like odor, dry.
-2 to -3		189			2' - 3': SAA: strong tar-like odor, moist.
-3 to -4		389			3' - 4': SAA: with <5% coal, <5% wood fragments, strong tar-like odor, wet.
-4 to -5		584	SB-13 (4-5)		4' - 5': SAA: strong tar-like odor, wet.
-5 to -10	1.0/ 5.0	597			5' - 13': SAA: strong tar-like odor, heavy tar sheen.
-10 to -15	5.0/ 5.0	221			
		201			13' - 15': Black timber, strong tar-like odor, heavy tar sheen, coated with tar at ~ 14'.
-15 to -20	5.0/ 5.0			OH	15' - 18': ORGANIC SILT (OH): silt with organics, grey, moderate tar-like odor.
		54			18' - 20': SAA
-20					20' - 23': SAA: with trace organics, moderate tar-like odor.

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-13

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 3 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.42' NAVD88
Date Pre-Cleared: 4-14-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-14-2010/4-15-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Sample ID	U.S.C.S	Geologic Description
-21 to -23	5.0/5.0	60			
-23 to -25		135		SM	23' - 25': SILTY SAND (SM): Fine grained sand with 10% silt, brown, strong tar-like odor.
-25 to -27	5.0/5.0	1600			25' - 27': SAA: strong tar-like odor, saturated with tar @ 27'.
-27 to -30		122			27' - 30': SAA: strong tar-like odor.
-30 to -31	5.0/5.0	NA			30' - 31': SAA: stong tar-like odor.
-31 to -35		>2000			31' - 37': SAA: strong tar-like odor, saturated with tar.
-35 to -37	5.0/5.0	>2000	SB-13 (35-37)		
-37 to -40		1310		ML	37' - 40': SANDY SILT (ML): silt with 10% very fine grained sand, grey, strong tar-like odor, small seams of heavy tar sheen.
-40 to -41				SM	40' - 45': SILTY SAND (SM): fine grained sand, 20% silt, brown, strong tar-like odor, heavy tar sheen.

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-13

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 3 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.42' NAVD88
Date Pre-Cleared: 4-14-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-14-2010/4-15-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-41 to -45	2.0/ 5.0	370						
-45 to -50	2.0/ 5.0	1250						45' - 50': SAA: strong tar-like odor, small blebs of tar in ground water
-50 to -55	2.0/ 5.0	223						50' -55': SAA: strong tar-like odor, heavy tar sheen, no blebs
-55 to -58	5.0/ 5.0	613						55' - 58': SAA; strong tar-like odor; heavy sheen
-58 to -60		22				ML		58' - 60': SANDY SILT (ML): silt 10% very fine grained sand, brown, no odor detected.
-60 to -61						NR		60' - 65': No recovery

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
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2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-13

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 3 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.42' NAVD88
Date Pre-Cleared: 4-14-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-14-2010/4-15-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-62 to -65	0.0/ 5.0	NA						
-65 to -69	5.0/ 5.0	12				ML		65' - 69': SANDY SILT (ML): silt 10% very fine grained sand, brown, no odor detected.
-69 to -70		4.5			SB-13 (69-70)	SM		69' - 70': SILTY SAND (SM): fine to coarse grained sand, 20% fine gravel, cobbles, brown, no odor detected. End of boring at 70 ft bgs

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-14

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 1 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.23' NAVD88
Date Pre-Cleared: 4/1/2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-1-2010/4-2-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
0 to -5	5.0/ 5.0	NA, 21.3, NA, 71.3, NA, 257	-2 to -8	-4 to -5	SB-14 (4-5)	FILL		0' - 0.75': REINFORCED CONCRETE SIDEWALK 0.75' - 1.5': SAND (Fill): fine to coarse grained sand with some silt, cobbles, dark brown. 1.5' - 2': CONCRETE (Fill). 2' - 5': SILT (Fill): silt, 10% fine to medium grained sand, brown, strong tar-like odor, tar sheen, wet.
-5 to -10	3.0/ 5.0	241, 44, NA, 3.9, 1.8		-5 to -6; -9 to -10	SB-14 (5-6); SB-14 (9-10)			5' - 6': SAND (Fill): fine to coarse grained sand with 20% silt, black, strong tar-like odor, tar sheen. 6' - 8': SILT (Fill): silt with 10% very fine grained sand, dark brown, moderate tar-like odor, tar sheen. 8' - 12': SILT (Fill): silt with <5% fine to coarse grained sand, small cobbles, brown.
-10 to -15	4.0/ 5.0	2.1, 0.0, 1.1, 1.6, 1.2				PT		12' - 15.5': FIBROUS and FRIABLE PEAT (PT): peat with <10% silt, brown.
-15 to -20	3.0/ 5.0	2.4, 0.0, NA, 6.4, NA, 2.8				OH SM		15.5' - 16': ORGANIC SILT (OH): silt with 20% organics, brown. 16' - 18': SILTY SAND (SM): very fine grained sand with 20% silt, grey. 18' - 20': SAA 20' - 21': SAA

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-14

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 1 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.23' NAVD88
Date Pre-Cleared: 4/1/2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-1-2010/4-2-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-21		11						21' - 25': SAA
-22	2.5/ 5.0	15						
-23								
-24		1.6						
-25								25' - 27': SAA, grading to fine grained sand with little silt.
-26		0.0						
-27	4.0/ 5.0					ML		27' - 30': SANDY SILT (ML): silt with very fine grained sand, brown.
-28								
-29		0.0						
-30								30' - 35': SAA, grades back and forth between silt and very fine grained sand.
-31		0.0						
-32	3.0/ 5.0							
-33								
-34		1.1						
-35		2.4						35' - 36': SAA
-36								36' - 40': SAA
-37	3.0/ 5.0							
-38		4.6						
-39		0.6						
-40						NR		40' - 45': No recovery
-41								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-14

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 1 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.23' NAVD88
Date Pre-Cleared: 4/1/2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-1-2010/4-2-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-41 to -45	0.0/ 5.0	NA						
-45 to -50	0.0/ 5.0	NA						45' - 50': No recovery
-50 to -55	2.5/ 5.0	18.9				SM		50' - 54': SILTY SAND (SM): fine grained sand and silt, brown, moderate coal/tar-like odor, no visible sheen.
		12.2						54' - 55': SAA
-55 to -60	3.5/ 5.0	0.0				SP		55' - 57': POORLY GRADED SAND (SP): fine grained sand, 10% silt, 10% fine to coarse gravel, brown.
								57' - 60': POORLY GRADED SAND (SP): silt with 10% very fine grained sand, little fine to coarse gravel, cobbles, brown.
-60 to -61								60' - 65': POORLY GRADED SAND (SP): fine to coarse grained sand with 10% fine gravel, brown.

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-14

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 1 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 9.23' NAVD88
Date Pre-Cleared: 4/1/2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-1-2010/4-2-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-62								
-63	1.0/ 5.0	0.0						
-64								
-65								
-66								65' - 70': SAA with cobbles.
-67								
-68	4.0/ 5.0	0.0						
-69					SB-14 (69-70)			End of boring at 70 ft bgs
-70								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-15

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 3 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 11.46' NAVD88
Date Pre-Cleared: 4-14-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-14-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
0 – 5	5.0/ 5.0	NA, 54, 351, 603, 733, 931		4-5	SB-15 (4-5)	FILL		0' - 0.25': ASPHALT 0.25' - 1': SAND (Fill): fine to coarse grained sand, with 30% silt, 20% fine to coarse gravel, dark brown , brick/concrete fragments, cobbles, dry, slight tar-like odor. 1' - 2': SAA: slight tar-like odor, dry. 2' - 4': SAA: slight tar-like odor, moist. 4' - 5': SILT (Fill): silt/ash, with 30% fine to coarse grained sand, 20% fine to coarse gravel, grey, coal, strong tar-like odor, small blebs of tar visible, wet.
5 – 10	4.0/ 5.0	400						5' - 10': SAA: strong tar-like odor, heavy tar sheen, slight coating of tar.
10 – 15	5.0/ 5.0	352						10' - 15': SAA: strong tar-like odor, heavy tar sheen.
15 – 20	5.0/ 5.0	226				PT		15' - 18': FIBROUS and FRIABLE PEAT (PT): dark brown peat fibrous throughout; moderate organic-like odor. 18' - 20': SAA
20 –						ML		20' - 22': SANDY SILTY (ML): silt with 50% very fine sand, grey, faint tar-like odor,

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

![AECOM]

Boring ID: SB-15

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 3 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 11.46' NAVD88
Date Pre-Cleared: 4-14-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-14-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-21		29						organics.
-22 to -25	5.0/ 5.0	34				SM		22' - 25': SILTY SAND (SM): fine grained sand with 40% silt, grey, faint tar-like odor.
-25 to -30	5.0/ 5.0	183						25' - 30': SAA: fine grained sand with 30% silt, grey, strong tar-like odor, weeping tar, heavy tar sheen.
-30 to -34	5.0/ 5.0	237						30' - 34': SAA: strong tar-like odor, weeping tar, heavy tar sheen, coated with tar at 34'.
-34 to -35		451				ML		34' - 35': SANDY SILTY (ML): silt with 40% very fine sand, grey, strong tar-like odor.
-35 to -37	5.0/ 5.0	337				SM		35' - 37': SILTY SAND (SM): fine grained sand, 50% silt, grey, moderate tar-like odor.
-37 to -39		1749			SB-15 (37-39)			37' - 39': SAA: saturated with tar.
-39 to -40		497				ML		39' - 40': SANDY SILT (ML): silt with <5% very fine grained sand, strong tar-like odor.
-40 to -41						NR		40' - 45': No recovery.

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-15

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 3 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 11.46' NAVD88
Date Pre-Cleared: 4-14-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-14-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-41 to -45	0.0/ 5.0	NA						
-45 to -50	5.0/ 5.0	236; NA				ML		45' - 49': SAA: (39'-40'), faint tar sheen, moderate tar-like odor.
						SM		49' - 50': SILTY SAND (SM): fine grained sand with 10% silt; grey, faint tar-like odor.
-50 to -55	4.0/ 5.0	102; 27; NA						50' - 52': SAA 52' - 53.5': SAA: sand with 20% fine gravel, 10% silt, no odor detectable. 53.5' - 55': SILTY SAND (SM): coarse grained sand with 30% gravel, <10% silt, black, no odor detectable.
-55 to -60	3.0/ 5.0	35; NA						55' - 59': SAA
						ML		59' - 60': SANDY SILTY (ML): silt with 40% very fine grained sand, grey, no odor detectable.
-60 to -61								60' - 63': SAA

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-15

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 3 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 11.46' NAVD88
Date Pre-Cleared: 4-14-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-14-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-62		29						
-63	5.0/ 5.0							63' - 65': SANDY SILTY (ML): silt with 10% fine to coarse grained sand, 10% fine to coarse gravel, cobbles, brown, no odor detectable.
-64		19						
-65								65' - 70': SAA
-66								
-67								
-68	5.0/ 5.0	18			SB-15 (69-70)			
-69								End of boring at 70 ft bgs
-70								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-16

Project Name: Metropolitan Former MGP
Project Number: 60137361-300
Client: National Grid
Date Pre-Cleared: 5-4-2010
Date Started/Completed: 5-5-2010

Drilling Company: Boart Longyear
Drilling Method: Sonic
Sampling Method: 5' disposable plastic liner
Boring Diameter: 8"
Logged By: Stephen Wright

Water Level: ~4 ft bgs
Total Depth: 70 ft bgs
Ground Elevation: 7.58' NAVD88
Converted To Well (Y/N): NO
Well ID: NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
0 - 5	5.0/ 5.0	NA, 4.4, NA, 18.2, 18.2		4 - 5	SB16 (4-5)	FILL		0' - 0.25': ASPHALT 0.25' - 1': SAND (Fill): fine to coarse grained sand with 20% silt, 10% fine to coarse gravel, brown, dry, no odor detected. 1' - 3': CONCRETE (Fill) 3' - 4': SILT (Fill): silt with 20% fine to coarse grained sand, 10% fine to coarse gravel, cobbles, black, little coal, no odor detectable, dry. 4' - 5': SAA: very moist.
5 - 10	5.0/ 5.0	NA						5' - 10': No recovery
10 - 15	4.0/ 5.0	570, 3.8	10 - 13	10 - 13	SB-16 (10-13)			10' - 13': SAND (Fill): fine to coarse sand with 30% silt, 20% fine to coarse gravel, wood fragments, black, strong tar-like odor, coated with tar. 13' - 15': SILT (Fill): silt with 20% fine to coarse sand, 20% fine to coarse gravel, brown, no odor detectable.
15 - 20	5.0/ 5.0	NA, 6.6	20 -			OH (from 16)		15' - 16': SAA 16' - 18': ORGANIC CLAY (OH): silt with organics, grey, no odor detectable. 18' - 20': SAA 20' - 25': SAA: moderate tar-like odor.

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-16

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 7.58' NAVD88
Date Pre-Cleared: 5-4-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 5-5-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-21 to -25	5.0/ 5.0	116						
-25 to -30	5.0/ 5.0	105						25' - 30': SAA
-30 to -31		NA						30' - 31': SAA
-31 to -35	4.0/ 5.0	305				SM		31' - 35': SILTY SAND (SM) very fine grained sand with 10% silt, grey, strong tar-like odor.
-35 to -36		NA						35' - 36': SAA
-36 to -40	5.0/ 5.0	102				ML		36' - 40': SANDY SILTY (ML): silt with 10% very fine grained sand, moderate tar-like odor.
-40 to -41		NA						40' - 41': SAA

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-16

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 7.58' NAVD88
Date Pre-Cleared: 5-4-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 5-5-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-41 to -45	4.0/ 5.0	143				SM		41' - 45': SILTY SAND (SM): very fine grained sand/silt, brown, moderate tar-like odor.
-45 to -50	4.0/ 5.0	110						45' - 50': SILTY SAND (SM): fine grained sand with 10% silt, gray, moderate tar-like odor.
-50 to -55	4.0/ 5.0	88						50' - 55': SAA
-55 to -60	4.0/ 5.0	69						55' - 60': SAA
-60 to -61								60' - 65': SAA

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-16

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 7.58' NAVD88
Date Pre-Cleared: 5-4-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 5-5-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-62								
-63	1.0/ 5.0	73						
-64								
-65								65' - 70': SAA
-66								
-67								
-68	4.0/ 5.0	43			SB-16 (68-70)			
-69								End of boring at 70 ft bgs
-70								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB - 17

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~ 3 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 7.15 ft
Date Pre-Cleared: 4-20-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-20-2010/4-21-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
0 to -5	5.0/ 5.0	NA, 18.6, 6.3, 101, 194		-4 to -5	SB-17 (4-5)	FILL		0' - 0.25': ASPHALT 0.25' - 2': SAND (Fill) fine to coarse grained sand, 30% silt, 20% fine to coarse gravel, coal gragments, slight hydrocarbon/naphthalene-like odor, dry, black. 2' - 3': SAA: with larger pieces of coal, dry, moderate hydrocarbon/naphthalene-like odor. 3' - 4': SILT (Fill): silt with 30% fine to coarse grained sand, 20% fine to coarse gravel, black, dry, moderate hydrocarbon/naphthalene-like odor. 4' - 5': SAA: strong hydrocarbon/naphthalene-like odor, very moist.
-5 to -10	0.0/ 5.0	NA				NR		5' - 10': NO RECOVERY - Difficult drilling with 2 pieces of 1-inch thick steel in core barrel at 7 ft bgs.
-10 to -15	1.0/ 5.0	NA, 51				FILL		10' - 11': SILT (Fill): silt with 20% fine to coarse sand and wood fragments, brown. 11' - 15': SILT (Fill): silt with 30% fine to coarse sand, 20% fine to coarse gravel, cobbles, and wood fragments, brown, strong tar-like odor.
-15 to -20		10.3, NA				OH		15' - 19': SILT (Fill): silt with 20% fine to coarse sand, 10% fine to coarse gravel, cobbles, brown, no odor. 19' - 20': ORGANIC SILT (OH): silt with shells and organics, grey, no odor. 20' - 25': SAA

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB - 17

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~ 3 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 7.15 ft
Date Pre-Cleared: 4-20-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-20-2010/4-21-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-21 to -25	5.0/ 5.0	3.0						
-25 to -30	2.0/ 5.0	5.3				SM		25' - 30': SILTY SAND (SM): fine grained sand, 20% silt, some shell fragments.
-30 to -32	5.0/ 5.0	36	X	X	SB-17 (30-32)			30' - 32': SILTY SAND (SM): fine grained sand with 10% silt, grey, slight tar-like odor.
-32 to -35		2.7				OH		32' - 35': ORGANIC SILT (OH): silt with 10% very fine grained sand and organics, grey, no odor.
-35 to -37	5.0/ 5.0	NA						35' - 37': SAA
-37 to -40		6.2				SM		37' - 40': SILTY SAND (SM): very fine to fine grained sand with 10% silt, brown/grey, no odor.
-40 to -41								40' - 45': SAA

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB - 17

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~ 3 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 50 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 7.15 ft
Date Pre-Cleared: 4-20-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-20-2010/4-21-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-41								
-42								
-43	2.5/ 5.0	4.4						
-44								
-45								45' - 50': SAA
-46								
-47								
-48	4.0/ 5.0	4.2			SB-17 (48-50)			
-49								End of boring at 50 ft bgs
-50								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-18

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 3 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 7.00' NAVD88
Date Pre-Cleared: 4-20-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-20-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
0	5.0/ 5.0	NA				FILL		0' - 0.75': ASPHALT
-1		315			SB-18 (1-2)			0.75' - 2': SILT (Fill): silt with 30% fine to coarse grained sand, 30% fine to coarse gravel, brick fragments, black, dry, strong tar-like odor.
-2		93						2' - 3': SAA: with cobbles, moist, strong tar-like odor.
-3		85						3' - 4': SAA: strong tar-like odor, brown, wet.
-4		66						4' - 5': SAA: strong tar-like odor, slight tar sheen, brown, wet.
-5	4.0/ 5.0	31						5' - 10': SAA: slight tar-like odor.
-10	5.0/ 5.0	2.2				OH		10' - 15': ORGANIC SILT (OH): silt with organics, slight organic odor, grey.
-15	5.0/ 5.0	1.9						15' - 18': SAA: slight organic odor; small bleb at ~16'.
-18								18' - 21': SAA: slight organic odor.
-20								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-18

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 3 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 7.00' NAVD88
Date Pre-Cleared: 4-20-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-20-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-21		NA				SM		21' - 24': SILTY SAND (SM): fine grained sand with 10% silt, brown, moderate tar-like odor.
-22 to -25	5.0/ 5.0	113						
-24						ML		24' - 26': SANDY SILT (ML): silt with 10% very fine grained sand, dark grey, slight tar-like odor.
-25		41						
-26						SM		26' - 30': SILTY SAND (SM): fine grained sand with 10% silt, brown, strong tar-like odor, saturated with tar from 28' - 30'.
-27 to -30	4.0/ 5.0	>2000			SB-18 (28-30)			
-30								30' - 34.5': SAA: strong tar-like odor, tar weeping from soil, heavy tar sheen.
-31 to -35	4.0/ 5.0	1256						
-34.5						ML		34.5' - 36': SANDY SILT (ML): silt with 10% very fine grained sand, brown, strong tar-like odor.
-36		330						36' - 37': SAA
-37						SM		37' - 40': SILTY SAND (SM): fine grained sand with 10% silt, grey, strong tar-like odor.
-35 to -40	5.0/ 5.0	540						
-40								40' - 45': SAA
-41								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-18

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 3 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 7.00' NAVD88
Date Pre-Cleared: 4-20-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-20-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-41 to -45	5.0/ 5.0	177						45' - 50': SAA.
-45 to -50	5.0/ 5.0	411						
-50 to -55	5.0/ 5.0	60						50' - 54': SAA: slight tar-like odor.
-55 to -60	5.0/ 5.0	24						54' - 61': SAA
-60 to -61		NA						
-61						ML		61' - 63': SANDY SILT (ML): silt with 20% very fine grained sand, 10% fine to coarse

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-18

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** 3 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 7.00' NAVD88
Date Pre-Cleared: 4-20-2010	**Boring Diameter:** 8"	**Converted To Well (Y/N):** NO
Date Started/Completed: 4-20-2010	**Logged By:** Stephen Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-62	5.0/ 5.0	1.8						gravel, cobbles, brown, no odor detected.
-63						SM		63' - 65': SILTY SAND (SM): fine grained sand with 10% silt, !0% fine to coarse gravel, reddish brown, no odor detected.
-64		2.1						
-65								
-66		1.9						65' - 67': SAA: grey.
-67	5.0/ 5.0					ML		67' - 70': SANDY SILT (ML): silt with 20% fine to coarse grained sand, 10% fine to coarse gravel, cobbles, brown, no odor detected.
-68		1.8						
-69					SB-18 (69-70)			End of boring at 70 ft bgs
-70								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) No Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

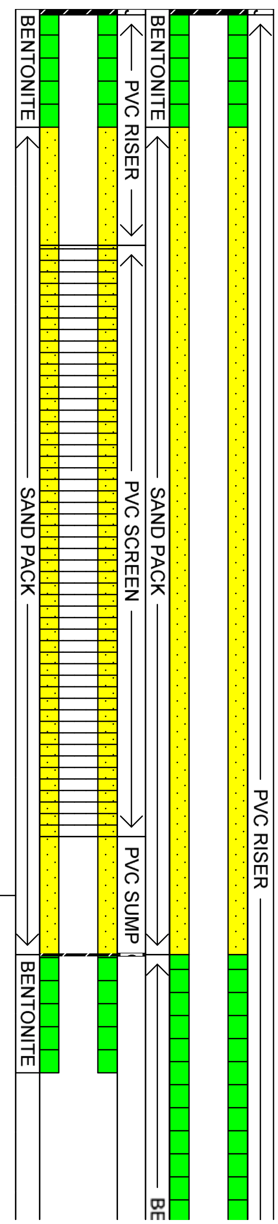
AECOM

Boring ID: SB-19/MW-19S/I

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~6.0 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 85 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.91 ft NAVD88
Date Pre-Cleared: 10/2/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 10/2/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-19S/I

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
	0	NA	NA				FILL		0-3 ft bgs: CONCRETE
8	-3		2.2						3-5 ft bgs: SILT (FILL): silt, ~30% gravel, ~15% medium to fine grained sand, dark gray, no odors.
6	-5	4.0'/ 5.0'	0.2						5-7 ft bgs: FILL: silt, ~30% brick debris, ~15% gravel, non-MGP staining, no odor, wet at 6 ft bgs.
4	-7		0.1						7-10 ft bgs: FILL: cobbles, wet, light brown, some non-MGP staining.
1	-10	3.0'/ 5.0'	75.6						10-13 ft bgs: FILL: cobbles and gravel, ~15% coarse to medium grained sand and silt, 7 inch core of wood, wet, brown, tar-like odor.
-2	-13		397						13-15 ft bgs: FILL: 4 inch piece of wood debris in tar saturated silt, ~15% fine grained sand, wet, black, trace DNAPL.
-4	-15	4.5'/ 5.0'	9.2				OH		15-17 ft bgs: ORGANIC CLAY (OH): organic clay, ~30% gravel, shells, loose, plastic, wet, organic
-6	-17		9.8						17-19 ft bgs: ORGANIC CLAY (OH): organic clay, cobbles, shells, ~30% wood debris, wet, organic odor.
-8	-19		4.1						19-20 ft bgs: ORGANIC SILT (OH): organic silt/clay, two wood cores, ~15% wood fibers, wet.
-9	-20	1.5'/	3.5						

Well Construction



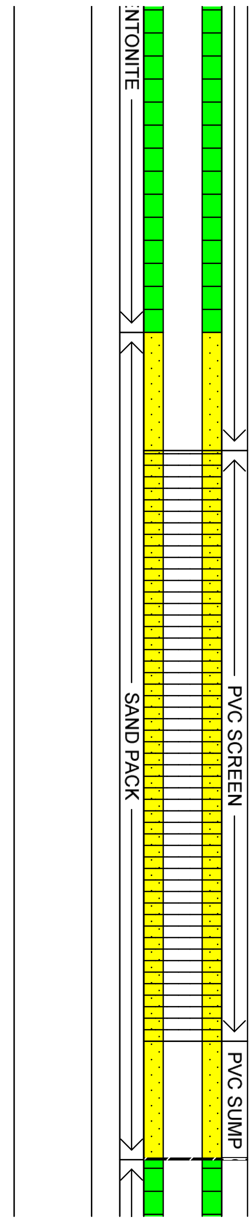
Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-19S/19I
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~6.0 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 85 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.91 ft NAVD88
Date Pre-Cleared: 10/2/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 10/2/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-19S/I

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-10	-21	5.0'							20-25 ft bgs: SAA, wood debris and shells, no wood core.
-14	-25	5.0'/ 5.0'	6.2				ML		25-27.5 ft bgs: SANDY SILT (ML): silt, ~30% organic clay, wet, dark gray, slight organic odor.
-17	-28		163.1				SW		27.5-30 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand, wet, naphthalene-like odor, 2 inch tar coated lense of coarse to medium grained sand at 28.5 ft bgs.
-19	-30	5.0'/ 5.0'	181.5				SM		30-32.5 ft bgs: SILTY SAND (SM): medium to fine grained sand, ~15% silt, moist, olive gray, moderate naphthalene-like odor.
-22	-33		522						32.5-34 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, moist, tar coated, bottom 6 inches clay and silt.
-23	-34		38.6						34-35 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, moist, light brown, slight naphthalene-like odor.
-24	-35	5.0'/ 5.0'	57.2				SP		35-37 ft bgs: POORLY GRADED SAND (SP): fine grained sand, brown, slight naphthalene-like odor, top 4 inches tar-like staining.
-26	-37		610			SB-19 (37-37.5)	SW		37-37.5 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand, tar coated and saturated, trace NAPL.
-27	-38		70.4				ML		37.5-40 ft bgs: SANDY SILT (ML): silt, <5% fine grained sand, plastic, slight naphthalene-like odor.
-29	-40	3.5'/ 5.0'	57						40-40.5 ft bgs: SANDY SILT (ML): silt, brown, slight naphthalene-like odor.
-30	-41		63				SM		

Well Construction



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-19S/19I
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
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7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-19/MW-19S/I

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~6.0 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 85 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.91 ft NAVD88
Date Pre-Cleared: 10/2/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 10/2/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-19S/I

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction MW-19S	Well Construction MW-19I
-30	-41								40.5-43.5 ft bgs: SILTY SAND (SM): fine grained sand, ~15% silt, olive gray, moderate naphthalene-like odor.		
-33	-44		54				SW		43.5-45 ft bgs: WELL GRADED SAND (SW): coarse to fine grained sand, ~15% silt, light brown.		
-34	-45	0.0'/ 5.0'	NA						45-50 ft bgs: No recovery.		
-39	-50	0.0'/ 5.0'	NA						50-55 ft bgs: No recovery.		
-44	-55	5.0'/ 5.0'	6.2				SM		55-57.5 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, light brown, slight naphthalene-like odor.		
-47	-58		13.1				SW		57.5-60 ft bgs: WELL GRADED SAND (SW): coarse to fine grained sand, ~30% silt, light gray, no odor.		
-49	-60	4.5'/ 5.0'	19						60-63 ft bgs: SAA, very slight naphthalene-llike odor.		

Elevation scale: -30, -31, -32, -33, -34, -35, -36, -37, -38, -39, -40, -41, -42, -43, -44, -45, -46, -47, -48, -49, -50

Depth scale: -41, -42, -43, -44, -45, -46, -47, -48, -49, -50, -51, -52, -53, -54, -55, -56, -57, -58, -59, -60, -61

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-19S/19I
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
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5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-19/MW-19S/I

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~6.0 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 85 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.91 ft NAVD88
Date Pre-Cleared: 10/2/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 10/2/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-19S/I

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction MW-19S	MW-19I
-51	-62										BENTONITE
-52	-63		8.4						63-65 ft bgs: WELL GRADED SAND (SW): coarse to fine grained sand, ~30% gravel, ~15% silt, brown.		
-53	-64										
-54	-65	5.0'/ 5.0'	18						65-69 ft bgs: SAA, very slight naphthalene-like odor.		
-55	-66										
-56	-67										
-57	-68		12.8								
-58	-69						ML		69-70 ft bgs: SANDY SILT (ML): silt, ~30% fine grained sand, slightly dense, brown.		
-59	-70	4.0'/ 5.0'	26.3						70-75 ft bgs: SAA, slight naphthalene-like odor.		
-60	-71										
-61	-72										
-62	-73		24.6			SB-19 (72.5-75)					
-63	-74										
-64	-75	0.0'/ 5.0'	NA						75-80 ft bgs: No recovery.		
-65	-76										
-66	-77										
-67	-78										
-68	-79										
-69	-80	0.0'/ 5.0'	NA						80-85 ft bgs: No recovery.		
-70	-81										
-71	-82										

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-19S/19I
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
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2) ft - feet
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5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-19/MW-19S/I

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~6.0 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 85 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.91 ft NAVD88
Date Pre-Cleared: 10/2/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 10/2/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-19S/I

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction MW-19S	Well Construction MW-19I
-71	-82										
-72	-83										
-73	-84								End of Boring 85 ft bgs		
-74	-85										

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-19S/19I
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
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4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

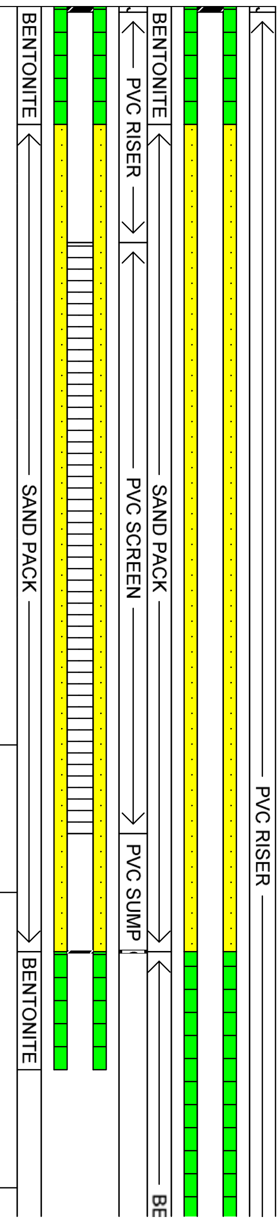
Boring ID: SB-20/MW-20I/S

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~15 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 85 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 11.69 ft NAVD88
Date Pre-Cleared: 10/16/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 10/16/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-20 S/I

Elevation (ft) scale: 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0, -1, -2, -3, -4, -5, -6, -7, -8, -9

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Geologic Description
0	5.0'/ 5.0'	2.6				FILL	0-3 ft bgs: CONCRETE
3		1.1					3-5 ft bgs: FILL: gravelly silt, brick debris, trace black staining from 4-5 ft bgs.
5	5.0'/ 5.0'	31					5-7 ft bgs: FILL: silt, ~30% fine grained sand, ~14% gravel, moist, light brown, no odor, slight black staining.
7		20.3					7-9 ft bgs: FILL: silt, ~15% gravel, moist, brown, no odor. trace black staining.
9		487			SB-20 (9-10)		9-10 ft bgs: FILL: silt, fine grained sand, moist, tar-like odor, slight black staining.
10	4.0'/ 5.0'	23					10-12.5 ft bgs: FILL: silt, medium to fine grained sand, ~30% brick debris, moist, light brown,slight tar-like odor, little tar-like staining
12		146.6					
12.5						SM	12.5-15 ft bgs: SILTY SAND (SM): sandy silt, ~30% gravel, moist, dark gray, 14-15 ft bgs black staining and tar-like odor.
13		409.1					
15	4.0'/ 5.0'	164				ML	15-20 ft bgs: SANDY SILT (ML): silt with fine grained sand, <5% gravel, wet, dark gray, naphthalene-like odor. Very soft clay in drill tip.
17.5		160					
20	4.0'/	137				OH	20-25 ft bgs: ORGANIC CLAY (OH): organic clay, peat,

Well Construction



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-20S/21I
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
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4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

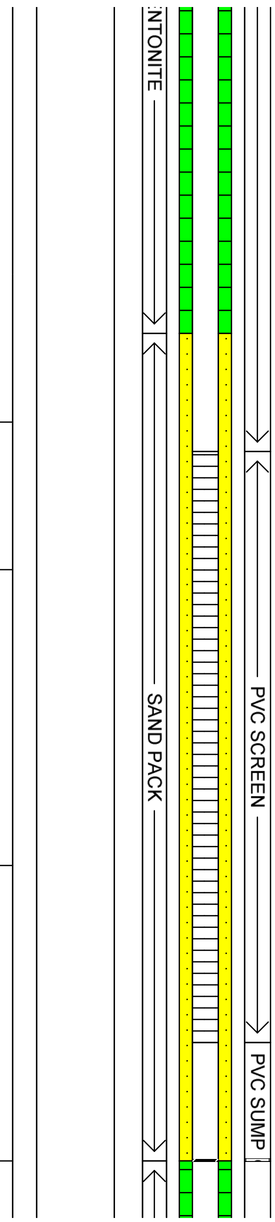
Boring ID: SB-20/MW-20I/S

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~15 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 85 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 11.69 ft NAVD88
Date Pre-Cleared: 10/16/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 10/16/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-20 S/I

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-9 to -13	-21 to -25	5.0'	67.4						slightly stiff, wet, dark gray, organic odor.
			19.3						
-13 to -15.5	-25 to -27.5	5.0'/ 5.0'	6.3						25-27.5 ft bgs: SAA, ~15-30% peat, ~30% interbedded silt.
-15.5 to -18	-27.5 to -30		7.2				SM		27.5-30 ft bgs: SILTY SAND (SM): fine grained sand, ~15% silt, wet, dark gray, no odor.
-18 to -23	-30 to -35	4.0'/ 5.0'	6.5				ML		30-35 ft bgs: SANDY SILT (ML): silt, ~30% fine grained sand, wet, brown and olive gray, 1 inch thick black stained lense at 32 ft bgs, slight tar-like odor.
			8.4						
-23 to -28	-35 to -40	0.0'/ 5.0'	NA						35-40 ft bgs: No recovery.
-28 to -29	-40 to -41	1.0'/ 5.0'	96.5				SM		40-45 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, wet, olive gray, very slight naphthalene-like odor.

Well Construction

MW-20S MW-20I



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-20S/21I
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
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7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-20/MW-20I/S

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~15 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 85 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 11.69 ft NAVD88
Date Pre-Cleared: 10/16/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 10/16/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-20 S/I

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction MW-20S	Well Construction MW-20I
-33	-45	5.0'/ 5.0'	60						45-50 ft bgs: SAA, brown interbedded silt, coarse to fine grained sand from 48-50 ft bgs, naphthalene-like odor.		
-36	-48		66.9								
-38	-50	4.5'/ 5.0'	32.2						50-55 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, wet, olive gray/brown, moderate naphthalene-like odor.		
-41	-53		62								
-43	-55	3.0'/ 5.0'	71.3						55-57.5 ft bgs: SAA, medium to fine grained sand, <5% gravel.		
-46	-58		38.5				SW		57.5-60 ft bgs: WELL GRADED SAND (SW): coarse to fine grained sand, wet, olive gray/brown, naphthalene-like odor, silt lense from 59.67-60 ft bgs.		
-48	-60	2.0'/ 5.0'	6.5						60-65 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand, ~15% coarse grained sand, ~15% silt, wet, brown, no odor.		

Elevation scale: -30, -31, -32, -33, -34, -35, -36, -37, -38, -39, -40, -41, -42, -43, -44, -45, -46, -47, -48, -49

Depth scale: -41, -42, -43, -44, -45, -46, -47, -48, -49, -50, -51, -52, -53, -54, -55, -56, -57, -58, -59, -60, -61

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-20S/21I
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

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7) PID - Photo Ionization Detector
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9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-20/MW-20I/S

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~15 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 85 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 11.69 ft NAVD88
Date Pre-Cleared: 10/16/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 10/16/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-20 S/I

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction MW-20S	Well Construction MW-20I
-53	-65	5.0'/ 5.0'	8.6						65-70 ft bgs: SAA, slight naphthalene-like odor from 68-70 ft bgs.	BENTONITE	
-56	-68		13.7								
-58	-70	1.5'/ 5.0'	8.3						70-75 ft bgs: SAA, no odor.		
-63	-75	5.0'/ 5.0'	11.7						75-78 ft bgs: SAA.		
-66	-78		11.6				ML		78-80 ft bgs: SANDY SILT (ML): silt with fine grained sand, wet, brown, no odor.		
-68	-80	3.5'/ 5.0'	1.3				SW		80-82.5 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand, ~30% silt, ~15% coarse grained sand, wet, brown, no odor.		

Elevation scale: -50 to -70; Depth scale: -62 to -82.

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-20S/21I
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
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3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-20/MW-20I/S

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~15 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 85 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 11.69 ft NAVD88
Date Pre-Cleared: 10/16/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** Yes
Date Started/Completed: 10/16/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-20 S/I

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction MW-20S	Well Construction MW-20I
	-82										
-71	-83		2.6				ML		83-85 ft bgs: SANDY SILT (ML): silt, fine grained sand, wet, brown, no odor.		
-72	-84					SB-20 (82.5-85)			End of Boring 85 ft bgs		
-73	-85										

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-20S/21I
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-21/MW-21D

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.07
Date Pre-Cleared: 10/12/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/18/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-21D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
10	0	NA	NA				FILL		0-5 ft bgs: ASPHALT, FILL: silty gravel with concrete and brick debris, ~15% coarse to medium grained sand, moist at 3 ft bgs, wet at 4 ft bgs, brown.	CONCRETE
5	-5	1.0'/ 5.0'	3.8				OH		5-10 ft bgs: ORGANIC SILT (OH): silt, medium to fine grained sand, <5% wood debris, <5% gravel, soft, plastic, moist, organic odor.	
0	-10	1.0'/ 5.0'	3.9						10-14 ft bgs: SAA, ~30% peat in bottom of tip, trace black staining, organic odor.	
-4	-14						PT		14-20 ft bgs: FIBROUS AND FRIABLE PEAT (PT): organic clay, ~30% peat, ~30% silt and medium to fine grained sand, ~15% gravel, <5% wood debris, little black staining, organic odor.	
-5	-15	3.0'/ 5.0'	5.7							
-7.5	-17.5		5.2							
-10	-20	5.0'/	7.0						20-22 ft bgs: SAA,~30% wire debris, <5% cobbles, <5% peat, organic odor.	

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-21D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-21/MW-21D

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.07
Date Pre-Cleared: 10/12/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/18/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-21D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-11	-21	5.0'								GROUT / PVC RISER
-12	-22		13.6				ML		22-25 ft bgs:SANDY SILT (ML): silt, <5% gravel, ~15% wire debris, wet, olive gray/brown, slight naphthalene-like odor.	
-15	-25	5.0'/ 5.0'	14.1		25-27.5	SB-21 (25-27.5)			25-28: SANDY SILT (ML): silt, ~30% fine grained sand, wet, brown, naphthalene-like odor.	
-17	-27		7.9							
-18	-28						CL		28-30 ft bgs: CLAY AND SILTY CLAY OF LOW PLASTICITY (CL): clay, ~15% interbedded silt, very stiff, wet, olive gray/brown.	
-20	-30	5.0'/ 5.0'	12.9						30-31 ft bgs: SAA.	
-21	-31						ML		31-34 ft bgs: SANDY SILT (ML): silt, ~30% fine grained sand, wet, brown, naphthalene-like odor.	
-22	-32		12.9							
-24	-34								34-35 ft bgs: SANDY SILT (ML): silt, interbedded clay, wet, olive gray/brown, naphthalene-like odor.	
-25	-35	1.0'/ 5.0'	12.7						35-40 ft bgs: SAA.	
-30	-40	5.0'/ 5.0'	13.7						40-41 ft bgs: SAA.	
-31	-41									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-21D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-21/MW-21D

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.07
Date Pre-Cleared: 10/12/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/18/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-21D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-31	-41								41-43.5 ft bgs: SANDY SILT (ML): silt, medium to fine grained sand, wet, brown and olive gray, naphthalene-like odor.	
-32	-42									
-33	-43		4.2							
-34	-44								43.5-45 ft bgs: SANDY SILT (ML): silt, <5% fine grained sand, wet, olive gray, no odor.	
-35	-45	1.0'/ 5.0'	6.2						45-50 ft bgs: SAA.	
-36	-46									
-37	-47									
-38	-48									
-39	-49									
-40	-50	5.0'/ 5.0'	5.9						50-51 ft bgs: SAA.	
-41	-51		5.0				SW		51-55 f bgs: WELL GRADED SAND (SW): coarse to fine grained sand, ~15% gravel, ~15% silt, wet, light brown.	
-42	-52									
-43	-53		6.1							
-44	-54									
-45	-55	1.0'/ 5.0'	3.7				ML		55-60 ft bgs: SANDY SILT (ML): silt, ~15% fine grained sand, wet, light brown, no odor.	BENTONITE
-46	-56									
-47	-57									
-48	-58									
-49	-59									
-50	-60	5.0'/ 5.0'	4.7						60-64 ft bgs: SAA, no odor.	
-51	-61									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-21D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-21/MW-21D

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.07
Date Pre-Cleared: 10/12/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/18/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-21D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-52	-62		5.1							SAND PACK / PVC SCREEN
-53	-63									
-54	-64		2.2				SM		64-65 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand, ~15% silt, ~15% gravel, 3 inch thick lense of black medium grained sand, wet, light brown, no odor.	
-55	-65	0.0'/ 5.0'	NA						65-70 ft bgs: No recovery.	
-56	-66									
-57	-67									
-58	-68									
-59	-69									
-60	-70	3.0'/ 5.0'	2.5				SW		70-72.5 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand, ~15% silt, ~30% gravel in tip, wet, light brown, no odor.	PVC SUMP
-61	-71									BENTONITE
-62	-72		2.7						72.5-75 ft bgs: SAA, <5% gravel in tip, reddish brown sand.	
-63	-73									
-64	-74									
-65	-75	1.0'/ 5.0'	4.7				SP-SM		75-80 ft bgs: POORLY GRADED SAND (SP) fine grained sand, ~15% silt, wet, reddish brown.	
-66	-76									
-67	-77									
-68	-78									
-69	-79									
-70	-80	5.0'/ 5.0'	6.1						80-84 ft bgs: SAA, no odor.	
-71	-81									
-72	-82									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-21D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
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9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-21/MW-21D

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~4 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 10.07
Date Pre-Cleared: 10/12/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/18/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-21D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-72	-82									
-73	-83		5.8							
-74	-84						ML		84-85 ft bgs: SANDY SILT (ML): silt, clay, ~15% fine grained sand, <5% gravel, wet, reddish brown, no odor.	
-75	-85	4.0'/ 5.0'	7.4				CL		85-90 ft bgs: CLAY AND SILTY CLAY OF LOW PLASTICITY (CL): clay with interbedded silt and gravel, 2- 4 inch in diameter cobbles, wet, brown/reddish brown, no odor.	
-76	-86									
-77	-87									
-78	-88		5.5		87.5-90	SB-21 (87.5-90)				
-79	-89								End of Boring 90 ft bgs	
	-90									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-21D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-22/MW-22 I/D

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3.5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.12' NAVD 88
Date Pre-Cleared: 10/5/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/5/2011-10/6/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-22 I/D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction MW-22 I	Well Construction MW-22 D
8	0	5.0'/ 5.0'	4.8				FILL		0-0.33 ft bgs: ASPHALT	CONCRETE	CONCRETE
7	-1		2.0						0.33-5 ft bgs: FILL: 1' road base material, gravel, silt, ~15% coarse to fine grained sand, concrete debris at 2.5' bgs.		
6	-2		0.6								
5	-3										
4	-4										
3	-5	3.0'/ 5.0'	0.0						5-6 ft bgs: FILL: wood debris, <5% peat, wet, organic odor.		
2	-6						OH		6-10 ft bgs: ORGANIC SILT (OH): silt, ~30% fine grained sand, <5% peat, wet, gray to olive gray, organic odor.		
1	-7										
0	-8		0.0								
-1	-9										
-2	-10	4.0'/ 5.0'	0.0						10-12.5 ft bgs: SAA		
-3	-11									GROUT	GROUT
-4	-12		0.3								PVC RISER
-5	-13		0.0						12.5-15 ft bgs: ORGANIC CLAY (OH): organic clay and peat, saturated lense at 13 ft bgs, ~2 inches thick, wet, gray, tar-like and organic odors.		
-6	-14										
-7	-15	5.0'/ 5.0'	0.0						15-17 ft bgs: SAA, 1 inch thick lense of tar-like stained silt, no odor.		
-8	-16										
-9	-17								17-18.5 ft bgs: ORGANIC CLAY (OH): organic clay, ~15% shells, wet, dark gray, organic odor.		
-10	-18										
-11	-19		0.0						18.5-20 ft bgs: SAA, no shells, <5% peat, organic odor.		
-12	-20	5.0'/	0.0				ML		20-22.5 ft bgs: SANDY SILT (ML): silt, ~15% fine grained		

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-22I/22D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

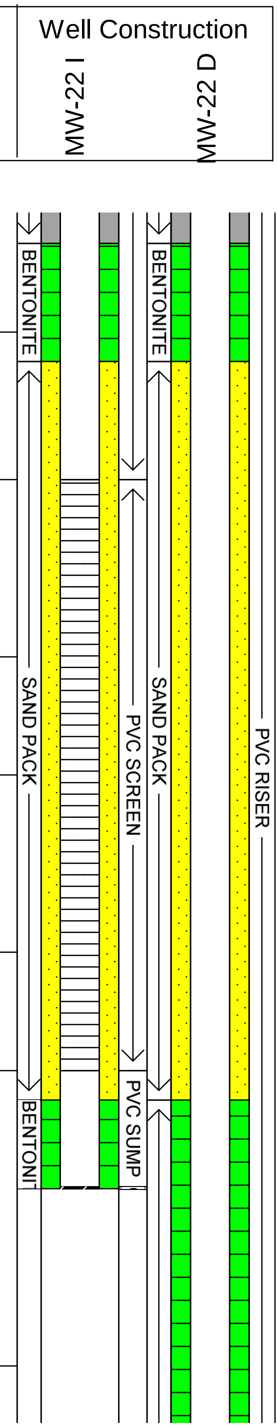
Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-22/MW-22 I/D

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3.5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.12' NAVD 88
Date Pre-Cleared: 10/5/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/5/2011-10/6/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-22 I/D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Geologic Description
-13	-21	5.0'						sand, <5% wire and plastic debris, dark brown/dark gray, slight organic odor.
-14	-22							
-15	-23		0.5				SP	22.5-25 ft bgs: POORLY GRADED SAND (SP): fine grained sand, ~15% silt, light gray, no odor.
-16	-24							
-17	-25	5.0'/ 5.0'	0.0				ML	25-28 ft bgs: SANDY SILT (ML): silt, interbedded clay, brown and rust-like color.
-18	-26							
-19	-27							
-20	-28		0.6				SP	28-30 ft bgs: POORLYGRADED SAND (SP): fine grained sand, ~15% silt, light brown, no odor.
-21	-29							
-22	-30	5.0'/ 5.0'	20.9			SB-22/ (30-33)		30-33 ft bgs: SANDY SILT (ML): silt, plastic, gray, slight organic odor.
-23	-31						ML	
-24	-32							
-25	-33		0.5				SP	33-35 ft bgs: POORLY GRADED SAND (SP): fine grained sand, ~15% silt, light brown, no odor.
-26	-34							
-27	-35	2.0'/ 5.0'	7.9				SM	35-40 ft bgs: SILTY SAND (SM): fine grained sand and silt, wet, olive gray, no odor.
-28	-36							
-29	-37							
-30	-38							
-31	-39							
-32	-40	5.0'/ 5.0'	6.8				ML	40-42 ft bgs: SANDY SILT (ML): silt, ~15% fine grained sand, wet, olive gray/dark gray, no odor.
-33	-41							

Well Construction



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-22I/22D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-22/MW-22 I/D

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3.5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.12' NAVD 88
Date Pre-Cleared: 10/5/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/5/2011-10/6/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-22 I/D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction MW-22 I / MW-22 D
-33	-41									
-34	-42		0.5				SM		42-43.5 ft bgs: SILTY SAND (SM): fine grained sand with silt, wet, olive gray/dark gray, no odor.	
-35	-43		1.3				ML		43.5-45 ft bgs: SANDY SILT (ML): silt, slightly dense, wet, olive gray/dark gray, no odor.	
-36	-44									
-37	-45	4.0'/ 5.0'	1.7				SW		45-50 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand, ~15% silt, wet, olive gray.	BENTONITE
-38	-46									
-39	-47		3.5							
-40	-48									
-41	-49									
-42	-50	5.0'/ 5.0'	5.1				SM		50-55 ft bgs: SILTY SAND (SM): fine grained sand and silt, moist, olive gray, no odor.	
-43	-51									
-44	-52		6.2							
-45	-53									
-46	-54									
-47	-55	2.0'/ 5.0'	4.0				SW		55-60 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand and silt, wet, olive gray, no odor.	
-48	-56									
-49	-57									
-50	-58									
-51	-59									
-52	-60	5.0'/ 5.0'	4.5				SM		60-62 ft bgs: SILTY SAND (SM): fine grained sand and silt, wet, olive gray, no odor.	
-53	-61									

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-22I/22D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

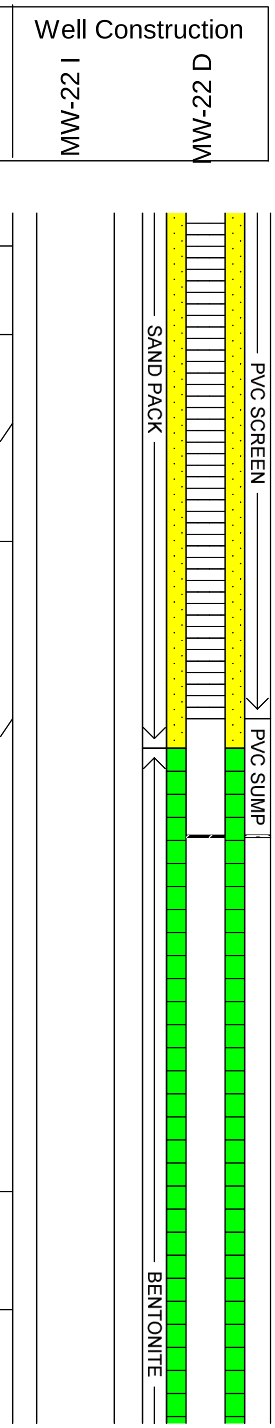
Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-22/MW-22 I/D

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3.5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.12' NAVD 88
Date Pre-Cleared: 10/5/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/5/2011-10/6/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-22 I/D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-54	-62		3.0				SW		62-63.5 ft bgs: WELL GRADED SAND (SW): coarse to fine grained sand and silt, <5% gravel, wet, olive gray, no odor.
-55	-63		3.7				ML		63.5-65 ft bgs: SANDY SILT (ML):silt, ~30% fine grained sand, ~15% interbedded soft clay in silt, wet, olive grey, no odor.
-56	-64								
-57	-65	5.0'/ 5.0'	2.4				SM		65-67 ft bgs: SILTY SAND (SM): fine grained sand and silt, wet, olive gray, no odor.
-58	-66								
-59	-67		1.2				SW		67-68.5 ft bgs: WELL GRADED SAND (SW): coarse to fine grained sand, ~15% silt, <5% gravel, wet, olive gray.
-60	-68		4.1						68.5-70 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand, ~15% silt, <5% gravel, <5% coarse grained sand, wet, olive gray.
-61	-69								
-62	-70	4.0'/ 5.0'	0.4				SM		70-72 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, <5% gravel, wet, olive gray.
-63	-71								
-64	-72		0.8						72-75 ft bgs: SILTY SAND (SM): sandy silt, fine grained sand, 2 rocks up to 3 inches in diameter, ~15% gravel, wet, olive gray.
-65	-73								
-66	-74								
-67	-75	3.5'/ 5.0'	1.7						75-78 ft bgs: SILTY SAND (SM): fine grained sand and silt, wet, light brown, no odor.
-68	-76								
-69	-77		0.0						
-70	-78						ML		78-80 ft bgs: SANDY SILT (ML): silt with gravel, ~30% subrounded 2 inch in diameter rocks, ~15% coarse to fine grained sand, wet, light brown/gray.
-71	-79								
-72	-80	2.0'/ 5.0'	0.3				SM		80-85 ft bgs: SILTY SAND (SM): silty fine grained sand, wet, light brown, no odor.
-73	-81								
-74	-82								

Well Construction



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-22I/22D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-22/MW-22 I/D

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3.5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.12' NAVD 88
Date Pre-Cleared: 10/5/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/5/2011-10/6/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-22 I/D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction MW-22 I	Well Construction MW-22 D
-74	-82										
-75	-83										
-76	-84										
-77	-85	5.0'/ 5.0'	0.0						85-90 ft bgs: SAA, 2 rocks in bottom 10 inches, ~15% coarse to medium grained sand.		
-78	-86										
-79	-87										
-80	-88		0.0								
-81	-89					SB-22/			End of Boring 90 ft bgs.		
	-90										

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-22I/22D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) No Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-23/MW-23D

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3.5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 5.22' NAVD 88
Date Pre-Cleared: 10/3/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/3/2011 - 10/4/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-23D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
5	0	5.0'/ 5.0'	1.0				FILL		0-0.25 ft bgs: ASPHALT	CONCRETE
4	-1								0.25-3 ft bgs: FILL: fill material with brick and concrete debris, ~30% slight staining.	
3	-2		0.9							
2	-3								3-5 ft bgs: FILL: concrete debris	
1	-4									
0	-5	3.5'/ 5.0'	1.4						5-7 ft bgs: FILL: gravel, ~30% silt and coarse to medium grained sand, wet, dark gray, no odor.	
-1	-6									
-2	-7		4.0						7-9.5 ft bgs: FILL: wood cores.	
-3	-8									
-4	-9						ML		9.5-10 ft bgs: SANDY SILT (ML): silt, ~15% gravel, ~15% wood fibers, slightly plastic, wet, brown.	
-5	-10	5.0'/ 5.0'	1.2				GW		10-12 ft bgs: WELL GRADED GRAVEL (GW): gravel, ~30% silt and coarse to medium grained sand, wet, dark gray, no odor.	
-6	-11									
-7	-12		2.3				OH		12-15 ft bgs: ORGANIC CLAY (OH): clay, ~15% fibrous peat, ~15% coarse grained sand and gravel, <5% wood debris, soft (thumb penetrates easily through), wet, organic odor.	
-8	-13									
-9	-14									
-10	-15	3.5'/ 5.0'	2.7						15-20 ft bgs: SAA, <5% peat fibers, organic odor, no wood debris, <5% gravel.	
-11	-16									
-12	-17		1.1							
-13	-18									
-14	-19									
-15	-20	3.0'/	3.2						20-25 ft bgs: SAA, ~30% gravel, <5% shells.	

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-23D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-23/MW-23D

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3.5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 5.22' NAVD 88
Date Pre-Cleared: 10/3/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/3/2011 - 10/4/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-23D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-16	-21	5.0'								GROUT / PVC RISER
-17	-22									
-18	-23		1.2							
-19	-24									
-20	-25	3.5'/ 5.0'	0.7						25-30 ft bgs: SAA, <5% wood debris.	
-21	-26									
-22	-27		1.3							
-23	-28									
-24	-29									
-25	-30	5.0'/ 5.0'	1.0						30-32 ft bgs: SAA.	
-26	-31									
-27	-32		1.4				SM		32-34 ft bgs: SILTY SAND (SM): fine grained sand and silt, wet, dark gray, no odor.	
-28	-33									
-29	-34		3.3				ML		34-35 ft bgs: SANDY SILT (ML): silt, ~30% fine grained sand, wet, reddish brown.	
-30	-35	4.0'/ 5.0'	0.7				SM		35-40 ft bgs: SILTY SAND (SM): fine grained sand , ~30% silt, wet, olive gray/light gray, no odor.	
-31	-36									
-32	-37		2.0							
-33	-38									
-34	-39									
-35	-40	4.0'/ 5.0'	0.3						40-45 ft bgs: SAA.	
	-41									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-23D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
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7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-23/MW-23D

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3.5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 5.22' NAVD 88
Date Pre-Cleared: 10/3/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/3/2011 - 10/4/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-23D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-36 to -37	-41 to -42									
-37 to -40	-42.5 to -45		2.5							
-40	-45	5.0'/ 5.0'	0.9						45-50 ft bgs: SAA, <5% gravel.	
-42	-47.5		2.2							
-45	-50	5.0'/ 5.0'	0.7						50-52.5 ft bgs: SAA, <5% gravel, slightly dense/cohesive, moist.	
-47.5	-52.5		0.8						52.5-55 ft bgs: SILTY SAND (SM): ~40% fine grained sand and ~60% silt, coarse to medium grained sand and gravel in a 3 inch thick lense at 54 ft bgs, moist, light brown.	
-50	-55	4.0'/ 5.0'	0.5						55-57.5 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, wet, light brown, no odor.	BENTONITE
-52.5	-57.5		1.3				SW		57.5-60 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand, ~15% silt, wet, light brown, no odor.	
-55	-60	5.0'/ 5.0'	0.5						60-61.5 ft bgs: WELL GRADED SAND (SW): coarse to fine grained sand, ~30% silt, ~15% subrounded gravel.	

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-23D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-23/MW-23D

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3.5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 5.22' NAVD 88
Date Pre-Cleared: 10/3/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/3/2011 - 10/4/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-23D

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Geologic Description
-61.5 – -63.5		0.9				SM	61.5-63.5 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, <5% gravel, wet, brown.
-63		1.6					
-63.5 – -65						ML	63.5-65 ft bgs: SANDY SILT (ML): silt with fine grained sand, wet, brown, no odor.
-65 – -70	5.0'/ 5.0'	1.8				SM	65-70 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, wet, light brown, no odor.
-67.5		1.8					
-70 – -72	5.0'/ 5.0'	1.8				SW	70-72 ft bgs: WELL GRADED SAND (SW): coarse to fine grained sand, ~30% gravel, ~15% silt, wet, brown, no odor.
-72 – -73.5		0.9				ML	72-73.5 ft bgs: SANDY SILT (ML): silt, ~30% fine grained sand, ~15% gravel, wet, brown.
-73.5 – -75		0.2				SM	73.5-75 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, <5% gravel, 2.5 inch in diameter subrounded rock, wet, brown, no odor.
-75 – -80	5.0'/ 5.0'	3.9					75-80 ft bgs: SAA.
-77.5		4.6					
-80 – -85	5.0'/ 5.0'	5.5		X	SB-23 (80-82.5)	SM	80-85 ft bgs: SILTY SAND (SM): fine grained sand with silt, moist, reddish brown, mild sweet odor.

Elevation (ft): -56 to -76

Well Construction: SAND PACK; PVC SCREEN; PVC SUMP; BENTONITE

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-23D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-23/MW-23D

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~3.5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 5.22' NAVD 88
Date Pre-Cleared: 10/3/2011	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/3/2011 - 10/4/2011	**Logged By:** Luis Ferreira	**Well ID:** MW-23D

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction
-77	-82		1.9							
-78	-83									
-79	-84									
-80	-85	5.0'/ 5.0'	1.7						85-87 ft bgs: SAA, trace sweet odor.	
-81	-86									
-82	-87		1.4			SB-23 (87-90)			87-90 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, wet, olive gray.	
-83	-88									
-84	-89								End of Boring 90 ft bgs.	
	-90									

Notes:
1) Location hand cleared from 0-5 ft bgs.
2) Boring was converted into Monitoring Well: MW-23D
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.020 slot size
5) Sand pack #0
6) No Meadow Mat Present
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-24

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.16' NAVD 88
Date Pre-Cleared: 10/11/11	**Boring Diameter:** 8 inches	**Converted To Well (Y/N):** NO
Date Started/Completed: 10/11/11 - 10/12/11	**Logged By:** Luis Ferreira	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
0	5.0'/ 5.0'	7.0				FILL		0-0.25 ft bgs: ASPHALT 0.25-5 ft bgs: FILL: back fill, gravel and sand with concrete and brick debris, <5% shell deposits, <5% wood and glass debris from 4-5 ft bgs, organic odor.
-2		12.1						
-4		9.5						
-5	4.0'/ 5.0'	11.3						5-10 ft bgs: FILL: slightly dense silt, ~30% gravel, ~30% coarse to fine grained sand, ~15% shell deposits, ~15% fill debris (wood chips, nails), one 4 inch in diameter cobble, wet, dark gray.
-7		9.1						
-10	5.0'/ 5.0'	3.6						10-11 ft bgs: SAA.
-11						OH		11-15 ft bgs: ORGANIC CLAY (OH): soft organic clay and peat, ~15% wood debris with creosote-like staining on wood and clay, one 4 inch in diameter cobble, wet, organic odor, less fibrous peat and more shell deposits from 13-15 ft bgs, <5% wire debris.
-12.5		1.4						
-15	5.0'/ 5.0'	1.2						15-16 ft bgs: ORGANIC CLAY (OH): slightly dense silt, ~15% gravel, ~30% coarse to fine grained sand, ~15% shell deposits, ~15% fill debris (wood chips, nails), one 4 inch in diameter cobble, wet, dark gray. 16-20 ft bgs: ORGANIC CLAY (OH): less soft organic clay, fibrous peat in bottom from 19-20 ft bgs, wet, dark gray, organic odor.
-17.5		1.6						
-20	5.0'/	12.4						20-23 ft bgs: SAA, <5% wood debris

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-24

Project Name: Metropolitan Former MGP
Project Number: 60137361-300
Client: National Grid
Date Pre-Cleared: 10/11/11
Date Started/Completed: 10/11/11 - 10/12/11

Drilling Company: Boart Longyear
Drilling Method: Sonic
Sampling Method: 5' disposable plastic liner
Boring Diameter: 8 inches
Logged By: Luis Ferreira

Water Level: ~5 ft bgs
Total Depth: 90 ft bgs
Ground Elevation: 8.16' NAVD 88
Converted To Well (Y/N): NO
Well ID: NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-21	5.0'							
-22								
-23		9.2				ML		23-25 ft bgs: SANDY SILT (ML): silt, ~30% medium to fine grained sand, wet, dark gray, no odor.
-24								
-25	5.0'/ 5.0'	2.0						25-27.5 ft bgs: SAA, no odor.
-26								
-27								
-28		1.7				SW		27.5-30 ft bgs: SILTY SAND (SM): medium to fine grained sand, ~30% silt, wet, brown, no odor.
-29								
-30	5.0'/ 5.0'	1.6						30-32.5 ft bgs: SAA.
-31								
-32								
-33		2.0				ML		32.5-35 ft bgs: SANDY SILT (ML): silt, ~15% fine grained sand, slightly dense, moist, reddish brown.
-34								
-35	4.0'/ 5.0'	3.0						35-40 ft bgs: SAA, wet.
-36								
-37								
-38								
-39								
-40	5.0'/ 5.0'	0.9						40-45 ft bgs: SAA, ~30% fine grained sand, wet.
-41								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-24

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.16' NAVD 88
Date Pre-Cleared: 10/11/11	**Boring Diameter:** 8 inches	**Converted To Well (Y/N):** NO
Date Started/Completed: 10/11/11 - 10/12/11	**Logged By:** Luis Ferreira	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-41								
-42								
-43		3.9						
-44								
-45	5.0'/ 5.0'	8.1						45-50 ft bgs: SANDY SILT (ML): silt, fine grained sand, wet, olive gray, no odor.
-46								
-47								
-48		8.8						
-49								
-50	5.0'/ 5.0'	9.0						50-52.5 ft bgs: SAA, moist.
-51								
-52								
-53		8.8				SW		52.5-55 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand, ~30% silt, <5% gravel, moist, olive gray, no odor.
-54								
-55	4.0'/ 5.0'	10.6				SM		55-60 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, wet, olive gray, no odor.
-56								
-57								
-58		9.7						
-59								
-60	5.0'/ 5.0'	10.8				ML		60-62.5 ft bgs: SANDY SILT (ML): silt, fine grained sand, wet, olive gray, no odor.
-61								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
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AECOM

Boring ID: SB-24

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.16' NAVD 88
Date Pre-Cleared: 10/11/11	**Boring Diameter:** 8 inches	**Converted To Well (Y/N):** NO
Date Started/Completed: 10/11/11 - 10/12/11	**Logged By:** Luis Ferreira	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-62								
-63		13.2				SM		62.5-65 ft bgs: SILTY SAND (SM):
-64								
-65	5.0'/ 5.0'	14.5		65-67.5	SB-24 (65-67.5)			65-70 ft bgs: SAA, ~15% medium to fine grained sand, <5% gravel from 69-70 ft bgs.
-66								
-67								
-68		12.5						
-69								
-70	5.0'/ 5.0'	6.6				SW		70-71 ft bgs: WELL GRADED SAND (SW): silty sand, coarse to fine grained sand, ~15% gravel, moist, reddish brown, no odor.
-71		4.8				ML		71-73 ft bgs: SANDY SILT (ML): silt with fine grained sand, moist, reddish brown, no odor.
-72								
-73		4.2						73-75 ft bgs: SAA, ~15% fine grained sand, no odor.
-74								
-75	4.0'/ 5.0'	6.0						75-80 ft bgs: SANDY SILT (ML): sandy silt, fine grained sand, wet, light brown, no odor.
-76								
-77								
-78		9.6						
-79								
-80	4.0'/ 5.0'	10.0				SW		80-85 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand with silt, ~15% coarse grained sand, ~10% gravel, wet, light brown, no odor.
-81								
-82								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-24

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 8.16' NAVD 88
Date Pre-Cleared: 10/11/11	**Boring Diameter:** 8 inches	**Converted To Well (Y/N):** NO
Date Started/Completed: 10/11/11 - 10/12/11	**Logged By:** Luis Ferreira	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-82								
-83		2.2						
-84								
-85	5.0'/ 5.0'	2.5				SM		85-90 ft bgs: SANDY SILT (ML): sandy silt, wet, light brown, no odor, 4 inch diameter cobble from 85-86 ft bgs.
-86								
-87								
-88		3.4		87.5-90	SB-24 (87.5-90)			
-89								End of Boring 90 ft bgs
-90								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

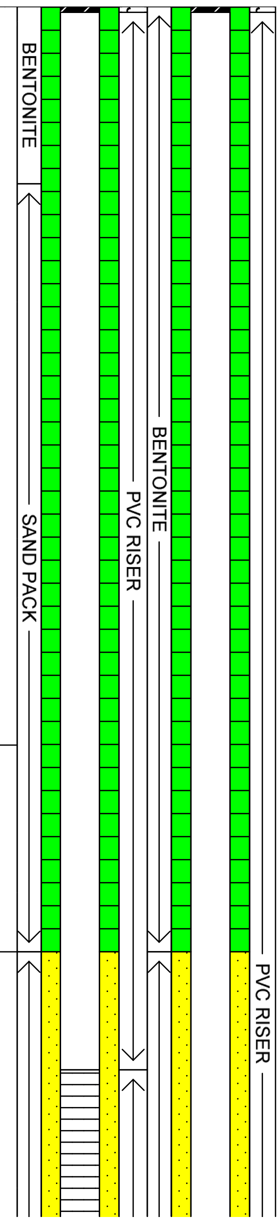
AECOM

Boring ID: SB-25/MW-25

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.51 ft bgs
Date Pre-Cleared: 10/12/11	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/12/11 - 10/13/11	**Logged By:** Luis Ferreira	**Well ID:** MW-25S/I

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
6.51 to 1.51	0-5	5.0'/ 5.0'	NA				FILL		0-0.25 ft bgs: ASPHALT 0.25-5 ft bgs: FILL: gravel, ~30% silt and sand, concrete and brick debris, no odor.
1.51 to -3.49	5-10	4.5'/ 5.0'	1.2 2.6						5-9 ft bgs: FILL: soupy gravel with silt, ~30% medium to fine grained sand, ~15% wood and ceramic debris, wet. 9-10 ft bgs: FILL: silt, ~30% gravel, <5% debris, wet, olive gray.
-3.49 to -8.49	10-15	5.0'/ 5.0'	2.5 2.2				OH		10-12.5 ft bgs: FILL: gravel, interbedded very soft clay, <5% wood and shell debris, wet, light brown, no odor. 12.5-15 ft bgs: ORGANIC CLAY (OH): clay with interbedded gravel and coarse grained sand, very soft, wet,olive gray, slgiht organic odor.
-8.49 to -13.49	15-20	5.0'/ 5.0'	2.7 2.0 1.4				CL		15 -16: ft bgs: SAA, <5% peat. 16-20 ft bgs: CLAY AND SILTY CLAY OF LOW PLASTICITY (CL): clay, very soft, wet, gray, no odor.
-13.49	20-	5.0'/	1.9						20-22.5 ft bgs: SAA, <5% gravel.

Well Construction



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-25S/25I
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-25/MW-25

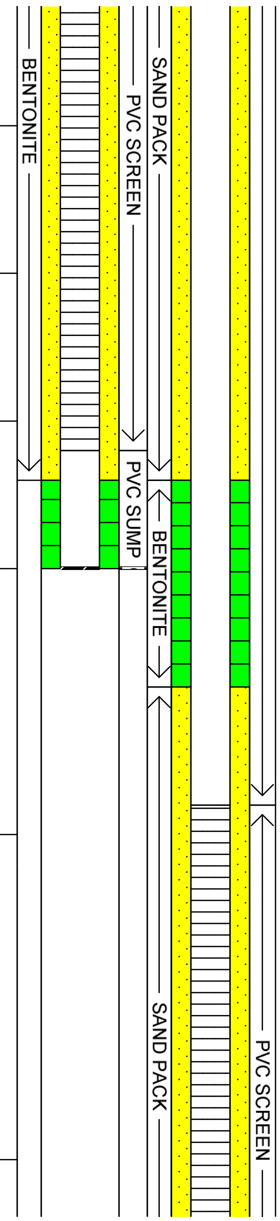
Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.51 ft bgs
Date Pre-Cleared: 10/12/11	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/12/11 - 10/13/11	**Logged By:** Luis Ferreira	**Well ID:** MW-25S/I

Elevation scale (ft): -14, -15, -16, -17, -18, -19, -20, -21, -22, -23, -24, -25, -26, -27, -28, -29, -30, -31, -32, -33, -34

Depth scale (ft): -21, -22, -23, -24, -25, -26, -27, -28, -29, -30, -31, -32, -33, -34, -35, -36, -37, -38, -39, -40, -41

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Geologic Description
20.5-22.5	5.0'						
22.5-25		1.1				ML	22.5-25 ft bgs: SANDY SILT (ML): silt, ~15% wood debris at 22.5 ft bgs, wet, olive gray, no odor.
25-27.5	5.0'/ 5.0'	2.2				SM	25-27.5 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, wet, light gray.
27.5-30		2.6				ML	27.5-30 ft bgs: SANDY SILT (ML): silt, ~15% fine grained sand, slightly dense, wet, light gray.
30-34.5	5.0'/ 5.0'	4.6; 2.0				SM	30-34.5 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, wet, light brown, no odor.
34.5-40	4.5'/ 5.0'	3.5; 7.0				ML	34.5-35 ft bgs: SANDY SILT (ML); silt with fine grained sand. 35-40 ft bgs: SAA.
40-45	4.0'/ 5.0'	9.9				SM	40-45 ft bgs: SILTY SAND (SM): fine grained sand with silt, wet, light gray, no odor.

Well Construction



Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-25S/25I
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-25/MW-25

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.51 ft bgs
Date Pre-Cleared: 10/12/11	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/12/11 - 10/13/11	**Logged By:** Luis Ferreira	**Well ID:** MW-25S/I

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-35	-41								
-36	-42								
	-43		17.8						
-37	-44								
-38									
-39	-45	5.0'/ 5.0'	11.0				SW		45-50 ft bgs: WELL GRADED SAND (SW): medium to fine grained sand, ~15% coarse grained sand, ~15% silt, <5% gravel, wet, light brown, no odor.
-40	-46								
-41	-47		16.3						
-42	-48								
-43	-49								
-44	-50	5.0'/ 5.0'	13.5						50-53 ft bgs: SAA, ~30% coarse grained sand, ~15% gravel.
-45	-51								
-46	-52								
-47	-53		10.6				ML		53-55 ft bgs: SANDY SILT (ML): silt, slightly dense, wet, light gray, no odor.
-48	-54								
-49	-55	3.0'/ 5.0'	12.0				SM		55-60 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, ~15% medium to fine grained sand, wet, light gray, no odor.
-50	-56								
-51	-57		12.3						
-52	-58								
-53	-59								
-54	-60	5.0'/ 5.0'	15.3				SW		60-62 ft bgs: WELL GRADED SAND (SW): coarse to fine grained sand, ~15% gravel, wet, light gray.
-55	-61								

Well Construction

MW-25S MW-25I

PVC SUMP

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-25S/25I
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-25/MW-25

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.51 ft bgs
Date Pre-Cleared: 10/12/11	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/12/11 - 10/13/11	**Logged By:** Luis Ferreira	**Well ID:** MW-25S/I

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Geologic Description
62-65		25.3				SM	62-65 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, ~15% medium to fine grained sand, wet, llight gray, no odor.
65-70	5.0'/ 5.0'	27.0, 40.0		67.5-70	SB-25 (67.5-70)	SW	65-70 ft bgs: WELL GRADED SAND (SW): coarse to fine grained sand, ~30% silt, <5% gravel, wet, light gray, slight salt-like odor.
70-70.5	2.5'/ 5.0'	9.0					70-70.5 ft bgs: SAA.
70.5-75						ML	70.5-75 ft bgs: SANDY SILT (ML): silt, ~15% fine grained sand, wet, light brown, no odor.
75-80	4.0'/ 5.0'	3.9, 3.2				SM	75-80 ft bgs: SILTY SAND (SM): fine grained sand, ~30% silt, ~15% medium grained sand, moist, light brown, no odor.
80-85	5.0'/ 5.0'	3.1					80-85 ft bgs: SAA.

Elevation (ft): -55 to -75 (depth -62 to -82)

Well Construction: MW-25S, MW-25I — BENTONITE

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-25S/25I
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-25/MW-25

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~5 ft bgs
Project Number: 60137361	**Drilling Method:** Sonic	**Total Depth:** 90 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 6.51 ft bgs
Date Pre-Cleared: 10/12/11	**Boring Diameter:** 8"	**Converted To Well (Y/N):** YES
Date Started/Completed: 10/12/11 - 10/13/11	**Logged By:** Luis Ferreira	**Well ID:** MW-25S/I

Elevation (ft)	Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description	Well Construction MW-25S	MW-25I
	-82										
-76			4.2								
	-83										
-77											
	-84										
-78											
	-85	3.5'/ 5.0'	5.4						85-90 ft bgs: SAA.		
-79											
	-86										
-80											
	-87										
-81			4.4			SB-25 (87.5-90)					
	-88										
-82											
	-89										
-83									End of Boring 90 ft bgs.		
	-90										

Notes:
1) Location was hand cleared to 5 ft bgs.
2) Boring was converted into Monitoring Well: MW-25S/25I
3) Riser Pipe: PVC sch. 40, 2" diameter
4) Screen: PVC sch. 40, 2" diameter, 0.010 slot size
5) Sand pack #0
6) Meadow Mat Observed
7) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-26

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~12 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 12.35 ft NAVD88
Date Pre-Cleared: 3/12/12	**Boring Diameter:** TBD	**Converted To Well (Y/N):** No
Date Started/Completed: 3/12/12- 3/13/12	**Logged By:** Steve Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
0 to -5	5'/ 5'	0				FILL		0-3 ft bgs: FILL: fine to coarse grained silty sand with gravel, moist, non-plastic, non-cohesive, ~10% of cobbles and brick fragments.
						SM		3-5 ft bgs: SILTY SAND (SM): fine to coarse grained sand and silt, and ~5% fine to coarse gravel, non-plastic, non-cohesive, moist.
-5 to -10	4'/ 5'	0						5-10 ft bgs SAA
-10 to -15	3.4'/ 5'	0						10-15 ft bgs SILTY SAND (SM): fine grained silty sand, brown, gray at 14 ft bgs, wet at 12 ft bgs.
-15 to -20	5'/ 5'	0						15-17.5 ft bgs SAA
						PT		17.5-18.5 ft bgs FIBROUS AND FRIABLE PEAT (PT): peat, dark gray, wet.
						SP		18.5-20 ft bgs POORLY GRADED SAND (SP): fine grained silty sand, gray, wet.
-20								20 -23 ft bgs SAA, grading to brown, wet.

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-26

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~12 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 12.35 ft NAVD88
Date Pre-Cleared: 3/12/12	**Boring Diameter:** TBD	**Converted To Well (Y/N):** No
Date Started/Completed: 3/12/12- 3/13/12	**Logged By:** Steve Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-21 to -25	4'/ 5'	0				SM		23-25 ft bgs SILTY SAND (SM): sandy silty, brown, wet.
-25 to -30	4'/ 5'	0						25-28.5 ft bgs SAA. 28.5-30 ft bgs SILTY SAND (SM): fine grained silty sand, brown, wet.
-30 to -35	4'/ 5'	0				CL		30-34 ft bgs SAA, wet. 34-35 ft bgs CLAY AND SILTY CLAY OF LOW PLASTICITY (CL): clay, ~5% of fine sand, low plasticity, cohesive, dark gray, wet.
-35 to -40	4'/ 5'	0				SP SM		35-37.5 ft bgs SAA 37.5-38.5 ft bgs POORLY GRADED SAND (SP): fine grained silty sand, grayish brown, wet. 38.5-47 ft bgs SILTY SAND (SM): sandy silt, ~5% clay, dark gray, wet.
-41								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

AECOM

Boring ID: SB-26

Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~12 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 12.35 ft NAVD88
Date Pre-Cleared: 3/12/12	**Boring Diameter:** TBD	**Converted To Well (Y/N):** No
Date Started/Completed: 3/12/12- 3/13/12	**Logged By:** Steve Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-41								
-42								
-43	4'/ 5'	0						
-44								
-45								
-46								
-47					SB-26 (47-49)			47-49 ft bgs SILTY SAND (SM): silty fine grained sand, grey, wet.
-48	4'/ 5'	0						
-49								49-50 ft bgs SILTY SAND (SM): fine to medium grained sand, brown, wet, trace of silt
-50								50-55 ft bgs: SAA
-51								
-52								
-53	2.8'/ 5'	0						
-54								
-55								55-60 ft bgs: SAA
-56								
-57								
-58	3'/ 5'	0						
-59								
-60								60-68 ft bgs: SILTY SAND (SM): well graded sand, ~10% silt, trace of fine gravel, brown, wet.
-61								

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Boring ID: SB-26

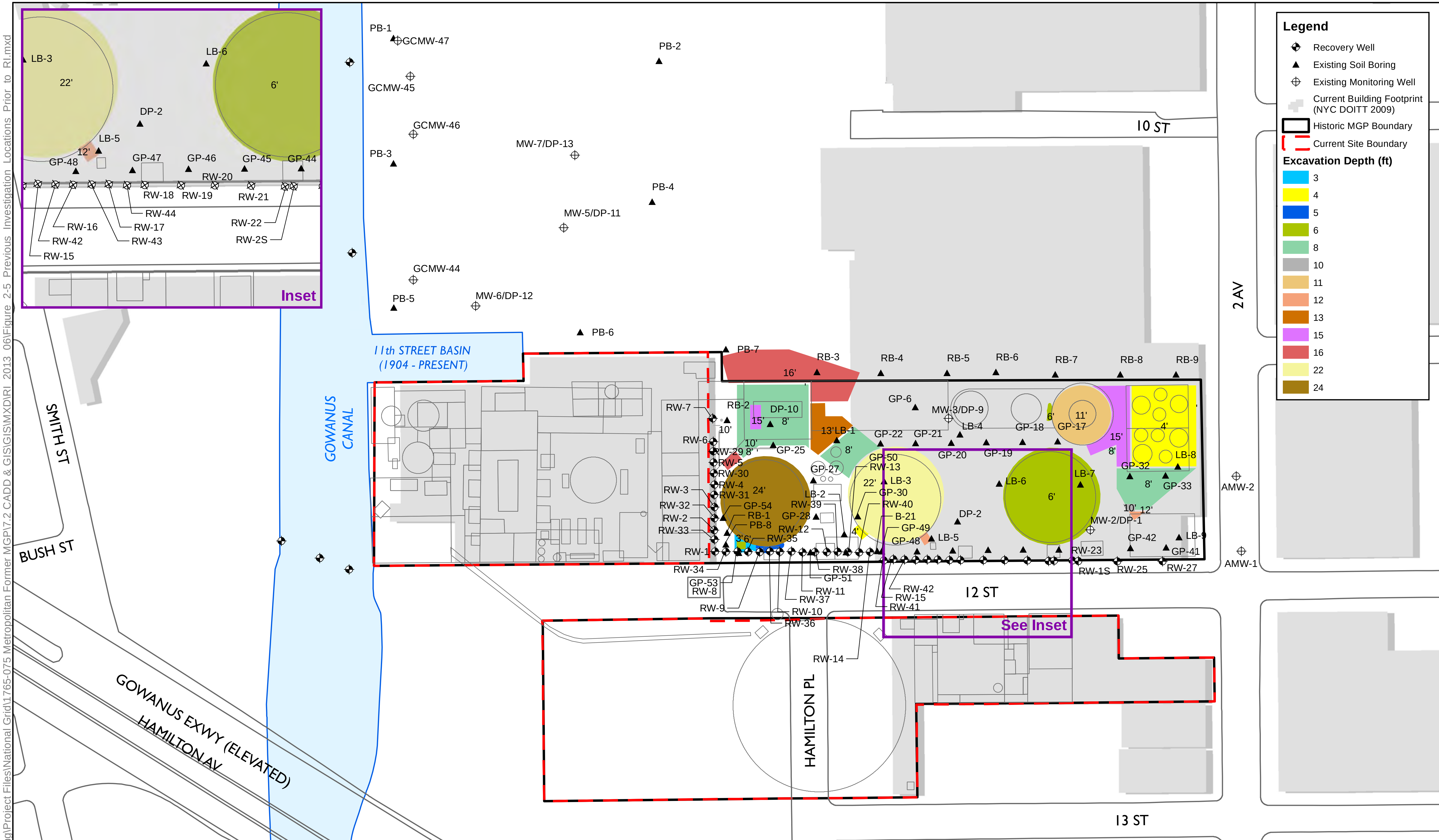
Project Name: Metropolitan Former MGP	**Drilling Company:** Boart Longyear	**Water Level:** ~12 ft bgs
Project Number: 60137361-300	**Drilling Method:** Sonic	**Total Depth:** 70 ft bgs
Client: National Grid	**Sampling Method:** 5' disposable plastic liner	**Ground Elevation:** 12.35 ft NAVD88
Date Pre-Cleared: 3/12/12	**Boring Diameter:** TBD	**Converted To Well (Y/N):** No
Date Started/Completed: 3/12/12- 3/13/12	**Logged By:** Steve Wright	**Well ID:** NA

Depth (ft)	Recovery (ft)	PID (ppm)	Impacts	Interval Sampled	Sample ID	U.S.C.S	Lithology	Geologic Description
-62 to -65	2.5'/ 5'	0						
-65 to -68	3'/ 5'	0						
-68 to -68.5								68-68.5 ft bgs: SANDY SILT (SM) silt, ~<5% fine grained sand, wet.
-68.5 to -70				69-70	SB-26 (69-70)			68.5- 70 ft bgs SILTY SAND (SM): silty fine grained sand, brown
-70								END OF BORING 70 ft bgs

Notes:
1) The location was pre-cleared to 5 ft bgs by hand-digging
2) Meadow Mat Present
3) Impacts include visual and olfactory

Definitions:
1) NA - Not Applicable
2) ft - feet
3) bgs - below ground surface
4) U.S.C.S.- Unified Soil Classification System
5) NAVD 88 - North American Vertical Datum of 1988
6) SAA - Same As Above
7) PID - Photo Ionization Detector
8) ppm - parts per million
9) NAPL - Non-Aqueous Phase Liquid

Historical Boring Logs for Locations illustrated on RI Report Figures



AECOM

1 inch = 100 feet

0 50 100 200 Feet

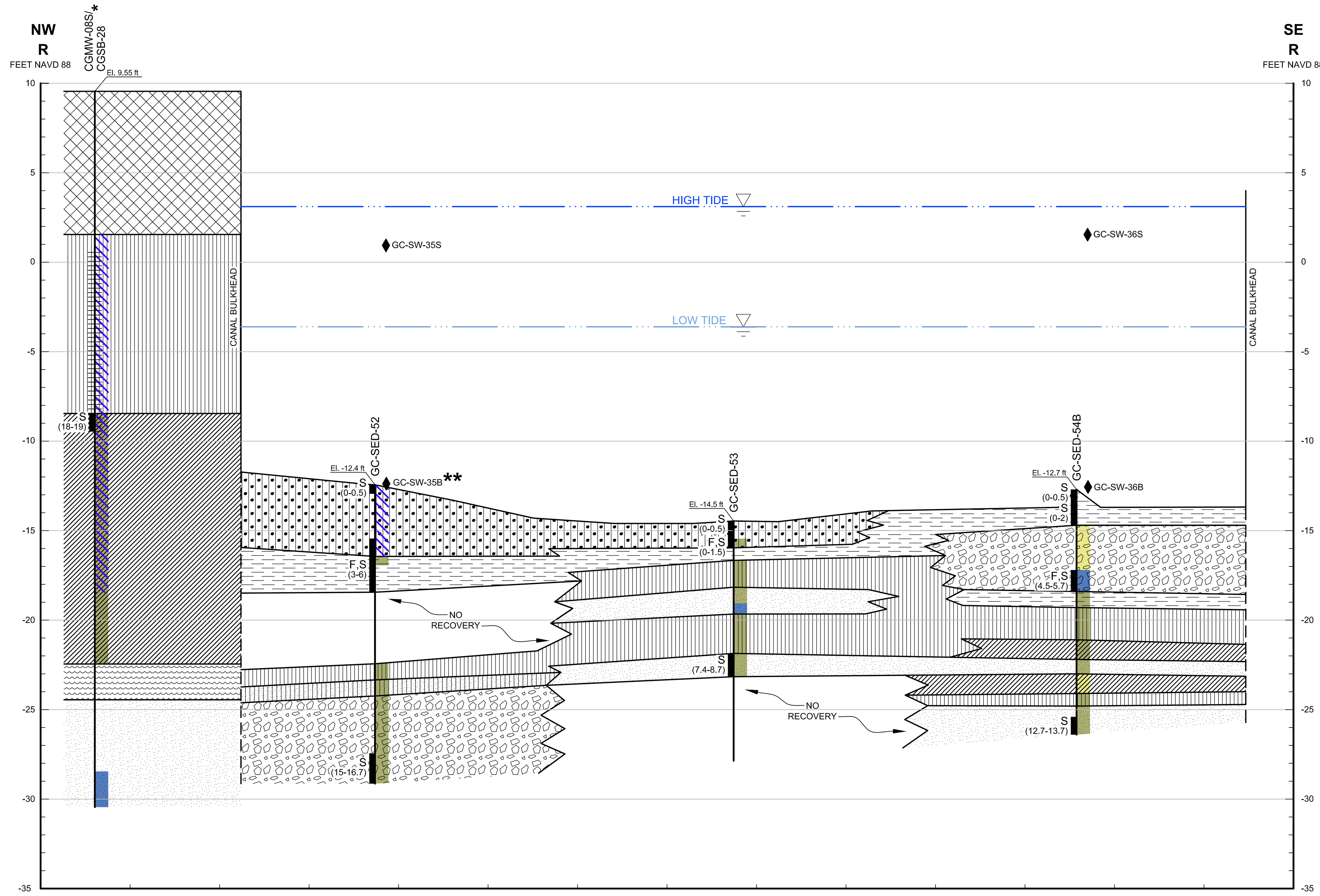
National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

Historic Investigation and Remediation Locations

DATE: 11/7/2013 | DRWN: HKM | FIGURE 2-5

NOTES:

1. TIDE MEASUREMENTS ARE FROM THE BATTERY, NY STATION ON JANUARY 29, 2006 AT 1:36 AM AND 7:42 AM (http://tidesandcurrents.noaa.gov).
2. SEDIMENT SURFACE ELEVATIONS OBTAINED DURING REMOTE SENSING SURVEY CONDUCTED IN OCTOBER 2005. SEDIMENT CORE LOCATIONS OBTAINED DURING CORING ACTIVITIES CONDUCTED IN DECEMBER 2005 AND JANUARY 2006.
3. GOWANUS CANAL BULKHEAD LOCATION BASED ON AERIAL PHOTOGRAPH OBTAINED FROM BLUE SKY INTERNATIONAL LTD. ALL RIGHTS RESERVED. COPYRIGHT 2006, SURFACE ELEVATIONS AND DEPTHS OF CANAL BULKHEAD ARE UNKNOWN.
4. HORIZONTAL DATUM: NEW YORK STATE PLANE COORDINATE SYSTEM COORDINATE SYSTEM (EAST ZONE, NORTH AMERICAN DATUM (NAD)83). VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM (NAVD) 88.
5. *SOIL BORING COMPLETED AS PART OF THE CARROLL GARDENS/PUBLIC PLACE (FORMER CITIZENS GAS WORKS MGP) REMEDIAL INVESTIGATION. GEOLOGY AND IMPACTS SHOWN ARE TO 40 FEET BELOW GROUND SURFACE.
6. **WATER SAMPLE ELEVATION DEPICTED IS APPROXIMATE.
7. PHYSICAL OBSERVATIONS AND GEOLOGIC INFORMATION PRESENTED ARE BASED UPON FIELD CONDITIONS OF SUBSURFACE MATERIALS ENCOUNTERED BY GEI DURING REMEDIAL INVESTIGATION ACTIVITIES.
8. LABORATORY ANALYTICAL RESULTS ARE SUMMARIZED IN TABLES 3 THROUGH 12 IN THE REMEDIAL INVESTIGATION TECHNICAL REPORT.
9. SEDIMENT SAMPLE DEPTH IS REFERENCED TO FEET BELOW THE BOTTOM OF THE GOWANUS CANAL. SUBSURFACE SOIL BORING SAMPLE DEPTH INFORMATION IS REFERENCED TO FEET BELOW GROUND SURFACE.



LEGEND

GEOLOGY

FILL MATERIAL

- FILL

ACCUMULATED SEDIMENT

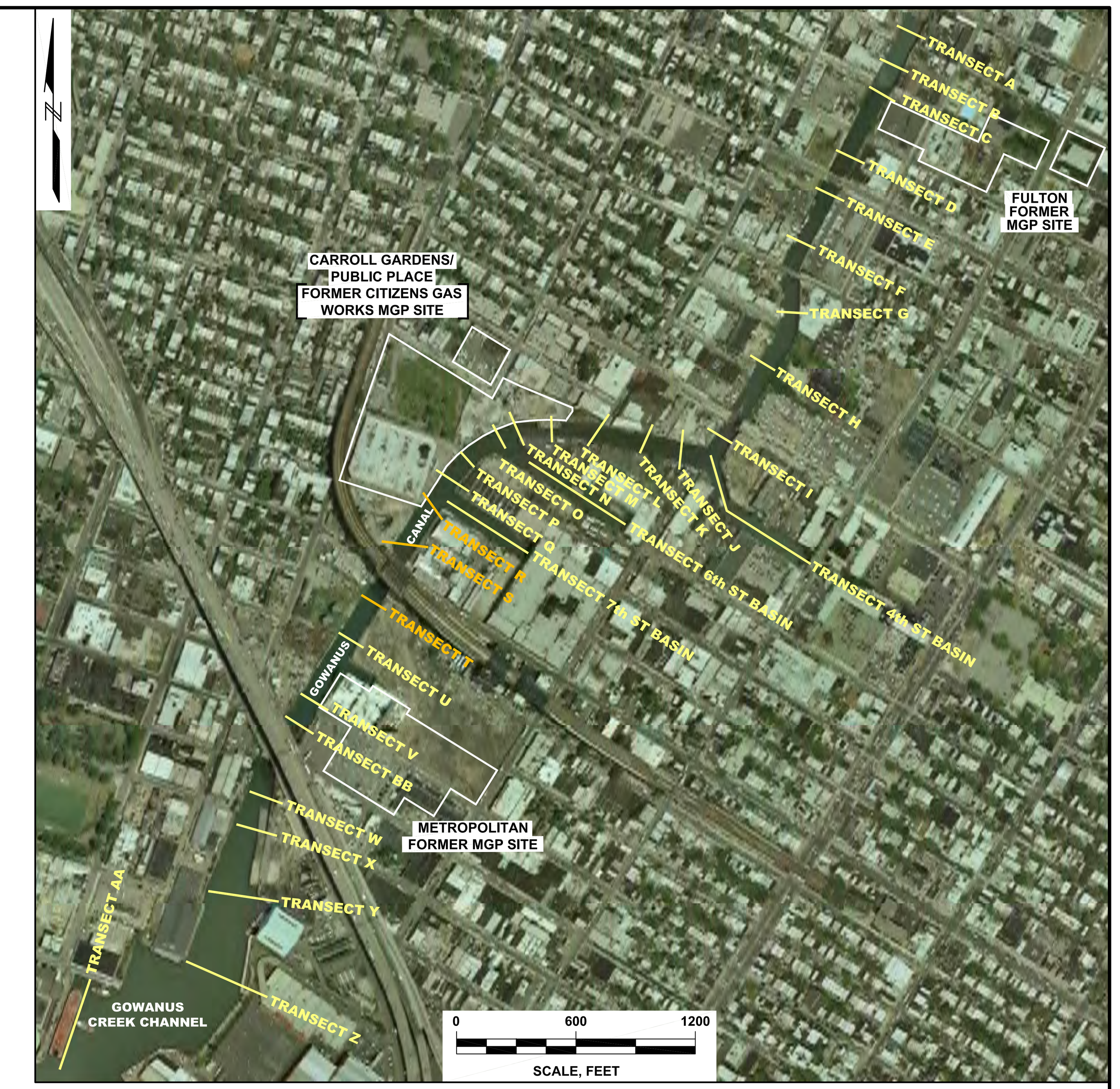
- ORGANIC SILTS AND CLAYS

NATIVE MATERIAL

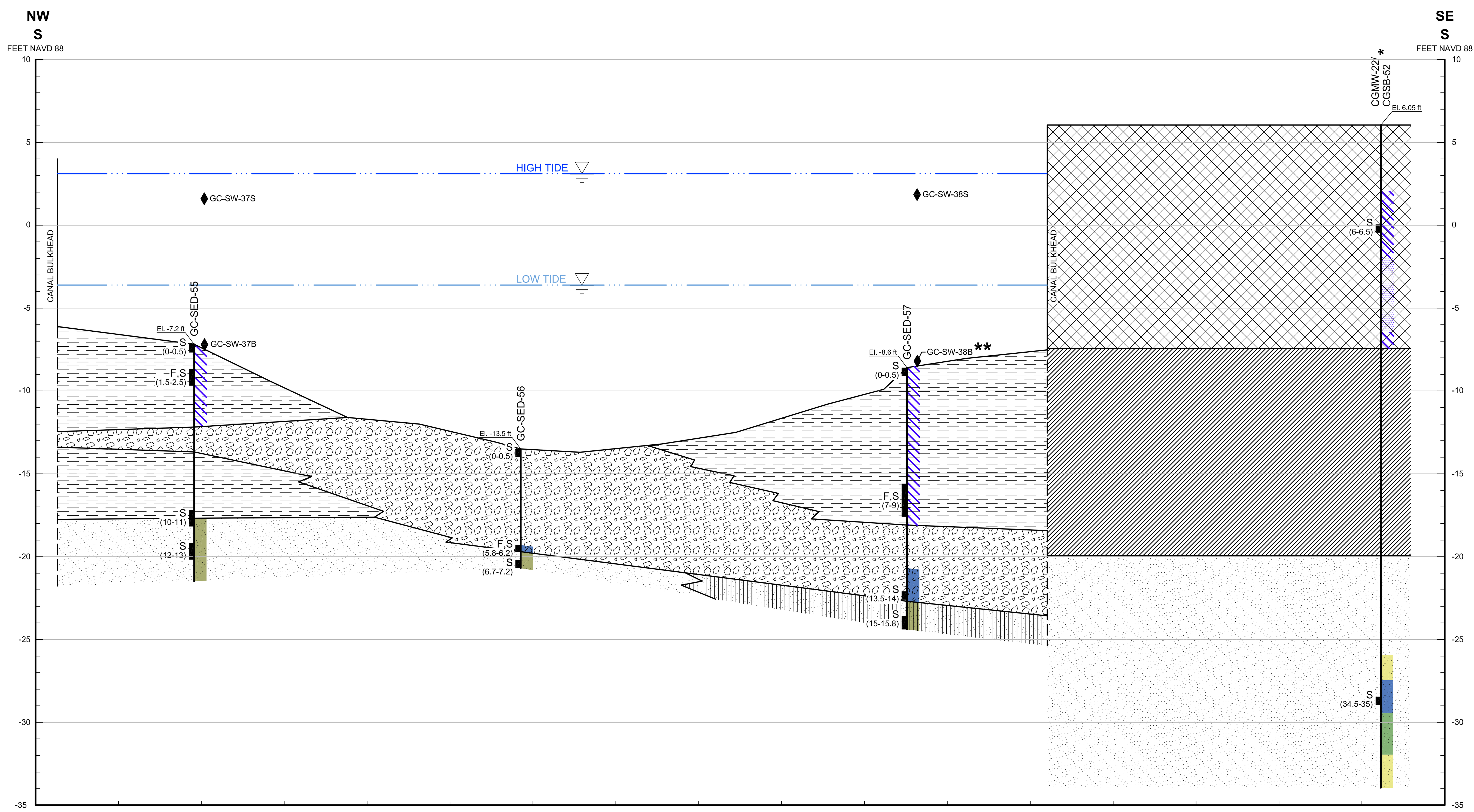
- PEAT
- CLAY
- SILT
- CLAYEY SAND
- SILTY SAND
- SAND
- CLAYEY GRAVEL
- SILTY GRAVEL
- GRAVEL

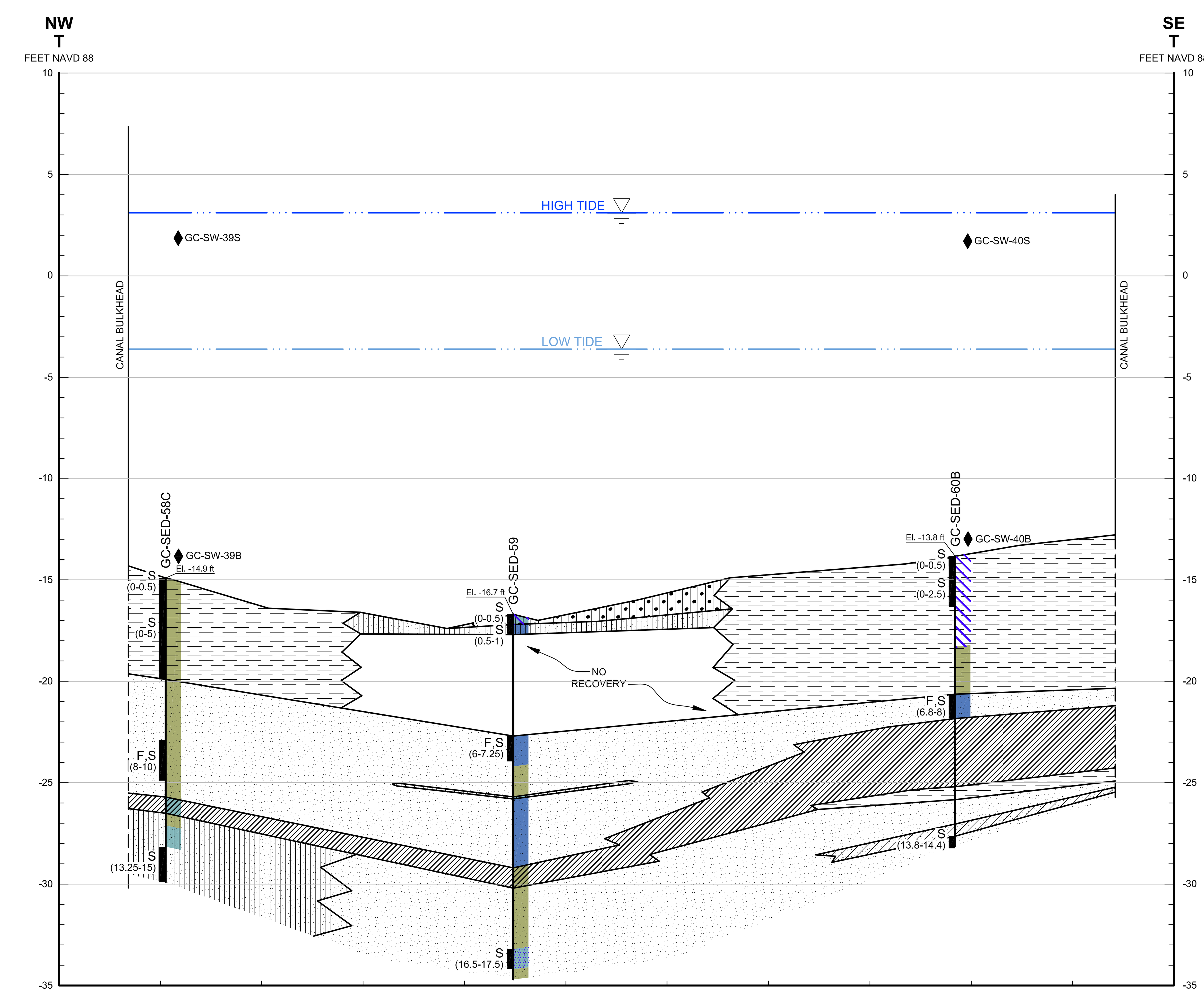
PHYSICAL OBSERVATIONS

- TAR SATURATED
- LENSES WITH TAR SATURATION AND TAR/NAPHTHALENE ODORS
- BLEBS, GLOBS, LENSES, COATINGS AND TAR/ NAPHTHALENE ODORS
- TAR STAINING, SHEEN, AND TAR/NAPHTHALENE ODORS
- TAR/ NAPHTHALENE-LIKE ODORS
- PETROLEUM SHEEN/ STAINING ODORS
- PETROLEUM ODORS
- S (19-20) — SOIL/SEDIMENT SAMPLE LOCATION (DEPTH IN FEET)
- F (10.5-11.5) — FORENSIC SOIL/SEDIMENT SAMPLE LOCATION (DEPTH IN FEET)
- GC-SW-05S — SURFACE WATER SAMPLE LOCATION
- HIGH TIDE — CANAL WATER ELEVATION AT HIGH TIDE ON 1/29/06
- LOW TIDE — CANAL WATER ELEVATION AT LOW TIDE ON 1/29/06



TRANSECT LOCATION MAP





SOURCES:

1. SANBORN MAPS (1886 THROUGH 1996)
2. PHOTOGRAPH OBTAINED FROM BLUE SKY INTERNATIONAL LTD. ALL RIGHTS RESERVED. COPYRIGHT 2006.
3. OCEAN SURVEYS, INCORPORATED, REMOTE SENSING SURVEY FOR UTILITY CROSSINGS GOWANUS CANAL, BROOKLYN, NEW YORK [OSI REPORT #05ES051] DATED DECEMBER 13, 2005.
4. OCEAN SURVEYS, INCORPORATED, FINAL REPORT GOWANUS CANAL CORING OPERATIONS BROOKLYN, NEW YORK DATED FEBRUARY 16, 2006.
5. SURVEY OF CARROLL GARDENS/PUBLIC PLACE SOIL BORINGS CONDUCTED BY GEI CONSULTANTS, INC. ON DECEMBER 3-4, 2002, MARCH 4, 2003, JUNE 4-6, 2003, JULY 10, 2003 AND JULY 19, 2006. SURVEYED BY NEW YORK STATE- LICENSED SURVEYOR NO. 050146..
6. FINAL REMEDIAL INVESTIGATION REPORT CARROLL GARDENS/PUBLIC PLACE PREPARED BY GEI CONSULTANTS INC., OCTOBER 2005.

0 10 20
HORIZONTAL SCALE, FEET

0 5 10
VERTICAL SCALE, FEET

VERTICAL EXAGGERATION = 2X

DRAFT

REMEDIAL INVESTIGATION TECHNICAL REPORT GOWANUS CANAL BOROUGH OF BROOKLYN, NEW YORK	GEI Consultants 455 WINDING BROOK DRIVE SUITE 201 GLASTONBURY, CONNECTICUT 06033	GOWANUS CANAL: MIDDLE REACH CROSS SECTION OF TRANSECTS R, S AND T
KEYSPAN CORPORATION		
PROJECT NO.: 061140-3-1205		March 2007 Plate 14

MUESER RUTLEDGE CONSULTING ENGINEERS
BORING LOG

BORING NO. B-21
SHEET 1 OF 3
FILE NO. 9446
SURFACE ELEV. 10.5
RES. ENGR. RANDOLPH NUNEZ

PROJECT: LOWE'S HOME CENTER
LOCATION: BROOKLYN, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
06:45	1D	0.0	40-29	Brown fine to coarse sand, some silt, trace			DRILLED	
12-18-00		2.0	32-31	gravel, brick (Fill) (SM)			AHEAD	
Monday	2D	2.0	9-20	Brown coarse to fine sand, some gravel,			4"	
		4.0	23-15	silt, trace brick (Fill) (SM)				
30°F						5		
	3D	5.0	1-3	Brown fine to coarse sand, some silt, trace				
		7.0	3-3	brick, cinders, vegetation (Fill) (SM)				
	4D	7.0	1-1	Brown gray peat, some silty clay (Pt)				WC=125
		9.0	1-1		F			
						10		
	5D	10.0	1-1	Brown peat, trace vegetation (Pt)				WC=281
		12.0	1-1					
	6D	12.0	5-7	Top 7": Do 5D, tr gravel, bricks, glass (Pt)				6D Top: WC=351
		14.0	9-6	Bot 12": Gray brown fine to medium sand,				
				some silt, trace gravel, mica (SM)		15		
	7D	15.0	1-1	Brown fine sand, some silt (SM)				Sample saturated
		17.0	2-2					with water.
	8D	17.0	3-1	Top 11" Do 7D, trace vegetation (SM)		17.9		
		19.0	2-2	Bot 13": Brown peat, trace vegetation (Pt)	O			8D Bot: WC=259
						19.5		
	9D	20.0	1-1	Gray silty fine sand, trace peat (SM)				
		22.0	2-1					
					S1			
						25		
	10D	25.0	10-12	Gray silty fine sand, trace mica (SM)				Petroleum odor.
		27.0	16-19					
						28.5		
						30		
	11D	30.0	5-3	Soft gray clayey silt, trace fine sand (ML)				WC=25
		32.0	6-5		M			
						35		
	12D	35.0	WH/12"	Top 10": Do 11D (ML)		36		12D Top: pp=0.5,
		37.0	13-17	Bot 7": Gray brown fine sand, some silt,	S1			WC=33
				mica (SM)				
						38.5		
						40		
	13D	40.0	WR-4	Soft gray clayey silt, some fine sand, trace	M			WC=32
		42.0	4-3	mica (ML)				
						43.5		
						45		
	14D	45.0	15-20	Brown fine sand, some silt, trace gravel				Petroleum odor;
		47.0	21-23	(SM)				sheens.
					S1			
						50		
	15D	50.0	18-26	Brown fine sand, some silt, trace mica (SM)				
		52.0	24-26					

MUESER RUTLEDGE CONSULTING ENGINEERS
BORING LOG

BORING NO. B-21
SHEET 2 OF 3
FILE NO. 9446
SURFACE ELEV. 10.5
RES. ENGR. RANDOLPH NUNEZ

PROJECT: LOWE'S HOME CENTER
LOCATION: BROOKLYN, NEW YORK

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd 12-18-00 Monday 30°F						55		
	16D	55.0 / 57.0	16-19 / 28-21	Brown fine sand, some silt, vegetation, mica (SM)				Petroleum odor.
						60		
	17D	60.0 / 62.0	17-19 / 22-24	Brown fine sand, some silt, mica (SM)	S1			
						65		
	18D	65.0 / 67.0	16-18 / 22-20	Brown fine to medium sand, some silt, trace gravel (SM)				
						70		
	19D	70.0 / 72.0	19-18 / 26-31	Brown gravelly coarse to fine sand, some silt (SM)				Heavy petroleum odor.
						75		
	20D	75.0 / 77.0	36-37 / 48-36	Do 19D (SM)				
						80		
	21D	80.0 / 80.8	50-100/3"	Brown silty fine to coarse sand, some gravel (SM)		80.8		REC=5" End of Boring at 80.8'.
						85		pp=Pocket Penetrometer Unconfined Compressive Strength in tsf.
						90		WC=Water Content in percent of dry weight.
						95		
						100		

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. B-21
SHEET 3 OF 3
FILE NO. 9446
SURFACE ELEV. 10.5
DATUM BOROUGH PRESIDENT OF BROOKLYN HIGHWAY

PROJECT LOWE'S HOME CENTER
LOCATION BROOKLYN, NEW YORK
BORING LOCATION SEE PLAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED	[X] YES	[ ] NO		
TRUCK	CME-55	MECHANICAL		DIA., IN 4	DEPTH, FT. FROM	0	TO	20
SKID		HYDRAULIC	X	DIA., IN.	DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.	DEPTH, FT. FROM		TO	
OTHER								

TYPE AND SIZE OF:
D-SAMPLER 2" O.D. SPLIT SPOON
U-SAMPLER
S-SAMPLER
CORE BARREL
CORE BIT
DRILL RODS N

DRILLING MUD USED [X] YES [ ] NO
DIAMETER OF ROTARY BIT, IN. 3-7/8
TYPE OF DRILLING MUD QUIK - GEL

AUGER USED [ ] YES [X] NO
TYPE AND DIAMETER, IN.

CASING HAMMER, LBS. 300 AVERAGE FALL, IN. 24
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30

WATER LEVEL OBSERVATIONS IN BOREHOLE

*SAFETY HAMMER USED.

DATE	TIME	DEPTH OF HOLE (FEET)	DEPTH OF CASING (FEET)	DEPTH TO WATER (FEET)	CONDITIONS OF OBSERVATION
					NO OBSERVATIONS MADE.

PIEZOMETER INSTALLED [ ] YES [X] NO SKETCH SHOWN ON

STANDPIPE: TYPE ID, IN. LENGTH, FT. TOP ELEV.
INTAKE ELEMENT: TYPE OD, IN. LENGTH, FT. TIP ELEV.
FILTER: MATERIAL OD, IN. LENGTH, FT. BOT. ELEV.

PAY QUANTITIES

2.5" DIA. DRY SAMPLE BORING	LIN. FT.	82	NO. OF 3" SHELBY TUBE SAMPLES	
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES	
CORE DRILLING IN ROCK	LIN. FT.		OTHER:	

BORING CONTRACTOR JERSEY BORING & DRILLING CO. INC.
DRILLER RAY LYNCH HELPERS EDWIN FELICIANO
REMARKS BOREHOLE GROUTED UPON COMPLETION.
RESIDENT ENGINEER RANDOLPH NUNEZ DATE 12-18-00

GEI Consultants, Inc. 455 Winding Brook Road Glastonbury, CT 06033 (860) 368-5300	CLIENT: National Grid PROJECT: Citizens OU-2 CITY/STATE: Brooklyn, New York GEI PROJECT NUMBER: 093250-2-1201	BORING LOG PAGE 1 of 3	CGSB-146

NORTHING (FT): EASTING (FT):
LOCATION:
TOTAL DEPTH (FT): 80.0
DRILLED BY: Boart Longyear / Frank Gardella
DATUM VERT. / HORZ.: NAVD 88 / NAD 83
LOGGED BY: Chris Anastasiou
DATE START / END: 11/6/2012 - 11/7/2012
DRILLING DETAILS:
WATER LEVEL DEPTHS (FT): ∇ 20.00 11/7/2012
GENERAL NOTE:

ELEV. FT.	DEPTH FT.	TYPE and NO.	PEN/REC IN./IN.	PID (PPM)	STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION
	0		60/NM						(0'- 0.1') ASPHALT. (0.1'- 4.5') SILTY SAND WITH GRAVEL (SM); ~55% sand, fine to coarse, ~25% gravel, fine to coarse, ~20% fines; moist, brown, brick fragments. FILL. (4.5'- 5') BRICK.
	5		60/48	1325			PLO		(5'- 6.9') SILTY SAND WITH GRAVEL (SM); ~40% sand, fine to coarse, ~30% gravel, fine to coarse, ~30% fines; moderate petroleum-like odor, black.
							PLO		(6.9'- 7.3') SILTY SAND (SM); ~80% sand, fine to coarse, ~20% fines; moderate petroleum-like odor, dark brown.
							PLO		(7.3'- 8.3') SILTY SAND (SM); ~85% sand, fine, ~15% fines; moderate petroleum-like odor, dark black.
								CGSB-146 (9-10)	(8.3'- 10') SILTY SAND (SM); ~85% sand, fine, ~15% fines; tan and brown.
	10		60/48	372			PLO		(10'- 11.9') SILTY SAND (SM); ~85% sand, fine to medium, ~15% fines; moderate petroleum-like odor, black staining.
							PLO		(11.9'- 12.5') SILTY SAND (SM); ~85% sand, fine to medium, ~15% fines; moderate petroleum-like odor, dark brown.
							PLO		(12.5'- 15') SILTY SAND (SM); ~80% sand, fine to medium, ~20% fines; moderate petroleum-like odor, brown.
	15		60/48	32.3					(15'- 18') BOG MATERIAL. (18'- 20') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to medium, ~10% fines; gray.
∇	20		60/48	104.3					(20'- 25') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to medium, ~10% fines; brown.

NOTES:

PEN = PENETRATION LENGTH OF SAMPLER OR CORE BARREL
REC = RECOVERY LENGTH OF SAMPLE
PID = PHOTOIONIZATION DETECTOR READING (PPM)
JHS = JAR HEADSPACE PID READING (PPM)

ppm = PARTS PER MILLION
IN. = INCHES
FT. = FEET

NLO = NAPHTHALENE LIKE ODOR
PLO = PETROLEUM LIKE ODOR
TLO = TAR LIKE ODOR
CLO = CHEMICAL LIKE ODOR
ALO = ASPHALT LIKE ODOR

CrLO= CREOSOTE LIKE ODOR
OLO = ORGANIC LIKE ODOR
SLO = SULFUR LIKE ODOR
MLO = MUSTY LIKE ODOR

NA = NOT APPLICABLE
NM = NOT MEASURED
Q_P = POCKET PENETROMETER
S_V = TORVANE PEAK

GEI Consultants, Inc.
455 Winding Brook Road
Glastonbury, CT 06033
(860) 368-5300

CLIENT: National Grid
PROJECT: Citizens OU-2
CITY/STATE: Brooklyn, New York
GEI PROJECT NUMBER: 093250-2-1201

CGSB-146

ELEV. FT.	DEPTH FT.	SAMPLE INFO: TYPE and NO.	SAMPLE INFO: PEN/REC IN./IN.	SAMPLE INFO: PID (PPM)	STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION
	25		60/48	61.3					(25'- 30') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to coarse, ~10% fines; wet, brown.
	30		60/48						(30'- 33.8') SILTY SAND (SM); ~85% sand, fine to coarse, ~15% fines; wet, brown.
									(33.8'- 35') SILTY SAND (SM); ~80% sand, fine to medium, ~20% fines; wet, brown.
	35		60/48						(35'- 37.5') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to coarse, ~10% fines; brown, orange band of iron.
									(37.5'- 38.8') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to coarse, ~10% fines; gray.
									(38.8'- 40') SANDY SILT (ML); ~50% sand, fine, ~50% fines; gray.
	40		60/48					CGSB-146 (40-45)	(40'- 42.7') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to coarse, ~10% fines; grayish brown.
									(42.7'- 45') WIDELY GRADED SAND (SW); ~95% sand, fine to coarse, ~5% fines; brownish orange.
	45		60/48						(45'- 46.7') WIDELY GRADED SAND (SW); ~95% sand, fine to coarse, ~5% fines; wet, brown.
									(46.7'- 47.5') SILTY SAND (SM); ~80% sand, fine to medium, ~20% fines; wet, brown.
									(47.5'- 50') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to coarse, ~10% fines; brown.
	50		60/48						(50'- 55') WIDELY GRADED SAND (SW); ~95% sand, fine to coarse, ~5% fines; wet, brown.

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Q_P = POCKET PENETROMETER
S_V = TORVANE PEAK

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IN. = INCHES
FT. = FEET

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PLO = PETROLEUM LIKE ODOR
TLO = TAR LIKE ODOR
CLO = CHEMICAL LIKE ODOR
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CrLO= CREOSOTE LIKE ODOR
OLO = ORGANIC LIKE ODOR
SLO = SULFUR LIKE ODOR
MLO = MUSTY LIKE ODOR

GEI Consultants, Inc.
455 Winding Brook Road
Glastonbury, CT 06033
(860) 368-5300

CLIENT: National Grid
PROJECT: Citizens OU-2
CITY/STATE: Brooklyn, New York
GEI PROJECT NUMBER: 093250-2-1201

CGSB-146

ELEV. FT.	DEPTH FT.	SAMPLE INFO: TYPE and NO.	PEN/REC IN./IN.	PID (PPM)	STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION
	55		60/36						(55'- 56.7') WIDELY GRADED SAND (SW); ~85% sand, fine to coarse, ~10% gravel, fine to coarse, ~5% fines; wet, brown.
									(56.7'- 57.2') WIDELY GRADED SAND (SW); ~90% sand, fine to coarse, ~5% gravel, fine, ~5% fines; wet, red.
									(57.2'- 60') WIDELY GRADED SAND (SW); ~90% sand, fine to coarse, ~5% gravel, fine to coarse, ~5% fines; wet, brown.
	60		60/30						(60'- 65') WIDELY GRADED SAND WITH GRAVEL (SW); ~65% sand, fine to coarse, ~30% gravel, fine to coarse, ~5% fines; wet, brown.
	65		60/48						(65'- 75') WIDELY GRADED SAND WITH GRAVEL (SW); ~65% gravel, fine to coarse, ~60% sand, fine to coarse; brown.
	70		60/44						
	75		60/48						(75'- 80') WIDELY GRADED SAND WITH GRAVEL (SW); ~65% sand, fine to coarse, ~30% gravel, fine to coarse, ~5% fines; light brown.
	80								End of Boring at 80 feet.

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(860) 368-5300

CLIENT: National Grid
PROJECT: Citizens OU-2
CITY/STATE: Brooklyn, New York
GEI PROJECT NUMBER: 093250-2-1201

BORING LOG

CGSB-147

NORTHING (FT):
EASTING (FT):
LOCATION:
TOTAL DEPTH (FT): 80.0
DRILLED BY: Boart Longyear / Frank Gardella
DATUM VERT. / HORZ.: NAVD 88 / NAD 83
LOGGED BY: Chris Anastasiou
DATE START / END: 11/8/2012 - 11/8/2012
DRILLING DETAILS:
WATER LEVEL DEPTHS (FT): ⊻ 20.00 11/8/2012
GENERAL NOTE:

ELEV. FT.	DEPTH FT.	SAMPLE INFO: TYPE and NO.	SAMPLE INFO: PEN/REC IN./IN.	SAMPLE INFO: PID (PPM)	STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION
	0		60/NM						(0'- 0.1') ASPHALT. (0.1'- 5') WIDLEY GRADED GRAVEL WITH SAND (GW); ~70% gravel, fine to coarse, ~30% sand, fine to coarse; FILL.
	5		60/36	181			NLO	CGSB-147 (7-8)	(5'- 8.6') ~40% sand, fine to coarse; moderate naphthalene-like odor, black tar staining. FILL.
							NLO		(8.6'- 10') SANDY SILT (ML); ~60% fines, ~40% sand, fine to coarse; moderate naphthalene-like odor, black staining.
	10		60/48				OLO		(10'- 15') SILT (ML); ~100% fines; moderate organic-like odor, gray.
	15		60/48	25.2					(15'- 20') SILT (ML); ~100% fines.
⊻	20		60/24	38					(20'- 25') NARROWLY GRADED SAND (SP); ~95% sand, fine to medium, ~5% fines; wet, gray.

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BORING LOG

CGSB-147

ELEV. FT.	DEPTH FT.	TYPE and NO.	PEN/REC IN./IN.	PID (PPM)	STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION
	25		60/38	33.5			NLO		(25'- 25.7') WIDELY GRADED SAND (SW); ~95% sand, fine to coarse, ~5% fines; slight naphthalene-like odor, gray.
							NLO		(25.7'- 25.8') WIDELY GRADED SAND (SW); ~95% sand, fine to coarse, ~5% fines; slight naphthalene-like odor, gray, tar band.
									(25.8'- 28.2') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to coarse, ~10% fines; brown.
							NLO		(28.2'- 30') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to coarse, ~10% fines; slight naphthalene-like odor, gray.
	30		60/48						(30'- 31.3') SILTY SAND (SM); ~85% sand, fine to coarse, ~15% fines; brown.
									(31.3'- 35') SILTY SAND (SM); ~85% sand, fine, ~15% fines; brown.
	35		60/40						(35'- 36.5') WIDELY GRADED SAND (SW); ~95% sand, fine to coarse, ~5% fines; brown.
									(36.5'- 37.3') WIDELY GRADED SAND (SW); ~95% sand, fine to coarse, ~5% fines; gray.
								CGSB-147 (38-40)	(37.3'- 45') WIDELY GRADED SAND (SW); ~95% sand, fine to coarse, ~5% fines; brown.
	40		60/48						
	45		60/48						
	50		60/36						(50'- 55') WIDELY GRADED SAND (SW); ~85% sand, fine to coarse, ~10% gravel, fine to coarse, ~5% fines; brown.

NOTES:

PEN = PENETRATION LENGTH OF SAMPLER OR CORE BARREL
REC = RECOVERY LENGTH OF SAMPLE
PID = PHOTOIONIZATION DETECTOR READING (PPM)
JHS = JAR HEADSPACE PID READING (PPM)

ppm = PARTS PER MILLION
IN. = INCHES
FT. = FEET

NLO = NAPHTHALENE LIKE ODOR
PLO = PETROLEUM LIKE ODOR
TLO = TAR LIKE ODOR
CLO = CHEMICAL LIKE ODOR
ALO = ASPHALT LIKE ODOR

CrLO= CREOSOTE LIKE ODOR
OLO = ORGANIC LIKE ODOR
SLO = SULFUR LIKE ODOR
MLO = MUSTY LIKE ODOR

NA = NOT APPLICABLE
NM = NOT MEASURED

Q_P = POCKET PENETROMETER
S_V = TORVANE PEAK

ELEV. FT.	DEPTH FT.	TYPE and NO.	PEN/REC IN./IN.	PID (PPM)	STRATA	VISUAL IMPACTS	ODOR	ANALYZED SAMPLE ID	SOIL / BEDROCK DESCRIPTION
	55		60/40						
	60		60/48						(60'- 65') WIDELY GRADED SAND WITH GRAVEL (SW); ~70% sand, fine to coarse, ~25% gravel, fine to coarse, ~5% fines; brown.
	65		60/48						(65'- 70') WIDELY GRADED SAND (SW); ~85% sand, fine to coarse, ~10% gravel, fine to coarse, ~5% fines; brown.
	70		60/34						(70'- 75') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine to coarse, ~10% fines; brown.
	75		60/48						(75'- 80') WIDELY GRADED SAND WITH SILT (SW-SM); ~90% sand, fine, ~10% fines; brown.
	80								End of Boring at 80 feet.

NOTES:

PEN = PENETRATION LENGTH OF SAMPLER OR CORE BARREL
REC = RECOVERY LENGTH OF SAMPLE
PID = PHOTOIONIZATION DETECTOR READING (PPM)
JHS = JAR HEADSPACE PID READING (PPM)

NA = NOT APPLICABLE
NM = NOT MEASURED
Q_P = POCKET PENETROMETER
S_V = TORVANE PEAK

ppm = PARTS PER MILLION
IN. = INCHES
FT. = FEET

NLO = NAPHTHALENE LIKE ODOR
PLO = PETROLEUM LIKE ODOR
TLO = TAR LIKE ODOR
CLO = CHEMICAL LIKE ODOR
ALO = ASPHALT LIKE ODOR

CrLO= CREOSOTE LIKE ODOR
OLO = ORGANIC LIKE ODOR
SLO = SULFUR LIKE ODOR
MLO = MUSTY LIKE ODOR

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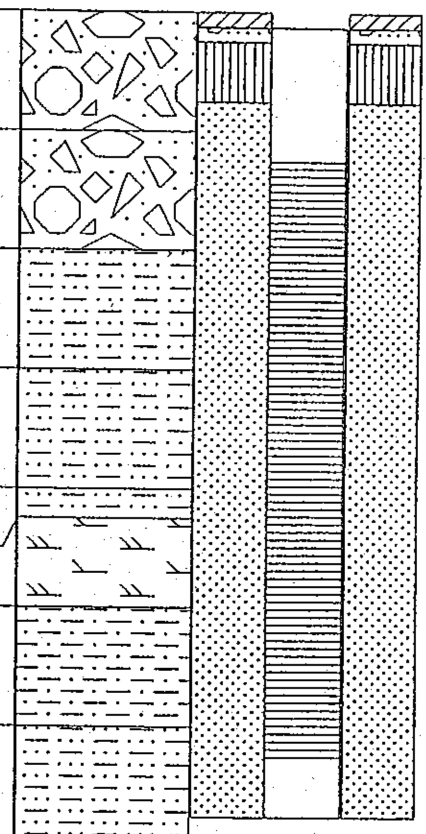
FIELD BOREHOLE LOG

BOREHOLE NUMBER
MW-2/DP-1

PROJECT NUMBER:	80030-0002	FIELD BOOK NO:	301
PROJECT NAME:	124-136 SECOND AVENUE	TOTAL DEPTH:	28 Feet
LOCATION:	BROOKLYN, NEW YORK	GROUND SURFACE ELEVATION:	0.0
DRILLING CO:	FENLEY & NICOL		
DRILLING METHOD:	HOLLOW STEM AUGER/GEOPROB		
FIELD PARTY:	CHRIS BOSS		
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:	12/14/2000	DATE COMPLETED:	12/14/2000

STATIC WATER LEVEL (BLS)		
Depth (ft)	5.3	
Time	12:35	
Date	12/22/2000	

DEPTH (ft)	SAMPLE NUMBER	BLOWS COUNT	PID/ppm	REMARKS	DESCRIPTION	LITHOLOGY	WELL INSTALLATION
0.0	1		ND		FILL: concrete and red brick fragments, ash, gray silty sand.		
	2		ND		FILL: concrete and red brick fragments, ash, gray silty sand.		
10.0	3		ND		SILTY SAND		
	4		ND		SILTY SAND		
	5		ND		SILTY SAND PEAT: clay		
20.0	6		ND		SILT		
	7		ND		SILTY SAND		



AKRF, INC. Environmental Consultants	FIELD BOREHOLE LOG	BOREHOLE NUMBER DP-2

PROJECT NUMBER:	80030-0002	FIELD BOOK NO:	301
PROJECT NAME:	124-136 SECOND AVENUE	TOTAL DEPTH:	28 Feet
LOCATION:	BROOKLYN, NEW YORK	GROUND SURFACE ELEVATION:	0.0
DRILLING CO:	FENLEY & NICOL		
DRILLING METHOD:	GEOPROBE		
FIELD PARTY:	CHRIS BOSS/JAY SEALE		
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:	12/14/2000	DATE COMPLETED:	12/14/2000

STATIC WATER LEVEL (BLS)		
Depth (ft)	5.0	
Time	10:10	
Date	12/14/2000	

DEPTH (ft)	SAMPLE NUMBER	BLOWS COUNT	PID/ppm	REMARKS	DESCRIPTION	LITHOLOGY	WELL INSTALLATION
0.0	1		ND		FILL: concrete and red brick fragments, ash, black silty sand.		
	2		83	Strong odor			
10.0	3		4				
	4		ND		PEAT: With Clay		
	5		36				
20.0	6		40		SILT: Brownish gray to gray SILT		
	7		ND				
					SAND: Fine to medium SAND		

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FIELD BOREHOLE LOG

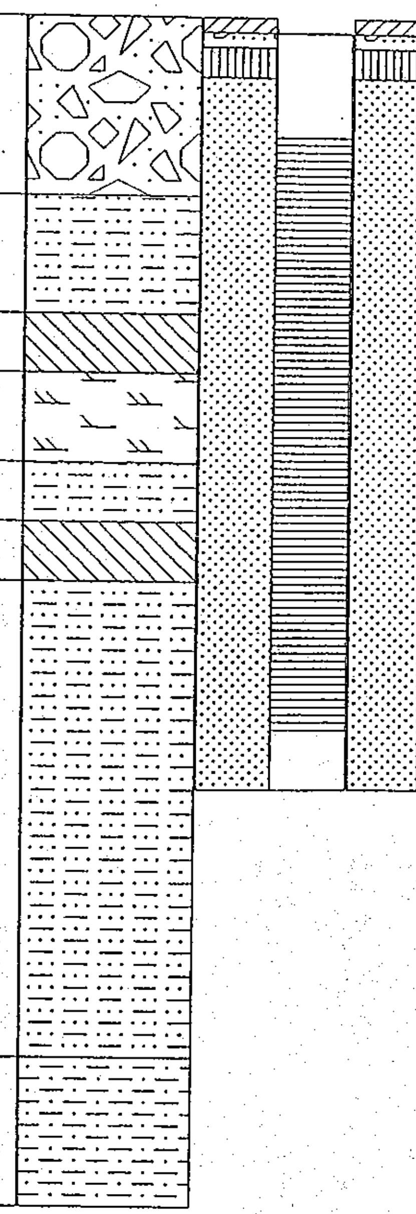
BOREHOLE NUMBER
MW-3/DP-9

PROJECT NUMBER:	80030-0002	FIELD BOOK NO:	301
PROJECT NAME:	124-136 SECOND AVENUE	TOTAL DEPTH:	40 FEET
LOCATION:	BROOKLYN, NEW YORK	GROUND SURFACE ELEVATION:	0.0
DRILLING CO:	FENLEY & NICOL		
DRILLING METHOD:	HOLLOW STEM AUGER/GEOPROBE		
FIELD PARTY:	JAY SALE		
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:	12/12/2000	DATE COMPLETED:	12/12/2000

STATIC WATER LEVEL (BLS)		
Depth (ft)	5.15	
Time	11:20	
Date	12/23/2000	

DEPTH (ft)	SAMPLE NUMBER	BLOWS COUNT	PID/ppm	REMARKS	DESCRIPTION
0.0	1		9		FILL: red brick and coal fragments, ash, black silty sand.
	2		7		SILTY SAND: dark black
10.0	3		ND		CLAY
	4		ND		PEAT: Clay
	5		ND		SILTY SAND CLAY
20.0	6		ND		SILTY SAND
	7		43	Strong odor, free product	
30.0	8		94		
	9		10	slight petroleum odor	
	10		13	slight petroleum odor	SILT: Dense reddish brown silt
40.0					

LITHOLOGY / WELL INSTALLATION



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FIELD BOREHOLE LOG

BOREHOLE NUMBER: DP- 10

PROJECT NUMBER:	80030-0002	FIELD BOOK NO:	301
PROJECT NAME:	124-136 SECOND AVENUE	TOTAL DEPTH:	28 Feet
LOCATION:	BROOKLYN, NEW YORK	GROUND SURFACE ELEVATION:	0.0
DRILLING CO:	FENLEY & NICOL		
DRILLING METHOD:	GEOPROBE		
FIELD PARTY:	JAY SEALE		
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:	12/13/2000	DATE COMPLETED:	12/13/2000

STATIC WATER LEVEL (BLS)

Depth (ft)	5.0	
Time	10:10	
Date	12/13/2000	

DEPTH (ft)	SAMPLE NUMBER	BLOWS COUNT	PID/ppm	REMARKS	DESCRIPTION	LITHOLOGY	WELL INSTALLATION
0.0	1		ND		FILL: concrete and red brick fragments, ash, black silty sand.		
	2						
			89	Strong odor	SILTY SAND: Gray Silty Sand changed to reddish brown Silty SAnd		
	3						
10.0			26	Strong odor	SILY SAND: Reddish brown Silty Sand with some pebbles		
	4				SILTY SAND: Black		
			40	Free product	CLAY: Dense		
	5				CLAY: With little SAND		
			27	Free product	CLAY: Dense		
20.0	6		45	Free product	Refusal: Location moved 15 feet north		
	7				CLAY: Dense		
			189	Free Product	SILT: Reddish Brown SILT		
					SAND: Fine to medium SAND		

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FIELD BOREHOLE LOG

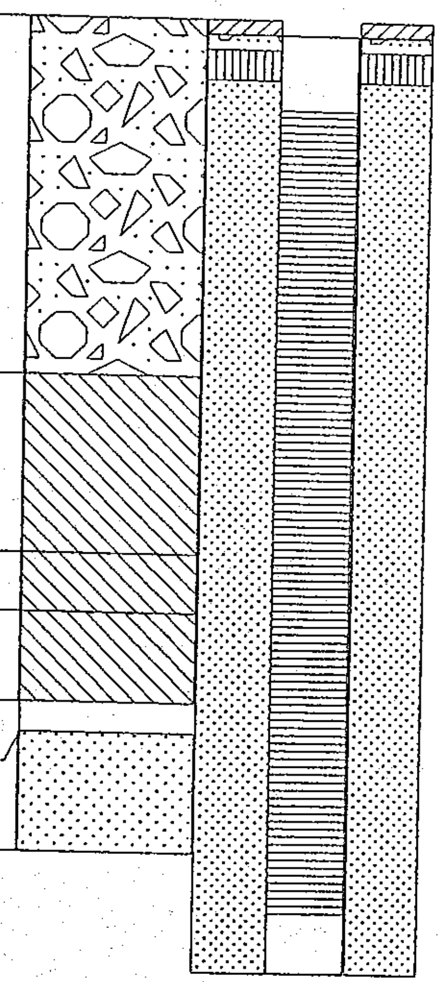
BOREHOLE NUMBER
MW-5/DP-11

PROJECT NUMBER:	80030-0002
PROJECT NAME:	124-136 SECOND AVENUE
LOCATION:	BROOKLYN, NEW YORK
DRILLING CO:	FENLEY & NICOL
DRILLING METHOD:	HOLLOW STEM AUGER/GEOPROBE
FIELD PARTY:	CHRIS MIGLIORE/JAY SEAL
GEOLOGIST:	MOHAMED AHMED
DATE BEGUN:	12/08/200
DATE COMPLETED:	12/08/2000
FIELD BOOK NO:	301
TOTAL DEPTH:	32 Feet
GROUND SURFACE ELEVATION:	0.0

STATIC WATER LEVEL (BLS)		
Depth (ft)	5.3	
Time	2:45	
Date	12/22/2000	

DEPTH (ft)	SAMPLE NUMBER	BLOWS COUNT	PID/ppm	REMARKS	DESCRIPTION
0.0	1		202	strong odor	FILL: Coal and red brick fragments, ash, black silty sand.
	2		ND		
10.0	3				
			ND		
	4		ND		CLAY: With little Silt
	5		ND		
20.0					CLAY: With little Peat
					CLAY
	6		ND		
			ND		SANDY CLAY
	7				SAND
30.0					

LITHOLOGY / WELL INSTALLATION



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FIELD BOREHOLE LOG

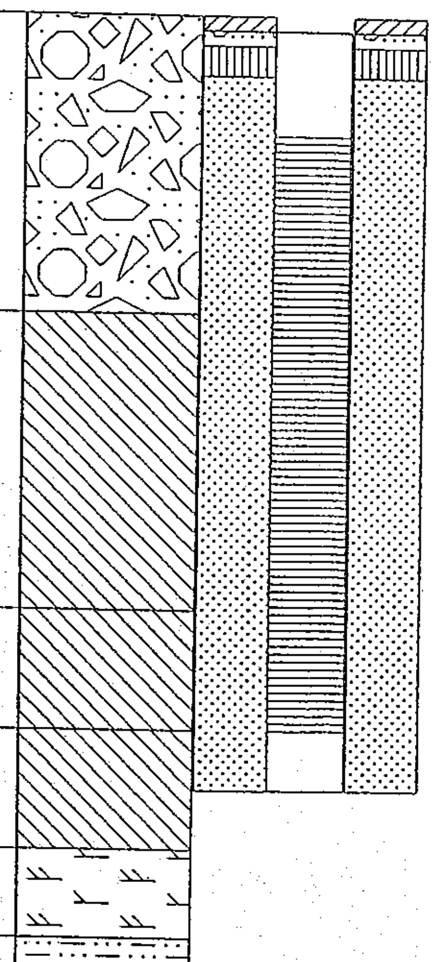
BOREHOLE NUMBER
MW-6/DP-12

PROJECT NUMBER:	80030-0002
PROJECT NAME:	124-136 SECOND AVENUE
LOCATION:	BROOKLYN, NEW YORK
DRILLING CO:	FENLEY & NICOL
DRILLING METHOD:	HOLLOW STEM AUGER/GEOPROBE
FIELD PARTY:	CHRIS MIGLIORE/JAY SEAL
GEOLOGIST:	MOHAMED AHMED
DATE BEGUN:	12/6/2000
DATE COMPLETED:	12/6/2000
FIELD BOOK NO:	301
TOTAL DEPTH:	32 Feet
GROUND SURFACE ELEVATION:	0.0

STATIC WATER LEVEL (BLS)		
Depth (ft)	4.95	
Time	10:30	
Date	12/23/2000	

DEPTH (ft)	SAMPLE NUMBER	BLOWS COUNT	PID/ppm	REMARKS	DESCRIPTION
0.0	1		ND		FILL: Coal and red brick fragments, ash, black silty sand.
	2		ND		
10.0	3				CLAY: With little Silt
			ND		
	4		ND		
	5		ND		
20.0	6		ND		CLAY: Shell fragments
			ND		
	7				CLAY: With little Silt
30.0			ND		PEAT: With Clay
			200	Free product	SILTY SAND

LITHOLOGY / WELL INSTALLATION



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FIELD BOREHOLE LOG

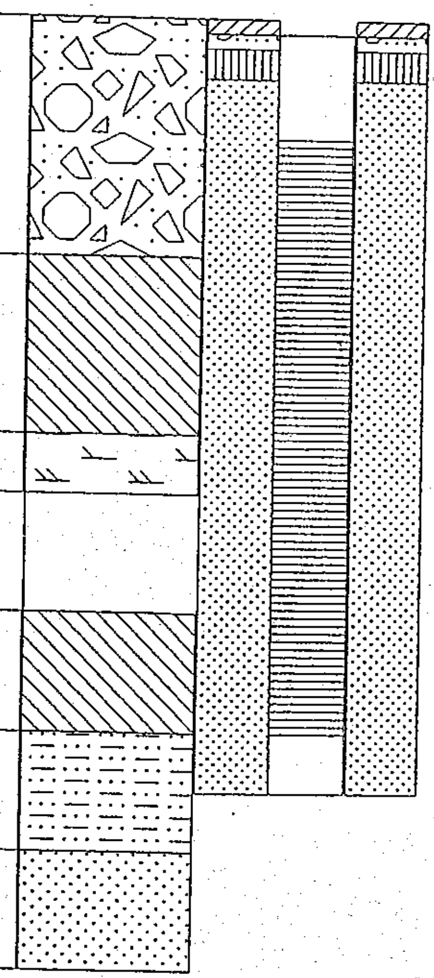
BOREHOLE NUMBER
MW-7/DP-13

PROJECT NUMBER:	80030-0002	FIELD BOOK NO:	301
PROJECT NAME:	124-136 SECOND AVENUE	TOTAL DEPTH:	32 Feet
LOCATION:	BROOKLYN, NEW YORK	GROUND SURFACE ELEVATION:	0.0
DRILLING CO:	FENLEY & NICOL		
DRILLING METHOD:	HOLLOW STEM AUGER/GEOPROBE		
FIELD PARTY:	CHRIS MIGLIORE/JAY SEAL		
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:	12/06/2000	DATE COMPLETED:	12/06/2000

STATIC WATER LEVEL (BLS)		
Depth (ft)	2.8	
Time	1:15	
Date	12/22/2000	

DEPTH (ft)	SAMPLE NUMBER	BLOWS COUNT	PID/ppm	REMARKS	DESCRIPTION
0.0	1		ND		FILL: Coal and red brick fragments, ash, black silty sand.
	2		ND		
10.0	3		ND		CLAY
	4		ND		
					PEAT
	5		ND		No Recovery
20.0	6		ND		CLAY: With Peat
	7		ND		SILTY SAND
30.0	8		ND		SAND: Medium to coarse brown SAND with some Gravel

LITHOLOGY / WELL INSTALLATION



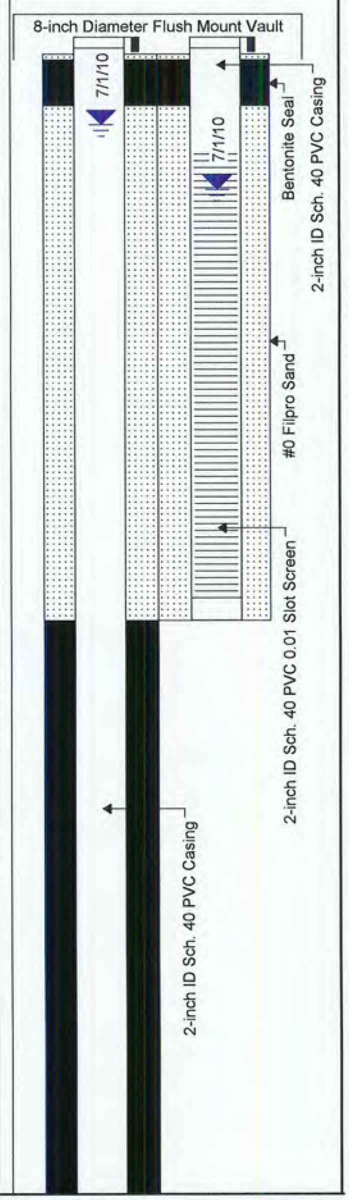
Project No: SERAS-059
Project: Gowanus Canal Superfund Site
Client: EPA/ERT
Location: 118 2nd Ave., Brooklyn, NY
Logged By: J. Bolduc

GCMW-44S Northing (ft): 184458.534
GCMW-44S Easting (ft): 985077.566
GCMW-44I Northing (ft): 184458.434
GCMW-44I Easting (ft): 985077.808
GCMW-44S Elevation (ft AMSL): 4.72
GCMW-44I Elevation (ft AMSL): 4.73

Log of Well: GCMW-44

Depth (ft)	Description	Elev. (ft.)	Sample Number
0	Ground Surface	0.00	
0	**Asphalt** 1/4-foot thick.		
0.25	**Gravel With Sand (SW-GW) Fill** Dark grayish brown to dark gray, fine to coarse angular gravel, some fine to coarse-grained sand, little silt, copper nails, wood, glass, clay pot fragments, spotty petroleum hydrocarbon sheens, no odor.		059-2122
12.5	**Silty Clay (CL)** Dark gray, low plasticity, soft, plant remains and shell fragments throughout, micaceous, wet, no stain, no odor.	-12.50	059-2123, 059-2124
25		-25.00	

PID Readings (ppmv): 0.0 at each reading from approximately 6.5 ft to 25 ft.



Drill Method: A300 Rotary Sonic
Start Date: 1300 6/8/10
Hole Size: 8 inches

Lockheed Martin/SERAS
2890 Woodbridge Avenue
Building 209 Annex
Edison, NJ 08837

Drill Company: Boart Longyear
End Date: 1630 6/8/10

Project No: SERAS-059
Project: Gowanus Canal Superfund Site
Client: EPA/ERT
Location: 118 2nd Ave., Brooklyn, NY
Logged By: J. Bolduc

GCMW-44S Northing (ft): 184458.534
GCMW-44S Easting (ft): 985077.566
GCMW-44I Northing (ft): 184458.434
GCMW-44I Easting (ft): 985077.808
GCMW-44S Elevation (ft AMSL): 4.72
GCMW-44I Elevation (ft AMSL): 4.73

Log of Well: GCMW-44

SUBSURFACE PROFILE / SAMPLE

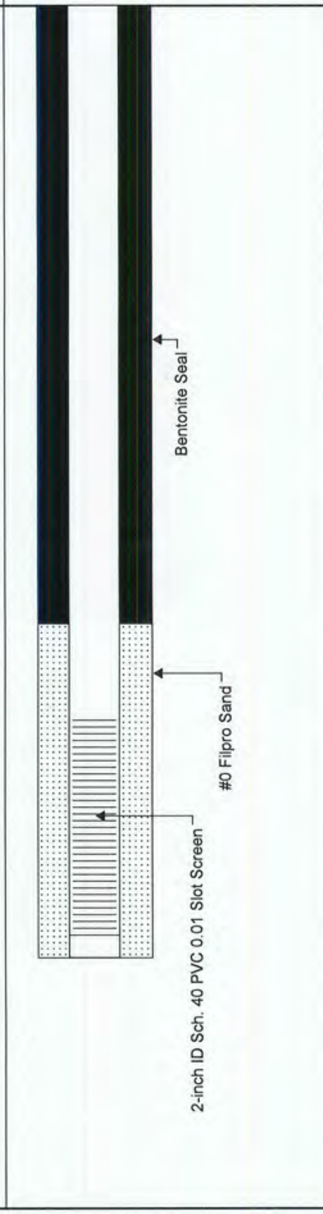
Depth	Description	Elev. (ft.)
25–27	***Clayey Sand (SC)*** Dark gray, fine to medium grained, some clay, little silt, shell fragments, wet, no stain, no odor.	-26.00
27–28	***Sand (SW)*** Dark gray, fine to coarse grained, trace silt, micaceous, wet, no stain, no odor.	-28.00
28–31	***Silty Clay (CL)*** Dark gray, trace fine to medium-grained sand, low plasticity, soft, micaceous, moist, no stain, no odor.	-31.00
31–35	***Silt (ML)*** Very dark grayish brown, clayey, trace fine-grained sand, occasional plant and shell fragments, micaceous, slightly moist, no stain, no odor.	-35.00
35–43	***Sand (SW)*** Light brownish gray, fine to coarse grained, trace silt, micaceous, wet, no stain, no odor.	-43.00
43–45	***No Recovery*** No recovery between 43 and 45 feet.	
50		-50.00

Sample Number	Depth (approx.)
059-2125	26
059-2126	30
059-2127	35
059-2128	39
059-2129	43

PID Readings (ppmv) (scale 0, 20, 40, 60, 80, 100)

0.0, 0.6, 0.6, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0

Well Completion Details



Drill Method: A300 Rotary Sonic
Start Date: 1300 6/8/10
Hole Size: 8 inches

Lockheed Martin/SERAS
2890 Woodbridge Avenue
Building 209 Annex
Edison, NJ 08837

Drill Company: Boart Longyear
End Date: 1630 6/8/10

Project No: SERAS-059
Project: Gowanus Canal Superfund Site
Client: EPA/ERT
Location: Lowes, Brooklyn, NY
Logged By: J. Bolduc

GCMW-45S Northing (ft): 184648.833
GCMW-45S Easting (ft): 985200.254
GCMW-45I Northing (ft): 184648.804
GCMW-45I Easting (ft): 985199.988
GCMW-45S Elevation (ft AMSL): 4.49
GCMW-45I Elevation (ft AMSL): 4.50

Log of Well: GCMW-45

SUBSURFACE PROFILE

Depth (ft)	Description	Elev. (ft.)
0	Ground Surface	0.00
0–0.25	**Asphalt** 1/4-foot thick.	
0.25–11	**Sand With Gravel (SW-GP) Fill** Dark gray, fine to coarse grained, little silt, some fine gravel, coal, brick, and wood fragments throughout, wet, no stain, no odor.	-11.00
11–13	**Peat (PT)** Brown, trace clay, fibrous, wet, no stain, no odor.	-13.00
13–25.1	**Silty Clay (CL)** Dark gray, trace fine sand, low plasticity, soft, plant and shell fragments, no plant fragments below 17 feet, wet, no stain, no odor. Several fine sand stringers from 1 to 3 inches thick from 24 to 26 feet.	-25.10

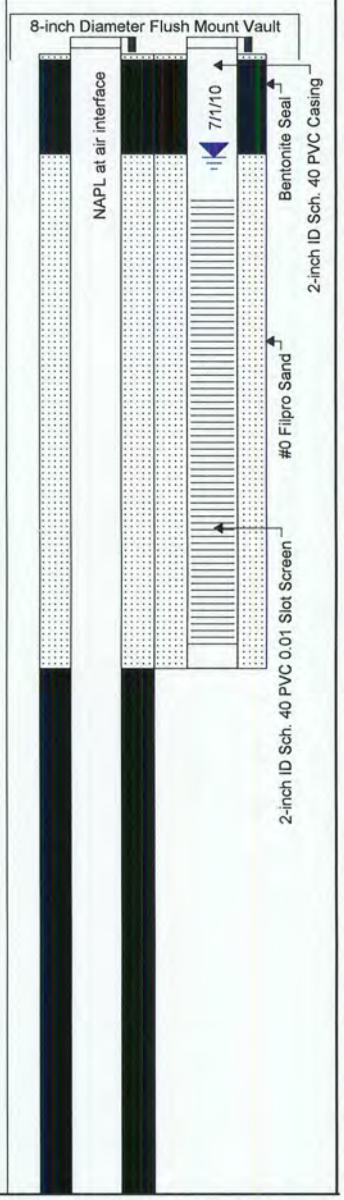
SAMPLE

Number
059-2114
059-2115
059-2116
059-2117

PID Readings (ppmv)

Depth (ft)	PID
7	0.0
8	0.0
9	0.0
10	13.0
11	0.0
12	0.0
13	1.0
14	0.0
15	0.0
16	0.0
17	0.0
18	0.0
19	0.0
20	0.0
21	0.0
22	0.0
23	0.0
24	0.0
25	0.0

Well Completion Details



Drill Method: A300 Rotary Sonic
Start Date: 0813 6/8/10
Hole Size: 8 inches

Lockheed Martin/SERAS
2890 Woodbridge Avenue
Building 209 Annex
Edison, NJ 08837

Drill Company: Boart Longyear
End Date: 1025 6/8/10
Sheet: 1 of 2

Project No: SERAS-059

Project: Gowanus Canal Superfund Site

Client: EPA/ERT

Location: Lowes, Brooklyn, NY

Logged By: J. Bolduc

GCMW-45S Northing (ft): 184648.833

GCMW-45S Easting (ft): 985200.254

GCMW-45I Northing (ft): 184648.804

GCMW-45I Easting (ft): 985199.988

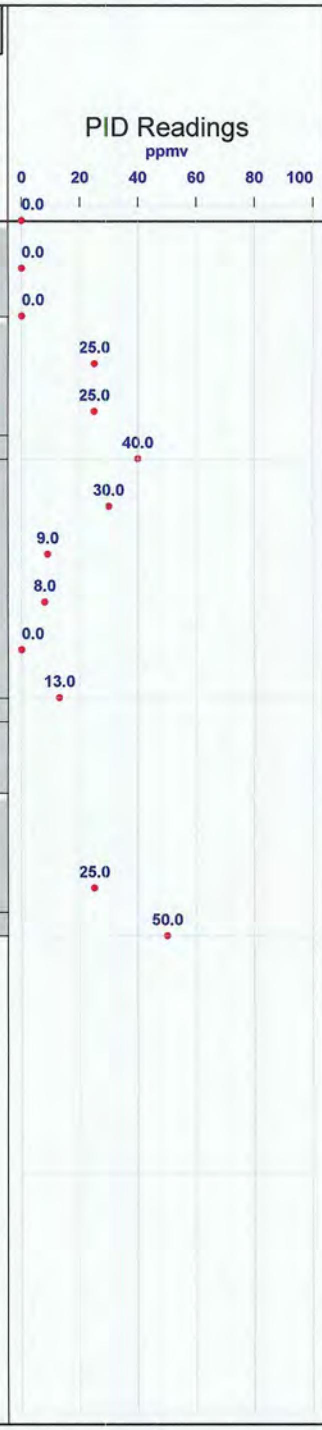
GCMW-45S Elevation (ft AMSL): 4.49

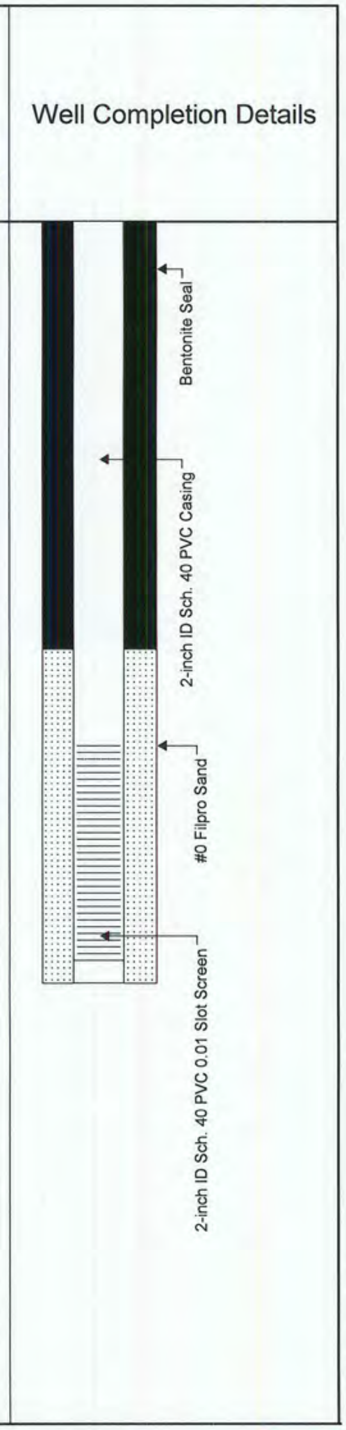
GCMW-45I Elevation (ft AMSL): 4.50

Log of Well: GCMW-45

SUBSURFACE PROFILE / SAMPLE

Depth (ft)	Description	Elev. (ft.)	Number
25.5–28	**Silty Clay (CL) As Above**	-28.00	
28–30	**Clayey Sand (SC)** Dark gray, fine to medium grained, shell fragments, wet, petroleum hydrocarbon sheen and low viscosity petroleum hydrocarbon saturated throughout, faint petroleum hydrocarbon odor.	-30.00	059-2118
30–33	**Silty Clay (CL)** Dark gray, little fine-grained sand, occasional plant fragments, micaceous, wet, no stain, no odor.	-33.00	
33–37	**Clayey Sand (SC)** Dark gray to black, fine to coarse grained, thin clay stringers from 33 to 37 feet, wet, low viscosity petroleum hydrocarbon saturated, dark brown petroleum hydrocarbon staining, faint petroleum hydrocarbon odor.	-37.00	059-2119
37–41	**Sand With Silt (SP-SM)** Dark gray, fine to medium grained, little silt, clay stringer at 37 feet, low viscosity petroleum hydrocarbon saturated, spotty PHC sheens throughout, moderate petroleum hydrocarbon		059-2120
50		-50.00	





Drill Method: A300 Rotary Sonic

Start Date: 0813 6/8/10

Hole Size: 8 inches

Lockheed Martin/SERAS
2890 Woodbridge Avenue
Building 209 Annex
Edison, NJ 08837

Drill Company: Boart Longyear

End Date: 1025 6/8/10

Project No: SERAS-059
Project: Gowanus Canal Superfund Site
Client: EPA/ERT
Location: 118 2nd Ave., Brooklyn, NY
Logged By: C. Sklaney

GCMW-46I Northing (ft): 184593.888
GCMW-46I Easting (ft): 985167.173
GCMW-46I Elevation (ft AMSL): 4.76

Log of Well: GCMW-46

Depth (ft)	Description	Elev. (ft.)	Sample Number	PID Readings (ppmv)
0	Ground Surface	0.00		
0–7	**Not Logged** Air knifed to clear borehole of underground utilities to 7 feet. Subsurface materials not logged during air knifing.	-7.00		0.0
7–15	**Gravel With Sand (GP-SP) Fill** Dark grayish brown, fine gravel, some medium to coarse-grained sand, little fines, gravel consists of fly ash, slag, and construction debris (concrete and brick), shell fragments.	-15.00	059-2167	0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0
15–30	**Clay (CL)** Very dark grayish brown, moderate plasticity, soft, little woody material (twigs, mulch, and chips), moist.	-30.10	059-2168, 059-2169, 059-2170, 059-2171	0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0

Well Completion Details: 8-inch Diameter Flush Mount Vault; 6/30/10

Drill Method: A300 Rotary Sonic
Start Date: 1415 6/15/10
Hole Size: 8 inches

Lockheed Martin/SERAS
2890 Woodbridge Avenue
Building 209 Annex
Edison, NJ 08837

Drill Company: Boart Longyear
End Date: 1620 6/15/10

Project No: SERAS-059

Project: Gowanus Canal Superfund Site

Client: EPA/ERT

Location: 118 2nd Ave., Brooklyn, NY

Logged By: C. Sklaney

GCMW-46I Northing (ft): 184593.888

GCMW-46I Easting (ft): 985167.173

GCMW-46I Elevation (ft AMSL): 4.76

Log of Well: GCMW-46

SUBSURFACE PROFILE / SAMPLE

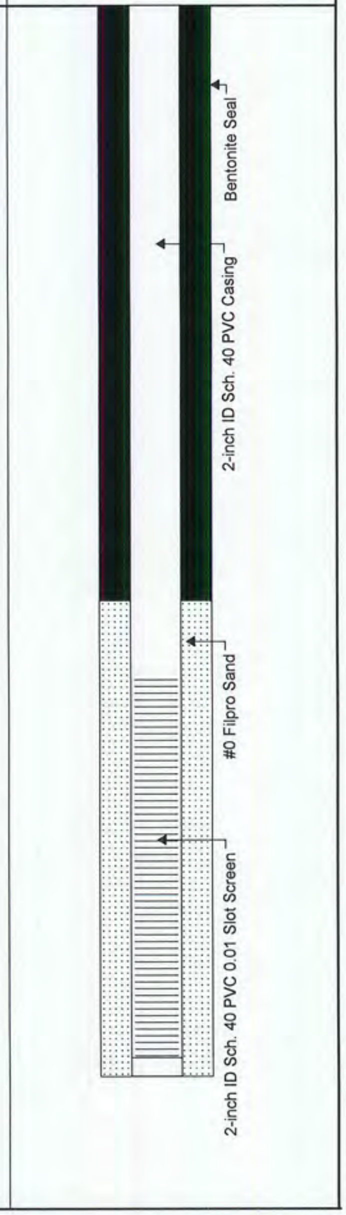
Depth (ft)	Description	Elev. (ft.)
30–32	**Clay (CL) As Above**	-32.00
32–33	**Clayey Sand (SC)** Gray, fine to medium grained, clayey, little silt, wet.	-33.00
33–35.5	**Sand (SP)** Very dark gray, medium grained, trace fines, wet.	-35.50
35.5–42	**Sand (ML)** Very dark gray, very fine grained, trace silt, wet.	-42.00
42–54	**Sand (SP)** Very dark gray, medium grained, subrounded to rounded, trace fines, wet. Sand becomes well rounded between 47 and 54 feet.	-54.00
54–55	**Sand With Gravel (SP-GP)** Very dark gray, coarse grained, and fine subrounded to rounded gravel, little fines, wet.	-55.00
55–60	**Sand (ML)** Very dark gray, very fine grained, silty, wet.	-60.00

Depth (ft)	Sample Number
35	059-2172
40	059-2173
45	059-2174
50	059-2175
55	059-2176

PID Readings (ppmv)

Depth (ft)	PID
31	0.0
33	0.0
35	0.0
37	0.0
39	0.0
41	0.0
43	0.0
45	0.0
47	1.0
49	1.0
51	1.0
53	1.0
55	1.0
57	1.0

Well Completion Details



Drill Method: A300 Rotary Sonic

Start Date: 1415 6/15/10

Hole Size: 8 inches

Lockheed Martin/SERAS
2890 Woodbridge Avenue
Building 209 Annex
Edison, NJ 08837

Drill Company: Boart Longyear

End Date: 1620 6/15/10

Sheet: 2 of 2

Project No: SERAS-059
Project: Gowanus Canal Superfund Site
Client: EPA/ERT
Location: 118 2nd Ave., Brooklyn, NY
Logged By: C. Sklaney

GCMW-47S Northing (ft): 184690.704
GCMW-47S Easting (ft): 985209.243
GCMW-47I Northing (ft): 184690.893
GCMW-47I Easting (ft): 985209.050
GCMW-47S Elevation (ft AMSL): 4.53
GCMW-47I Elevation (ft AMSL): 4.62

Log of Well: GCMW-47

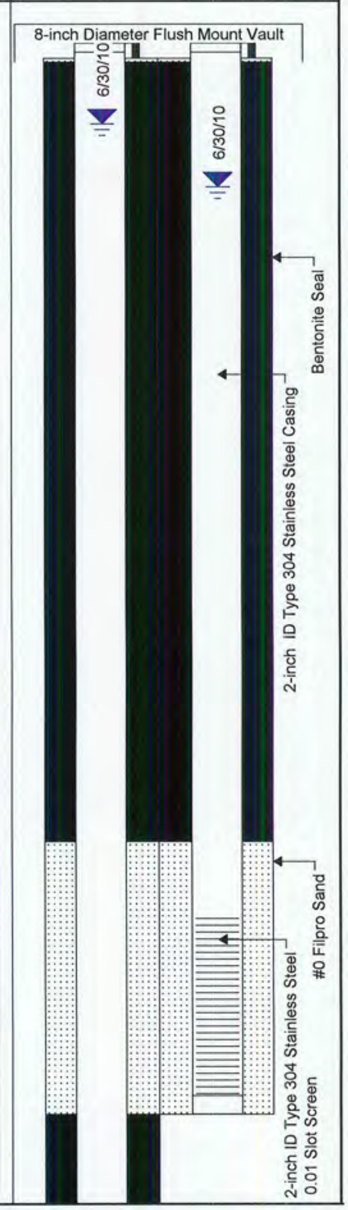
SUBSURFACE PROFILE / SAMPLE

Depth (ft)	Description	Elev. (ft.)	Number
0	Ground Surface	0.00	
0–7	**Not Logged** Air knifed to clear underground utilities to 7 feet. Subsurface materials not logged during air knifing.	-7.00	
7–14.5	**Sand With Silt and Gravel (SW-SM) Fill** Very dark grayish brown, fine to coarse grained, some gravel, some cobbles, some silt, shell fragments, wet.	-14.50	
14.5–16	**Silty Clay (CL) Fill** Very dark grayish brown, silty, medium stiff, some roots, plant remains, peat, faint sulfur-like odor.	-16.00	059-2234
16–17		-17.00	
17–23	**Sand With Silt and Gravel (SW-SM) Fill** Very dark grayish brown, fine to coarse grained, some gravel, some cobbles, some silt, shell fragments, wet.		059-2235
	Silty Clay (CL) Very dark grayish brown, medium stiff, some roots, plant remains, peat, faint sulfur-like odor.	-23.00	
23–28	**Sand With Silt (SP-SM)** Very dark gray, fine to medium grained, little fines, petroleum hydrocarbon staining, sheen and saturation present, strong petroleum hydrocarbon odor.	-28.00	059-2236
28–30	**Sandy Silt (ML)** Very dark grayish brown, sandy, little peat, petroleum hydrocarbon staining and sheen present.	-30.00	

PID Readings (ppmv)

Depth (ft)	PID (ppmv)
7	0.0
8	0.0
9	0.0
10	0.0
11	0.0
12	0.0
13	0.0
14	0.0
15	0.0
16	0.0
17	0.0
19	0.0
21	0.0
23	0.0
24	7.0
25	7.0
26	25.0
27	10.0
29	15.0
30	40.0

Well Completion Details



Drill Method: A300 Rotary Sonic
Start Date: 0935 6/28/10
Hole Size: 8 inches

Lockheed Martin/SERAS
2890 Woodbridge Avenue
Building 209 Annex
Edison, NJ 08837

Drill Company: Boart Longyear
End Date: 1430 6/28/10
Sheet: 1 of 2

Project No: SERAS-059

Project: Gowanus Canal Superfund Site

Client: EPA/ERT

Location: 118 2nd Ave., Brooklyn, NY

Logged By: C. Sklaney

GCMW-47S Northing (ft): 184690.704

GCMW-47S Easting (ft): 985209.243

GCMW-47I Northing (ft): 184690.893

GCMW-47I Easting (ft): 985209.050

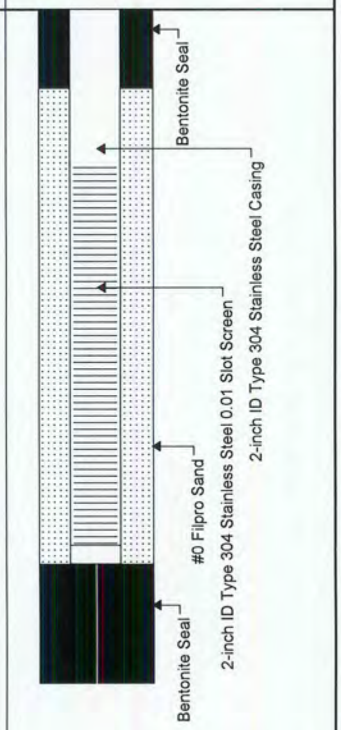
GCMW-47S Elevation (ft AMSL): 4.53

GCMW-47I Elevation (ft AMSL): 4.62

Log of Well: GCMW-47

SUBSURFACE PROFILE			SAMPLE			PID Readings (ppmv)
Depth	Description	Elev. (ft.)	Number	Type	Recovery	0 20 40 60 80 100
30–31.5	**Sand (SP)** Very dark grayish brown, medium grained, petroleum hydrocarbon stain, sheen, and odor present.	-31.00	059-2237			40.0
31.5–34	**Clay (CL)** Very dark brown, low plasticity, very stiff, abundant peat.	-34.00				10.0
34–47	**Sand (SP)** Very dark grayish brown, medium to coarse grained, loose, petroleum hydrocarbon staining, sheen, high saturation from 34 to 37 feet, and odor present. Spotty petroleum hydrocarbon saturation between 37 and 43.5 feet. No visible or olfactory evidence of petroleum hydrocarbon presence between 43.5 and 47 feet.		059-2238			40.0
			059-2239			
			059-2240			
60		-60.00				

Well Completion Details



Drill Method: A300 Rotary Sonic

Start Date: 0935 6/28/10

Hole Size: 8 inches

Lockheed Martin/SERAS
2890 Woodbridge Avenue
Building 209 Annex
Edison, NJ 08837

Drill Company: Boart Longyear

End Date: 1430 6/28/10

AKRF, INC.
Environmental Consultants

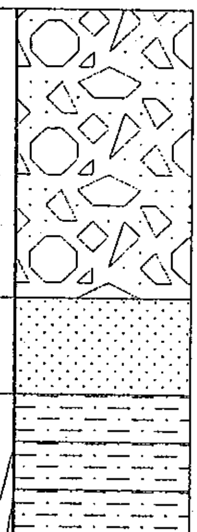
FIELD BOREHOLE LOG

BOREHOLE NUMBER
GP-6

PROJECT NUMBER:	80030-0003	START TIME	0850
PROJECT NAME:	124-136 Second Ave. (Gowanus)	END TIME	0925
LOCATION:	Brooklyn, NY	GROUND SURFACE ELEVATION:	0
DRILLING CO:			
DRILLING METHOD:	GeoProbe		
FIELD PARTY:			
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:	02/21/01	DATE COMPLETED:	02/21/01

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY	
0.0				refusal at -11 ft.; three attempts made; refusal at 7 ft. and 4 ft.; sampling location 5 ft. SE of flag	fill: light brown medium coarse sand and gravel		
4.0							
			0.5		sand: black/dark brown medium sand and silt; wet at -6 ft.		
8.0	GP6				silt: black/dark brown silt and medium coarse sand with small cobbles		
					silt: brown/tan silt and medium coarse sand with small cobbles		
12.0			1.9		silt: black silt and medium coarse sand with small cobbles		
16.0							



AKRF, INC. Environmental Consultants	FIELD BOREHOLE LOG	BOREHOLE NUMBER GP-17

PROJECT NUMBER: 80030-0003

PROJECT NAME: 124-136 Second Ave. (Gowanus)

LOCATION: Brooklyn, NY

DRILLING CO:

DRILLING METHOD: GeoProbe

FIELD PARTY:

GEOLOGIST: MOHAMED AHMED

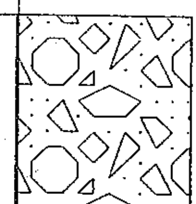
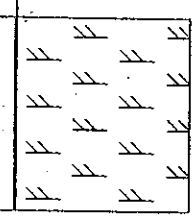
DATE BEGUN: 02/22/01 DATE COMPLETED:

START TIME 1045

END TIME 1130

GROUND SURFACE ELEVATION: 0

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/4	8		fill: ash, brick fragments	
8.0		48/0		no recovery	(no recovery)	
12.0	GP17	48/36			peat: dark brown peat	
16.0						

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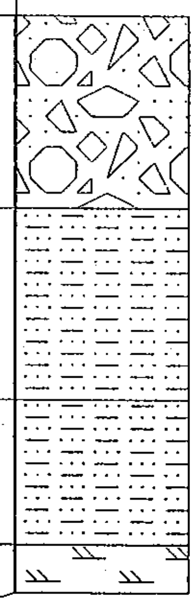
FIELD BOREHOLE LOG

BOREHOLE NUMBER: GP-18

PROJECT NUMBER:	80030-0003	START TIME	1135
PROJECT NAME:	124-136 Second Ave. (Gowanus)	END TIME	1215
LOCATION:	Brooklyn, NY	GROUND SURFACE ELEVATION:	0
DRILLING CO:			
DRILLING METHOD:	GeoProbe		
FIELD PARTY:			
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:	02/22/01	DATE COMPLETED:	02/22/01

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/42	16.0		fill: red bricks, coal fragments, ash, black silty sand	
8.0	GP18	48/20	2.5	FREE PRODUCT	silty sand: black silty sand, free product	
12.0		48/24	7.0	FREE PRODUCT	silty sand: brownish gray silty sand	
					peat	
16.0						



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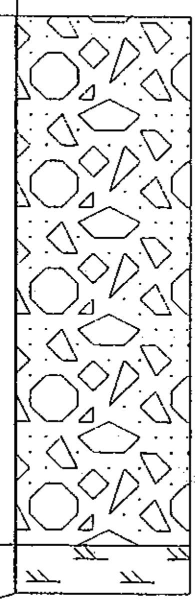
FIELD BOREHOLE LOG

BOREHOLE NUMBER: GP-19

PROJECT NUMBER:	80030-0003	START TIME	1330
PROJECT NAME:	124-136 Second Ave. (Gowanus)	END TIME	1415
LOCATION:	Brooklyn, NY	GROUND SURFACE ELEVATION:	0
DRILLING CO:			
DRILLING METHOD:	GeoProbe		
FIELD PARTY:			
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:	02/22/01	DATE COMPLETED:	02/22/01

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

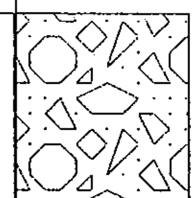
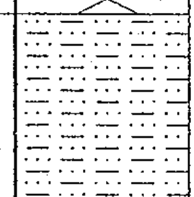
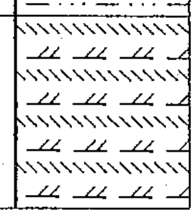
DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/40	3.0		fill: ash, coal fragments, red bricks, black to brownish gray silty sand	
8.0		48/36	2.5			
12.0	GP19	48/36	3.0			
					peat	
16.0						



AKRF, INC. Environmental Consultants	**FIELD BOREHOLE LOG**	BOREHOLE NUMBER GP-20

PROJECT NUMBER:	80030-0003	START TIME	1420
PROJECT NAME:	124-136 Second Ave. (Gowanus)	END TIME	1515
LOCATION:	Brooklyn, NY	GROUND SURFACE ELEVATION:	0
DRILLING CO:			
DRILLING METHOD:	GeoProbe		
FIELD PARTY:			
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN: 02/22/01	DATE COMPLETED: 02/22/01		

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0						
4.0		48/48			fill: coal fragments, ash, red bricks, black silty sand	
8.0		48/36			silty sand: brownish gray silty sand, dense, peat at tip of sampler	
12.0	GP20	48/48			clay and peat: dense peat and clay	
16.0						

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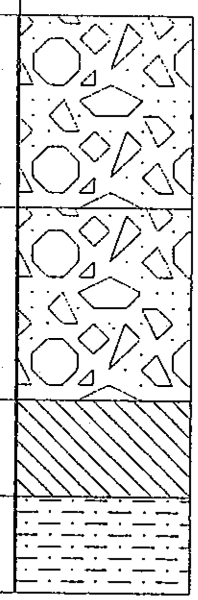
FIELD BOREHOLE LOG

BOREHOLE NUMBER
GP-21

PROJECT NUMBER:	80030-0003	START TIME	0815
PROJECT NAME:	124-136 Second Ave. (Gowanus)	END TIME	0830
LOCATION:	Brooklyn, NY	GROUND SURFACE ELEVATION:	0
DRILLING CO:			
DRILLING METHOD:	GeoProbe		
FIELD PARTY:			
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:	02/27/01	DATE COMPLETED:	02/27/01

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/46	2		fill: red brick fragments, ash, coal fragments	
8.0		48/24	12		fill: red brick fragments, ash, coal fragments, free product in lower 6 in.	
	GP21			FREE PRODUCT		
12.0		48/42	9		clay: very dense gray clay	
					silt: dense brownish grey silt, peat at tip of liner	
16.0						



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FIELD BOREHOLE LOG

BOREHOLE NUMBER
GP-22

PROJECT NUMBER: 80030-0003
PROJECT NAME: 124-136 Second Ave. (Gowanus)
LOCATION: Brooklyn, NY
DRILLING CO:
DRILLING METHOD: GeoProbe
FIELD PARTY:
GEOLOGIST: MOHAMED AHMED
DATE BEGUN: 02/27/01 DATE COMPLETED: 02/27/01

START TIME: 0835
END TIME: 0850
GROUND SURFACE ELEVATION: 0

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0	GP22	48/42	65	FREE PRODUCT	fill: ash, coal fragments, black silty sand, loose, free product	
8.0		48/36	11	FREE PRODUCT	fill: ash, coal fragments, black silty sand, loose, free product	
12.0		48/48	ND		clay and peat: very dense clay and peat	
16.0						

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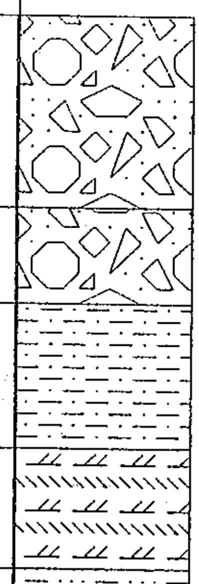
FIELD BOREHOLE LOG

BOREHOLE NUMBER: GP-25

PROJECT NUMBER:	80030-0003	START TIME	1000
PROJECT NAME:	124-136 Second Ave. (Gowanus)	END TIME	1045
LOCATION:	Brooklyn, NY	GROUND SURFACE ELEVATION:	0
DRILLING CO:			
DRILLING METHOD:	GeoProbe		
FIELD PARTY:			
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:	02/27/01	DATE COMPLETED:	02/27/01

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/46	55	FREE PRODUCT	fill: ash, coal fragments, wood, black silty sand stained with free product	
8.0		48/36	22	FREE PRODUCT	fill: ash, coal fragments, wood, black silty sand stained with free product	
					silt: brownish gray dense silt	
12.0	GP25	48/48	76			
					clay and peat: dense clay and peat	
				FREE PRODUCT	silty sand: black silty sand with free product	
16.0						



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FIELD BOREHOLE LOG

BOREHOLE NUMBER: GP-27

PROJECT NUMBER:	80030-0003	START TIME	1130
PROJECT NAME:	124-136 Second Ave. (Gowanus)	END TIME	1215
LOCATION:	Brooklyn, NY	GROUND SURFACE ELEVATION:	0
DRILLING CO:			
DRILLING METHOD:	GeoProbe		
FIELD PARTY:			
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:	02/27/01	DATE COMPLETED:	02/2701

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY	
0.0					fill, not sampled		
4.0		48/24	ND		fill: red bricks, concrete [and] coal fragments, ash		
8.0		48/0		no recovery	(no recovery, void)		
12.0		48/48	ND		silt: light gray dense silt; peat at tip of sampler		
16.0					peat		

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FIELD BOREHOLE LOG

BOREHOLE NUMBER: GP-28

PROJECT NUMBER:	80030-0003
PROJECT NAME:	124-136 Second Ave. (Gowanus)
LOCATION:	Brooklyn, NY
DRILLING CO:	
DRILLING METHOD:	GeoProbe
FIELD PARTY:	
GEOLOGIST:	MOHAMED AHMED
DATE BEGUN:	02/27/01
DATE COMPLETED:	02/27/01
START TIME	1230
END TIME	1255
GROUND SURFACE ELEVATION:	0

STATIC WATER LEVEL (BLS)

Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/46	ND		fill: red brick, concrete, ash, wood;	
8.0		48/48	ND		silt: brownish gray to light gray dense silt	
12.0		48/48	14			
	GP28				clay and peat: dense clay and peat	
16.0						

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FIELD BOREHOLE LOG

BOREHOLE NUMBER: GP-30

PROJECT NUMBER:	80030-0003	START TIME	1305
PROJECT NAME:	124-136 Second Ave. (Gowanus)	END TIME	1320
LOCATION:	Brooklyn, NY	GROUND SURFACE ELEVATION:	0
DRILLING CO:			
DRILLING METHOD:	GeoProbe		
FIELD PARTY:			
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:	02/27/01	DATE COMPLETED:	02/27/01

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/48	ND		fill: brick, concrete, wood	
					clay and peat: dense clay and peat	
8.0		48/46	ND		clay and peat	
12.0				end of boring		
16.0						

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FIELD BOREHOLE LOG

BOREHOLE NUMBER: GP-32

PROJECT NUMBER:	80030-0003	START TIME	1255
PROJECT NAME:	124-136 Second Ave. (Gowanus)	END TIME	1345
LOCATION:	Brooklyn, NY	GROUND SURFACE ELEVATION:	0
DRILLING CO:			
DRILLING METHOD:	GeoProbe		
FIELD PARTY:			
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:	02/21/01	DATE COMPLETED:	02/21/01

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY	
0.0				2 ft. NW of flag--refusal at -4 ft.; [sampling location] 3 ft. SW of flag	fill, not sampled		
4.0	GP32	48/42	382	odor; sheen on liner	sand: black sand--strong odor, some dark brown sand and silt at -4 ft., fine gravel at -8 ft.; sheen on liner		
8.0		48/12	63.8	odor	sand: black sand--odor		
12.0		48/48	0		sand and silt: silt and fine to medium sand, black		
					peat: tan peat		
16.0							

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FIELD BOREHOLE LOG

BOREHOLE NUMBER: GP-33

PROJECT NUMBER: 80030-0003
PROJECT NAME: 124-136 Second Ave. (Gowanus)
LOCATION: Brooklyn, NY
DRILLING CO:
DRILLING METHOD: GeoProbe
FIELD PARTY:
GEOLOGIST: MOHAMED AHMED
DATE BEGUN: 02/21/01 DATE COMPLETED: 02/21/01

START TIME: 1215
END TIME: 1250
GROUND SURFACE ELEVATION: 0

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

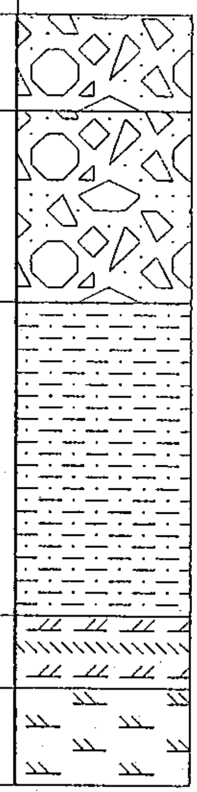
DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0				[sampling location] 3 ft. SE of flag	fill, not sampled	
4.0	GP33	48/48	14		sand: dark brown sand; some staining at 6 ft.; 2 in of wet peat or other organic at -6 ft.	
				staining	sand: medium coarse sand and fine gravel	
8.0		48/12	4.4		gravel: gray/black fine gravel and sand	
12.0		48/30	1.9			
					peat: brown/tan peat	
16.0						

AKRF, INC. Environmental Consultants	FIELD BOREHOLE LOG	BOREHOLE NUMBER GP-41

PROJECT NUMBER:	80030-0003	START TIME	1300
PROJECT NAME:	124-136 Second Ave. (Gowanus)	END TIME	1345
LOCATION:	Brooklyn, NY	GROUND SURFACE ELEVATION:	0
DRILLING CO:			
DRILLING METHOD:	GeoProbe		
FIELD PARTY:			
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN: 03/01/01	DATE COMPLETED: 03/01/01		

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/36	ND		fill: red brick, gray silty sand	
					fill: cinders, ash, coal fragments, black silty sand	
8.0		48/48	ND			
					silt: reddish briown dense silt	
12.0		48/24	ND			
16.0		48/40	ND			
					clay and peat: dense clay and peat	
					peat	
20.0						



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FIELD BOREHOLE LOG

BOREHOLE NUMBER: GP-42

PROJECT NUMBER: 80030-0003
PROJECT NAME: 124-136 Second Ave. (Gowanus)
LOCATION: Brooklyn, NY
DRILLING CO:
DRILLING METHOD: GeoProbe
FIELD PARTY:
GEOLOGIST: MOHAMED AHMED
DATE BEGUN: 03/01/01 DATE COMPLETED: 03/01/01

START TIME: 1400
END TIME: 1405
GROUND SURFACE ELEVATION: 0

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/24	ND		fill: cinders, ash, coal fragments	
8.0		48/24	ND		fill: black silty sand, red bricks	
12.0		48/10	ND		silt: reddish brown loose silt	
16.0		48/40	ND		clay and peat	
					peat	
20.0						

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FIELD BOREHOLE LOG

BOREHOLE NUMBER
GP-44

PROJECT NUMBER:	80030-0003	START TIME	1440
PROJECT NAME:	124-136 Second Ave. (Gowanus)	END TIME	
LOCATION:	Brooklyn, NY	GROUND SURFACE ELEVATION:	0
DRILLING CO:			
DRILLING METHOD:	GeoProbe		
FIELD PARTY:			
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:	03/01/01	DATE COMPLETED:	03/01/01

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

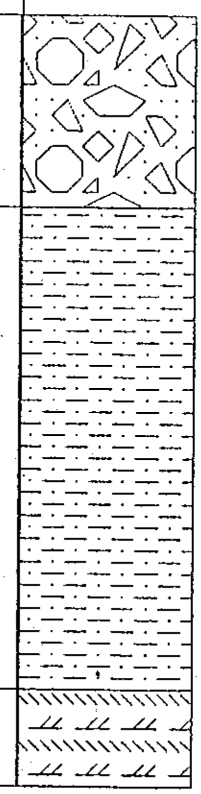
DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/20	9.0		fill: red brick, glass, ash, gray silty sand	
				FREE PRODUCT	silty sand: black silty sand, free product	
8.0		48/46		FREE PRODUCT		
	GP44					
			30			
					silt: gray loose silt	
12.0		48/46	1.6	FREE PRODUCT	silt: reddish brown silt, free product; peat at tip of liner	
16.0					peat	

AKRF, INC. Environmental Consultants	FIELD BOREHOLE LOG	BOREHOLE NUMBER GP-45

PROJECT NUMBER:	80030-0003	START TIME	
PROJECT NAME:	124-136 Second Ave. (Gowanus)	END TIME	
LOCATION:	Brooklyn, NY	GROUND SURFACE ELEVATION:	0
DRILLING CO:			
DRILLING METHOD:	GeoProbe		
FIELD PARTY:			
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:	03/02/01	DATE COMPLETED:	03/02/01

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/44	ND		fill: ash, red bricks, gray silty sand	
8.0		48/42	ND		silt: reddish brown loose silt	
12.0		48/48	ND			
16.0		48/48	ND			
					clay and peat	
20.0						



AKRF, INC. Environmental Consultants	FIELD BOREHOLE LOG	BOREHOLE NUMBER GP-46

PROJECT NUMBER:	80030-0003	START TIME	
PROJECT NAME:	124-136 Second Ave. (Gowanus)	END TIME	
LOCATION:	Brooklyn, NY	GROUND SURFACE ELEVATION:	0
DRILLING CO:			
DRILLING METHOD:	GeoProbe		
FIELD PARTY:			
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN: 03/01/01	DATE COMPLETED: 03/01/01		

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/46	46		fill: concrete, ash , red bricks	
	GP46				sand: black to reddish gray silty sand	
8.0		48/42	ND		silt: reddish brown loose silt; peat at lower 3 in.	
12.0		48/24	ND			
16.0		48/24	ND			
20.0					peat	

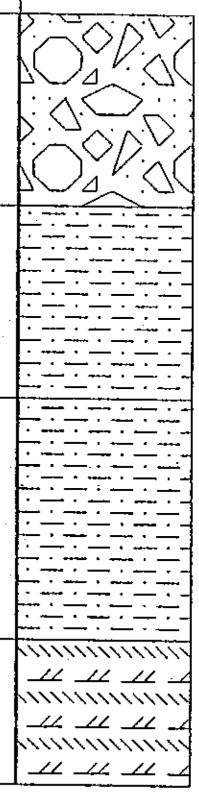
AKRF, INC. Environmental Consultants	FIELD BOREHOLE LOG	BOREHOLE NUMBER GP-47

PROJECT NUMBER: 80030-0003
PROJECT NAME: 124-136 Second Ave. (Gowanus)
LOCATION: Brooklyn, NY
DRILLING CO:
DRILLING METHOD: GeoProbe
FIELD PARTY:
GEOLOGIST: MOHAMED AHMED
DATE BEGUN: 03/02/01 DATE COMPLETED: 03/02/01

START TIME
END TIME
GROUND SURFACE ELEVATION: 0

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/42	ND		fill: concrete, ash, red brick, yellow silt	
8.0		48/30	ND		silt: gray loose silt	
12.0		48/15	ND		silt: reddish brown loose silt	
16.0		48/48	ND		clay and peat	
20.0						



AKRF, INC. Environmental Consultants	FIELD BOREHOLE LOG	BOREHOLE NUMBER GP-48

PROJECT NUMBER: 80030-0003

PROJECT NAME: 124-136 Second Ave. (Gowanus)

LOCATION: Brooklyn, NY

DRILLING CO:

DRILLING METHOD: GeoProbe

FIELD PARTY:

GEOLOGIST: MOHAMED AHMED

DATE BEGUN: 03/02/01 DATE COMPLETED: 03/02/01

START TIME

END TIME

GROUND SURFACE ELEVATION: 0

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/46	ND		fill: cinders, ash, wood, red bricks, concrete chips	
8.0		48/46	ND		silt: reddish brown loose silt	
12.0		48/44	ND		clay and peat	
16.0						

AKRF, INC. Environmental Consultants	FIELD BOREHOLE LOG	BOREHOLE NUMBER GP-49

PROJECT NUMBER: 80030-0003

PROJECT NAME: 124-136 Second Ave. (Gowanus)

LOCATION: Brooklyn, NY

DRILLING CO:

DRILLING METHOD: GeoProbe

FIELD PARTY:

GEOLOGIST: MOHAMED AHMED

DATE BEGUN: 03/02/01 DATE COMPLETED: 03/02/01

START TIME

END TIME

GROUND SURFACE ELEVATION: 0

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/48	ND		fill: concrete chips, ash, gray silty sand	
					clay: dense clay; peat at tip of sampler	
8.0		48/48	ND		clay and peat	
12.0						

AKRF, INC. Environmental Consultants	FIELD BOREHOLE LOG	BOREHOLE NUMBER GP-50

PROJECT NUMBER: 80030-0003

PROJECT NAME: 124-136 Second Ave. (Gowanus)

LOCATION: Brooklyn, NY

DRILLING CO:

DRILLING METHOD: GeoProbe

FIELD PARTY:

GEOLOGIST: MOHAMED AHMED

DATE BEGUN: DATE COMPLETED:

START TIME

END TIME

GROUND SURFACE ELEVATION: 0

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/30	ND		fill: concrete, red brick, black silty sand	
8.0		48/36	ND			
12.0		48/36	ND		silt: reddish/brown loose silt	
16.0		48/40	ND			
					clay and peat	
20.0						

AKRF, INC. Environmental Consultants	FIELD BOREHOLE LOG	BOREHOLE NUMBER GP-51

PROJECT NUMBER: 80030-0003

PROJECT NAME: 124-136 Second Ave. (Gowanus)

LOCATION: Brooklyn, NY

DRILLING CO:

DRILLING METHOD: GeoProbe

FIELD PARTY:

GEOLOGIST: MOHAMED AHMED

DATE BEGUN: 03/02/01 DATE COMPLETED: 03/02/01

START TIME

END TIME

GROUND SURFACE ELEVATION: 0

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0		48/36	ND		fill: concrete, red brick, ash, gray silty sand	
8.0		48/48	ND		silt: reddish brown loose silt	
12.0		48/24	ND			
16.0		48/48	ND		clay: dense clay	
					clay and peat	
20.0						

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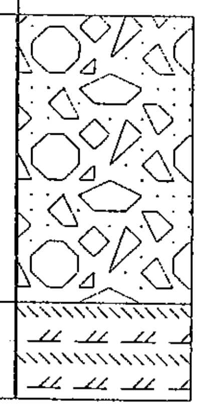
FIELD BOREHOLE LOG

BOREHOLE NUMBER: GP-53

PROJECT NUMBER:	80030-0003	START TIME	
PROJECT NAME:	124-136 Second Ave. (Gowanus)	END TIME	
LOCATION:	Brooklyn, NY	GROUND SURFACE ELEVATION:	0
DRILLING CO:			
DRILLING METHOD:	GeoProbe		
FIELD PARTY:			
GEOLOGIST:	MOHAMED AHMED		
DATE BEGUN:		DATE COMPLETED:	

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY	
0.0					fill, not sampled		
4.0		48/48	ND		fill: concrete chips, cinder, ash, gray silty sand		
8.0		48/48	ND				
10.0					clay and peat		
12.0							
16.0							



AKRF, INC. Environmental Consultants	FIELD BOREHOLE LOG	BOREHOLE NUMBER GP-54

PROJECT NUMBER: 80030-0003
PROJECT NAME: 124-136 Second Ave. (Gowanus)
LOCATION: Brooklyn, NY
DRILLING CO:
DRILLING METHOD: GeoProbe
FIELD PARTY:
GEOLOGIST: MOHAMED AHMED
DATE BEGUN: 03/02/01 DATE COMPLETED: 03/02/01

START TIME
END TIME
GROUND SURFACE ELEVATION: 0

STATIC WATER LEVEL (BLS)		
Depth (ft)	NA	
Time	NA	
Date	NA	

DEPTH (ft)	SAMPLE NUMBER	RECOVERY(in) [driven/recovered]	PID(ppm)	REMARKS	DESCRIPTION	LITHOLOGY
0.0					fill, not sampled	
4.0	GP54	48/46	324	FREE PRODUCT	silty sand: dark black silty sand, fill, red brick, free product	
8.0		48/24	159	FREE PRODUCT	silty sand: dark black silty sand, fill, red brick, free product	
12.0		48/24	227	FREE PRODUCT	silty sand: dark black silty sand, fill, red brick, free product	
16.0						

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LOG OF BORING LB1

SHEET 1 OF 2

PROJECT: Loews @ Gowanus	PROJECT NO.: 1531601
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: approx. el 11 [BBHDD]
DRILLING EQUIPMENT: Davey Kent DK50RA Track Rig	DATE STARTED: 12/9/98 — DATE FINISHED: 12/11/98 — COMPLETION DEPTH: 81 ft.
SIZE AND TYPE OF BIT: 4 7/8" and 3 7/8" Tri-Cone Roller Bits	NUMBER OF SAMPLES: DIST. 21 — UNDIST. ----- — CORE -----
CASING DIAMETER (in): 4 1/2" OD 4" ID — CASING DEPTH (ft): 18.5	WATER LEVEL (ft.): FIRST ▽ ----- — COMPL. ▼ ----- — 24 HR. ▼ 8.5
SAMPLER: Standard Split Spoon (SS) or Shelby Tube (ST)	DRILLING FOREMAN: Tom Gregory/Kurt Conlon
SAMPLER HAMMER: WEIGHT (lbs) 140 — DROP (in) 30	INSPECTING ENGINEER: Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
								*New York City BC Classification numbers in parenthesis
el 11	Inferred 4.5" CONCRETE							
	Brown f.-m. SAND, trace c. sand, f. gravel, and silt (11-65)*		S1	SS	4.5	10 24 24 100/3"	48	Hard slow drilling on concrete first 4.5" S1 SS Tip plugged with rocklike material (in S1 jar) PID = 580 ppm Added water D=0.25' Spoon refusal D=2' Rig chatter D=2' Petroleum like material floating in wash tub D=5'
	Brown f.-m. SAND, trace c. sand (11-65)	5	S2	SS	8	10 11 7 8	18	PID = 820 ppm
	Brown f.-m. SAND, trace c. sand (11-65)	10	S3 S4	SS	11	2 3 3 2	6	Started casing D=10' PID = 320 ppm PID = 420 ppm
0.0	Brown f.-m. SAND, trace organics/root, f.-m. gravel, clay, silt, and c. sand (11-65)							Advanced casing D=10'-13.5'
	Gray silty CLAY, some organics/root (11-65)	15	S5	SS	16	2 1 1 2	2	PP = 0.3-0.6 tsf PID = 150 ppm
	Gray silty CLAY, trace organics/root (11-65)		T1	ST	30	PUSH PUSH PUSH PUSH		PP = 0.2-0.3 tsf TV = 0.23 tsf WOH : Weight of Hammer
	Gray silty CLAY, trace organics/root (11-65)	20	S6	SS	24	WOH 2 3 4	5	PP = 0.2-0.3 tsf PID = 480 ppm
	Brown SILT, trace f. sand and clay (10-65)	25	S7	SS	17	8 7 14 21	21	PID = 860 ppm
	Brown/gray CLAY and SILT, trace f. sand (10-65)	30	S8 S9 S10	SS	16	8 8 7 10	15	S8 4" Lense of Brown f. SAND, trace silt and clay (8-65) w/ PID = 580 ppm in top of SS PP = 1.2-2.1 tsf PID = 720 ppm S10 2" Gray f. SAND, trace clay and silt w/ PID = 850 ppm in bottom of SS Visible petroleum like material D=30'-32'
	Brown f. SAND, trace silt and clay (8-65)	35	S11	SS	15	14 20 22 16	42	PID = 380 ppm
	Brown f. SAND, trace silt and clay (8-65)	40	S12	SS	16	12 13 12 13	25	Brown f. sandy SILT, trace clay in SS tip PID = 330 ppm Trace visible petroleum like material

BORING 1531601.GPJ

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PROJECT	Loews @ Gowanus	PROJECT NO.	1531601
LOCATION	Brooklyn, NY	ELEVATION AND DATUM	approx. el 11 (BBHDD)

ELEV. (ft)	SAMPLE DESCRIPTION	SYMBOL LOG	DEPTH SCALE	SAMPLE DATA NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Brown f. sandy SILT, trace clay (10-65)		45	S13	SS	17	17 17 15 20	32	PID = 570 ppm
	Brown SILT, trace clay and f. sand (10-65)		50	S15 S14	SS	15	14 15 22 26	37	PID = 540 ppm PID = 650 ppm Trace visible petroleum like material
	Brown f. SAND, trace silt (8-65)								
	Brown f. SAND, trace m. sand (7-65)		55	S16	SS	14.5	11 18 16 17	32	PID = 710 ppm
	Gray f. SAND, trace m.-c. sand (7-65)		60	S17	SS	13.5	15 22 20 22	42	Brown/gray SILT, trace f. sand and clay in SS tip PID = 530 ppm Trace visible petroleum like material near bottom of SS tip Minor on/off rig chatter D=60.5'-63'
	Brown f. sandy SILT, trace clay (10-65)		65	S18	SS	13	19 23 23 26	46	PID = 1240 ppm
	Red brown f. sandy SILT, some f. sand, trace clay (10-65)		70	S19	SS	15.5	20 29 28 26	57	PID = 950 ppm
	Inferred Red brown f.-c. SAND, trace f.-m. gravel (7-65)								On/off rig chatter D=73'-74.5' Slow/hard drilling D=74.5'-75.5' w/ rig chatter
	Inferred BOULDER (6-65)		75						
	Red brown f. SAND, trace silt, f. gravel, m.-c. sand, and clay (6-65)			S20	SS	13	51 66 100/3"	66/11"	PID = 900 ppm Spoon refusal D=77.5' Slow/hard drilling D=77.5'-78.75'
	Inferred BOULDER (6-65)								
	Red brown and brown f.-m. SAND, trace f.-m. gravel, c. sand, silt, and clay		80	S21	SS	24	19 41 36 36	77	PID = 1200 ppm
	Boring terminated D=81'		85						
			90						

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LOG OF BORING LB2

SHEET 1 OF 2

PROJECT	Loews @ Gowanus
PROJECT NO.	1531601
LOCATION	Brooklyn, NY
ELEVATION AND DATUM	approx. el 11 [BBHDD]
DRILLING EQUIPMENT	Davey Kent DK50RA Track Rig
DATE STARTED	12/8/98
DATE FINISHED	12/9/98
COMPLETION DEPTH	80 ft.
SIZE AND TYPE OF BIT	4 7/8" and 3 7/8" Tri-Cone Roller Bits
NUMBER OF SAMPLES	DIST. 20; UNDIST. ----; CORE ----
CASING DIAMETER (in)	4 1/2" OD 4" ID
CASING DEPTH (ft)	13.5
WATER LEVEL (ft.)	FIRST ----; COMPL. ----; 24 HR. 6.5
SAMPLER	2" OD 1 3/4" ID Split Spoon (SS)
DRILLING FOREMAN	Tom Gregory/Kurt Conlon
SAMPLER HAMMER	WEIGHT (lbs) 140; DROP (in) 30
INSPECTING ENGINEER	Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION
approx. el 11	4" CONCRETE
	Brown and black f. SAND, trace silt, f.-c. sand, f. gravel, and coal (11-65)*
	Black and brown c. SAND and f. GRAVEL/COAL, trace f.-m. sand and silt (11-65)
0.0	Gray silty CLAY, some brown peat, trace f. sand (11-65)
	Brown/black f. SAND, some silt, trace clay (11-65)
	Brown f. sandy SILT, trace clay (11-65)
	Gray/brown PEAT, trace f. sand, silt, and clay (11-65)
	Gray silty CLAY, trace organics/root (11-65)
	Gray f. SAND, some clay, trace silt (8-65)
	Brown/gray f. SAND, some silt, trace clay (8-65)
	Brown f.-m. sandy SILT, trace clay (10-65)
	Brown f. SAND, trace m. sand (7-65)
	Brown/gray f. SAND, trace m. sand, clay, and silt (8-65)

DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
0	S1	SS	13.5	32 28 24 24	52	*New York City BC Classification numbers in parenthesis Started drilling w/ water PID = 650 ppm On/off rig chatter D = 0.75'-5'
5	S2	SS	13	10 7 9 7	16	PID = 102 ppm
10	S3 S4	SS	8	2 1 4 8	5	PID = 9 ppm PID = 10.2 ppm
15	S5 S6	SS	18	3 3 3 4	6	PID = 19.6 ppm PID = 400 ppm Added mud D = 15'
20	S7 S8	SS	24	1 3 5 5	8	PP = 0.6 - 1.25 tsf PID = 19.7 ppm PID = 40 ppm
25	S9	SS	15	4 4 5 7	9	PID = 9 ppm
30	S10	SS	19.5	11 10 8 7	18	PID = 330 ppm Visible petroleum like material
35	S11	SS	16	14 16 22 24	38	PID = 800 ppm
40	S12	SS	18	5 7 12 16	19	PID = 20 ppm

BORING 1531601.GPJ LANGANFL.GDT 22/12/98

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PROJECT: Loews @ Gowanus
PROJECT NO.: 1531601
LOCATION: Brooklyn, NY
ELEVATION AND DATUM: approx. el 11 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLE DATA NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Brown f. sandy SILT, trace clay (10-65)	45	S13	SS	18	8 10 11 13	21	PID - 500 ppm
	Brown f. sandy SILT, trace clay (10-65)	50	S14	SS	14	18 19 22 28	41	PID = 1020 ppm
	Brown SILT, trace f. sand and clay (10-65)	55	S15	SS	17	19 24 24 25	48	PID - 830 ppm Gray/brown f. SAND, trace silt in S15 SS tip
	Brown f. SAND, trace m. sand and silt (7-65)	60	S16	SS	18	11 17 17 13	34	PID = 50 ppm Slightly visible petroleum like material
	Brown f. SAND, trace m.-c. sand, f. gravel, and silt (7-65)	65	S17	SS	14	17 44 44 24	88	PID = 600 ppm Visible petroleum like material
	Brown f.-m. SAND, trace c. sand, f. gravel, and silt (7-65)	70	S18	SS	5.5	14 13 16 22	29	PID = 880 ppm
	Inferred boulder (6-65)							Rig chatter D = 72.5' - 75' Very slow/hard drilling D = 72.5' - 73.5'
	Red brown f. SAND, some m.-c. gravel, trace silt, m.-c. sand, f. gravel, and clay (6-65)	75	S19	SS	11	22 26 32 23	58	PID = 500 ppm
	Red brown f. SAND, trace silt and clay (8-65)		S20	SS	6	32 32 25 29	57	PID > 2000 ppm
	Boring terminated D = 80'	80						Borehole grouted upon completion
		85						
		90						

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LOG OF BORING LB3

SHEET 1 OF 2

PROJECT: Loews @ Gowanus		PROJECT NO.: 1531601	
LOCATION: Brooklyn, NY		ELEVATION AND DATUM: approx. el 11 [BBHDD]	
DRILLING EQUIPMENT: Davey Kent DK50RA Track Rig		DATE STARTED: 12/8/98 · DATE FINISHED: 12/9/98	COMPLETION DEPTH: 80.5 ft.
SIZE AND TYPE OF BIT: HW Rock Core and Tri-Cone Roller Bits		NUMBER OF SAMPLES: DIST. 18 · UNDIST. ----	CORE: -----
CASING DIAMETER (in): 4 1/2" OD 4" ID	CASING DEPTH (ft): 19.5	WATER LEVEL (ft.): FIRST ---- · COMPL. ----	24 HR. 2.6
SAMPLER: 2" OD 1 3/4" ID Split Spoon (SS)		DRILLING FOREMAN: Gus Suri/Mike Chizmar	
SAMPLER HAMMER: WEIGHT (lbs) 140	DROP (in) 30	INSPECTING ENGINEER: Gary L. Gleason	

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
approx. el 11	6" CONCRETE w/ wire mesh							*New York City BC Classification numbers in parenthesis Started coring w/ water
	Inferred miscellaneous FILL (11-65)* Black/gray f.-m. SAND, trace silt, c. sand, f. gravel, and coal (11-65)		S1	SS	8	25 33 44 93	77	PID = 125 ppm Slightly visible petroleum like material On/off rig chatter D = 1' - 5'
	Brown f.-m. SAND, trace red brick and silt (11-65)	5	S2	SS	3	21 28 20 12	48	Petroleum like material floating in wash tub D = 5' PID = 84 ppm
	Brown c. SAND, some f. gravel, trace clay, silt, and f.-m. sand (11-65)	10	S3	SS	8	15 4 4 7	8	PID = 155 ppm Slightly visible petroleum like material
	Brown f.-c. SAND, some gravel, trace clay and silt (11-65)	15	S4	SS	4	5 2 3 4	5	Added mud D = 15' PID = 55 ppm Slightly visible petroleum like material
	Brown f.-c. SAND and f. GRAVEL, some clay, trace silt (11-65) Inferred CONCRETE	20	S5	SS	2.5	102/2.5	Refusa	Refusal D = 20' Hard drilling D = 20.25' - 20.75' PID = 340 ppm Visible petroleum like material Added mud D = 20'
	Brown SILT, trace clay, f. sand, and f. gravel (10-65)	25	S6	SS	7	6 10 8 13	18	PID = 220 ppm
	Brown/gray SILT, trace clay and f. sand (10-65)	30	S7	SS	11	5 8 7 7	15	Hole too tight D = 23' to get rods down so removed existing casing and drilled to D = 30' w/ 4 7/8" bit, then spun/cored casing to D = 19.5' PID = 45 ppm Slightly visible petroleum like material
	Brown f. SAND, trace silt and clay (8-65)	35	S8	SS	10	3 4 4 12	8	PID = 480 ppm
	Brown f. sandy SILT, trace clay (10-65)	40	S9	SS	14	7 12 12 14	24	PID = 640 ppm

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LOG OF BORING LB3

PROJECT: Loews @ Gowanus	PROJECT NO.: 1531601
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: approx. el 11 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Brown f. SAND, trace silt (8-65)	45	S11 S10	SS	12	11 10 10 10	20	]PID 25 ppm S11 4" Lense of brown SILT, trace clay and f. sand (10-65) w/ PID = 55 ppm in bottom of SS
	Brown f.-m. SAND (7-65)	50	S12	SS	14	10 11 12 17	23	PID = 90 ppm
	Brown f. SAND, trace m.-c. sand (7-65)	55	S13	SS	8.5	11 14 19 17	33	PID = 9.8 ppm
	Brown f. SAND, trace m.-c. sand and silt (7-65)	60	S15 S14	SS	11.5	15 17 17 19	34	PID = 280 ppm PID = 210 ppm
	Brown/gray SILT, trace clay and f. sand (10-65)							
	Red brown f. SAND, some silt, trace f. gravel, m.-c. sand, and clay (7-65)	65	S16	SS	5	23 100/3"	100/3"	Spoon refusal D = 66' w/ bouncing Rig chatter D = 66' PID = 95 ppm
	Red brown f.-m. SAND, trace c. sand and f. gravel (7-65)	70	S18 S17	SS	8	17 40 22 21	62	PID = 510 ppm PID = 800 ppm
	Red brown SILT, trace f. gravel, f.-c. sand, and clay (10-65)							Minor on/off rig chatter D = 72' - 76.5'
		75						
	Inferred BOULDER							Slow/hard drilling D = 76.5' - 79' w/ minor rig chatter
	Inferred Red brown f.-c. SAND, trace f. gravel, silt, and clay (7-65)	80		SS	0	58 53 100/3"	53/11"	Spoon refusal D = 80.5' Borehole grouted upon completion
	Boring terminated D=80.5'							
		85						
		90						

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LOG OF BORING LB4

SHEET 1 OF 2

PROJECT: Loews @ Gowanus	PROJECT NO.: 1531601
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: approx. el 11 [BBHDD]
DRILLING EQUIPMENT: Davey Kent DK50RA Track Rig	DATE STARTED: 12/3/98 — DATE FINISHED: 12/7/98 — COMPLETION DEPTH: 80 ft.
SIZE AND TYPE OF BIT: HW and NQ Rock Cores and Tri-Cone Roller Bits	NUMBER OF SAMPLES: DIST. 16 — UNDIST. ---- — CORE ----
CASING DIAMETER (in): 4 1/2" OD 4" ID — CASING DEPTH(ft): 24	WATER LEVEL (ft.): FIRST ----- — COMPL. ----- — 24 HR. 6.7
SAMPLER: Standard Split Spoon (SS) or Shelby Tube (ST)	DRILLING FOREMAN: Gus Suri/Mike Chizmar
SAMPLER HAMMER: WEIGHT(lbs) 140 — DROP(in) 30	INSPECTING ENGINEER: Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
approx. el 11	5.5" CONCRETE w/ wire mesh							*New York City BC Classification numbers in parenthesis
	Inferred miscellaneous FILL (11-65)*							
0.0	Black/brown f.-c. SAND, trace silt, red brick, f.-c. gravel/coal (11-65)		S1	SS	8	17 82 85/1.5"	57/7.5"	Started coring with water Spoon refusal D=2' PID = 400 ppm COBBLE fragment in D=1'-3' SS tip
	Very c. CONCRETE	5						Lost majority of water D=2'-12'
		10						
	Inferred CONCRETE							Hard/slow drilling D=12'-13.5' Broke through concrete D=13.5'
	Inferred WOOD (11-65)	15						WOOD in wash D=13.5'-25' w/ slow drilling
	WOOD FIBERS, trace gray f. sand (11-65)		S2	ST	5	PUSH PUSH PUSH PUSH		One bend/dent in end of tube D=17'-19' PID = 58 ppm Petroleum like material odor
		20						Added mud D~20'
	WOOD FIBERS (11-65)		S3	SS	3	12 10 10 11	20	PID = 7.2 ppm Petroleum like material odor
	WOOD FIBERS (11-65)	25						Petroleum like material odor D=25'-25.5'
	Brown f. SAND, trace silt and clay (8-65)		S4	SS	14	19 22 23 24	45	PID = 5.4 ppm
	Brown f. SAND, trace silt (8-65)	30	S5	SS	10	13 20 20 15	40	PID = 148 ppm Visible petroleum like material Visible petroleum like material
	Brown f. SAND, trace silt (8-65)	35	S6	SS	7	9 8 8 7	16	PID = 90 ppm Visible petroleum like material Visible petroleum like material
	Brown f. SAND, trace m. sand, silt, and clay (7-65)	40	S7	SS	14.5	10 10 12 12	22	PID = 9.2 ppm

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LOG OF BORING LB4
SHEET 2 OF 2

PROJECT	Loews @ Gowanus	PROJECT NO.	1531601
LOCATION	Brooklyn, NY	ELEVATION AND DATUM	approx. el 11 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	SYMBOL LOG	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Brown f. SAND, trace silt and clay (8-65)		45	S8	SS	16	9 12 17 18	29	PID = 1.8 ppm
	Brown SILT, some f. sand, trace m. sand and clay (10-65)		50	S9	SS	15.5	13 15 21 21	36	PID = 368 ppm
	Brown f. sandy SILT, trace m. sand (10-65)		55	S11 S10	SS	11	13 18 18 18	36	PID = 7 ppm PID = 13.5 ppm
	Brown f. SAND, trace m. sand and silt (7-65)								
	Brown/gray f. SAND, trace m. sand and silt (7-65)		60	S12	SS	11	12 16 16 15	32	PID = 5.2 ppm Slightly visible petroleum like material
									Rig chatter D=64.5'-65'
	Red brown f.-m. SAND, trace f. gravel, c. sand, silt, and clay (7-65)		65	S13	SS	11	25 39 33 45	72	PID = 780 ppm On/off rig chatter D=65'-70'
	Red brown f.-m. SAND, trace f.-m. gravel, c. sand, and silt (7-65)		70	S14	SS	12	32 55 56 87	111	Added mud D = 70' PID = 1 ppm On/off rig chatter D=70'-75'
	Red brown c. SAND, some f.-m. sand and f.-m. gravel, trace silt (6-65)		75	S15	SS	2.5	100/4.5"	R*	*Spoon refusal D=75.5' PID = 4.6 ppm On/off rig chatter D=75'-78'
	Red brown f.-m. gravelly f.-m. SAND, trace c. sand and silt (6-65)			S16	SS	14.5	40 53 87 102	140	C. GRAVEL in S16 SS tip PID = 0.4 ppm Borehole grouted upon completion
	Boring terminated D=80'		80						
			85						
			90						

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LOG OF BORING LB5
SHEET 1 OF 2

PROJECT: Loews @ Gowanus	PROJECT NO.: 1531601
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: approx. el 11 [BBHDD]
DRILLING EQUIPMENT: Davey Kent DK50RA Track Rig	DATE STARTED: 12/4/98 · DATE FINISHED: 12/8/98 · COMPLETION DEPTH: 80 ft.
SIZE AND TYPE OF BIT: 4 7/8" and 3 7/8" Tri-Cone Roller Bits	NUMBER OF SAMPLES: DIST. 15 · UNDIST. ----- · CORE -----
CASING DIAMETER (in): 4 1/2" OD 4" ID · CASING DEPTH (ft): 30.5	WATER LEVEL (ft.): FIRST ----- · COMPL. ----- · 24 HR. 6.4
SAMPLER: 2" OD 1 3/4" ID Split Spoon (SS)	DRILLING FOREMAN: Tom Gregory/Kurt Conlon
SAMPLER HAMMER: WEIGHT (lbs) 140 · DROP (in) 30	INSPECTING ENGINEER: Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
approx. el 11	4.5" CONCRETE							*New York City BC Classification numbers in parenthesis Began drilling with water
	5.5" DENSE GRADED AGGREGATE		S1	SS	0	50/0.5"	R*	*Spoon refusal D=1' 50/0.5" w/ bouncing PID = 49 ppm Sample S1 Gray f.-c. SAND and c. GRAVEL FRAGMENT, trace silt from SS tip
	3.5" CONCRETE							
0.0	2.5" DENSE GRADED AGGREGATE							
	Red BRICK (11-65)*							Hard/slow drilling w/ on/off rig chatter D=1'-5' and Red wash water D~2.5'-5'
	Inferred Red BRICK	5						
	(Red f.-c. SAND, trace silt and clay) Inferred red BRICK (11-65)		S2	SS	4	90/4"	R*	*Spoon refusal D=5.5' 90/4" w/ bouncing PID ~ 20 + ppm Hard/slow drilling w/ on/off rig chatter and red wash water D=5'-10'
	(Red f.-c. SAND, trace f. gravel and silt) Inferred red BRICK (11-65)	10	S3	SS	3	100/3"	R*	*Spoon refusal D=10' 100/3" w/ bouncing PID = 21 ppm Hard/slow drilling w/ on/off rig chatter and red wash water D=10'-27.5'
	Inferred red BRICK (11-65)	15						
	Inferred red BRICK (11-65)	20						
	Inferred red BRICK (11-65)	25						Petroleum like material in wash water D=27.5' Hard drilling D=28'-28.5'
	Gray f.-m. SAND, trace c. sand (11-65)	30	S4	SS	17	3 3 9 18	12	PID = 20 ppm Visible petroleum like material Gray f. sandy SILT, trace clay and m. sand in S4 SS tip Added mud D=30'
	Gray silty CLAY, trace f. sand (11-65)	35	S5 S6	SS	19	4 5 23 28	28	PP = 1.2-1.5 tsf PID = 9.8 ppm PID = 180 ppm
	Gray/brown f. SAND, trace m. sand and silt (7-65)							
	Brown/gray silty f. SAND (8-65)	40	S7	SS	13	11 11 13 11	24	PID = 1.1 ppm

BORING 1531601.GPJ LANGANFL.GDT 7/1/99

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LOG OF BORING LB5

SHEET 2 OF 2

PROJECT: Loews @ Gowanus	PROJECT NO.: 1531601
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: approx. el 11 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	SYMBOL LOG	DEPTH SCALE	SAMPLE DATA: NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Brown/gray SILT, some f. sand, trace clay (10-65)		45	S8	SS	12.5	11 15 19 24	34	PP = No reading PID = 400 ppm
	Gray/brown f. SAND, some silt, trace m. sand (7-65)		50	S9	SS	15	13 19 22 23	41	PID = 1.2 ppm
	Gray/brown f.-m. SAND, trace silt (7-65)		55	S10	SS	8	8 16 19 22	35	PID = 2.2 ppm Hard drilling D=58'-60'
	Brown f.-c. SAND, trace f.-m. gravel and silt (6-65)		60	S11	SS	9	12 17 27 38	44	PID = 0.4 ppm On/off rig chatter D=60'-65'
	Red brown f. SAND, some silt, trace m.-c. sand and f. gravel (7-65)		65	S12	SS	15	19 20 25 26	45	PID = 8.2 ppm On/off rig chatter D=65'-70'
	Red brown f.-m. SAND, some f.-m. gravel, trace c. sand and silt (6-65)		70	S13	SS	6	62 35 67 31	102	PID = 3.3 ppm On/off rig chatter D = 70'-75'
	Red brown f.-c. SAND, trace f.-m. gravel and silt (6-65)		75	S14	SS	7	22 49 25 13	74	PID = 0.4 ppm On/off rig chatter D=75'-78'
	Red brown f.-m. SAND, trace silt, c. sand, and f. gravel (7-65)			S15	SS	8	26 24 28 15	52	PID = 340 ppm
	Boring terminated D=80'		80						Borehole grouted upon completion
			85						
			90						

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LOG OF BORING LB6

SHEET 1 OF 2

PROJECT: Loews @ Gowanus	PROJECT NO.: 1531601
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: approx. el 11 [BBHDD]
DRILLING EQUIPMENT: Davey Kent DK50RA Track Rig	DATE STARTED: 11/24/98; DATE FINISHED: 11/25/98; COMPLETION DEPTH: 77 ft.
SIZE AND TYPE OF BIT: HW Rock Core and Tri-Cone Roller Bits	NUMBER OF SAMPLES: DIST. 16; UNDIST. -----; CORE -----
CASING DIAMETER (in): 4 1/2" OD 4" ID; CASING DEPTH (ft): 13.5	WATER LEVEL (ft.): FIRST -----; COMPL. -----; 24 HR. 3.8
SAMPLER: 2" OD 1 3/4" ID Split Spoon (SS)	DRILLING FOREMAN: Gus Suri/Mike Chizmar
SAMPLER HAMMER: WEIGHT (lbs) 140; DROP (in) 30	INSPECTING ENGINEER: Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
approx. el 11	5" CONCRETE w/ wire mesh Inferred Miscellaneous FILL (11-65)* Black/brown f.-c. SAND, trace f.-c. gravel/coal and silt (11-65)		S1	SS	14	24 21 14 12	35	*New York City BC Classification numbers in parenthesis Started coring w/ water PID = 16.4 ppm
	Brown f.-c. SAND, trace f.-m. gravel/coal and silt (11-65)	5	S2	SS	4	7 7 5 5	12	Trace wood and red brick in wash D=6.25'-10' PID = 5.5 ppm Rig chatter D=7.25'-8.25' Lost some water D=7.25'-10' Added mud D=10'
	Brown/black f.-c. SAND, trace silt, c. gravel/coal, and organics/wood fibers (11-65)	10	S3	SS	11.5	12 4 5 20	9	PID = 11.8 ppm
	Brown f.-c. SAND, some silt and clay, trace f.-m. gravel (11-65) Brown, gray, and black PEAT, trace silt and clay (11-65)	15	SS S4	SS	16	1 2 2 2	4	PID = 4.2 ppm PID = 18.3 ppm
	Brown f. SAND, some silt, trace clay (8-65)	20	S6	SS	17	2 1 2 2	3	PID = 5 ppm
	Gray/brown f. SAND, trace silt (8-65)	25	S7	SS	13	11 12 16 15	28	PID = 20 ppm
	Brown and gray f.-m. SAND, some silt, trace clay (7-65)	30	S8	SS	14.5	7 8 8 7	16	PID = 30 ppm
	Gray/brown f.-m. SAND (7-65) Gray CLAY, trace f. sand and silt (9-65)	35	S9	SS	17	4 6 17 20	23	PP = 0.9-1.4 tsf PID = 11.2 ppm
	Brown f. SAND, trace silt (8-65)	40	S10	SS	16.5	10 17 15 16	32	0.5" of Gray CLAY, trace f. sand and silt (9-65) in top of S10 SS sample PID = 550 ppm

BORING 1531601.GPJ LANGAHFL.GDT 22/12/98

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LOG OF BORING LB6

PROJECT: Loews @ Gowanus	PROJECT NO.: 1531601
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: approx. el 11 (BBHDD)

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLE DATA NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Brown SILT, some f. sand, trace clay (10-65)	45	S11	SS	14	16 19 13 14	32	PID - 1.4 ppm
	Gray/black f.-m. SAND, trace silt (7-65)	50	S12	SS	18	20 24 25 22	49	PID = 1.2 ppm
								Rig chatter D=53.75'-55'
	Inferred COBBLE (6-65)	55	-	SS	0	162/4"	R*	*Spoon refusal D=55' Rig chatter D=55'-55.25'
								Minor rig chatter D=58.75'
	Red brown f. SAND, some f.-c. gravel, trace m.-c. sand and silt (6-65)	60	S13	SS	111	150 58 51 65	109	PID = 400 ppm Slow/hard drilling D=62.25'-62.5' On/off rig chatter D=60'-65'
	Red brown f. SAND, some f.-c. gravel, trace m.-c. sand and silt (6-65)	65	S14	SS	6	96 39 26 26	65	PID = 155 ppm On/off rig chatter D=65'-70'
	Red brown f. SAND, some f.-m. gravel, trace m.-c. sand and silt (6-65)	70	S15	SS	13	62 100 93 32	193	PID = 410 ppm Minor on/off rig chatter D=70'-75'
	Red brown f.-c. GRAVEL and f.-c. SAND, trace silt (6-65)	75	S16	SS	14	100 88 77 56	165	PID = 380 ppm Borehole grouted upon completion
	Boring terminated D=77'							
		80						
		85						
		90						

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LOG OF BORING LB7

SHEET 1 OF 2

PROJECT: Loews @ Gowanus	PROJECT NO.: 1531601
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: approx. el 11 [BBHDD]
DRILLING EQUIPMENT: Davey Kent DK50RA Track Rig	DATE STARTED: 11/19/98 ; DATE FINISHED: 11/24/98 ; COMPLETION DEPTH: 77 ft.
SIZE AND TYPE OF BIT: HW and NQ Rock Cores and Tri-Cone Roller Bit	NUMBER OF SAMPLES: DIST. 18 ; UNDIST. 1 ; CORE ----
CASING DIAMETER (in): 4 1/2" OD 4" ID ; CASING DEPTH(ft): 7	WATER LEVEL (ft.): FIRST ---- ; COMPL. ---- ; 24 HR. 6.5
SAMPLER: Standard Split Spoon (SS) or Shelby Tube (ST)	DRILLING FOREMAN: Gus Suri/Mike Chizmar
SAMPLER HAMMER: WEIGHT(lbs) 140 ; DROP(in) 30	INSPECTING ENGINEER: Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
approx. el 11	5" CONCRETE w/ wire mesh 5" CONCRETE							*New York City BC Classification numbers in parenthesis Started coring w/ water
	Inferred miscellaneous FILL (11-65)* Gray/black f.-c. SAND, some silt (11-65)		S1	SS	7	28 47 54 20	101	Lost some water D = 1.5' PID = 400 ppm Petroleum like material odor On/off rig chatter D = 1.5' - 4.5' Petroleum like material in wash D = 4.75'
	Black SILT/PETROLEUM LIKE MATERIAL, some c. sand, and white cement fragments, trace f.-m. sand and clay (11-65)	5	S2	SS	2	4 2 1 50/1"	3	Spoon refusal 50/1" w/ bouncing D = 6' PID = 480 ppm
0.0	Piece of STEEL Inferred miscellaneous FILL (11-65)							A 16" x 4" x 1/4" piece of vertical steel on a 1/2" thick base plate D = 7' w/ 2" wide horizontal pieces of steel, which were cut, at the top inside and bottom outside D = 6' - 7'
0.0	0.5" STEEL CONCRETE		S3					
0.0	Petroleum like material treated WOOD (11-65) Inferred WOOD (11-65) Inferred Brown PEAT, some silt (11-65)	10	-	SS	0	WOR WOR WOR WOR	WOR	Lost some water D = 8' - 9.25' Added mud D = 9.25' Drilled through WOOD and lost circulation D = 9.75' WOR: Weight of rods WOR went from D = 10' - 15'
	Inferred Brown PEAT, some silt (11-65)	15	S4	SS	0	WOH WOH WOH WOH	WOH	WOH: Weight of hammer Sample S4 SS tip material PID = 590 ppm WOH went from D = 15' - 17.5'
	Brown PEAT, some silt (11-65)		T1	ST	24	PUSH PUSH PUSH PUSH	PUSH	Visible petroleum like material w/ odor Pushing became more difficult D = 19.25'
	Brown/gray f. SAND, some silt (8-65) Brown f. SAND, some silt (8-65)	20	S5	SS	19	1 3 3 4	6	Added mud D = 20' PID = 920 ppm
	Brown f. SAND, trace silt and clay (8-65)	25	S6	SS	11	34 42 33 40	75	PID = 700 ppm Trace wood fibers in wash D = 27' - 30.5' Tight fit for bit D = 27' - 30.5'
	Brown f.-m. SAND, trace silt (7-65)	30	S8 S7	SS	7	18 19 11 12	30	1" of WOOD FIBERS, trace f.-m. sand w/ PID = 170 ppm in top of SS PID = 750 ppm Brown SILT, trace clay and f. sand in SS tip D = 32.5'
	Brown SILT, trace clay and f. sand (10-65) Gray CLAY, some silt (9-65)	35	S10 S9	SS	18	4 3 2 3	5	PP = 0.1 - 0.3 tsf PID = 640 ppm PP = 0.6 - 0.9 tsf PID = 320 ppm
	Gray/brown CLAY, some silt, trace f. sand (9-65)	40	S11	SS	17	WOH 2 2 4	4	PP = 0.4 - 0.65 tsf PID > 2000 ppm

BORING 1531601.GPJ LANGANFL.GDT 2/12/98

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LOG OF BORING LB7
SHEET 2 OF 2

PROJECT	PROJECT NO.
Loews @ Gowanus	1531601
LOCATION	ELEVATION AND DATUM
Brooklyn, NY	approx. el 11 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLE DATA NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Brown CLAY, some silt, trace f. sand (9-65)	45	S12	SS	13	6 4 4 4	8	PP = 0.6 - 0.65 tsf PID = 170 ppm
	Brown f. SAND, trace silt (8-65)	50	S13	SS	14	13 31 25 19	56	PID = 550 ppm
								Rig chatter D = 52.25' - 53'
	Brown f.-c. SAND, trace silt and f.-m. gravel (6-65)		S14	SS	10.5	20 20 24 24	44	PID = 710 ppm
		55						Added mud D = 57' - 58' Rig chatter D = 57.5 - 58'
	Red brown f.-c. SAND, trace silt and f.-m. gravel (6-65)	60	S15	SS	8	19 36 31 22	67	PID = 40 ppm
								On/off rig chatter D = 60' - 65'
	Red brown f.-c. SAND, some f.-m. gravel, trace silt (6-65)	65	S16	SS	8	28 42 22 13	64	PID = 640 ppm
								On/off rig chatter D = 65' - 70'
	Red brown f.-c. SAND, some f.-m. gravel, trace silt (6-65)	70	S17	SS	7.5	45 26 22 24	46	PID = 20 ppm
								On/off rig chatter D = 70' - 75'
	Red brown f.-c. SAND, some f.-m. gravel, trace silt (6-65)	75	S18	SS	8	50 28 22 25	50	PID = 540 ppm
	Boring terminated D = 77'							Borehole grouted upon completion
		80						
		85						
		90						

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LOG OF BORING LB8

SHEET 1 OF 2

PROJECT: Loews @ Gowanus	PROJECT NO.: 1531601
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: approx. el 11 [BBHDD]
DRILLING EQUIPMENT: Davey Kent DK50RA Track Rig	DATE STARTED: 11/18/98 · DATE FINISHED: 11/19/98 · COMPLETION DEPTH: 55 ft.
SIZE AND TYPE OF BIT: HW and NQ Rock Cores and Tri-Cone Roller Bits	NUMBER OF SAMPLES: DIST. 14 · UNDIST. ----- · CORE -----
CASING DIAMETER (in): 4 1/2" OD 4" ID · CASING DEPTH (ft): 19.5	WATER LEVEL (ft.): FIRST ▽ ----- · COMPL. ▼ ----- · 24 HR. ▼ 3.6
SAMPLER: 2" OD 1 3/4" ID Split Spoon (SS)	DRILLING FOREMAN: Gus Suri/Mike Chizmar
SAMPLER HAMMER: WEIGHT (lbs) 140 · DROP (in) 30	INSPECTING ENGINEER: Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
approx. el 11	5" CONCRETE w/ wire mesh CONCRETE DEBRIS and inferred miscellaneous FILL (11-65)*							*New York City BC Classification numbers in parenthesis Started coring w/ water Lost some water D = 2'
	Red BRICK, some gray c. sand, trace f. gravel, concrete, tan brick, gray f.-m. sand, and white tile (11-65)		S1	SS	4.5	12 9 10 24	19	PID = 82 ppm Lost water D = 2' - 6.5'
0.0	Red BRICK, some c. sand, trace f.-m. sand and gravel (11-65)	5	S2	SS	1	25/5"	R*	*Spoon refusal 28/5" w/ bouncing D = 4.5' Hard/slow drilling w/ rig chatter D = 4.5' - 5' PID = 135 ppm
0.0	CONCRETE Inferred reinforced CONCRETE							
	Gray c. SAND, trace coal, concrete, red brick, gray f.-m. sand, f.-m. gravel, and glass (11-65)		S3	SS	3	9 7 4 4	11	PID = 15 ppm
		10						
	Gray c. SAND, trace coal, red brick, gray f.-m. sand, silt, and f. gravel (11-65)		S4	SS	1	5 3 2 4	5	PID = 260 ppm
	Gray c. SAND, some coal, trace red brick, gray f.-m. sand, silt, and f. gravel (11-65)	15	S5	SS	9	2 2 3 6	5	PID = 52 ppm
	Brown PEAT (11-65)							Added mud D = 20'
	Brown f. sandy SILT, trace clay (10-65)	20	S6	SS	6	4 4 6 5	10	PID = 30 ppm
	Brown f.-m. SAND, trace silt (7-65)	25	S7	SS	6	29 31 33 28	64	PID = 11 ppm
	Gray/brown SILT, some f. sand, trace m. sand and clay (10-65)	30	S8	SS	5	WOH 5 8 9	13	WOH: Weight of hammer Over drilled to D = 30'-5" resulting in WOH blow count PID = 36 ppm
	Brown/gray SILT, some clay, trace f. sand (10-65)	35	S10 S9	SS	17	4 3 3 6	6	PP = No reading PID = 420 ppm PP = 0.4 tsf PID = 340 ppm
	Brown/gray silty CLAY, trace f. sand (9-65)							
	Brown/gray silty CLAY, trace f. sand (9-65)	40	S11	SS	19	2 4 2 5	6	PP = 0.3 - 0.4 tsf PID = 108 ppm

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LOG OF BORING LB8

SHEET 2 OF 2

PROJECT: Loews @ Gowanus	PROJECT NO.: 1531601
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: approx. el 11 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	SYMBOL LOG	DEPTH SCALE	SAMPLE DATA: NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Brown/gray silty CLAY, trace f. sand (9-65)		45	S12	SS	19	2 1 WOH [illegible]	1	PP = No reading - 0.2 tsf PID = 810 ppm
	Brown/gray silty CLAY, trace f. sand (9-65)		50	S13	SS	17	WOH WOH 9 17	9	PP = 0.2 - 0.7 tsf PID = 400 ppm
	Brown f.-m. SAND, trace gray silt and clay (7-65)			S14	SS	11	14 14 13 16	27	PID = 520 ppm
	Boring terminated D = 55'		55						Borehole grouted upon completion
			60						
			65						
			70						
			75						
			80						
			85						
			90						

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LOG OF BORING LB9

SHEET 1 OF 2

PROJECT: Loews @ Gowanus	PROJECT NO.: 1531601
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: approx. el 11 [BBHDD]
DRILLING EQUIPMENT: Davey Kent DK50RA Track Rig	DATE STARTED: 11/16/98 · DATE FINISHED: 11/18/98 · COMPLETION DEPTH: 57 ft.
SIZE AND TYPE OF BIT: 4 7/8" (0' - 5') and 3 7/8" Tri-Cone Roller Bits	NUMBER OF SAMPLES: DIST. 14 · UNDIST. ----- · CORE -----
CASING DIAMETER (in): 4 1/2" OD 4" ID · CASING DEPTH(ft): 13.5	WATER LEVEL (ft.): FIRST ----- · COMPL. ----- · 24 HR. 4.6
SAMPLER: 2" OD 1 3/4" ID Split Spoon (SS)	DRILLING FOREMAN: Gus Suri/Mike Chizmar
SAMPLER HAMMER: WEIGHT(lbs) 140 · DROP(in) 30	INSPECTING ENGINEER: Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
approx. el 11	4" CONCRETE Inferred DENSE GRADED AGGREGATE CONCRETE							*New York City BC Classification numbers in parenthesis Started drilling w/ water Lost some water D=2.5' D=0'-4.5' : Slow/hard drilling and wash water Gray cement/concrete color NX Rock Core Barrel used D=4'-4.5' : 6" Concrete core recovered Lost some water D=4.5'
0.0	Inferred miscellaneous FILL (11-65)*	5	S1	SS	0	4 7 5 4	12	Attempted a 2nd SS to acquire some form a sample: Only gray sand wash was recovered, Sample S1
	Inferred Gray c. SAND/COAL, trace silt, f.-m. sand, clay, f. gravel, and organics (11-65)		S2	SS	0	3 2 2 2	4	PID = 2 ppm Overdrove SS 7'-10' to aid in recovery Sample S2 SS tip material
	Gray c. SAND/COAL, trace f.-m. sand, silt, and f. gravel (11-65)	10	S3	SS	4	2 3 2 2	5	Overdrove SS D=10'-13' to aid in recovery PID = 3.3 ppm
								Added mud D=15'
	Gray silty, organic/rooty CLAY (11-65)	15	S5 S4	SS	16.5	3 2 2 2	4	PID = 0 ppm PID = 0 ppm
	Brown/gray PEAT (11-65)							
	Brown SILT, trace clay and f. sand (10-65)	20	S6	SS	10.5	5 7 12 10	19	PID = 38 ppm
	Inferred Brown/gray f.-m. SAND, trace silt (7-65)	25	-	SS	0	27 32 27 34	59	
	Brown/gray f.-m. SAND, trace silt (7-65)		S7	SS	17	24 26 39	65	PID = 0 ppm
	Brown f.-m. SAND, trace silt and clay	30	S8	SS	7	11 11 9 10	20	PID = 0 ppm
	Gray/brown silty CLAY, trace f.-m. sand (9-65)	35	S9	SS	17.5	3 4 6 6	10	PID = 0.2 ppm
	Brown/gray f.-m. SAND, trace silt (7-65)	40	S10	SS	10.5	16 10 10 10	20	PID = 0 ppm

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LOG OF BORING LB9

SHEET 2 OF 2

PROJECT	PROJECT NO.
Loews @ Gowanus	1531601
LOCATION	**ELEVATION AND DATUM**
Brooklyn, NY	approx. el 11 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	SYMBOL LOG	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Brown/gray SILT, some f. sand, trace clay (10-65)		45	S11	SS	19	7 6 6 [illegible]	12	PID = 0 ppm
	Brown/gray f. sandy SILT, trace f. gravel (10-65)		50	S12	SS	15	15 16 15 17	31	PID = 0 ppm
	Brown/gray f.-m. SAND, trace silt (7-65)			S13					PID = 0 ppm
	Brown f.-m. SAND, trace silt (7-65)		55	S14	SS	15	17 19 23 22	42	PID = 0 ppm
									Borehole grouted upon completion
	Boring terminated D=57'		60						
			65						
			70						
			75						
			80						
			85						
			90						

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LOG OF BORING RB1

SHEET 1 OF 2

PROJECT: Gowanus Development	PROJECT NO.: 1503701
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: Approx. el. 7.4 [BBHDD]
DRILLING EQUIPMENT: Mobile B61 Truck Mounted Rig	DATE STARTED: 10/20/98 · DATE FINISHED: 10/20/98 · COMPLETION DEPTH: 80 ft.
SIZE AND TYPE OF BIT: 4 7/8" (0'-3') and 3 7/8" Tri-Cone Roller Bits	NUMBER OF SAMPLES: DIST. 16 · UNDIST. -------- · CORE --------
CASING DIAMETER (in): 4 1/2" OD 4" ID · CASING DEPTH(ft): 18	WATER LEVEL (ft.): FIRST 8 · COMPL. ----- · 24 HR. -----
SAMPLER: 2" OD 1 3/4" ID Split Spoon (SS)	DRILLING FOREMAN: Ernest Thomas/Desmond Williams
SAMPLER HAMMER: WEIGHT(lbs) 140 · DROP(in) 30	INSPECTING ENGINEER: Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
Approx. el. 7.4	Surficial ASPHALT							* New York City BC Classification numbers in parenthesis Added water D = 0'
	Brown f.-c. SAND, trace silt and red brick (11-65)*	5	S1	SS	14	4 3 3 2	6	PID = 0 ppm
	Brown f.-c. SAND, trace f.-m. gravel/coal, silt, and red brick (11-65)	10	S2	SS	4	1 6 2 2	8	PID = 196 ppm, visible "Copper" brown petroleum like material Trace wood in wash
	Brown f.-c. SAND, trace silt, f.-m gravel, and wood (11-65)	15	S3	SS	13	8 5 3 2	8	PID = 290 ppm, visible petroleum like material Added mud D = 15'
	Inferred WOOD FIBERS and brown clayey SILT, trace f. sand (11-65)	20	S4	SS	0	6 2 2 1	4	PID = 25 ppm Sample S4 spoon tip material
	WOOD FIBERS, trace brown silt and f. sand (11-65)	25	S5	SS	9	21 29 38 41	67	PID = 52 ppm Very slow/hard drilling and wood fibers in wash D = 23' - 28'
	Green brown SILT, trace clay, wood fibers, and f.-m. sand (11-65)	30	S6	SS	16	8 10 11 12	21	PID = 9.6 ppm
	Brown/gray f.-m SAND, some silt and clay (7-65)	35	S7	SS	19	4 7 15 13	22	PID = 168 ppm, slightly visible petroleum like material
	Brown silty f. SAND (8-65)	40	S8	SS	14.5	10 13 10 10	23	PID = 20 ppm

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LOG OF BORING RB1

SHEET 2 OF 2

PROJECT	PROJECT NO.
Gowanus Development	1503701
LOCATION	ELEVATION AND DATUM
Brooklyn, NY	Approx. el. 7.4 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	SYMBOL LOG	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Gray/brown f.-m SAND (7-65)		45	S9	SS	13	9 12 15 21	27	PID = 410 ppm, petroleum like material very visible
	Gray/brown f.-m. SAND, trace silt (8-65)		50	S10	SS	15	12 15 18 20	33	PID = 188 ppm, visible petroleum like material
	Brown f.-m. SAND (7-65)		55	S11	SS	12	6 9 11 11	20	PID = 7.1 ppm, visible petroleum like material
	Brown f.-m. SAND, trace silt (7-65)		60	S12	SS	16	11 14 16 18	30	PID = 330 ppm, very visible petroleum like material
									Rig chatter D = 62'
									Slow/hard drilling D = 62' - 63'
	Red/gray f.-c. GRAVEL and f.-c. SAND, trace silt (6-65)		65	S13	SS	4	77 82 22 18	84	PID = 25 ppm Minor rig chatter D = 63' to 68'
	Inferred Gray f.-c. GRAVEL, some red/brown silty clay and f.-c. sand (6-65)		70	S14	SS	0	21 28 22 26	50	Petroleum like material floating on the surface of wash tub PID = 19.8 ppm Sample S14 spooon tip material
	Red brown f.-c. SAND, trace silt, f.-m. gravel, and clay (6-65)		75	S15	SS	12	33 27 19 19	46	PID = 3 ppm
									Rig chatter D = 77'
	Red brown f.-c. SAND, some clay, trace silt and f.-m. gravel (6-65)		80	S16	SS	9.5	14 12 14 12	26	PID = 5.1 ppm
	Boring terminated D = 80'								Borehole grouted upon completion
			85						
			90						

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LOG OF BORING RB2
SHEET 1 OF 2

PROJECT: Gowanus Development	PROJECT NO.: 1503701
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: Approx. el. 9.0 [BBHDD]
DRILLING EQUIPMENT: CME 75 Truck Mounted Rig	DATE STARTED: 10/19/98; DATE FINISHED: 10/20/98; COMPLETION DEPTH: 85 ft.
SIZE AND TYPE OF BIT: 4 7/8" (0'-3') and 3 7/8" Tri-Cone Roller Bits	NUMBER OF SAMPLES: DIST. 16; UNDIST. --------; CORE --------
CASING DIAMETER (in): 4 1/2" OD 4" ID; CASING DEPTH(ft): 14	WATER LEVEL (ft.): FIRST ∇ 10; COMPL. ▼ -----; 24 HR. ▼ -----
SAMPLER: 2" OD 1 3/4" ID Split Spoon (SS)	DRILLING FOREMAN: Tommy Gregorey/Chris Mitchell
SAMPLER HAMMER: WEIGHT(lbs) 140; DROP(in) 30	INSPECTING ENGINEER: Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
pprox. el. 9.0	Surficial ASPHALT	0						*New York City BC Classification numbers in parenthesis Added water D = 2'
	Brown f.-c. GRAVEL, trace f.-c. sand, silt, and red brick (11-65)*	5	S1	SS	4	4 4 5 5	9	PID = 0.1 ppm
	Brown/black f.-m. SAND, trace silt, coarse sand, and f. gravel/coal (11-65)	10 ∇	S2	SS	3.5	4 2 5 2	7	PID = 14 ppm
	Gray silty CLAY, trace roots and shell (11-65)	15	S3	SS	24	2 1 1 1	2	PID = 0.4 ppm WOH: Weight of hammer Added mud D = 20'
	Gray silty CLAY, some roots/wood (11-65)	20	S4	SS	24	WOH WOH 2 1	2	PID = 0.2 ppm
	Brown f.-m. SAND, trace silt and m. gravel (7-65)	25	S5	SS	13	9 14 18 19	32	PID = 17.2 ppm, visible petroleum like material sheen
	Brown f.-m. SAND (7-65)	30	S6	SS	24	19 29 38 30	67	PID = 250 ppm, visible petroleum like material
	Brown silty f. SAND (8-65)	35	S7	SS	17	10 16 13 14	29	PID = 40 ppm, visible petroleum like material
	Brown SILT, trace f. sand and clay (10-65)	40	S8	SS	15	20 17 17 18	34	PID = 32 ppm

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LOG OF BORING RB2
SHEET 2 OF 2

PROJECT	PROJECT NO.
Gowanus Development	1503701
LOCATION	ELEVATION AND DATUM
Brooklyn, NY	Approx. el. 9.0 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	SYMBOL LOG	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
			45						
	Gray/brown f.-m. SAND, trace silt (7-65)			S9	SS	17	7 6 12 14	18	PID = 8 ppm, visible petroleum like material Minor rig chatter
	Gray/brown f.-m. SAND (7-65)		50	S10	SS	20	12 13 13 15	26	PID = 20 ppm, slightly visible petroleum like material
	Gray/brown f.-m. SAND (7-65)		55	S11	SS	20	9 7 8 10	15	PID = 10.8 ppm
	Brown f.-m. SAND, some silt, trace clay (7-65)		60	S12	SS	18	9 12 10 11	22	PID = 5.9 ppm
									Rig chatter D = 63.5' - 65'
	Red brown f.-c. sandy SILT, some clay, trace f. gravel (10-65)		65	S13	SS	15	31 16 19 27	35	"Copper" brown petroleum like material floating on the surface of wash tub PID = 6.2 ppm Major rig chatter D = 65' - 70'
	Red brown f.-m. SAND,trace silt, clay, and m. gravel (7-65)		70	S14	SS	14	24 29 27 21	56	PID = 8.6 ppm Minor rig chatter D = 70' - 75'
	Red brown f.-m. SAND, trace silt, clay, and f. gravel (7-65)		75	S15	SS	14	23 22 21 28	43	PID = 43 ppm
			80						Rig chatter D = 75' - 83'
	Red brown f.-m. SAND, trace silt, clay, and c. sand (7-65)			S16	SS		43 30 39 38	69	PID = 6 ppm
			85						
	Boring terminated D = 85'								Borehole grouted upon completion
			90						

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LOG OF BORING RB3A

SHEET 1 OF 1

PROJECT: Gowanus Development	PROJECT NO.: 1503701
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: Approx el. 10.1 [BBHDD]
DRILLING EQUIPMENT: Mobile B61 Truck Mounted Rig	DATE STARTED: 10/19/98 · DATE FINISHED: 10/19/98 · COMPLETION DEPTH: 1 ft.
SIZE AND TYPE OF BIT: 4 7/8" Tri-Cone Roller Bits w/water	NUMBER OF SAMPLES: DIST. -------- · UNDIST. ------- · CORE ---------
CASING DIAMETER (in): ----- · CASING DEPTH(ft):	WATER LEVEL (ft.): FIRST ----- · COMPL. ----- · 24 HR. -----
SAMPLER: --------	DRILLING FOREMAN: Ernest Thomas/Desmond Williams
SAMPLER HAMMER: WEIGHT(lbs) ----- · DROP(in) -----	INSPECTING ENGINEER: Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION	SYMBOL LOG	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT.	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
Approx el. 10.1	2.5" ASPHALT 6.5" Black f.-c. SAND and GRAVEL (11-65)* 3" COBBLE/BOULDER (6-65)								*New York City BC Classification numbers in parenthesis Added water D = 0.5' Hard/slow drilling D = 0.75' - 1' Drill equipment refusal D = 1'
	Boring terminated D = 1'		5						
			10						
			15						
			20						
			25						
			30						
			35						
			40						

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LOG OF BORING RB3B

PROJECT: Gowanus Development	PROJECT NO.: 1503701
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: Approx. el. 10.1 [BBHDD]
DRILLING EQUIPMENT: Mobile B61 Truck Mounted Rig	DATE STARTED: 10/19/98 / DATE FINISHED: 10/19/98 / COMPLETION DEPTH: 80 ft.
SIZE AND TYPE OF BIT: 4 7/8" (0'-3') and 3 7/8" Tri-Cone Roller Bits	NUMBER OF SAMPLES: DIST. 13 / UNDIST. -------- / CORE --------
CASING DIAMETER (in): 4 1/2" OD 4" ID / CASING DEPTH(ft): 13	WATER LEVEL (ft.): FIRST 8 / COMPL. ----- / 24 HR. -----
SAMPLER: 2" OD 1 3/4" ID Split Spoon (SS)	DRILLING FOREMAN: Ernest Thomas/Desmond Williams
SAMPLER HAMMER: WEIGHT(lbs) 140 / DROP(in) 30	INSPECTING ENGINEER: Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
Approx. el. 10.1	Surficial ASPAHLT							*New York City BC Classification numbers in parenthesis Rig chatter D = 0' - 3'
	Black f.-c. SAND, trace silt, f. gravel, and red brick (11-65)*	5	S1	SS	13	10 6 9 8	15	PID = 5 ppm, petroleum like material oder
	Inferred miscellaneous FILL (11-65)	10	-	SS	0	2 1 1 1	2	Added mud D = 10'
	Gray/brown organic SILT/PEAT, trace f. gravel (11-65)	15	S2	SS	10	2 2 2 1	4	PID = 0.1 ppm, petroleum like material oder WOH: Weight of hammer
	Gray silty CLAY, trace shell and organics/root (11-65)	20	S3	SS	21	WOH WOH WOH WOH	WOH	PID = 0 ppm
	Gray silty CLAY, trace shell and organics (11-65)	25	S4	SS	15	2 2 2 2	4	PID = 0 ppm
	Brown silty f. SAND, trace clay (8-65)	30	S5	SS	15	3 4 7 8	11	PID = 0.5 ppm, slight pertroleum like material oder
	Gray f.-m. SAND (7-65)	35	S6	SS	20	13 18 18 15	36	PID = 95 ppm, visible petroleum like material w/oder
	Brown/gray f. sandy SILT, trace clay (10-65)	40	S7	SS	15	9 12 9 16	21	PID = 8 ppm, petroleum like material oder

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PROJECT	PROJECT NO.
Gowanus Development	1503701
LOCATION	ELEVATION AND DATUM
Brooklyn, NY	Approx. el. 10.1 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Brown silty f. SAND, trace clay (8-65)	45	S8	SS	14	8 11 13 14	24	PID = 5.2 ppm, petroleum like material oder
	Brown silty f.-m. SAND, trace clay (7-65)	50	S9	SS	17	12 13 18 24	31	PID = 6.5 ppm, petroleum like material oder
	Brown/gray f.-c. SAND, trace f. gravel (7-65)	55	S10	SS	13	9 12 14 15	26	PID = 0.6 ppm, slight petroleum like material oder
	Gray/brown f.-c. SAND (7-65)	60	S11	SS	14	13 18 18 20	36	PID = 1.2 ppm, petroleum like material oder
	Gray/brown SILT, some clay, trace f. sand (10-65)	65	S12	SS	15	10 9 18 20	27	PID = 0.2 ppm
	Red brown f.-c. SAND, trace silt and f. gravel (6-65)	70	S13	SS	7	21 24 80 100/3"	104	PID = 0.7 ppm, petroleum like material oder Spoon refusal D = 69.5' Rig chatter D = 69.5' and 73'
	Red brown f.-c. SAND, some silt and clay, trace f. gravel (7-65)	75	S14	SS	7	28 21 15 18	36	PID = 0.1 ppm Minor rig chatter D = 73' - 78'
	Red brown clayey SILT, trace f. sand, trace m. gravel (10-65)	80	S15	SS	18	18 19 13	32	PID = 0.3 ppm, petroleum like material oder
	Boring terminated D = 80'	85						Borehole grouted upon completion
		90						

BORING 1503701.GPJ LANGANFL.GDT 25/11/98

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LOG OF BORING RB4

PROJECT: Gowanus Development		PROJECT NO.: 1503701	
LOCATION: Brooklyn, NY		ELEVATION AND DATUM: Approx. el. 10.4 [BBHDD]	
DRILLING EQUIPMENT: CME 75 Truck Mounted Rig		DATE STARTED: 10/16/98 / DATE FINISHED: 10/19/98	COMPLETION DEPTH: 73 ft.
SIZE AND TYPE OF BIT: 4 7/8" (0'-3') and 3 7/8" Tri-Cone Roller Bits		NUMBER OF SAMPLES: DIST. 14 / UNDIST. --------	CORE: --------
CASING DIAMETER (in): 4 1/2" OD 4" ID	CASING DEPTH(ft): 10	WATER LEVEL (ft.): FIRST ----- / COMPL. -----	24 HR. 6.5
SAMPLER: 2" OD 1 3/4" ID Split Spoon (SS)		DRILLING FOREMAN: Tommy Gregorey/Chris Mitchell	
SAMPLER HAMMER: WEIGHT(lbs) 140	DROP(in) 30	INSPECTING ENGINEER: Gary L. Gleason	

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
Approx. el. 10.4	Surficial ASPHALT	0						*New York City BC Classification numbers in parenthesis Black drill water w/ petroleum like material oder D = 1.5' - 5'
	Black/brown f.-c. SAND, some silt, trace f. gravel/coal, wood/organics, and red brick (11-65)*	5	S1	SS	5	2 8 6 8	14	PID = 0.2 ppm, petroleum like material oder
	Black and white f. GRAVEL/COAL, trace m.-c. sand (11-65)	10	S2	SS	TRACE	1 1 WOH WOH	1	WOH: Weight of hammer PID = 3 ppm, petroleum like material oder Over drove spoon to aid in Sample recovery
	Black and white f. GRAVEL/COAL, trace m.-c. sand and glass (11-65)	15	S3	SS	TRACE	1 2 1 1	3	PID = 4 ppm, petroleum like material oder Added mud D = 15'
	Gray silty CLAY, trace shell and f. gravel (11-65)	20	S4	SS	14	1 WOH WOH WOH	WOH	PID = 0.4 ppm, petroleum like material oder
	Gray silty CLAY, trace shell (11-65)	25	S5	SS	8	1 WOH WOH WOH	WOH	PID = 7.2 ppm, petroleum like material oder
	Gray SILT, trace clay, f.-m. sand, f.-m. gravel/coal, and shell (10-65)	30	S6	SS	22	9 12 12 9	24	PID = 8 ppm, slight petroleum like material odor
	Brown f.-m. SAND (7-65)	35	S7	SS	16	22 23 22 13	45	PID = 190 ppm, visible petroleum like material w/ oder
	Brown f.-m. SAND, trace silt and coal (7-65)	40	S8	SS	19	20 15 15 20	30	PID = 2.5 ppm, petroleum like material

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LOG OF BORING RB4

SHEET 2 OF 2

PROJECT	PROJECT NO.
Gowanus Development	1503701
LOCATION	ELEVATION AND DATUM
Brooklyn, NY	Approx. el. 10.4 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	SYMBOL LOG	DEPTH SCALE	SAMPLE DATA NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Brown f. SAND, trace silt (8-65)		45	S9	SS	15	16 14 18 16	32	PID = 5 ppm, petroleum like material oder Added mud D = 46'
	Brown f. SAND, trace silt (8-65)		50	S10	SS	12	18 20 26 28	46	PID = 1.6 ppm, petroleum like material oder
	Gray f.-m. SAND (7-65)		55	S11	SS	24	17 14 15 21	29	PID = 1 ppm, petroleum like material oder
	Brown f.-c. SAND (7-65)		60	S12	SS	13	29 32 25 21	57	PID = 9 ppm, petroleum like material oder
	Gray/brown f.-c. SAND, trace f.-m. gravel (6-65) Red brown SILT, some f. sand, trace clay (10-65)		65	S13	SS	13	28 41 59 63	100	PID = 0.6 ppm, slight petroleum like material oder Rig chatter D = 66.5' - 68.5'
	Red brown f.-c. SAND, trace silt, f.-m. gravel, and clay (6-65)		70	S14	SS	10	30 37 47 50	84	Rig chatter D = 70' - 73' PID = 0.9 ppm, slight petroleum like material odor Very hard/slow drilling D = 72' - 73' Drilling equiptment refusal D = 73'
	Boring terminated D = 73'		75						Bore hole grouted upon completion
			80						
			85						
			90						

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PROJECT: Gowanus Development		PROJECT NO.: 1503701	
LOCATION: Brooklyn, NY		ELEVATION AND DATUM: Approx. el. 10.6 [BBHDD]	
DRILLING EQUIPMENT: Mobile B61 Truck Mounted Rig		DATE STARTED: 10/15/98	DATE FINISHED: 10/16/98 — COMPLETION DEPTH: 79.5 ft.
SIZE AND TYPE OF BIT: 4 7/8" (0'-1') and 3 7/8" Tri-Cone Roller Bits		NUMBER OF SAMPLES: DIST. 16	UNDIST. -------- — CORE --------
CASING DIAMETER (in): 4 1/2" OD 4" ID	CASING DEPTH(ft): 13	WATER LEVEL (ft.): FIRST ▽ 9	COMPL. ▼ ----- — 24 HR. ▼ -----
SAMPLER: 2" OD 1 3/4" ID Split Spoon (SS)		DRILLING FOREMAN: Ernest Thomas/Desmond Williams	
SAMPLER HAMMER — WEIGHT(lbs): 140	DROP(in): 30	INSPECTING ENGINEER: Gary L. Gleason	

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
Approx. el. 10.6	Surficial ASPHALT							*New York City BC Classification numbers in parenthesis Added water D = 0.5' Rig chatter D = 1'
	Black/gray f.-c. SAND, some f-c. gravel/coal, trace silt and red brick (11-65)*	5	S1	SS	10	13 14 4 3	18	Petroleum like material/oder and color in drill water D = 1' to 3' PID = 6 ppm, petroleum like material odor
								Trace wood in wash WOH: Weight of hammer
	Inferred Black/gray f.-c. GRAVEL, trace f.-c. sand, silt, and metal (11-65)	10	S2	SS	0	2 1 WOH 1	1	PID = 3 ppm, petroleum like material oder Sample S2 spoon tip material
								PID = 1 ppm, petroleum like material oder
	Gray silty CLAY, some woody roots, trace shell (11-65)	15	S3	SS	17	2 2 2 2	4	
								WOR: Weight of rods
	Gray silty CLAY, trace organics/root (11-65)	20	S4	SS	14	WOR WOR WOR WOR	WOR	PID = 0.2 ppm, petroleum like material oder
	Brown f. SAND, trace silt and wood (8-65)	25	S5	SS	18	5 8 12 13	20	PID = 6.5 ppm, petroleum like material oder
	Brown/gray f.-c. SAND (7-65)	30	S6	SS	18	13 14 10 6	24	PID = 4 ppm, visible petroleum like material and odor
	Gray/brown f. SAND (8-65)	35	S7	SS	13	9 18 21 20	39	PID = 13 ppm, petroleum like material oder
	Brown/gray f.-m. SAND (7-65)	40	S8	SS	17	11 14 8 13	22	PID = 0.4 ppm, petroleum like material oder

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LOG OF BORING RB5

SHEET 2 OF 2

PROJECT	Gowanus Development	PROJECT NO.	1503701
LOCATION	Brooklyn, NY	ELEVATION AND DATUM	Approx. el. 10.6 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Gray/brown f. SAND, trace silt (8-65)	45	S9	SS	18	13 13 14 15	27	PID = 3.9 ppm, petroleum like material oder
	Brown f.-m. SAND, trace silt (7-65)	50	S10	SS	18	10 12 15 18	27	PID = 0.5 ppm, slight petroleum like material oder
	Brown SILT, trace f. sand and clay (10-65)	55	S11	SS	18	11 14 18 20	32	PID = 0.3 ppm, slight petroleum like material oder
	Brown f.-m. SAND, trace silt (7-65)		S12	SS	14	17 21 100/3"	121/9"	PID = 0.4 ppm, petroleum like material oder Spoon refusal D = 59' Major rig chatter D = 60'
	Red brown f.-c. SAND, some f.-m. gravel, trace silt and clay (6-65)	60, 65	S13	SS	14	35 51 62 24	113	Rig chatter D = 60' - 63' PID = 0.2 ppm, slight petroleum like material oder Rig chatter D = 63' - 68'
	Red brown f.-c. SAND, trace f.-m. gravel, silt, and clay (7-65)	70	S14	SS	14	41 40 66 100	106	Rig chatter D = 68' - 73' PID = 0.4 ppm, slight petroleum like material oder
	Red brown f.-c. SAND, trace silt, f.-m. gravel, and clay (6-65)	75	S15	SS	16	56 35 50 35	85	PID = 0.1 ppm Major rig chatter D = 76' - 77'
	Red brown f.-c. SAND, trace silt, f. gravel, and clay (6-65)		S16	SS	10	41 89 100/5"	189/11"	Spoon refusal D = 79.5' PID = 0 ppm, slight petroleum like material oder
	Boring terminated D = 79.5'	80, 85, 90						Borehole grouted upon completion

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LOG OF BORING RB6

PROJECT: Gowanus Development	PROJECT NO.: 1503701
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: Approx. el. 10.6 [BBHDD]
DRILLING EQUIPMENT: CME 75 Truck Mounted Rig	DATE STARTED: 10/15/98 · DATE FINISHED: 10/16/98 · COMPLETION DEPTH: 82 ft.
SIZE AND TYPE OF BIT: 4 7/8" (0'-3') and 3 7/8" Tri-Cone Roller Bits	NUMBER OF SAMPLES: DIST. 16 · UNDIST. --------- · CORE ---------
CASING DIAMETER (in): 4 1/2" OD 4" ID · CASING DEPTH(ft):	WATER LEVEL (ft.): FIRST ----- · COMPL. ----- · 24 HR. 8
SAMPLER: 2" OD 1 3/4" ID Split Spoon (SS)	DRILLING FOREMAN: Robert Danielson/Tommy Gregorey/Chris Mitchell
SAMPLER HAMMER: WEIGHT(lbs) 140 · DROP(in) 30	INSPECTING ENGINEER: Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
Approx. el. 10.6	Surficial ASPHALT	0						*New York City BC Classification numbers in parenthesis Added water D = 3'
	Inferred miscellaneous FILL with coal (11-65)*	5	S1	SS	0	3 1 1 1	2	Sample S1 spoon tip material
								WOH: Weight of hammer
	Black/gray f.-m. GRAVEL/COAL, trace f.-c. sand and wood (11-65)	10	S2	SS	2	1 1 WOH WOH	1	PID = 40 ppm, petroleum light material odor
	Gray silty CLAY, some wood/root, trace shell (11-65)	15	S3	SS	24	1 WOH 1 1	1	PID = 0.1 ppm, petroleum like material odor
	Gray silty CLAY, trace root (11-65)	20	S4	SS	22	1 1 1 1	2	PID = 0 ppm
	Brown/gray f.-m. SAND, trace silt (7-65)	25	S5	SS	20	16 20 19 18	39	PID = 0.2 ppm Added mud D = 27'
	Gray/brown clayey SILT, trace f.-m. sand (10-65)	30	S6	SS	12	6 9 8 13	17	PID = 0.2 ppm
	Gray f.-m. SAND (7-65)	35	S7	SS	12	20 22 18 19	40	PID = 0.1 ppm, slight petroleum like material odor
	Gray f.-m. SAND (7-65)	40	S8	SS	14	11 13 12 12	25	PID = 0.5 ppm, petroleum like material odor

PROJECT	PROJECT NO.
Gowanus Development	1503701
LOCATION	ELEVATION AND DATUM
Brooklyn, NY	Approx. el. 10.6 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	SYMBOL LOG	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Gray/brown f.-m. SAND, trace silt (7-65)		45	S9	SS	14	S13 12 8 7	20	PID = 0.2 ppm, slight petroleum like material odor
	Brown f. SAND (8-65)		50	S10	SS	15	12 15 25 27	40	PID = 0.4 ppm, petroleum like material odor
	Brown f.-m. SAND, trace silt (8-65)		55	S11	SS	18	18 30 34 41	64	PID = 0.2 ppm
	Brown SILT, trace f. sand and clay (10-65)		60	S12	SS	15	25 34 31 44	65	PID = 0.8 ppm, petroleum like material odor Rig chatter D = 63.5'
	Red brown c.-f. SAND, some f.-c. gravel, trace silt and clay (6-65)		65	S13	SS	12	82 64 50 54	114	PID = 0.6 ppm Rig chatter D = 65' - 70'
	Red brown silty f.-m. SAND, trace f.-m. gravel and clay (6-65)		70	S14	SS	8	34 50 100/5"	150/11	PID = 0 ppm Spoon refusal D = 71.5' Rig chatter and slow drilling D = 70' - 75'
	Red brown f.-c. SAND and GRAVEL, trace silt and clay (6-65)		75	S15	SS	3	100/3"	R*	PID = 0.7 ppm Major rig chatter Slow drilling
	Red brown fine GRAVEL and f.-c. SAND, some silt, trace clay (6-65)		80	S16	SS	7	38 72 100	172	PID = 0.6 ppm, slight petroleum like material odor
	Boring terminated D = 82'								Borehole grouted upon completion
			85						
			90						

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LOG OF BORING RB7

SHEET 1 OF 2

PROJECT: Gowanus Development	PROJECT NO.: 1503701
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: Approx. el. 10.6 [BBHDD]
DRILLING EQUIPMENT: Mobile B61 Truck Mounted Rig	DATE STARTED: 10/15/98 — DATE FINISHED: 10/15/98 — COMPLETION DEPTH: 80 ft.
SIZE AND TYPE OF BIT: 4 7/8" (0'-3') and 3 7/8" Tri-Cone Roller Bits	NUMBER OF SAMPLES: DIST. 17 — UNDIST. -------- — CORE --------
CASING DIAMETER (in): 4 1/2" OD 4" ID — CASING DEPTH(ft): 13	WATER LEVEL (ft.): FIRST ▽ 8 — COMPL. ▼ ----- — 24 HR. ▼ -----
SAMPLER: 2" OD 1 3/4" ID Split Spoon	DRILLING FOREMAN: Ernest Thomas/Desmond Williams
SAMPLER HAMMER: WEIGHT(lbs) 140 — DROP(in) 30	INSPECTING ENGINEER: Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
Approx. el. 10.6	Surficial ASPHALT							*New York City BC Classification numbers in parenthesis Added water D = 0'
	Brown/black f.-c. SAND, trace silt, m. gravel/coal, and red brick (11-65)*	5	S1	SS	5	2 3 3 2	6	PID = 0.1 ppm
	Gray/black f.-c. SAND, trace silt, f. gravel/coal, and glass (11-65)	10	S2	SS	5	4 3 2 2	5	PID = 0 ppm
	Brown/black PEAT (11-65)	15	S3	SS	0	4 1 1 1	2	PID = 0.9 ppm, organic odor Sample S3 from second recovery attempt WOH: Weight of hammer
	Gray/brown/black f.-m. sandy PEAT, trace silt (11-65) Gray/brown f. SAND, trace silt (8-65)	20	S4	SS	24	WOH 4 3 6	7	PID = 0 ppm PID = 0 ppm
	Brown f.-m. SAND, trace silt (7-65)	25	S6	SS	18	12 16 18 17	34	Sample S5 6" Lense of Gray/brown SILT, trace clay and f. sand in top of sample PID = 0 ppm PID = 0 ppm
	Brown f.-m. SAND (7-65)	30	S7	SS	15	9 10 10 5	20	
	Gray f.-m. SAND, some clay, trace silt (7-65)	35	S8	SS	19	3 3 8 14	11	
	Brown/gray f.-m. SAND (7-65)	40	S9	SS	16	8 14 18 18	32	

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LOG OF BORING RB7

PROJECT	PROJECT NO.
Gowanus Development	1503701
LOCATION	ELEVATION AND DATUM
Brooklyn, NY	Approx. el. 10.6 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Gray f.-m. SAND (7-65)	45	S10	SS	16	12 14 19 16	33	
	Gray/brown f.-m. SAND, trace silt (7-65)	50	S11	SS	24	10 9 7 8	16	Sample S11 12" Lense of Gray/brown silty CLAY, trace f. sand in bottom of sample
	Brown/gray f.-m. SAND, trace silt (7-65)	55	S12	SS	16	17 21 27 30	48	
	Brown/gray f.-c. SAND, trace f.-m. gravel and silt (6-65)	60	S13	SS	15	27 40 31 33	71	
	Red brown silty f.-c. SAND, trace f.-m. gravel (6-65)	65	S14	SS	8	19 29 38 30	67	
	Red brown f.-c. SAND, trace f.-m. gravel, silt, and clay (6-65)	70	S15	SS	8	50 95 28 37	123	Rig chatter
	Red brown f.-c. SAND, trace silt, clay, and f.-c. gravel (6-65)	75	S16	SS	12	37 48 33 40	81	Rig chatter
	Red brown f.-c. SAND, trace f.-c. gravel, silt, and clay (6-65)	80	S17	SS	9	21 37 62 48	99	
	Boring terminated D = 80'							Borehole grouted upon completion
		85						
		90						

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LOG OF BORING RB8

PROJECT: Gowanus Development	PROJECT NO.: 1503701
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: Approx. el. 10.9 [BBHDD]
DRILLING EQUIPMENT: CME 75 Truck Mounted Rig	DATE STARTED: 10/14/98; DATE FINISHED: 10/15/98; COMPLETION DEPTH: 82 ft.
SIZE AND TYPE OF BIT: 4 7/8" (0'-4') and 3 7/8" Tri-Cone Roller Bits	NUMBER OF SAMPLES: DIST. 19; UNDIST. --------; CORE --------
CASING DIAMETER (in): 4 1/2" OD 4" ID; CASING DEPTH(ft): 8	WATER LEVEL (ft.): FIRST ∇ 8; COMPL. ▼ -----; 24 HR. ▼ -----
SAMPLER: 2" OD 1 3/4" ID Split Spoon	DRILLING FOREMAN: Greg Marney/Robert Danielson/Tommy Gregorey
SAMPLER HAMMER: WEIGHT(lbs) 140; DROP(in) 30	INSPECTING ENGINEER: Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
Approx. el. 10.9	2" ASPHALT							
	Black f.-c. SAND, some f.-m. gravel/coal and red brick, trace silt (11-65)*		S1	SS	6	25 26 39	65	*New York City BC Classification numbers in parenthesis; PID = 21 ppm, petroleum like material odor
	Black f.-c. SAND, trace f.-m. gravel/coal, red brick, silt, and wood (11-65)		S2	SS	7	80 85 42 47	127	PID = 4.5 ppm, petroleum like material odor; Added water/mud D = 4'
	Black/brown f.-m. GRAVEL/COAL, some f.-c. sand, trace silt and glass (11-65)	5	S3	SS	7	8 11 2 2	13	PID = 4.5 ppm, petroleum like material odor
	Black/brown f.-c. silty SAND, trace f. gravel/coal (11-65)		S4	SS	3.5	3 3 2 3	5	PID = 1.5 ppm, petroleum like material odor
	Black/gray f.-c. SAND, some silt and wood, trace f. gravel/coal (11-65)		S5	SS	3	4 3 3 3	6	PID = 0 ppm, petroleum like material odor
		10						
	WOOD, some black/gray f.-c. sand and f. gravel/coal, trace silt and glass (11-65)	15	S6	SS	2	6 3 3 2	6	PID = 2 ppm, petroleum like material odor
	Gray/brown f. sandy SILT, trace roots, shell, and clay (11-65)	20	S7	SS	18	2 3 6 6	9	PID = 0 ppm
	Brown f.-m. SAND (7-65)	25	S8	SS	22	20 19 17 17	36	PID = 0 ppm
								Sample S9 6" Lense brown clayey SILT, trace f. sand (10-65) in bottom of sample
	Brown f.-m. SAND (7-65)	30	S9	SS	11	10 5 7 8	12	PID = 0.1 ppm
	Gray f.-m. SAND, trace silt and clay (7-65)	35	S10	SS	20	8 11 13 13	24	PID = 0.1 ppm
	Brown/gray f.-m. SAND (7-65)	40	S11	SS	16	8 8 7 6	15	PID = 0.3 ppm

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LOG OF BORING RB8

PROJECT: Gowanus Development
PROJECT NO.: 1503701
LOCATION: Brooklyn, NY
ELEVATION AND DATUM: Approx. el. 10.9 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Brown/gray silty f. SAND sand, trace clay (8-65) / Brown/gray f.-m. SAND, trace silt (7-65)	45	S12	SS	19	6 7 8 8	15	PID = 0.2 ppm PID = 0.3 ppm
	Brown/gray clayey SILT, trace f.-m. sand (10-65)	50	S13	SS	19	3 3 4 5	7	PID = 0.1 ppm Rig chatter D = 53'
	Inferred Red brown f.-c. SAND, some f.-m. gravel, trace silt and clay (6-65)	55	S14	SS	0	40 39 39 35	78	Sample S14 spoon tip material Rig chatter D = 55' - 60'
	Red brown f.-c. SAND, some silt, trace f.-m. gravel and clay (6-65)	60	S15	SS	4	27 43 37 39	80	PID = 0 ppm Rig chatter D = 60' - 65'
	Red brown silty f.-c. SAND, some f.-c. gravel, trace clay (6-65)	65	S16	SS	4	26 33 34 41	67	
	Red brown f.-m. GRAVEL, some f.-c. sand, trace silt (6-65)	70	S17	SS	3	29 65 54 76	119	
	Red brown f.-m. GRAVEL, trace f.-c. sand, silt, and clay (6-65)	75	S18	SS	2	29 58 52 73	110	
	Red brown f.-c. GRAVEL, some f.-c. sand, trace silt and clay (6-65)	80	S19	SS	3	31 32 47 36	79	
	Boring terminated D = 82'	85						Borehole grouted upon completion
		90						

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LOG OF BORING RB9

SHEET 1 OF 2

PROJECT: Gowanus Development	PROJECT NO.: 1503701
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: Approx. el. 11.2 [BBHDD]
DRILLING EQUIPMENT: Mobile B61 Truck Mounted Rig	DATE STARTED: 10/14/98; DATE FINISHED: 10/15/98; COMPLETION DEPTH: 82 ft.
SIZE AND TYPE OF BIT: 4 7/8" (0'-4') and 3 7/8" Tri-Cone Roller Bits	NUMBER OF SAMPLES: DIST. 19; UNDIST. --------; CORE --------
CASING DIAMETER (in): 4 1/2" OD 4" ID; CASING DEPTH(ft): 14	WATER LEVEL (ft.): FIRST ▽ 6; COMPL. ▼ -----; 24 HR. ▼ -----
SAMPLER: 2" OD 1 3/4" ID Split Spoon	DRILLING FOREMAN: Ernest Thomas/Desmond Williams
SAMPLER HAMMER: WEIGHT(lbs) 140; DROP(in) 30	INSPECTING ENGINEER: Gary L. Gleason

ELEV. (ft)	SAMPLE DESCRIPTION	DEPTH SCALE	NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
Approx. el. 11.2	3" ASPHALT Black/brown f.-c. GRAVEL/COAL, some f.-c. sand, trace silt (11-65)*		S2	SS	7	28 21 100	121	*New York City BC Classification numbers in parenthesis Added water D = 0.5' PID = 11 ppm, petroleum like material odor
	Black/brown f.-c. SAND, trace f.-m. gravel/coal, silt, and metal (11-65)		S2	SS	10	7 8 2 2	10	PID = 0.2 ppm, petroleum like material odor
	Black/brown f.-m. GRAVEL/COAL and f.-c. SAND, trace silt (11-65)	5	S3	SS	6	3 4 2 3	6	PID = 0.3 ppm, petroleum like material odor
	Gray/brown f.-c. SAND, some silt, trace f.-m. gravel/coal, one seed (11-65)		S4	SS	0.5	4 3 3 4	6	PID = 0 ppm
	Inferred miscellaneous FILL (11-65)		-	SS	0	4 2 2 2	4	
		10						Very hard drilling Added mud D = 14' - 15'
	Brown f.-c. SAND, trace f. gravel and silt (11-65) Brown/black PEAT (11-65)	15	S6 S5	SS	14	5 4 3 4	7	PID = 0.1 ppm, petroleum like material odor PID = 1 ppm, petroleum like material odor
	Brown-silty f. SAND, trace clay (8-65)	20	S7	SS	10	2 2 5 7	7	PID = 0 ppm, petroleum like material odor
	Brown f. SAND, trace silt (8-65)	25	S8	SS	20	13 14 15 17	29	PID = 0.1 ppm
	Gray/brown f. SAND, some silt (8-65)	30	S9	SS	21	5 3 2 4	5	PID = 0 ppm Sample S9 10" Lense Gray clayey SILT, trace f. sand (10-65) w/ PID = 0 ppm in bottom of sample
	Gray clayey f.-m. SAND, trace silt (7-65) Brown/gray f.-m. SAND (7-65)	35	S10	SS	19	12 15 19 20	34	PID = 0 ppm PID = 0 ppm
	Brown/gray f.-m. SAND (7-65)	40	S11	SS	17	5 7 8 9	15	PID = 0 ppm

PROJECT: Gowanus Development	PROJECT NO.: 1503701
LOCATION: Brooklyn, NY	ELEVATION AND DATUM: Approx. el. 11.2 [BBHDD]

ELEV. (ft)	SAMPLE DESCRIPTION	SYMBOL LOG	DEPTH SCALE	SAMPLE DATA NUMBER	TYPE	RECOV. (in)	PENETR. RESIST BL/6in	N-VALUE BLOWS PER FT	REMARKS (DRILLING FLUID, DEPTH OF CASING, FLUID LOSS, DRILLING RESISTANCE, ETC.)
	Brown/gray f.-m. sandy SILT (10-65)		45	S12	SS	11119	2 3 5 7	8	PID = 0 ppm
	Brown/gray SILT, trace clay and f.-m. sand (10-65)		50	S13	SS	24	2 1 2 3	3	PID = 0 ppm
	Red brown silty f.-c. SAND, trace clay and f. gravel (7-65)		55	S14	SS	12	10 13 19 16	32	PID = 0 ppm PID = 0 ppm
									Slow/hard drilling D = 59'
	Red brown silty f.-c. SAND, some f.-m. gravel, trace clay (6-65)		60	S15	SS	16	17 25 26 28	51	PID = 0 ppm
	Red brown silty f.-c. SAND, some f.-m. gravel, trace clay (6-65)		65	S16	SS	16	21 49 67 100/5"	116	Spoon refusal D = 67'
	Red brown f.-c. SAND, some f.-m. gravel and silt, trace clay (6-65)		70	S17	SS	5	21 100/6"	100/6"	Spoon refusal 100/6" D = 71'
									Rig chatter
	Red brown f.-c. SAND, some f.-m. gravel, trace silt and clay (6-65)		75	S18	SS	14	40 53 58 38	111	
	Gray f.-c. GRAVEL and red brown f.-c. SAND, trace silt and clay (6-65)		80	S19	SS		66 83 100/5"	183/11"	Spoon refusal D = 81.5'
	Boring terminated D = 82'								Borehole grouted upon completion
			85						
			90						

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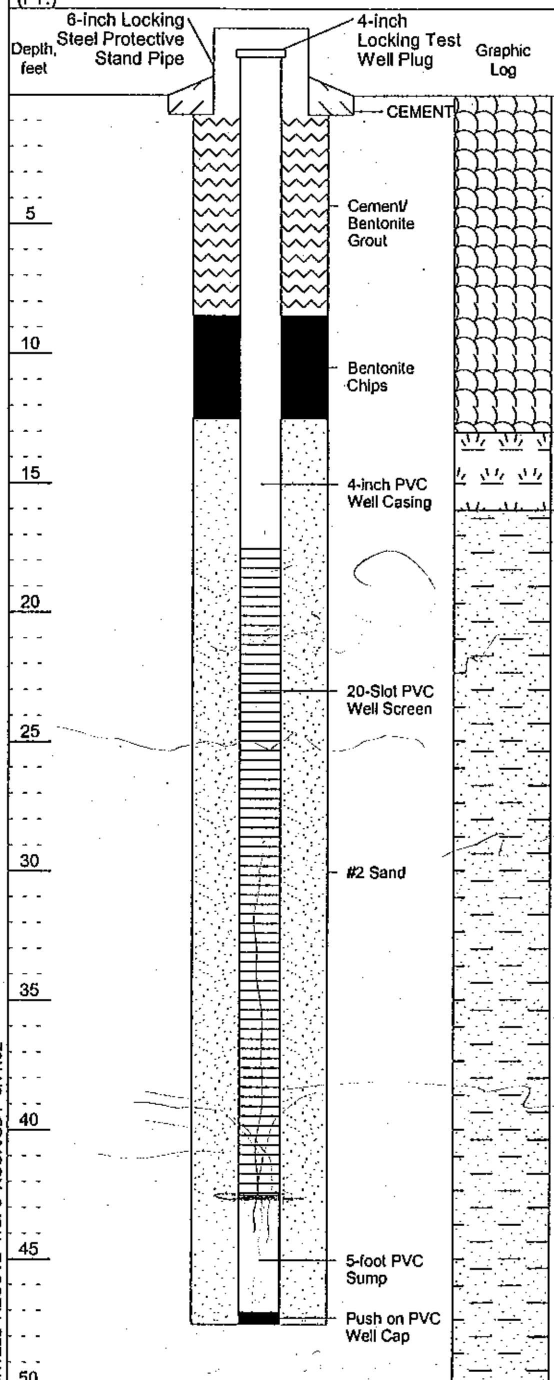
WELL CONSTRUCTION LOG

WELL NO. RW-1	NORTHING	EASTING
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York
APPROVED BY G. Tyers	LOGGED BY C. Battista	
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / S. Miller		GEOGRAPHIC AREA On Site Along 12th Street

DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD Mobile Drill B-61 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 3/18/02-4/1/02

CASING MAT./DIA. SCH 40 PVC / 4-inch — SCREEN: TYPE Slotted — MAT. SCH 40 PVC — TOTAL LENGTH 25.0 — DIA. 4-inch — SLOT SIZE 20-Slot

ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
			/		#2



Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
Brown fine to coarse SAND, some Gravel, trace Brick; dry to wet (fill)			Strong odor
Brown fine to coarse SAND, some Silt, little Gravel, trace Brick; dry to wet (fill)		21.8	Sheen and strong odor
No recovery			
Brown to dark brown fine to coarse Sand, and Gravel, little Silt, little Wood; wet (fill)		29.3	Sheen and strong odor
Brown to red fine to coarse SAND, some Silt, little Gravel, trace Brick, trace Concrete; wet (fill)		13.7	
Green to grey PEAT; moist			Thickness of peat interval interpreted from previous Site investigation
Dark gray Silt and fine Sand; wet		4.5	Strong odor
Dark gray Silt and fine Sand; wet		5.8	
Dark gray Silt and fine Sand, trace Gravel; wet		10.4	
Brown Silt and fine Sand; wet			Sheen and strong odor
Brown Silt and fine Sand; wet		79.4	Sheen and strong odor
Brown Silt and fine Sand; wet			Trace free product
Brown Silt and fine Sand; wet		30.1	Bottom of well 47.5 feet below land surface

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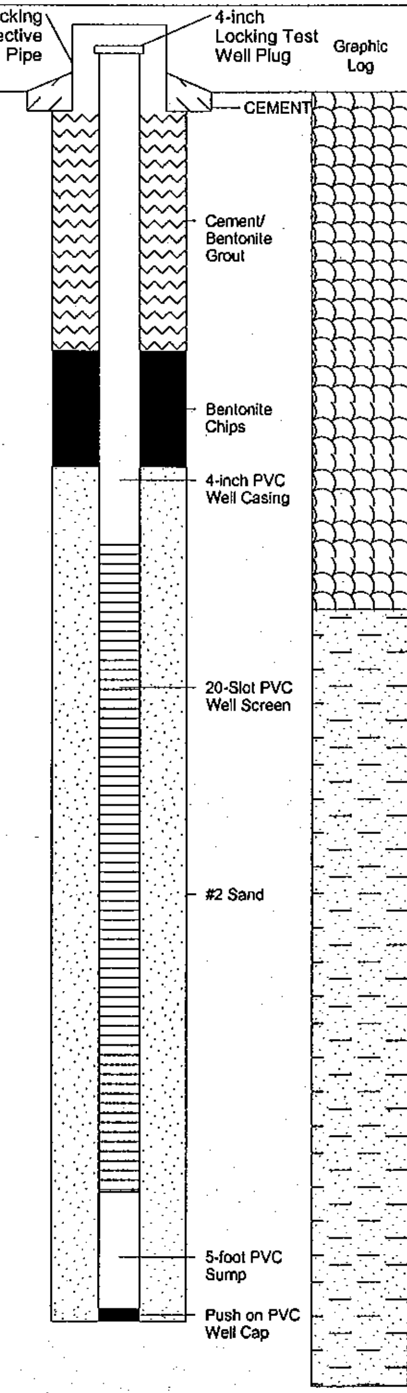
WELL CONSTRUCTION LOG

WELL NO. RW-2	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY C. Battista			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / S. Miller		GEOGRAPHIC AREA On Site Along Pathmark Wall		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD Mobile Drill B-61 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 3/21/02-3/29/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.) GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse SAND, little Gravel, trace Silt, trace Brick, trace Coal Fragments; dry to wet (fill)			
10	Brown fine to coarse SAND, trace Silt, trace Gravel; wet (fill)		0.3	
12	Brown fine to medium SAND, trace Silt, trace Gravel; wet (fill)		0.3	
14	Brown fine to medium SAND, trace Silt, trace Gravel; wet (fill)		0.6	
16	Brown fine to medium SAND, trace Silt, trace Gravel, trace Wood; wet (fill)		0.1	
18	Brown fine to medium SAND, trace Silt, trace Gravel, trace Wood; wet (fill)		0.1	
20	Brown Silt and fine Sand, little coarse Gravel; wet		126	Strong odor
25	Brown Silt and fine Sand, little Gravel; wet		303	Strong odor
30	Brown Silt and fine Sand, little Gravel; wet		493 274	Trace free product
35	Brown Silt and fine Sand, little Gravel; wet		311	Free product
40	Brown Silt and fine Sand, little Gravel; wet		893	Free product
45	Dark gray to brown fine SAND, little Silt; wet		>2000	Free product Bottom of well 47.5 feet below land surface

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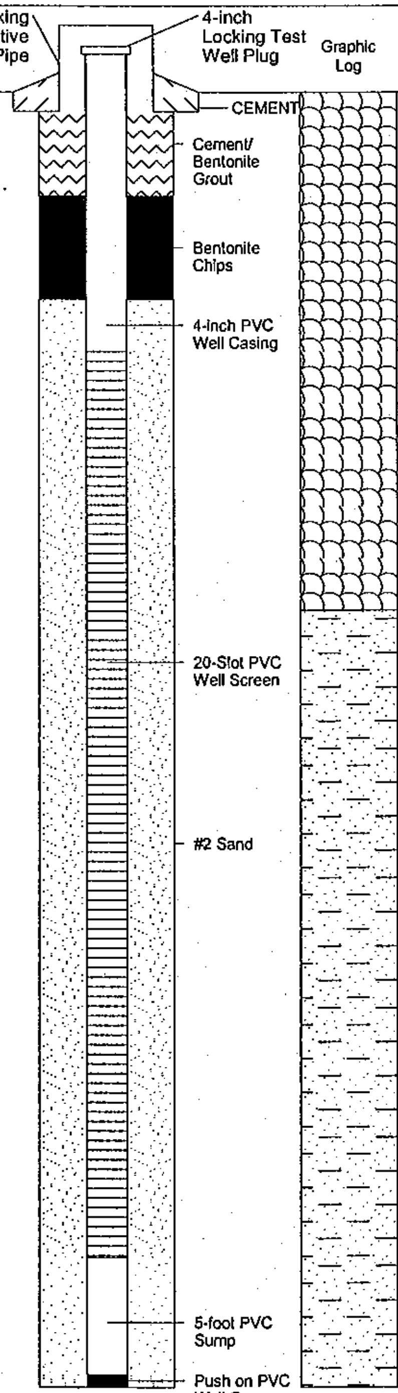
WELL CONSTRUCTION LOG

WELL NO. RW-3	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along Pathmark Wall		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 3/21/02-3/28/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 35.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN / GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse SAND, trace Gravel, trace Brick; wet at 5 (fill)			
10	Brown fine to coarse SAND, little Gravel, little Brick, trace Silt; wet (fill)		0.0	
12	Brown fine to coarse SAND, little Gravel, little Brick, trace Silt; wet (fill)		0.0	
14	Brown fine to coarse SAND, trace Gravel, trace Silt; wet (fill)		1.4	
16	Brown fine to medium SAND, trace Silt, trace Gravel; wet (fill)		5.7	Strong odor and trace free product
18	Brown fine to medium SAND, trace Silt, trace Gravel; wet (fill)		1.4	Trace free product
20	Brown fine to coarse SAND, little Silt; wet		27.4	Odor
25	Brown fine to coarse SAND, little Silt, trace Gravel; wet		15.1	Odor
30	Brown fine to coarse SAND, little Silt, trace Gravel; wet		152	Free product
35	Brown SILT, some fine Sand, trace coarse Sand; wet		98.1	Odor and free product
40	Brown fine SAND, little Silt, trace Gravel; wet		237	Odor and free product
45	Brown fine SAND, little Silt, trace Gravel; wet		1681	Free product
50				Bottom of well 50 feet below land surface

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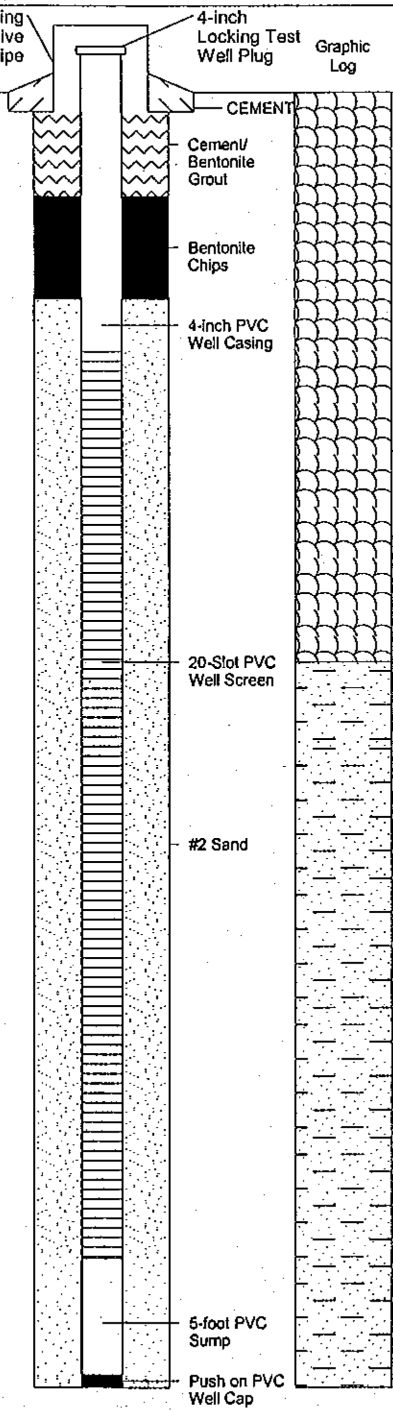
WELL CONSTRUCTION LOG

WELL NO. RW-4	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along Pathmark Wall		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 3/21/02-3/28/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 35.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE
GRAVEL PACK #2				



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse SAND, trace Brick, trace Silt, trace Gravel; wet at 5 (fill)			
10	Brown fine to coarse SAND, trace Brick, trace Silt, trace Gravel; wet (fill)		0.1	
	Brown fine to coarse SAND, trace Brick, trace Silt, trace Gravel; wet (fill)		1.6	Odor
15	Brown fine to coarse SAND, trace Brick, trace Silt, trace Gravel; wet (fill)		1.8	Odor
	Brown fine to coarse SAND, trace Brick, trace Silt, trace Gravel; wet (fill)		0.9	Slight odor
	Brown fine to medium SAND, trace Gravel, trace Silt; wet		1.9	
20	Brown fine to medium SAND, trace Gravel; wet (fill)		4.7	Black staining and strong Odor
	Gray fine SAND, little Wood; wet (fill)			
	Brown fine to coarse SAND, little Silt, trace Gravel; wet		26.8	
25	Brown fine to coarse SAND, some Silt, trace Gravel; wet		7.2	Odor and trace free product
30	Brown fine to coarse SAND, some Silt, trace Gravel; wet		5.6	Odor and trace free product
35	Brown fine to coarse SAND, some Silt, trace Gravel; wet		14.9	Odor and trace free product
40	Brown fine to coarse SAND, some Silt, trace Gravel; wet		35.1	Free product
45	Brown fine to coarse SAND, some Silt, trace Gravel; wet		87.4	Free product
50				Bottom of well 50 feet below land surface

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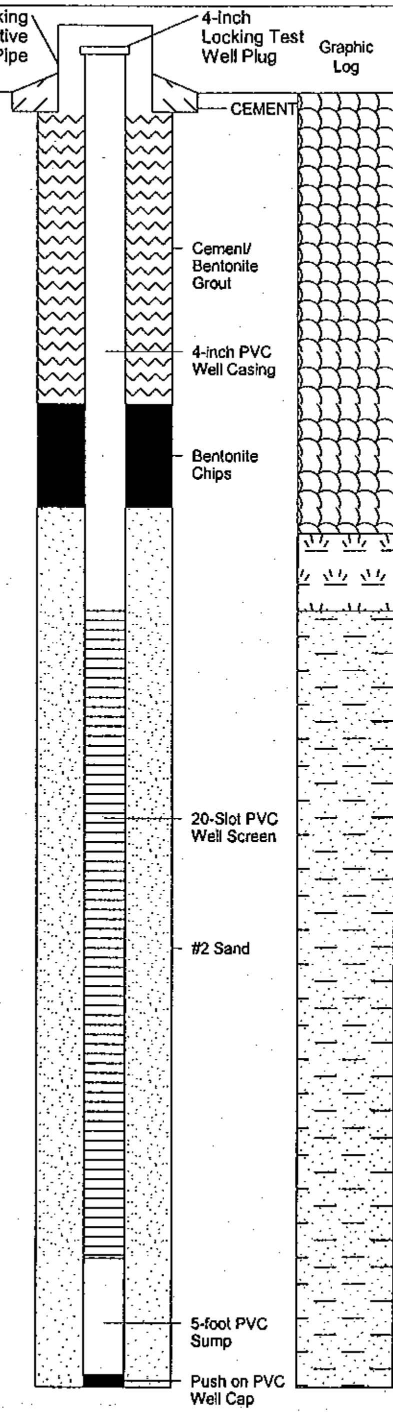
WELL CONSTRUCTION LOG

WELL NO. RW-5	NORTHING	EASTING
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York
APPROVED BY G. Tyers	LOGGED BY C. Battista	
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / S. Miller		GEOGRAPHIC AREA On Site Along Pathmark Wall

DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD Mobile Drill B-61 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 3/21/02-3/27/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC	TOTAL LENGTH 25.0 DIA. 4-inch	SLOT SIZE 20-Slot

ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
			/		#2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown coarse to fine SAND, trace Gravel, trace Brick, trace Silt; dry to wet (fill)			
10	Brown fine SAND, trace Silt, trace Gravel; wet (fill)		0.0	
	Brown fine SAND, trace Silt, trace Gravel; wet (fill)		3.3	
15	Brown fine SAND, little Silt, trace Gravel; wet (fill)		9.5	Black staining
	No recovery			
	Green to gray Peat and Clay, trace Sand; wet		14.6	Thickness of peat interval interpreted from previous Site investigation
20	Brown fine to coarse SAND, little Silt, little Gravel; wet		2.6	Strong odor
25	Brown fine to coarse SAND, some Silt; wet		1.7	Strong odor
30	Brown fine to coarse SAND, some Silt, trace Gravel; wet		106	Strong odor
35	Brown fine to coarse SAND, some Silt, trace Gravel; wet		134	Trace free product
40	Brown fine to coarse SAND, some Silt; wet		281	Free product
45	Brown Silt and fine Sand; wet		375	Odor and free product
50				Bottom of well 50 feet below land surface

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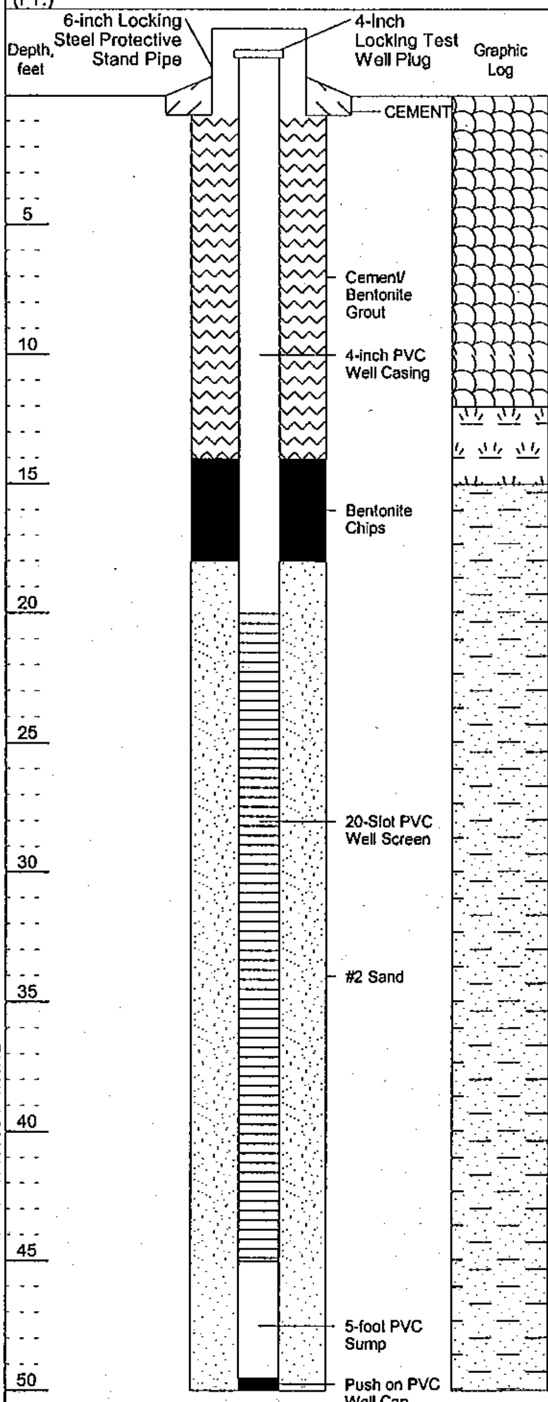
WELL CONSTRUCTION LOG

WELL NO. RW-6	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along Pathmark Wall		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 3/21/02-3/25/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN / GW SURFACE	GRAVEL PACK #2



Depth (feet)	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse SAND, trace Gravel, trace Brick, trace Silt; dry to wet (fill)			
10	Brown fine SAND, little Silt, trace Brick; wet (fill)		1.6	Odor and Black Staining
12	Green to gray Peat and Clay, trace brown Sand; moist		7.3	
14			5.9	Thickness of peat interval interpreted from previous Site investigation Black staining Odor
15	Fine SAND, trace Gravel, trace Silt; wet			
20	Gray fine SAND, little Silt, trace Gravel; wet		1.9	Black staining Odor
25	Gray fine SAND, little Silt, trace Gravel; wet		4.7	Slight Odor
30	Grey SILT, Some fine Send; wet		156	Odor
35	Brown to green fine SAND, some Silt; wet		350	Odor
40	Brown to green fine SAND, some Silt; wet		1254	Odor
45	Brown to green fine SAND, some Silt; wet		1824	Odor
50				Bottom of well 50 feet below land surface

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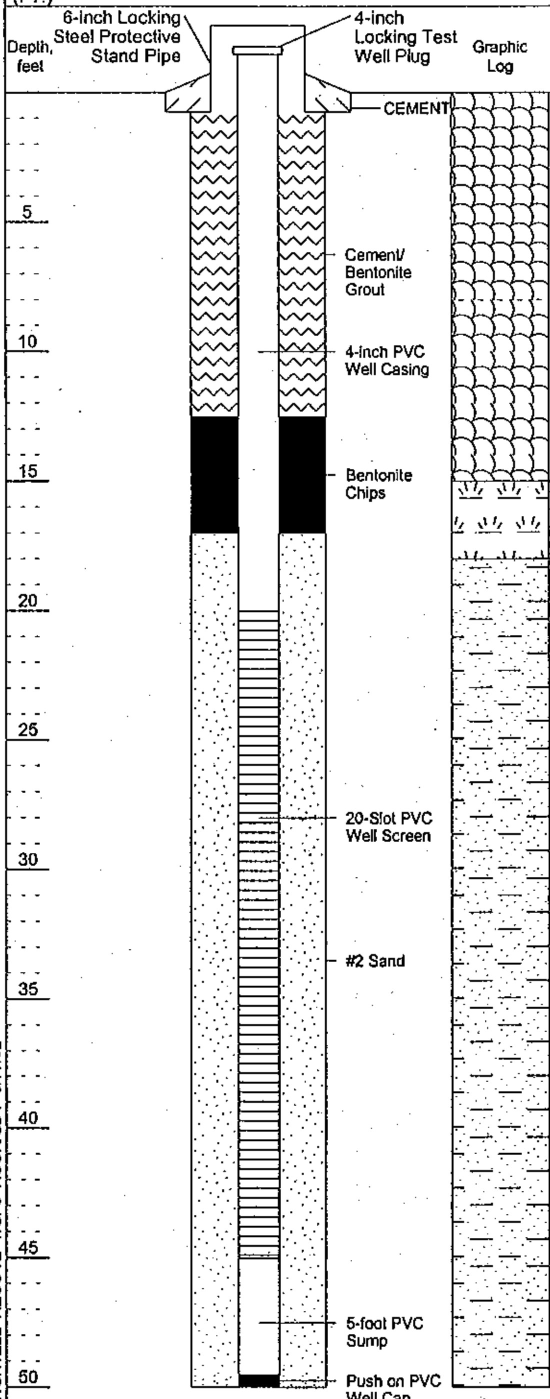
WELL CONSTRUCTION LOG

WELL NO. RW-7	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY C. Battista			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / S. Miller		GEOGRAPHIC AREA On Site Along Pathmark Wall		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD Mobile Drill B-61 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 3/21/02-3/25/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.) GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse SAND, trace Gravel, trace Brick, trace Silt; dry to wet (fill)			
9	No recovery			
10	Fine SAND, some Gravel, trace Silt; wet (fill)		0.7	Black staining
12	Brown fine SAND, little Silt; wet (fill)		1.4	Black staining
14			1.9	Odor and black staining
15	Brown fine SAND, little Silt; wet (fill)			
15	Green to gray Peat and Clay; wet		7.3	Odor
16				Thickness of peat interval interpreted from previous Site investigation
18	Brown fine to coarse SAND, some Silt, trace Gravel; wet			
20	Brown fine to coarse SAND, some Silt, trace Gravel; wet		10.2	Odor
25	Brown fine to coarse SAND, some Silt, trace Gravel; wet		11.7	Odor
30	No recovery			
35	Dark Gray fine to medium SAND, some Silt; wet		27.1	
40	Dark Gray fine to medium SAND, some Silt, little Gravel; wet		21.0	Odor
45	Dark gray Silt and fine Sand; wet		30.6	Sheen and odor
50				Bottom of well 50 feet below land surface

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WELL CONSTRUCTION LOG

WELL NO. RW-8	NORTHING	EASTING
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York
APPROVED BY G. Tyers	LOGGED BY C. Battista	
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / S. Miller		GEOGRAPHIC AREA On Site Along 12th Street

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
6.25-in. / Auger	10-inches	Mobile Drill B-61 / HSA	2" Split Spoon	3/22/02-4/2/02

CASING MAT./DIA. SCH 40 PVC / 4-inch — SCREEN: TYPE Slotted — MAT. SCH 40 PVC — TOTAL LENGTH 25.0 — DIA. 4-inch — SLOT SIZE 20-Slot

ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
			/		#2

Well construction: 6-inch Locking Steel Protective Stand Pipe; 4-inch Locking Test Well Plug; CEMENT; Cement/ Bentonite Grout; 4-inch PVC Well Casing; Bentonite Chips; 20-Slot PVC Well Screen; #2 Sand; 5-foot PVC Sump; Push on PVC Well Cap

Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse fine SAND, trace Gravel, trace Brick, trace Silt; dry to wet (fill)			
10.5	Brown fine to coarse SAND, trace silt, trace concrete; wet (fill)			Black staining and trace free product
12.5	Brown fine to medium SAND, trace Silt; wet (fill)			
14	Brown PEAT; wet			Thickness of peat interval interpreted from previous Site investigation
16.5	Brown fine to coarse SAND, little Silt, trace Gravel; wet		38.5	
20	Brown fine to coarse SAND, little Silt; wet		17.1	Strong odor and trace free product Slight odor and Sheen
25	Brown fine to coarse SAND, little Silt, trace Gravel; wet		0.0	Slight odor and Sheen
30	Brown to dark gray fine to medium SAND, some Silt, little Clay; wet		333	Odor
35	Brown to dark gray fine to medium SAND, some Silt, little Clay; wet		235	Odor
40	Dark gray to brown fine SAND, little Silt; wet		427	Odor
45	Dark gray to brown fine SAND, little Silt; wet		236	Odor
50				Bottom of well 49.5 feet below land surface

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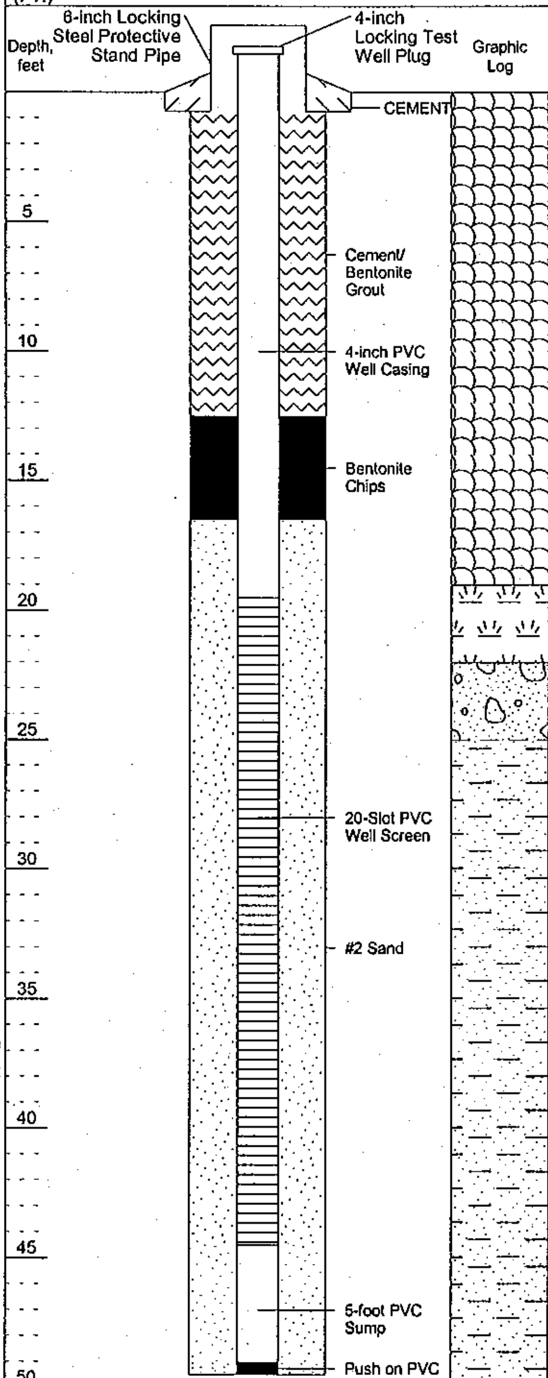
WELL CONSTRUCTION LOG

WELL NO. RW-9	NORTHING	EASTING
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York
APPROVED BY G. Tyers	LOGGED BY D. Moss	
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along 12th Street

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
6.25-in. / Auger	10-inches	CME-75 / HSA	2" Split Spoon	3/22/02-4/2/02

CASING MAT./DIA.: SCH 40 PVC / 4-inch
SCREEN: TYPE Slotted MAT. SCH 40 PVC TOTAL LENGTH 25.0 DIA. 4-inch SLOT SIZE 20-Slot

ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
			/		#2



Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
Brown fine to coarse SAND, trace Gravel, trace Brick, trace Silt; dry to wet (fill)			
Brown WOOD; wet (fill)		120	Free product
Brown fine SAND, little Silt, trace Gravel; wet (fill)		180	Black staining Odor and free product
Green to tan fine to medium SAND, little Silt; wet (fill)		109	Trace free product
Green to brown fine SAND, some Silt, trace Peat; wet (fill)		57.6	
Brown PEAT; moist			Thickness of peat interval interpreted from previous Site investigation
Black fine to coarse SAND, little Gravel; wet		84.9	Odor and free product
Black fine to coarse SAND, some Silt, trace Gravel; wet		28.5	Black staining Trace free product
Black to gray SILT, little fine Sand; wet		66.8	Black staining Odor and trace free product
Brown Silt and fine Sand, trace coarse Sand; wet		28.2	Odor and sheen
Brown Silt and fine Sand, trace coarse Sand; wet		19.7	Odor and sheen
Brown Silt and fine Sand, trace coarse Sand; wet		27.1	Odor and sheen
			Bottom of well 49.5 feet below land surface

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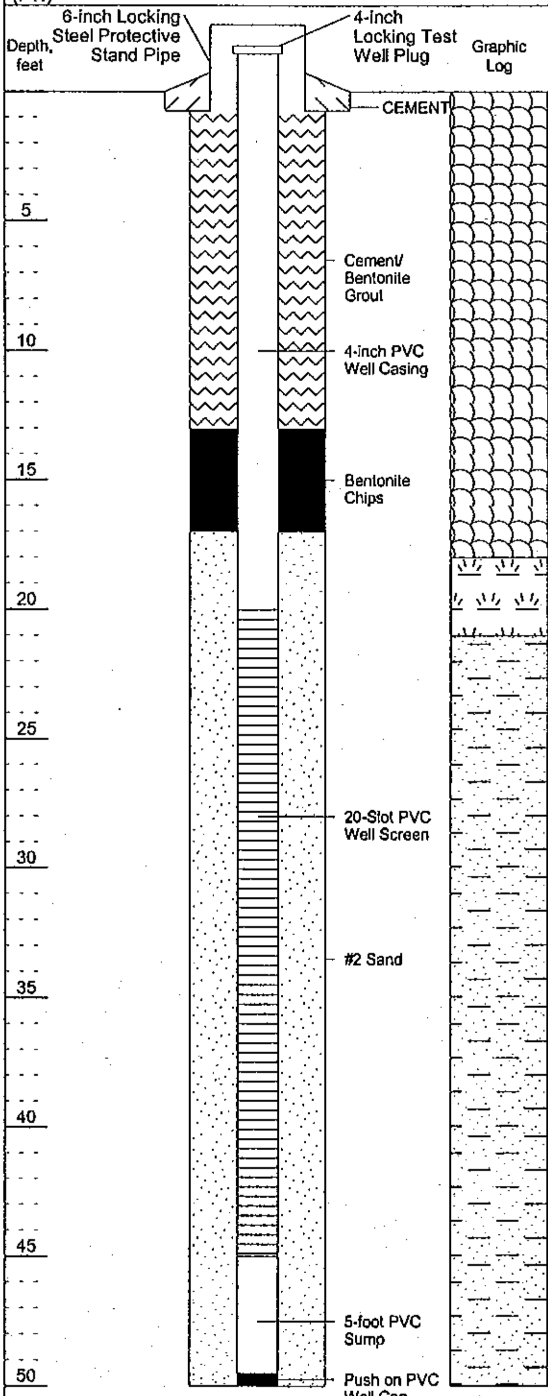
WELL CONSTRUCTION LOG

WELL NO. RW-10	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY R. Kovacs			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along 12th Street		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 3/22/02-4/1/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC	TOTAL LENGTH 25.0	DIA. 4-inch SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE / GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse SAND, trace Gravel, trace Silt, trace Brick; dry to wet (fill)			
10	Green to brown fine SAND, little Silt, trace Gravel; wet (fill)		8.2	Black staining
12	Green to brown fine SAND, little Silt; wet (fill)		8.1	Black staining Slight Odor
14	Green to brown fine SAND, little Silt; wet (fill)		6.0	Black staining
16	Green to brown fine to coarse SAND, little Silt, little Peat at 18; wet (fill)		8.7	Black staining
18	Brown PEAT; moist		54.0	Thickness of peat interval interpreted from previous Site investigation
21	Brown to light brown fine SAND, some Silt; wet		59.0	Odor and sheen
25	Brown to reddish brown fine to medium SAND, some Silt; wet		96.5	Free product
30	Brown to light brown fine to medium SAND, some Silt; wet		219	Odor and free product
35	Brown fine to medium SAND, some Silt; wet		110	Odor and free product
40	Brown SILT, some medium Sand; wet		172	Odor and free product
45	Brown SILT, some fine to medium Sand; wet		162	Odor and free product
50				Bottom of well 50 feet below land surface

BORING/WELL RECOVE-1.GPJ ROUX.GDT 6/11/02

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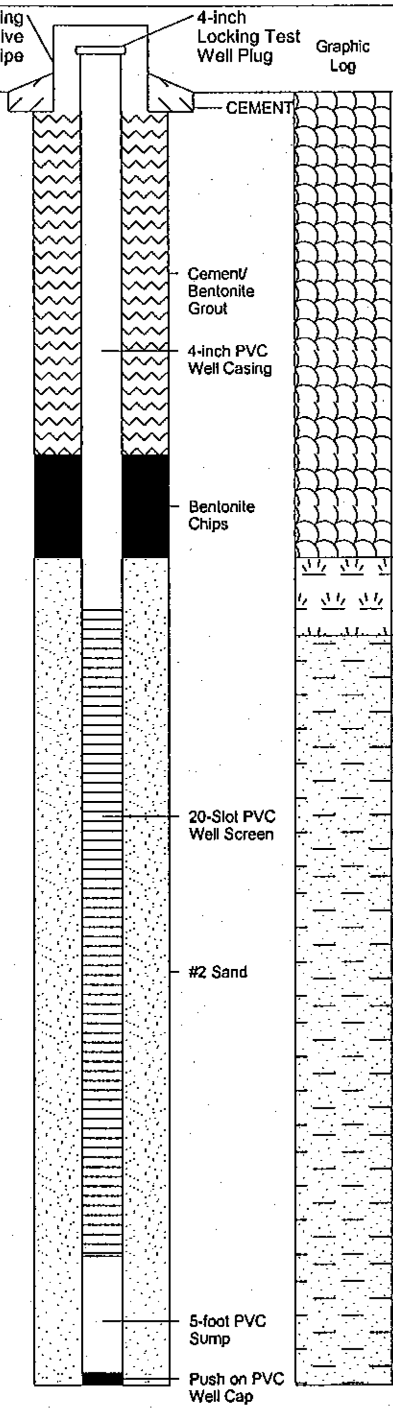
WELL CONSTRUCTION LOG

WELL NO. RW-11	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along 12th Street		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 3/22/02-3/29/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN / GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse SAND, little Gravel, trace Brick, trace Silt; wet at 6 (fill)			
10	Brown fine to coarse SAND, little Gravel, trace Brick, trace Silt; wet (fill)		50.0	Black staining
12	Brown fine to coarse SAND, little Gravel, trace Brick, trace Silt; wet (fill)		71.9	Black staining
14	Brown fine to medium SAND, little Gravel, little Silt; wet (fill)		43.9	
16	Brown fine to coarse SAND, trace Gravel, trace Silt, trace Brick; wet (fill)		31.2	
18	Brown PEAT; moist		138	Thickness of peat interval interpreted from previous Site investigation
21	Brown fine to coarse SAND, little Silt, trace Gravel; wet		7.2	
25	Brown fine to coarse SAND, some Silt; wet		7.2	Odor and trace free product
30	Brown fine to coarse SAND, some Silt; wet		23.2	Trace free product
35	Brown fine to coarse SAND, some Silt; wet		17.6	Trace free product
40	Brown Silt and fine Sand, trace coarse Sand, trace Gravel; wet		1124	Trace free product
45	Brown Silt and fine Sand, trace coarse Sand, trace Gravel; wet		280	
50				Bottom of well 50 feet below land surface

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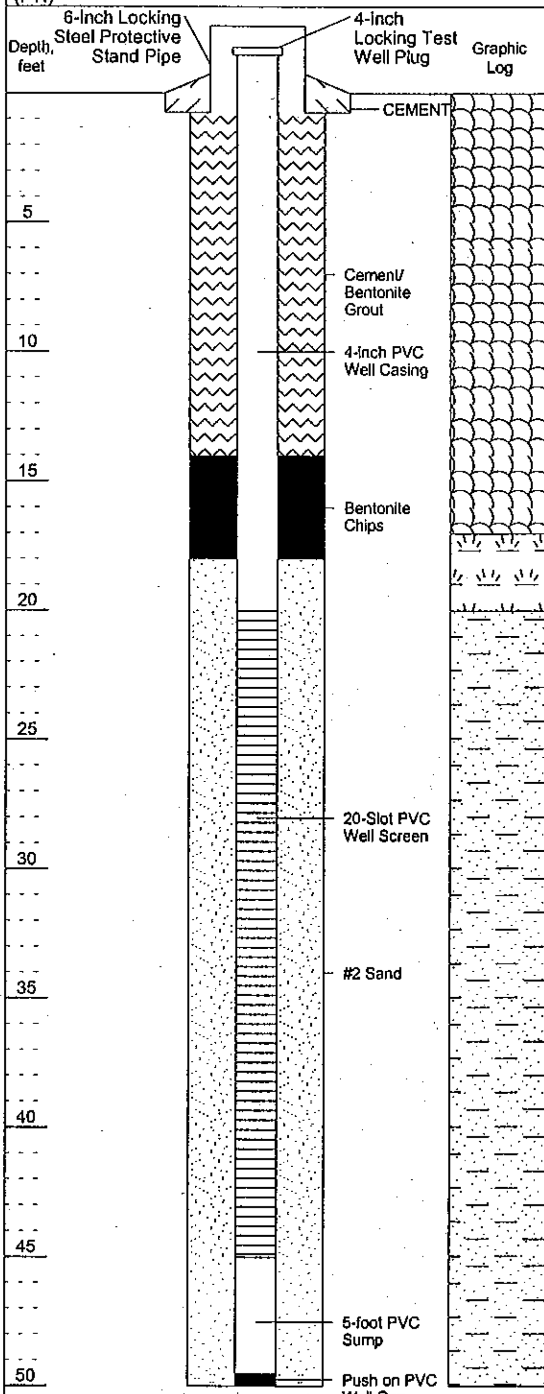
WELL CONSTRUCTION LOG

WELL NO. RW-12	NORTHING	EASTING
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York
APPROVED BY G. Tyers	LOGGED BY D. Moss	
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along 12th Street

DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 3/22/02-3/27/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.) GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse SAND, trace Gravel, trace Silt, trace Brick; dry to moist (fill)			
5	BRICK; dry (fill)			
	Brown fine to coarse SAND, some Gravel, trace Brick, trace Silt; wet at 7 (fill)			
10	Brown fine to coarse SAND, little Silt, trace Gravel; wet (fill)			Sheen and odor
	Brown fine to coarse SAND, little Silt, little Gravel; wet (fill)		55.3	Slight odor
15	Brown fine to coarse SAND, little Silt, little Gravel; wet (fill)		72.2	Slight odor
	Brown fine to coarse SAND, some Gravel, little Silt; wet (fill)		74.9	
	Brown PEAT; moist		1.7	Thickness of peat interval interpreted from previous Site investigation
20	Brown fine to coarse SAND, some Silt, trace Gravel; wet		11.7	
25	Brown fine to coarse SAND, some Silt, trace Gravel; wet		19.3	
30	Brown fine to coarse SAND, some Silt, trace Gravel; wet		4.1	
35	Brown fine to coarse SAND, some Silt, trace Gravel; wet		35.1	Odor
40	Brown fine to coarse SAND, some Silt, trace Gravel; wet		174	Odor and trace free product
45	Brown fine to coarse SAND, some Silt, trace Gravel; wet		294	Odor and trace free product
50				Bottom of well 50 feet below land surface

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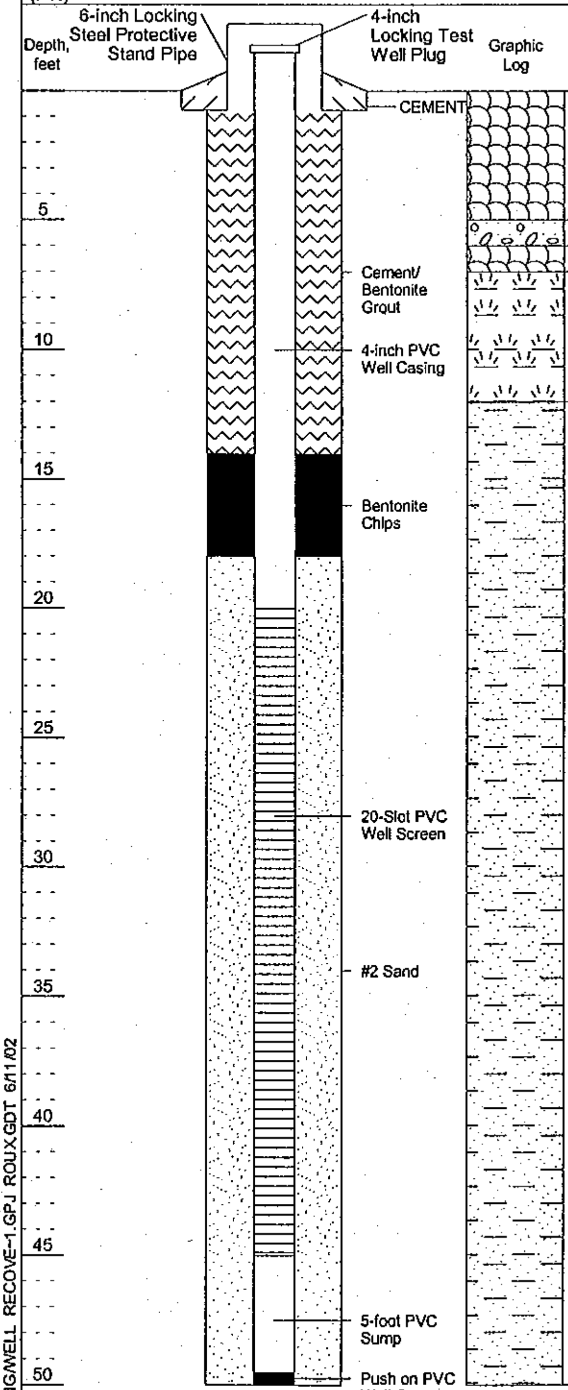
WELL CONSTRUCTION LOG

WELL NO. RW-13	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along 12th Street		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 3/22/02-3/26/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN / GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse SAND, trace Gravel, trace Silt, trace Brick; dry to moist (fill)			
5	Brick and Concrete; dry (fill)			
	Brown fine to coarse Sand and Brick; wet (fill)		80.8	Black staining
	Brown PEAT; moist			
	Brown PEAT; moist			
10	Brown PEAT; moist		73.9	
	Fine SAND, some Silt, trace Gravel; wet			Black staining
15			21.7	Odor
	Brown to green fine SAND, some Silt; wet			Odor
			17.1	
20	Brown fine SAND, little Silt; wet			Slight odor
			9.7	
25	Brown SILT, little fine Sand, trace Gravel; wet			Odor and trace free product
			118	
30	Brown SILT, little fine Sand, trace Gravel; wet			Odor and trace free product
			15.6	
35	Brown fine SAND, some Silt; wet			Odor
			5.3	
40	Brown to green SILT, little fine Sand; wet			Odor and trace free product
			459	
45	Brown SILT, some Sand; wet			Odor
			154	
50				Bottom of well 50 feet below land surface

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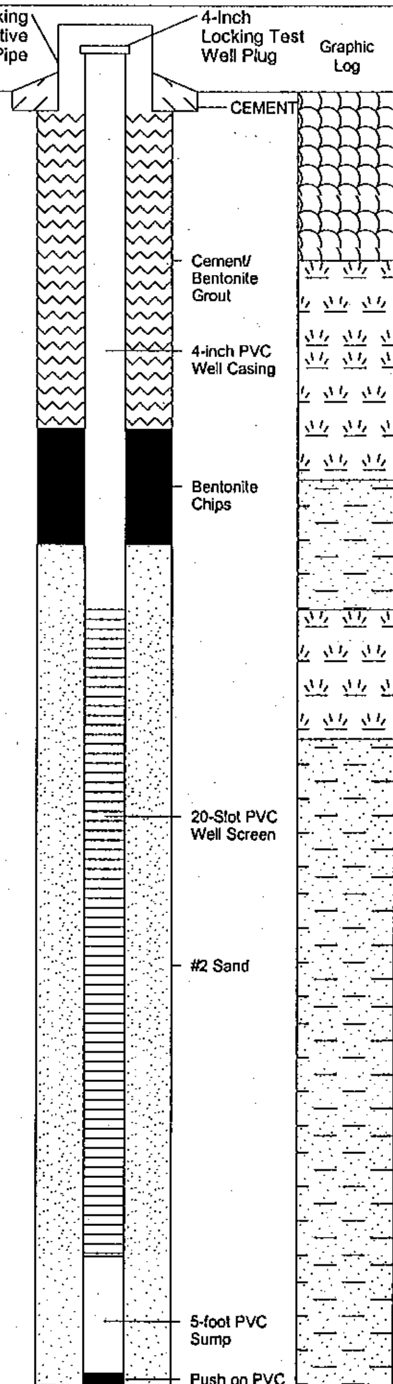
WELL CONSTRUCTION LOG

WELL NO. RW-14	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue		
APPROVED BY G. Tyers	LOGGED BY C. Battista	Brooklyn, New York		
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / S. Miller		GEOGRAPHIC AREA On Site Along 12th Street		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD Mobile Drill B-61 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 3/22/02-3/26/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.) GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse SAND, little Gravel, trace Silt; dry (fill)			
5	Brown fine to coarse SAND, little Gravel, trace Silt; dry to moist (fill)		49.5	
	Brown fine to coarse SAND, little Gravel, trace Silt; wet (fill)		45.9	
	Brown PEAT; moist			
10	Brown PEAT; moist to wet		1.3	
15	Dark brown SAND, some Silt, trace Peat; wet		2.7	
20	Dark brown PEAT; moist to wet		125	
25	Dark brown fine SAND, little Silt; wet		147	Odor end trace free product
30	Dark brown fine SAND, little Silt; wet		413	Sheen
35	Dark brown fine SAND, little Silt; wet		475	Trace free product
40	Dark brown fine SAND, little Silt; wet		>2000	Sheen
45	Dark brown fine SAND, little Silt; wet		524	
50				Bottom of well 50 feet below land surface

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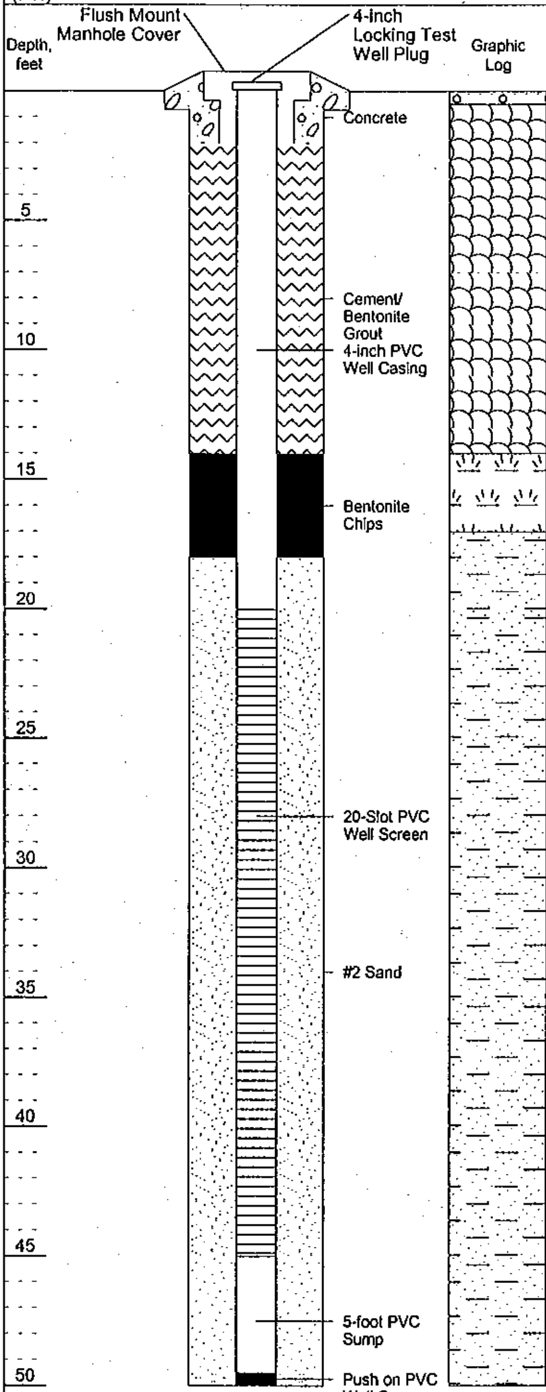
WELL CONSTRUCTION LOG

WELL NO. RW-15	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue, Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA Off Site 12th Street Sidewalk		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 4/4/02-4/4/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC, TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN / ; GW SURFACE	GRAVEL PACK #2



Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
CONCRETE			
Brown fine to coarse SAND, trace Gravel, trace Brick, trace Silt; dry to wet (fill)			
Brown to green fine SAND, little Silt, trace Gravel, trace Brick, trace Concrete; wet (fill)		73.7	Odor and sheen
Brown fine SAND, little Silt, trace coarse SAND, trace Gravel; wet (fill)		147	
Brown fine to coarse SAND, little Silt, trace Gravel; wet (fill)		51.8	
Brown fine SAND, some Silt, trace coarse SAND; wet (fill)		7.1	
Brown PEAT; moist			Thickness of peat interval interpreted from previous Site investigation
Brown fine SAND, little Silt, trace coarse Sand; wet		29.2	
Brown fine Sand and Silt, trace coarse Sand; wet		89.7	Slight odor
Brown fine SAND, little Silt, trace coarse Sand; wet		154	Slight odor
Brown fine SAND, little Silt, trace Coarse Sand; wet		243	
Brown fine SAND, little Silt, trace Coarse Sand; wet		172	Trace free product
Brown fine SAND, little Silt, trace Coarse Sand; wet		612	Trace free product
Brown fine Sand and Silt; wet		684	Odor and trace free product
			Bottom of well 50 feet below land surface

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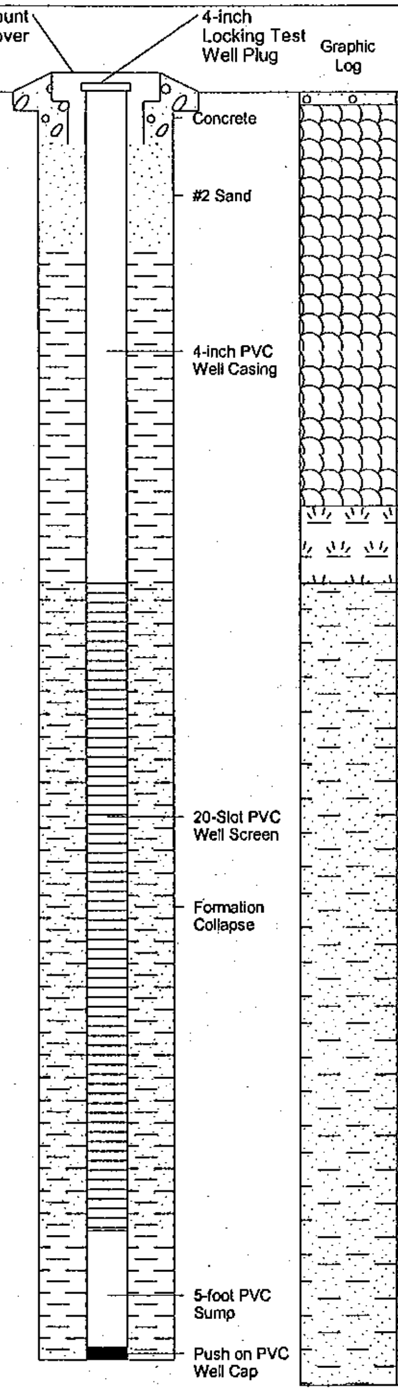
WELL CONSTRUCTION LOG

WELL NO. RW-16	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY C. Battista			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA Off Site 12th Street Sidewalk		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 4/5/02-4/5/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN / GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	CONCRETE			
0–5	Brown to dark brown fine to coarse SAND, some Gravel, trace Silt; wet at 4 (fill)			
5–10	Dark gray fine to coarse Sand and Gravel, little Silt; wet (fill)		7.9	Slight odor
10–12	Brown to dark gray GRAVEL, some fine to coarse Sand, trace Silt, trace Ash, trace Cinders; wet (fill)		5.8	
12–14	Brown to dark gray fine to coarse SAND, trace Silt, trace Gravel; wet (fill)		4.1	
14–16	Brown fine to coarse SAND, trace Silt, trace Gravel; wet (fill)		26.4	
16–19	Brown PEAT; moist			Thickness of peat interval interpreted from previous Site investigation
19–25	Brown Silt and fine Sand, little Gravel; wet			
25–30	Brown Silt and fine Sand, little Gravel; wet		11.5	odor
30–35	Brown Silt and fine Sand, little Gravel; wet		6.1	odor
35–40	Brown Silt and fine Sand, little Gravel; wet		10.0	odor
40–45	Dark gray fine SAND, some Silt, little Clay; wet		62.3	
45–50	Dark gray fine SAND, some Silt, little Clay, little Gravel; wet		4.4	Trace free product
50				Bottom of well 49 feet below land surface

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WELL CONSTRUCTION LOG

WELL NO. RW-17	NORTHING	EASTING
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue
APPROVED BY G. Tyers	LOGGED BY R. Kovacs	Brooklyn, New York
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA Off Site 12th Street Sidewalk
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA; SAMPLING METHOD 2" Split Spoon; START-FINISH DATE 4/9/02-4/9/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC; TOTAL LENGTH 25.0; DIA. 4-inch; SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING; TOP & BOTTOM SCREEN /; GW SURFACE; GRAVEL PACK #2

Well construction labels: Flush Mount Manhole Cover; 4-inch Locking Test Well Plug; Concrete; Cement/ Bentonite Grout; 4-inch PVC Well Casing; Bentonite Chips; 20-Slot PVC Well Screen; #2 Sand; 5-foot PVC Sump; Push on PVC Well Cap

Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	CONCRETE			
0–5	Brown to dark brown fine to coarse SAND, some Silt; wet (fill)		13.0	Slight odor
5–10	Brown to dark brown fine to medium SAND, some Silt; wet (fill)		14.0	Slight odor
10–12	Brown to dark brown fine Sand and Silt; wet (fill)		22.3	Slight odor
12–13	Brown fine to medium SAND; wet (fill)		12.7	
13–14	Brown fine Sand and Silt; wet (fill)		12.3	Slight odor
14–15	Brown to reddish brown fine to medium SAND; wet (fill)		10.7	Slight odor
15–17	Brown PEAT; moist		7.4	Thickness of peat interval interpreted from previous Site investigation
17–20	Brown fine to medium SAND; wet			Slight odor
20–25	Brown to dark brown fine SAND; wet		10.7	Slight odor
25–30	Brown to dark brown fine SAND; wet		11.9	Slight odor
30–35	Brown to dark brown fine SAND; wet		14.9	Slight odor
35–40	Brown fine to medium SAND; wet		9.7	Slight odor
40–45	Brown fine to medium SAND; wet		47.3	Odor and trace free product
45–50	Brown fine to medium SAND; wet		59.9	Odor and trace free product
50				Bottom of well 50 feet below land surface

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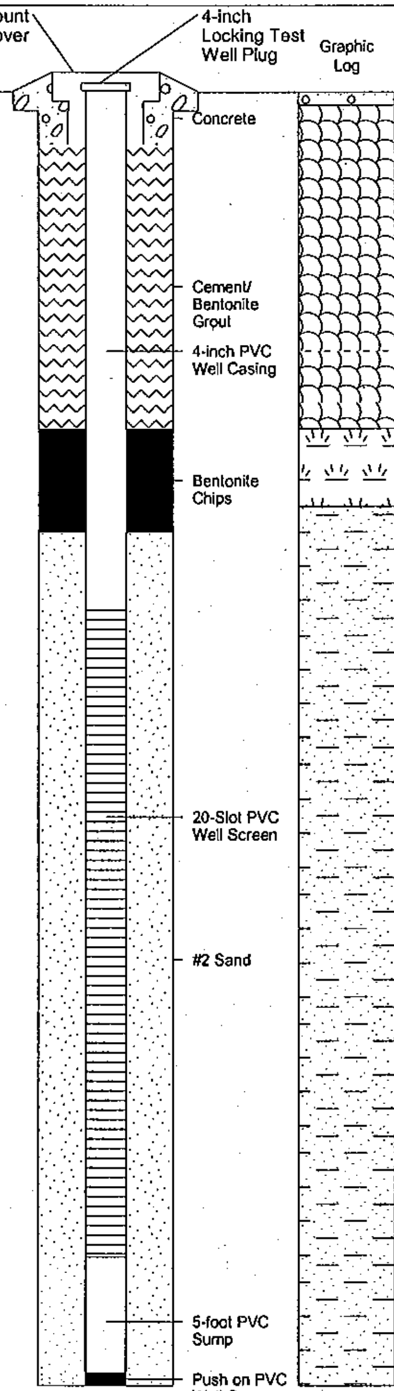
WELL CONSTRUCTION LOG

WELL NO. RW-18	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY C. Battista			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA Off Site 12th Street Sidewalk		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 4/19/02-4/19/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.) GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	CONCRETE			
	Brown fine to coarse SAND, little Silt, trace Brick, trace Gravel; wet at 4 (fill)			
11	Brown fine to coarse SAND, little Silt, trace Brick, traco Gravel; wet (fill)		0.0	
13	Brown fine to coarse SAND, little Silt, trace Brick, trace Gravel; wet (fill)		0.0	Strong organic odor
14	Brown PEAT; moist		8.3	Thickness of peat interval interpreted from previous Site investigation
16	Brown fine to coarse SAND, some Peat, little Silt, trace Gravel; wet		0.0	
21	Brown fine to coarse SAND, some Peat, some Silt, trace Gravel; wet		0.0	
26	Brown fine to coarse SAND, some Silt, trace Peat, trace Gravel; wet		0.0	
31	Brown fine to coarse SAND, some Silt, trace Peat, trace Gravel; wet		0.5	
36	Brown to dark gray fine SAND, little Silt, trace Gravel; wet			
41	Brown to dark gray fine SAND, little Silt, trace Gravel; wet		5.8	
46	Brown to dark gray fine SAND, little Silt, trace Gravel; wet		0.0	
50				Bottom of well 50 feet below land surface

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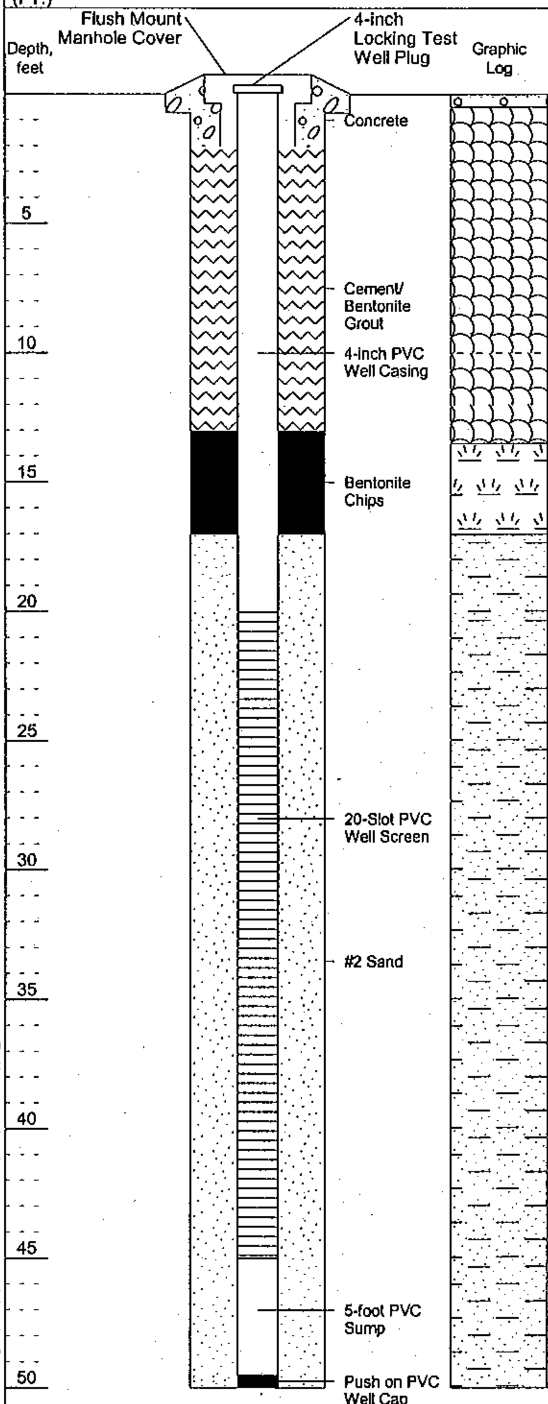
WELL CONSTRUCTION LOG

WELL NO. RW-19	NORTHING	EASTING
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York
APPROVED BY G. Tyers	LOGGED BY D.Moss	
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA Off Site 12th Street Sidewalk

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
6.25-in. / Auger	10-inches	CME-75 / HSA	2" Split Spoon	4/18/02-4/18/02

CASING MAT./DIA.	SCREEN: TYPE	MAT.	TOTAL LENGTH	DIA.	SLOT SIZE
SCH 40 PVC / 4-inch	Slotted	SCH 40 PVC	25.0	4-inch	20-Slot

ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
			/		#2



Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
Concrete			
Brown fine to coarse SAND, little Silt, trace Brick, trace Gravel; wet at 4 (fill)			
Brown fine SAND, trace Silt, trace coarse Sand, trace Gravel; moist (fill)		0.9	
Brown fine SAND, trace Silt; wet (fill)		0.7	
Peat and green-grey CLAY; moist			Thickness of peat interval intrepreted from previous Site investigation
Brown fine SAND, little Silt, trace Gravel; wet		1.8	
Brown fine SAND, little Silt; wet		0.0	
Brown fine SAND, little Silt; wet		0.0	Odor
Brown fine SAND, little Silt, trace coarse Sand; wet		0.7	Odor
Brown fine SAND, little Silt, trace coarse Sand; wet		0.0	Odor
Brown fine SAND, little Silt; wet		0.0	Odor
Brown fine SAND, little Silt; wet		0.0	Odor
			Bottom of well 50 feet below land surface

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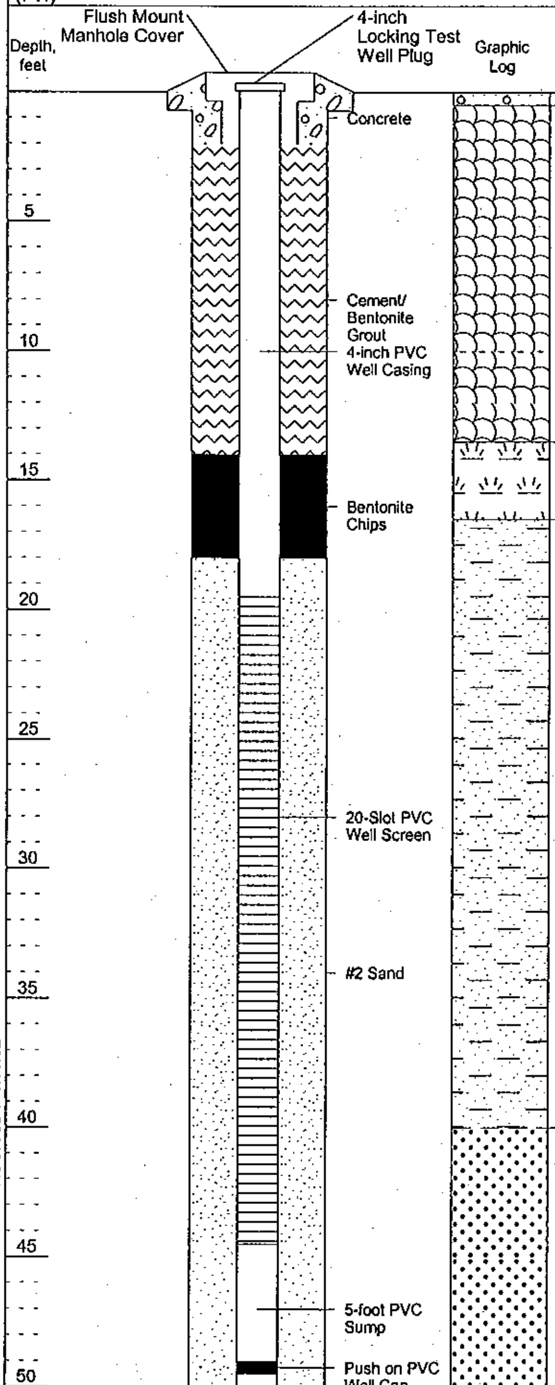
WELL CONSTRUCTION LOG

WELL NO. RW-20	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY C. Battista			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA Off Site 12th Street Sidewalk		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 4/17/02-4/17/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE
GRAVEL PACK #2				



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	CONCRETE			
0–10.5	Dark brown fine to coarse SAND, trace Gravel, trace Brick, trace Silt; dry to wet (fill)			
6				Odor
7.5			13.3	
10.5–12	Brown to dark green fine to coarse SAND, little Gravel, trace Silt, trace Brick; wet (fill)		11.4	
12–13.5	Brown fine to coarse SAND, little Gravel, trace Silt, trace Brick; wet (fill)		12.0	
13.5–16.5	Brown PEAT; moist			Thickness of peat interval interpreted from previous Site investigation
16.5	Brown medium to coarse SAND, little Silt, trace Gravel, trace Peat; wet		10.5	Slight odor
20.5	Brown fine SAND, little Silt; wet		6.5	
25.5	Brown fine SAND, little Silt; wet		21.9	Odor
30.5	Brown fine SAND, little Silt; wet		3.8	
35.5	Brown fine SAND, little Silt, trace Gravel; wet		6.4	
40–45	Dark gray to light brown fine to medium SAND; wet		4.3	
45–50	Dark gray to light brown fine to medium SAND, trace Silt, trace Gravel; wet		5.2	
50				Bottom of well 49.5 feet below land surface.

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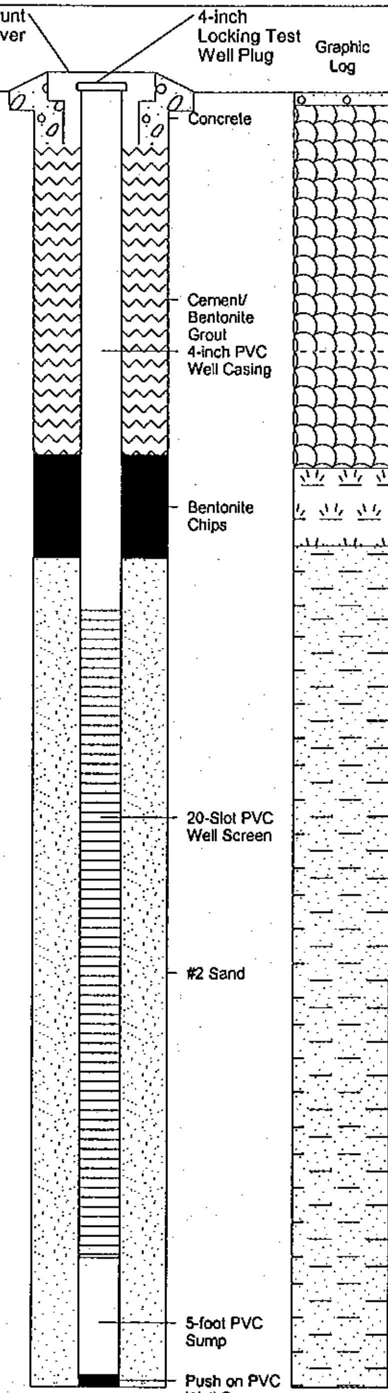
WELL CONSTRUCTION LOG

WELL NO. **RW-21**	NORTHING	EASTING
PROJECT NO./NAME **92401Y03 / FC Gowanus former MGP Site**		LOCATION **124-136 2nd Avenue** **Brooklyn, New York**
APPROVED BY **G. Tyers**	LOGGED BY **D. Moss**	
DRILLING CONTRACTOR/DRILLER **Aquifer Drilling & Testing, Inc. / L. Adams**		GEOGRAPHIC AREA **Off Site 12th Street Sidewalk**

DRILL BIT DIAMETER/TYPE **6.25-in. / Auger**	BOREHOLE DIAMETER **10-inches**	DRILLING EQUIPMENT/METHOD **CME-75 / HSA**	SAMPLING METHOD **2" Split Spoon**	START-FINISH DATE **4/16/02-4/16/02**

CASING MAT./DIA. **SCH 40 PVC / 4-inch** | SCREEN: TYPE **Slotted** MAT. **SCH 40 PVC** TOTAL LENGTH **25.0** DIA. **4-inch** SLOT SIZE **20-Slot**

ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
			/		#2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	CONCRETE			
0–10	Brown fine to coarse SAND, trace Gravel, trace Brick, trace Silt; dry to wet (fill)			
10	Brown fine SAND, little Silt, trace coarse Sand; wet (fill)		32.1	
12	Brown fine to coarse SAND, trace Silt, trace Gravel; wet (fill)		11.6	
15	Brown Peat and green to gray Silt and Clay; moist			Thickness of peat interval interpreted from previous Site investigation
17	Brown fine SAND, little Silt; wet		5.0	
20	Brown fine SAND, little Silt, trace coarse Sand; wet		10.8	
25	Brown fine SAND, little Silt; wet		52.9	Strong odor
30	Brown fine SAND, little Silt; wet		87.4	Strong odor
35	Brown fine SAND, little Silt; wet		28.6	Slight odor
40	Brown fine SAND, little Silt; wet		18.8	Slight odor
45	Brown fine SAND, little Silt; wet		16.4	Slight odor
50				Bottom of well 50 feet below land surface

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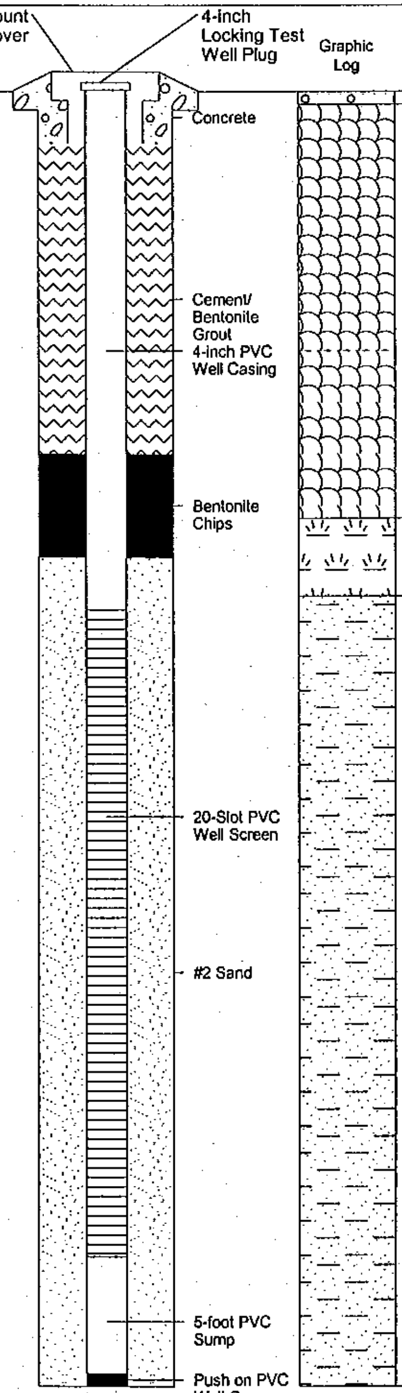
WELL CONSTRUCTION LOG

WELL NO. RW-22	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA Off Site 12th Street Sidewalk		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 4/15/02-4/15/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN / GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Concrete			
	Brown fine to coarse SAND, trace silt, trace Brick, trace Concrete, trace Gravel; dry to wet (fill)			
10	Brown fine SAND, trace Silt; wet (fill)		699	
	Brown fine to coarse SAND, trace Silt; wet (fill)		>2000	Odor and black staining
15	Brown fine to coarse SAND, little silt; wet (fill)		5.7	
	Brown fine SAND, little Silt; wet (fill)		3.7	
	PEAT, Green-Gray Clay and fine Sand		27.8	Thickness of peat interval interpreted from previous Site investigation
20	Brown to gray fine SAND, little Silt, trace coarse Sand, trace Gravel; wet		0.0	
25	Brown to gray fine SAND, little Silt, trace coarse Sand, trace Gravel; wet		11.9	
30	Brown to gray fine SAND, little Silt, trace coarse Sand, trace Gravel; wet		0.0	
35	Brown to gray fine SAND, little Silt, trace coarse Sand, trace Gravel; wet		0.0	
40	Brown fine SAND, little silt; wet		2.1	
45	Brown fine SAND, little silt; wet		0.0	
50				Bottom of well 50 feet below land surface

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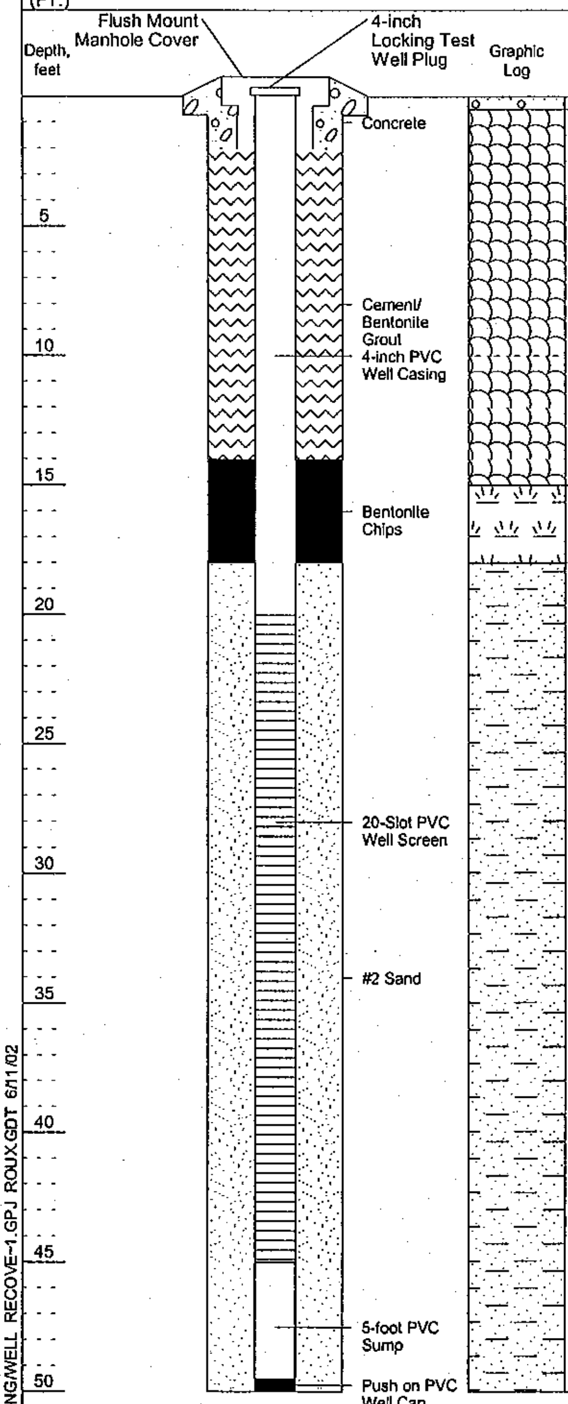
WELL CONSTRUCTION LOG

WELL NO. RW-23	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA Off Site 12th Street Sidewalk		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 4/10/02-4/10/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE · GRAVEL PACK #2



Depth (ft)	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Concrete			
0–10.5	Brown fine to coarse SAND, trace Brick, trace Concrete, trace Gravel; dry to wet (fill)			
10–12	Brown fine to coarse SAND, little Silt, trace Gravel; wet (fill)		1354	Odor and trace free product
12–14	Brown fine Sand and Silt, trace coarse Sand; wet (fill)		72.8	Odor
14–15.5	Brown fine SAND, little Silt, trace Gravel; wet (fill)		352	Odor
15.5–18	PEAT and Green-Gray CLAY, trace Shells; moist			Thickness of peat interval interpreted from previous Site investigation Odor
18–20	Brown fine to coarse SAND, little Silt, trace Gravel; wet		92.5	
20–25	Brown fine to coarse SAND, little Silt, trace Gravel; wet		50.7	Odor
25–30	Brown fine to coarse SAND, little Silt, trace Gravel; wet		25.2	Odor
30–35	Brown fine to coarse SAND, little Silt; wet		40.1	Odor
35–40	Brown fine to coarse SAND, little Silt; wet		13.7	Odor
40–45	Brown fine to coarse SAND, little Silt; wet		9.6	Odor
45–50	Brown fine to coarse SAND, some Silt; wet		12.7	Odor
50				Bottom of well 50 feet below land surface

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING		
RW-25				
PROJECT NO./NAME: 92401Y03 / FC Gowanus former MGP Site		LOCATION: 124-136 2nd Avenue, Brooklyn, New York		
APPROVED BY: G. Tyers	LOGGED BY: D. Moss			
DRILLING CONTRACTOR/DRILLER: Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA: Off Site 12th Street Sidewalk		
DRILL BIT DIAMETER/TYPE: 6.25-in. / Auger	BOREHOLE DIAMETER: 10-inches	DRILLING EQUIPMENT/METHOD: CME-75 / HSA	SAMPLING METHOD: 2" Split Spoon	START-FINISH DATE: 4/11/02-4/11/02
CASING MAT./DIA.: SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC; TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING; TOP & BOTTOM SCREEN: /	GW SURFACE	GRAVEL PACK: #2

Well construction labels: Flush Mount Manhole Cover; 4-inch Locking Test Well Plug; Concrete; Cement/ Bentonite Grout; 4-inch PVC Well Casing; Bentonite Chips; 20-Slot PVC Well Screen; #2 Sand; 5-foot PVC Sump; Push on PVC Well Cap

Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Concrete			
0–10	Brown fine to coarse SAND, trace Brick, trace Concrete, trace Gravel; dry to wet (fill)			
10	Brown fine SAND, little Silt, trace Gravel; wet (fill)		8.1	
12	Brown fine to coarse SAND, little Silt, trace Gravel; wet (fill)		198	Odor
14	Brown fine to coarse SAND, little Silt, trace Gravel; wet (fill)		478	Odor
16	PEAT and Green-Gray CLAY; moist			Odor Thickness of peat interval interpreted from previous Site investigation
19	Brown fine to coarse SAND, little Silt, trace Gravel; wet		518	
20	Brown fine to coarse SAND, little Silt, trace Gravel; wet		610	Odor
25	Brown fine to coarse SAND, little Silt; wet		31.4	
30	Brown fine to coarse SAND, little Silt; wet		231	Odor
35	Brown fine SAND, little Silt, trace coarse Sand; wet		315	Odor
40	Brown fine SAND, some Silt, trace coarse Sand; wet		136	Odor
45	Brown fine Sand and Silt; wet		246	Odor
50				Bottom of well at 50 feet below land surface

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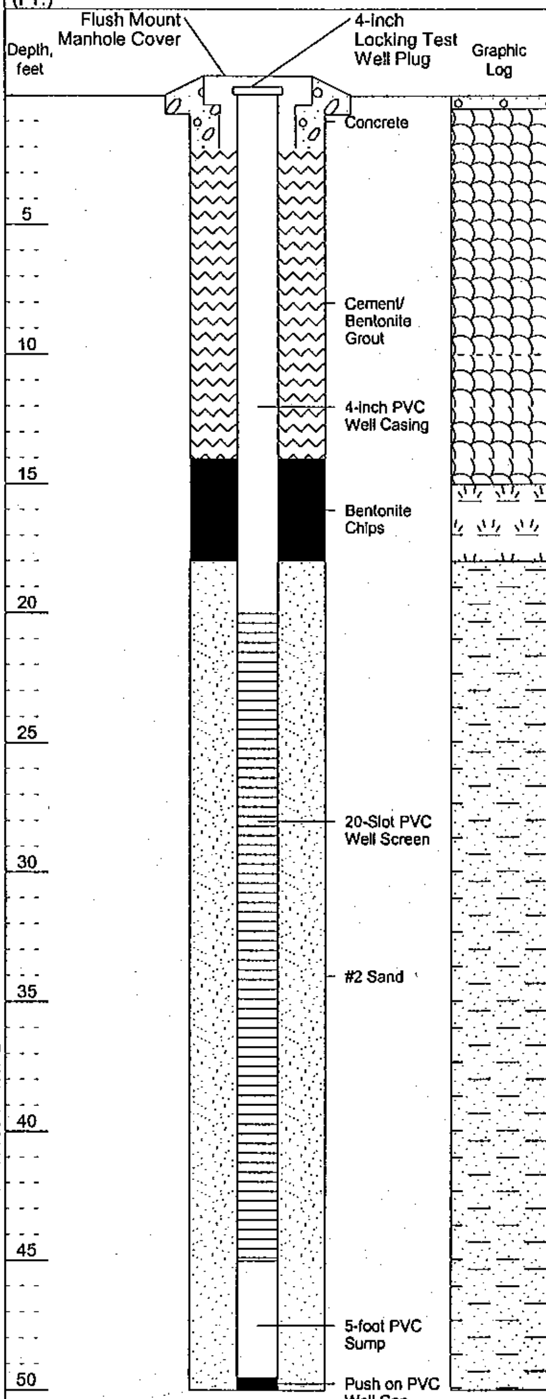
WELL CONSTRUCTION LOG

WELL NO. RW-27	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA Off Site 12th Street Sidewalk		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 4/12/02-4/12/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE
GRAVEL PACK #2				



Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
Concrete			
Brown fine to coarse SAND, trace Brick, trace Concrete, trace Gravel; dry to wet (fill)			
Brown fine to coarse SAND, little Gravel; wet (fill)		1.7	
Brown fine to coarse SAND, little Gravel; wet (fill)		6.9	
Brown fine to coarse SAND, little Gravel, trace Silt; wet (fill)		3.1	
PEAT and Green-Gray CLAY; moist		2.7	Thickness of peat interval interpreted from previous Site investigation
Brown fine SAND, little Silt, trace Gravel, trace coarse Sand; wet			
Brown fine to coarse SAND, little Silt, trace Gravel; wet		17.7	
Brown fine SAND, little Silt; wet		32.4	
Brown fine SAND, little Silt, trace coarse Sand; wet		3.8	
Brown fine SAND, little Silt, trace coarse Sand; wet		5.2	
Brown fine SAND, some Silt; wet		3.8	
Brown fine SAND, some Silt; wet		7.1	
			Bottom of well 50 feet below land surface

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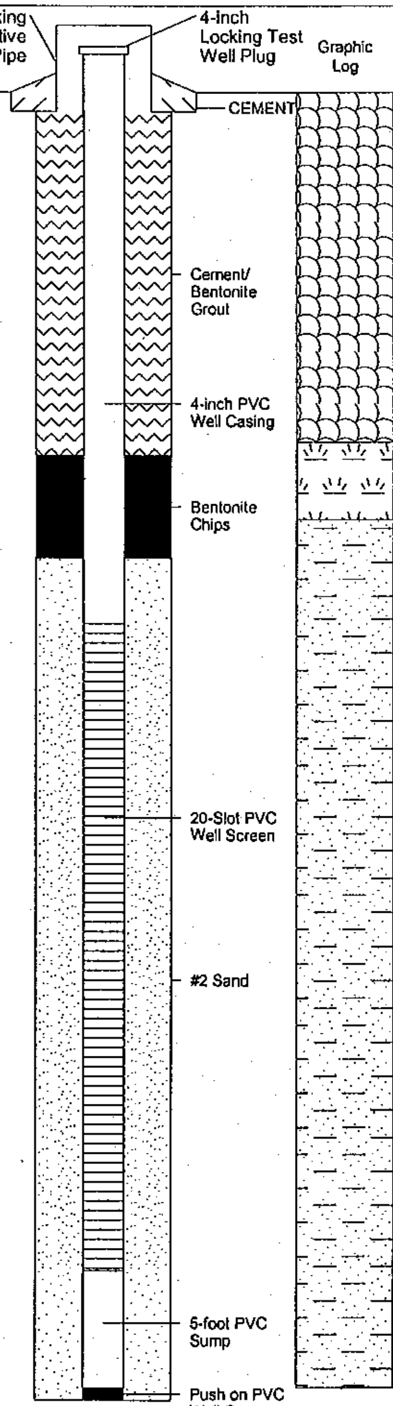
WELL CONSTRUCTION LOG

WELL NO. RW-29	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along Pathmark Wall		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 4/25/02-4/25/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown coarse to fine SAND, trace Silt, trace Brick, trace Gravel; dry to moist (fill)			
5	Black fine to coarse SAND, little Wood, trace Gravel; moist to wet (fill)		301	Odor and black staining
10	CONCRETE and WOOD; wet (fill)			Black staining
	Brown fine to medium SAND, little Silt, trace Gravel, wet (fill)		12.8	Black staining
15	Green to gray CLAY and PEAT; moist			Thickness of peat interval interpreted from previous Site investigation
	Gray fine SAND, little Silt, little Wood; wet		44.4	Black staining
20	Gray fine to coarse SAND, little Silt, trace Wood; wet		17.6	Odor and black staining
25	Gray fine SAND, some Silt, trace coarse SAND; wet		12.5	Odor and black staining
30	Gray to brown fine SAND, little Silt; wet		6.0	Odor
35	Gray to brown fine SAND, little Silt; wet		459	Odor
40	Brown fine to medium SAND, some Silt; wet		762	Odor and trace free product
45	Brown fine SAND, little Silt; wet		314	Odor
50				Bottom of well 50.5 feet below land surface

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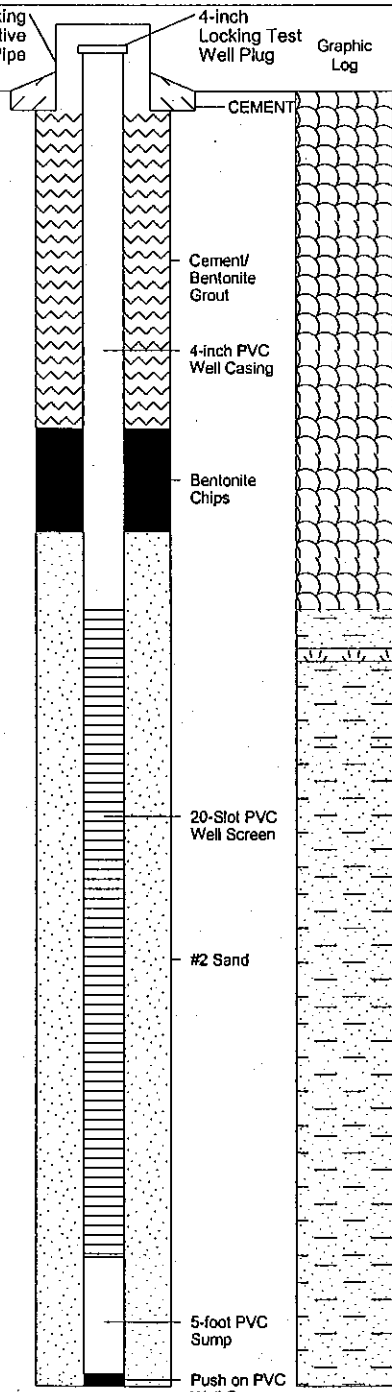
WELL CONSTRUCTION LOG

WELL NO. RW-30	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along Pathmark Wall		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 4/26/02-4/26/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.) GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown coarse to fine SAND, trace Silt, trace Brick, trace Gravel; dry to moist (fill)			
5	Brown coarse to fine SAND, little Gravel; moist (fill)		228	Odor and black staining
10	Brown fine to coarse SAND, little Gravel, trace Wood, trace Brick; wet (fill)		5.7	
	Brown fine to medium SAND, trace Gravel, trece Silt; wet (fill)		6.2	
15	Brown fine SAND, little Silt, trace Gravel; wet (fill)		8.9	Odor and black staining
	Brown fine SAND, little Silt, trace Gravel; wet (fill)		8.7	Odor and black staining
	Gray fine to medium SAND, trace Silt, trace Peat; wet		10.4	Odor and black staining
20	Fine SAND, trace Silt; wet		22.2	Black staining
	Brown PEAT; moist			
	Brown fine SAND, little Silt; wet		13.3	Odor and black staining
25	Gray fine SAND, trace Silt; wet		12.7	Odor and black staining
30	Brown fine SAND, little Silt; wet		17.1	Odor and trace free product
35	Fine SAND, little Silt; wet		728	Odor, black staining, and free product
40	Fine SAND, little Silt; wet		1067	Odor, black staining, and free product
45	Fine SAND, little Silt; wet		840	Odor, black staining, and free product
50				Bottom of well 50 feet below land surface

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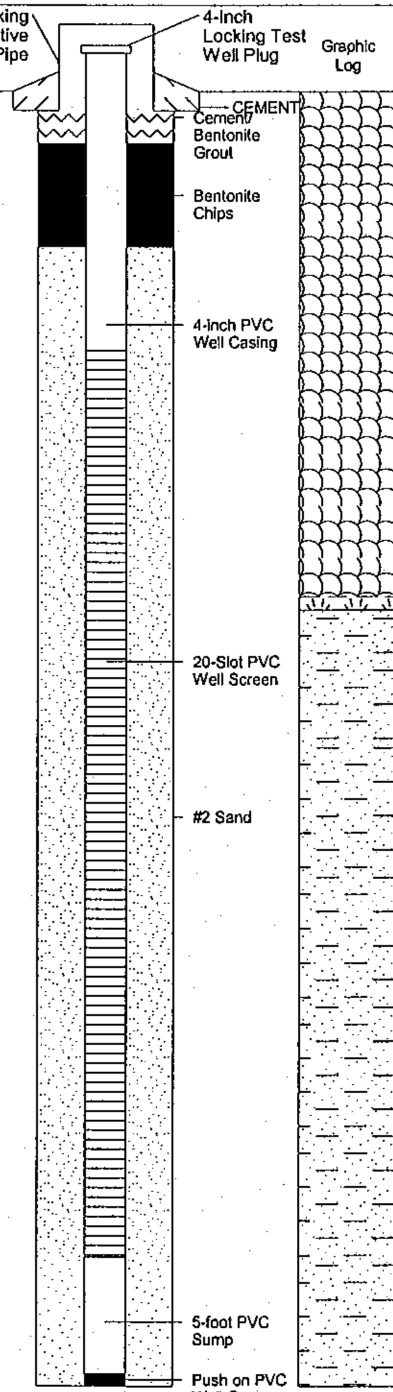
WELL CONSTRUCTION LOG

WELL NO. RW-31	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along Pathmark Wall		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 4/29/02-4/29/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 35.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.) GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown coarse to fine SAND, trace Silt, trace Brick, trace Gravel; dry to moist (fill)			
5	Fine SAND, trace Silt; wet (fill)		945	Odor, black staining, and sheen
10				
	Brown fine to medium SAND, trace Silt, trace Brick, trace Gravel, trace Wood, trace Coal Fragments; wet (fill)		35.9	
15	Brown fine to medium SAND, some Silt, trace Gravel; wet (fill)		26.3	
	Brown fine to coarse SAND, little Silt, trace Gravel; wet (fill)		>2000	Odor
	Brown fine to coarse SAND, little Silt, trace Gravel; wet (fill)		886	Odor, black staining, and trace free product
20	Brown PEAT; moist			
	Brown fine to coarse SAND, little Silt, trace Gravel; wet		>2000	Odor and free product
	Brown fine SAND, little Silt; wet		1349	
25	Gray to brown fine SAND, little Silt, trace coarse SAND; wet		257	Odor and trace free product
30	Gray to brown fine SAND, little Silt, trace coarse SAND; wet		192	Odor and trace free product
35	Gray to brown fine SAND, little Silt, trace coarse SAND; wet		254	Odor and trace free product
40	Gray to brown fine SAND, little Silt, trace coarse SAND; wet		415	Odor and trace free product
45	Gray to brown fine SAND, some Silt; wet		785	Odor and trace free product
50				Bottom of well 50 feet below land surface

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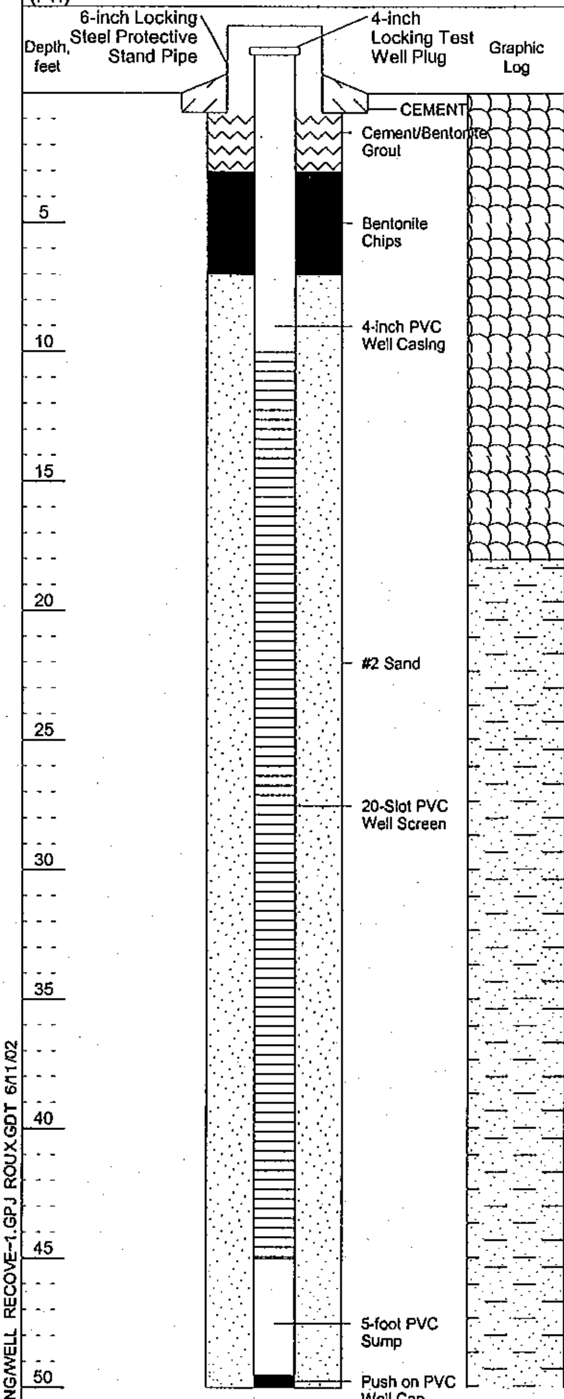
WELL CONSTRUCTION LOG

WELL NO.: **RW-32**	NORTHING	EASTING		
PROJECT NO./NAME: **92401Y03 / FC Gowanus former MGP Site**		LOCATION: **124-136 2nd Avenue** **Brooklyn, New York**		
APPROVED BY: **G. Tyers**	LOGGED BY: **D. Moss**			
DRILLING CONTRACTOR/DRILLER: **Aquifer Drilling & Testing, Inc. / L. Adams**		GEOGRAPHIC AREA: **On Site Along Pathmark Wall**		
DRILL BIT DIAMETER/TYPE: **6.25-in. / Auger**	BOREHOLE DIAMETER: **10-inches**	DRILLING EQUIPMENT/METHOD: **CME-75 / HSA**	SAMPLING METHOD: **2" Split Spoon**	START-FINISH DATE: **4/30/02-4/30/02**
CASING MAT./DIA.: **SCH 40 PVC / 4-inch**	SCREEN: TYPE **Slotted** MAT. **SCH 40 PVC** TOTAL LENGTH **35.0**	DIA. **4-inch**	SLOT SIZE **20-Slot**	
ELEVATION OF: (FT.) GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN: /	GW SURFACE	GRAVEL PACK: **#2**



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown coarse to fine SAND, trace Silt, trace Brick, trace Gravel; dry to moist (fill)			
5	Gray-brown fine to coarse SAND, trace Silt, trace Gravel; moist (fill)			
			21.1	
10	Gray-brown medium SAND, trace Silt, trace Gravel, trace coarse Sand; moist (fill)		13.8	Odor, sheen
15	Brown coarse to fine Sand, little Silt, trace Gravel; moist (fill)		6.5	Odor, trace black staining
	Brown fine to medium SAND, little Silt, trace coarse Sand; wet (fill)		7.3	Odor
	Brown fine to coarse SAND, little Silt; wet		15.3	
20	Gray-brown fine SAND, little Silt, trace coarse Sand; wet		36.0	Odor, sheen
25	Gray-brown fine SAND, little Silt, trace coarse Sand; wet		87.4	Odor, sheen
30	Gray-brown fine SAND, little Silt, trace coarse Sand; wet		118	Odor, sheen
35	Brown fine SAND, some Silt; wet		67.4	Odor
40	Brown fine to medium SAND, little Silt; wet		107	Odor
45	Brown fine SAND, some Silt; wet		68.9	Odor
50				Bottom of well 50 feet below land surface

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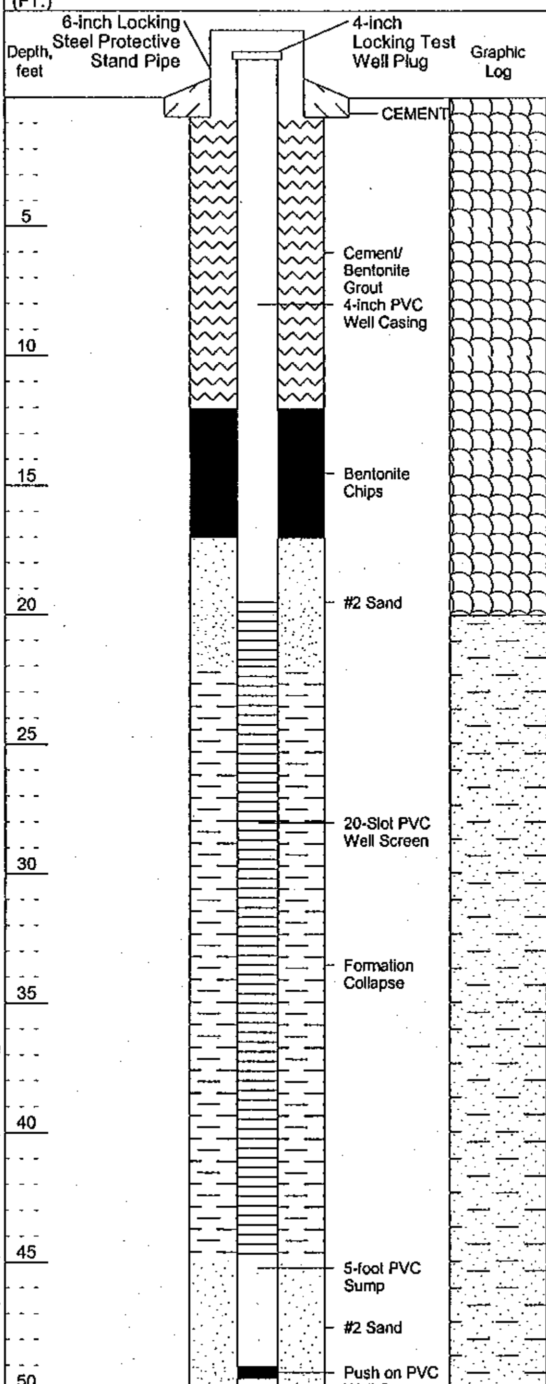
WELL CONSTRUCTION LOG

WELL NO. RW-33	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along Pathmark Wall		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 5/1/02-5/1/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown coarse to fine SAND, trace Silt, trace Brick, trace Gravel; dry to moist (fill)			
5	Brown fine to coarse SAND, little Silt; wet (fill)		0.0	
10	Brown fine SAND, some Silt; wet (fill)		1.3	
15	Brown fine SAND, some Silt, trace coarse Sand, trace Gravel; wet (fill)		8.3	
	Brown to Black stained fine to coarse SAND, trace Gravel; wet (fill)		0.0	Trace free product
20	Gray-brown fine to medium SAND, little Silt, trace Gravel; Wet		0.0	
25	Brown fine SAND, little Silt, trace coarse Sand; wet		439	Odor
30	Brown fine SAND, little Silt, trace coarse Sand; wet		7.2	Odor
35	Brown fine SAND, some Silt; wet		18.4	
40	Brown fine SAND, some Silt; wet		79.5	Odor
45	Brown fine SAND, some Silt, trace coarse Sand; wet		194	Odor
50				Bottom of well 49.5 feet below land surface

BORING/WELL RECOVE~1.GPJ ROUX.GDT 6/11/02

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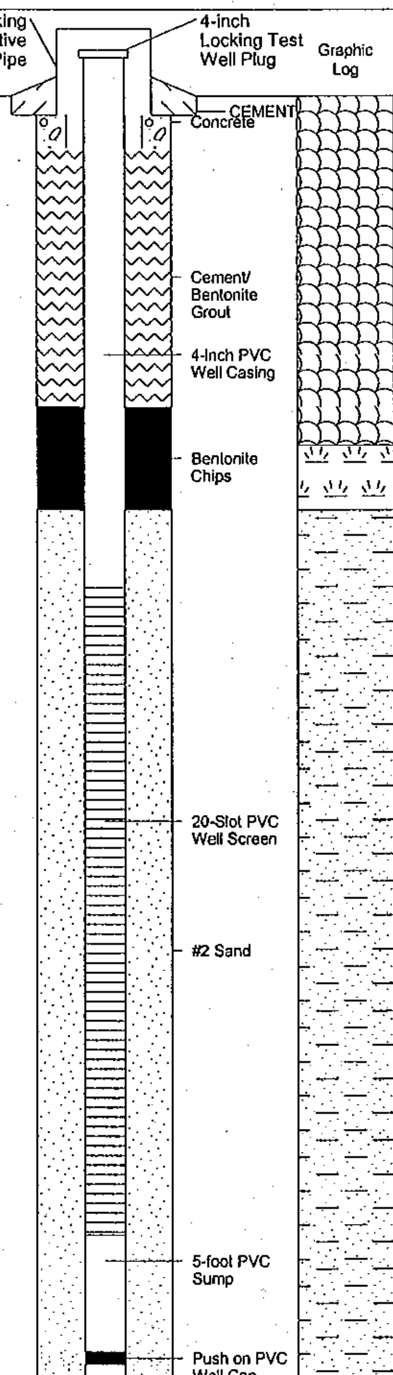
WELL CONSTRUCTION LOG

WELL NO. RW-34	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along 12th Street		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 5/3/02-5/3/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.) GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse SAND, little Silt, trace Gravel; moist to wet at appoximately 7 ft bls (fill)			
5			31.2	
10	Brown fine to coarse SAND, trace Silt, trace Gravel; wet (fill)		10.3	
	Brown fine sand, little Silt, trace coarse Sand; wet (fill)		17.1	
	Green-gray CLAY and PEAT; moist			
15			47.4	Thickness of peat interval interpreted from previous Site investigation Odor
	Brown fine SAND, little Silt, trace coarse Sand; wet			
20	Gray-brown fine SAND, little Silt, trace Gravel; wet		26.9	Odor, sheen
25	Gray-brown fine SAND, some Silt; wet		16.6	Odor
30	Gray-brown fine SAND, some Silt; wet		24.3	Odor
35	Gray-brown fine SAND, some Silt, trace coarse Sand; wet		107	Odor, sheen
40	Brown fine SAND, little Silt; wet		126	Odor
45	Brown fine SAND, little Silt; wet		134	Odor
50				Bottom of well 49 feet below land surface

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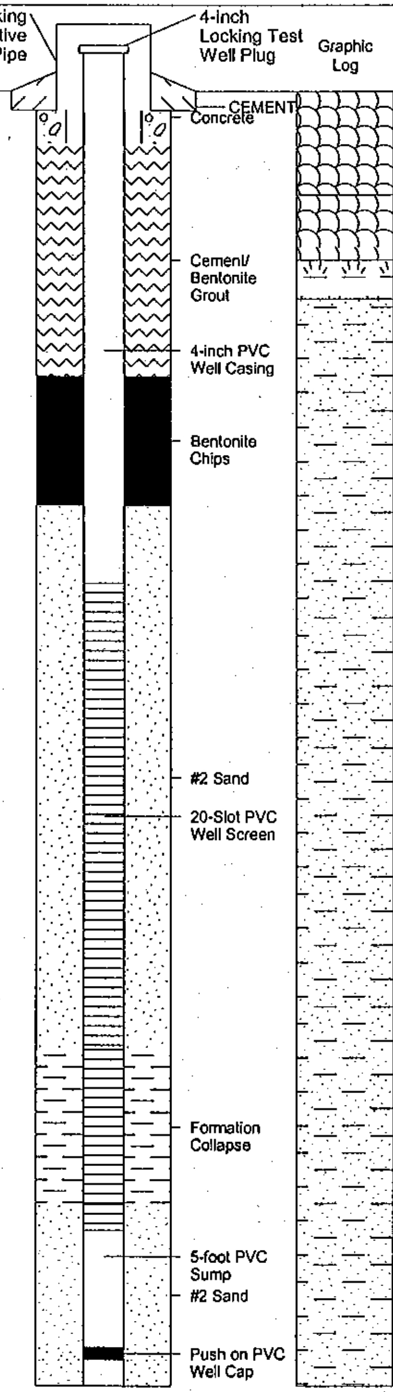
WELL CONSTRUCTION LOG

WELL NO. RW-35	NORTHING	EASTING
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York
APPROVED BY G. Tyers	LOGGED BY D. Moss	
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along 12th Street
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA; SAMPLING METHOD 2" Split Spoon; START-FINISH DATE 5/6/02-5/8/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC; TOTAL LENGTH 25.0; DIA. 4-inch; SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING; TOP & BOTTOM SCREEN /; GW SURFACE; GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse SAND, trace silt, trace gravel, trace brick; moist (fill)			
5	Black fine SAND, trace Silt; moist to wet at approximately 5.5 ft bls (fill)		>2000	Odor, trace free product
	Black fine SAND, little Silt; wet (fill)		>2000	Odor, free product
	Green-gray CLAY and PEAT; moist			
	Black to brown fine SAND and SILT; wet		872	Odor, free product
10				
	Brown to black fine SAND, some Silt, trace coarse Sand; wet			
15			272	Odor
20	Gray-brown fine SAND, little Silt, trace Clay, trace Peat; wet		311	
25	Brown fine SAND, little Silt; wet		182	Odor
30	Brown fine SAND, little Silt; wet		158	Odor
35	Brown fine SAND, little Silt, trace coarse Sand; wet		552	Odor, trace free product
40	Gray-brown fine to medium SAND, little Silt; wet		918	Trace free product
45	Gray-brown fine to medium SAND, little Silt; wet		723	Trace free product
50				Bottom of well 49 feet below land surface

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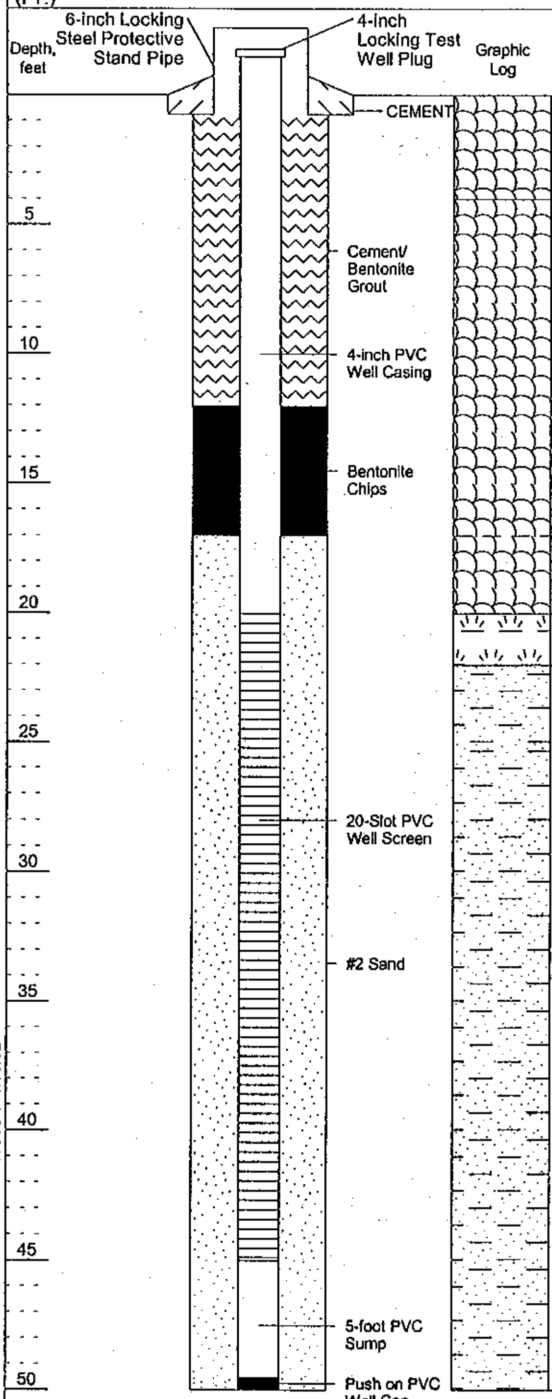
WELL CONSTRUCTION LOG

WELL NO. RW-36	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along 12th Street		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 5/6/02-5/7/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN / GW SURFACE	GRAVEL PACK #2



Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
Brown fine to coarse SAND, trace silt, trace gravel, trace brick; moist (fill)			
Black fine SAND, some Silt; wet (fill)		94.3	Odor
Brown to black fine SAND, some Silt, trace Clay, trace Coal, trace Shells, trace Gravel; wet (fill)		199	Odor
Black fine SAND, little silt; wet(fill)		8.7	Odor, trace free product
Brown to black fine to coarse SAND, little Silt, trace Gravel; wet (fill)		35.0	Odor, trace free product, sheen
Brown to black fine SAND, little Silt, trace Wood; wet (fill)		51.2	
Brown to black fine to medium SAND, little Silt; wet (fill)		109	Odor
Grey-brown fine SAND, some Silt; wet (fill)		22.9	Odor
Brown fine to coarse SAND; wet (fill)		5.0	
Green-grey CLAY and PEAT; moist			Thickness of peat interval interpreted from previous Site investigation
Grey to black fine to coarse SAND, little Silt, trace Gravel; wet		>2000	Odor, trace free product
Grey to black fine to coarse SAND, little Silt, trace Gravel; wet		111	Odor, trace free product
Grey-brown fine to coarse SAND, little Silt, trace Gravel; wet		>2000	Odor, trace free product
Grey-brown fine to coarse SAND, little Silt, trace Gravel; wet		>2000	Odor, trace free product
Brown fine SAND, little Silt, trace coarse Sand; wet		1785	Odor, trace free product
Brown to light brown fine SAND, some Silt; wet		708	Odor, free Product

Bottom of well 50 feet below land surface

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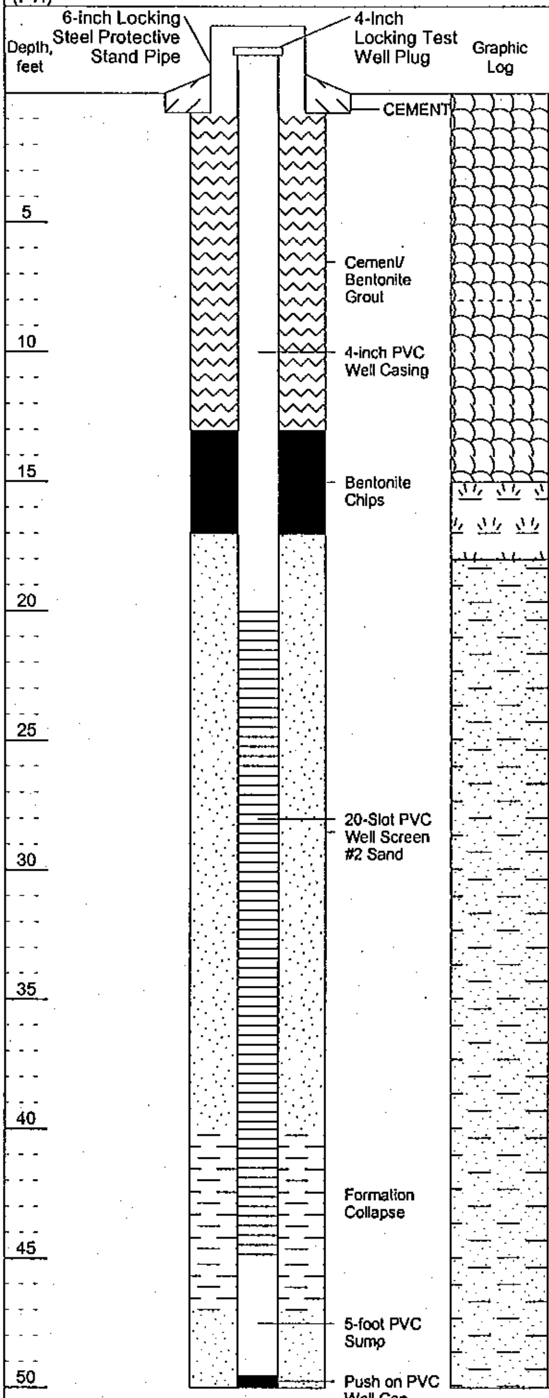
WELL CONSTRUCTION LOG

WELL NO. RW-37	NORTHING	EASTING
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York
APPROVED BY G. Tyers	LOGGED BY D. Moss	
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along 12th Street
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA; SAMPLING METHOD 2" Split Spoon; START-FINISH DATE 5/9/02-5/9/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC; TOTAL LENGTH 25.0; DIA. 4-inch; SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE; TOP OF WELL CASING	TOP & BOTTOM SCREEN /; GW SURFACE; GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse SAND, trace Gravel, trace Silt, trace Brick; moist to wet (fill)			
10	Brown to black fine to medium SAND, little Silt, trace Gravel, trace Coal; wet (fill)		1271	Odor
	Brown-green to black fine SAND, little Silt, trace Gravel, trace Wood; wet (fill)		1197	Odor
	Brown fine to medium SAND, trace Gravel, trace Silt; wet (fill)		380	
15	Brown-green fine SAND, some Silt; wet (fill)		158	
	Green-grey CLAY and PEAT; moist		252	Thickness of peat interval interpreted from previous Site investigation
	Brown fine SAND, little Silt, trace coarse SAND, trace Gravel; wet			
20	Brown fine SAND, little Silt, trace coarse SAND; wet		207	Odor
25	Brown fine SAND, little Silt, trace coarse SAND; wet		664	Odor
30	Brown fine SAND, little Silt; wet		775	Odor
35	Brown fine SAND, little Silt; wet		1345	Odor
40	Brown fine SAND, little Silt; wet		1489	Odor, trace free product
45	Brown fine SAND, little Silt; wet		1183	Odor, trace free product
50				Bottom of well at 50 ft bls

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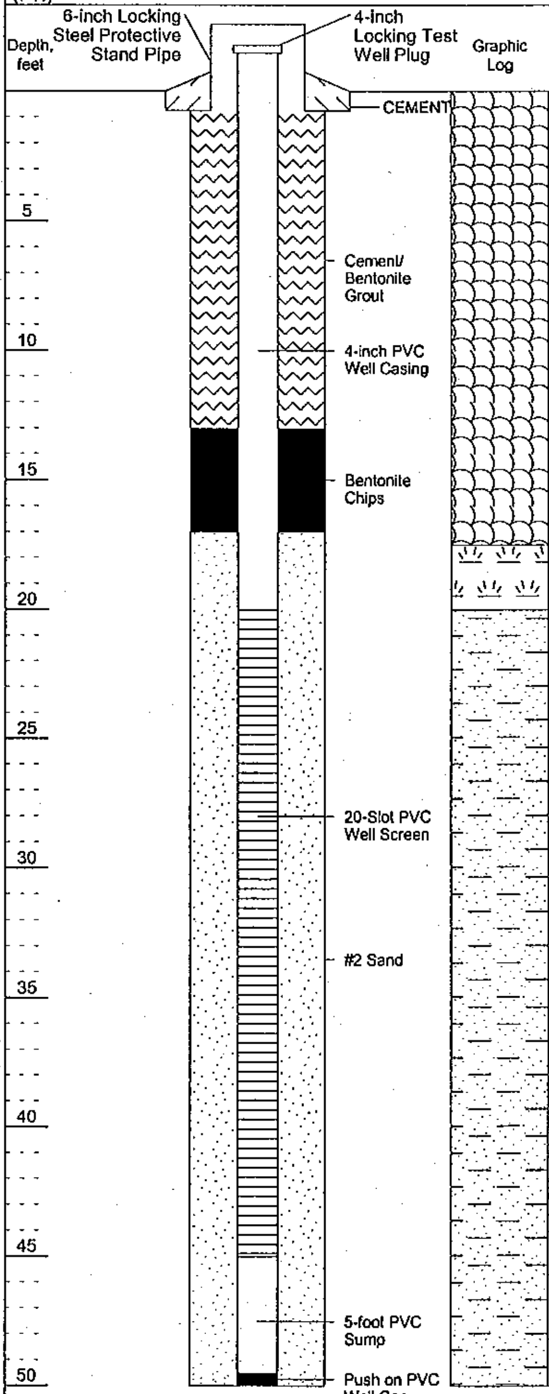
WELL CONSTRUCTION LOG

WELL NO. RW-38	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along 12th Street		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 5/10/02-5/10/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN / GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse SAND, trace Gravel, trace Silt, trace Brick; moist (fill)			
10	Brown fine to coarse SAND, little Silt, trace Gravel; moist (fill)		35.4	Odor
12	Brown fine to coarse SAND, little Silt, trace Gravel; moist (fill)		867	Odor
14	Brown fine SAND, little Silt, trace coarse Sand; wet (fill)		>2000	Odor
16	Brown fine SAND, little Silt, trace coarse Sand; wet (fill)		6.9	
18	Green-gray CLAY and PEAT; moist			Thickness of peat interval interpreted from previous Site investigation
20	Gray-brown fine to coarse SAND, little Silt, trace Gravel; wet		96.6	Odor
25	Gray-brown fine to coarse SAND, little Silt, trace Gravel; wet		381	Odor
30	Gray-brown fine to coarse SAND, little Silt, trace Gravel; wet		874	Odor
35	Gray-brown fine to medium SAND, little Silt; wet		1341	Odor
40	Brown fine SAND, some Silt; wet		1033	Odor, trace free product
45	Gray-brown fine to medium SAND, little Silt; wet		1271	Odor, trace free product
50				Bottom of well 50 feet below land surface

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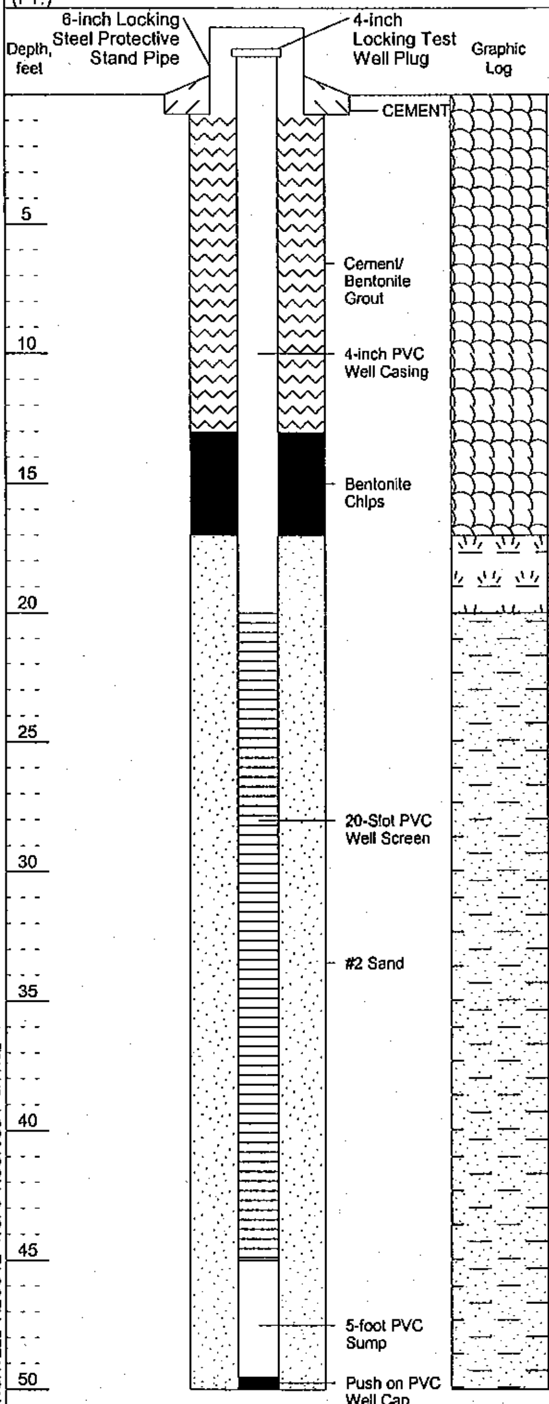
WELL CONSTRUCTION LOG

WELL NO. RW-39	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY R. Kovacks			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along 12th Street		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 5/13/02-5/13/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.) GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown coarse to fine SAND, trace Gravel, trace Silt, trace Brick, trace Cobbles; moist (fill)			
10	Brown medium to fine SAND, trace Silt, trace Gravel; moist (fill)		19.9	Slight odor
	Brown to reddish brown fine SAND, some Silt; moist (fill)		762	Slight odor
15	Brown to reddish brown fine SAND, some Silt; wet (fill)		659	Odor
	Brown to reddish brown fine SAND, some Silt, trace coarse SAND; wet (fill)			Odor
	Peat			Thickness of peat interval interpreted from previous Site investigation
20	Gray to brown medium SAND, some Silt; wet			Odor
25	Gray-brown fine SAND, some Silt; wet		129	Odor
30	Gray-brown fine SAND, some Silt; wet		421	Odor
35	Gray-brown fine SAND, some Silt; wet		>2000	Odor
40	Gray-brown fine SAND, some Silt; wet		1200	Odor, trace free product
45	Gray-brown fine SAND, trace Silt, trace Gravel; wet		1421	Trace free product
50				Bottom of well 50 feet below land surface

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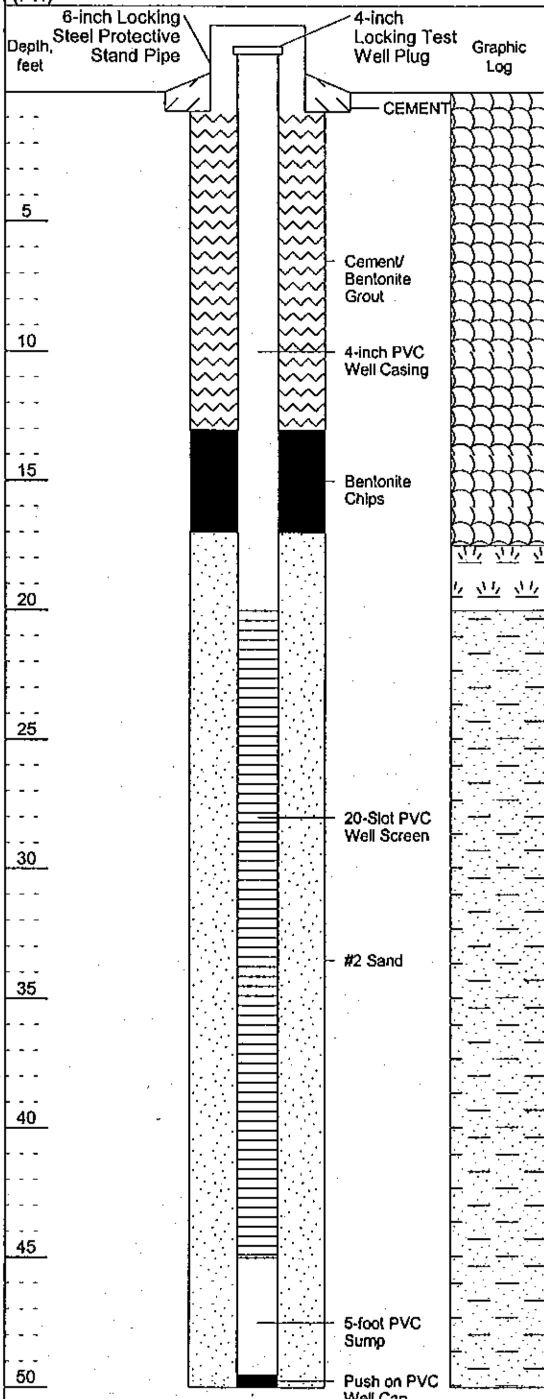
WELL CONSTRUCTION LOG

WELL NO. RW-40	NORTHING	EASTING	
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York	
APPROVED BY G. Tyers	LOGGED BY D. Moss		
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA On Site Along 12th Street	
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon; START-FINISH DATE 5/14/02-5/14/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC; TOTAL LENGTH 25.0	DIA. 4-inch; SLOT SIZE 20-Slot
ELEVATION OF: (FT.) GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE; GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown to black stained fine to medium SAND, little Silt, trace coarse SAND, trace Gravel; wet (fill)		17.1	
5				Odor
10	Gray-brown fine SAND, some Silt; wet (fill)		10.1	Odor
14	Brown fine to medium SAND, little Silt; wet (fill)		22.8	Odor
16	Brown fine to coarse SAND, little Silt; wet (fill)		21.3	Odor
17.5	Green-gray CLAY and PEAT; moist			Thickness of peat interval interpreted from previous Site investigation
20	Gray-brown fine to medium SAND, little Silt; wet		29.2	Odor
25	Gray-brown fine SAND, some Silt; wet		35.1	
30	Grey-brown fine SAND, some Silt; wet		65.2	Odor
35	Grey-brown fine SAND, some Silt; wet		149	Odor
40	Grey-brown fine SAND, some Silt; wet		78.1	Odor, trace free product
45	Brown fine SAND, little Silt; wet		522	Odor, trace free product
50				Bottom of well 50 feet below land surface

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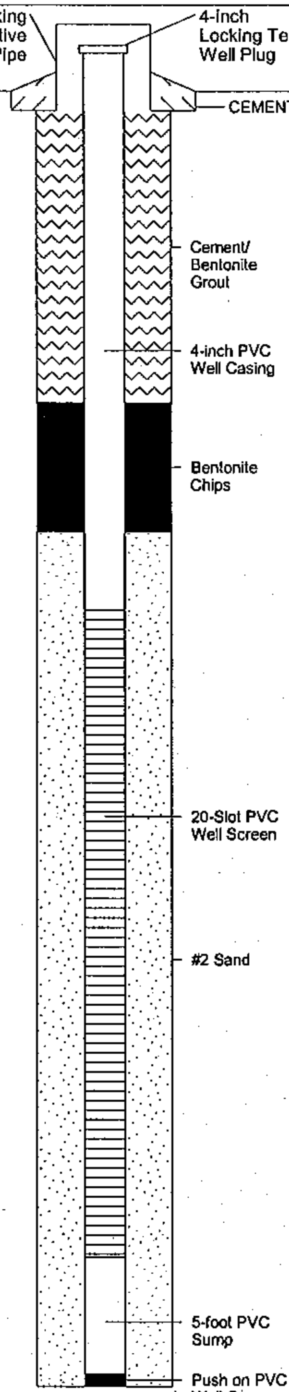
WELL CONSTRUCTION LOG

WELL NO. **RW-41**	NORTHING	EASTING
PROJECT NO./NAME **92401Y03 / FC Gowanus former MGP Site**		LOCATION **124-136 2nd Avenue Brooklyn, New York**
APPROVED BY **G. Tyers**	LOGGED BY **D. Moss**	
DRILLING CONTRACTOR/DRILLER **Aquifer Drilling & Testing, Inc. / L. Adams**		GEOGRAPHIC AREA **Off Site 12th Street Sidewalk**
DRILL BIT DIAMETER/TYPE **6.25-in. / Auger**	BOREHOLE DIAMETER **10-inches**	DRILLING EQUIPMENT/METHOD **CME-75 / HSA**; SAMPLING METHOD **2" Split Spoon**; START-FINISH DATE **5/16/02-5/16/02**
CASING MAT./DIA. **SCH 40 PVC / 4-inch**	SCREEN: TYPE **Slotted**	MAT. **SCH 40 PVC**; TOTAL LENGTH **25.0**; DIA. **4-inch**; SLOT SIZE **20-Slot**
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING; TOP & BOTTOM SCREEN **/**; GW SURFACE; GRAVEL PACK **#2**



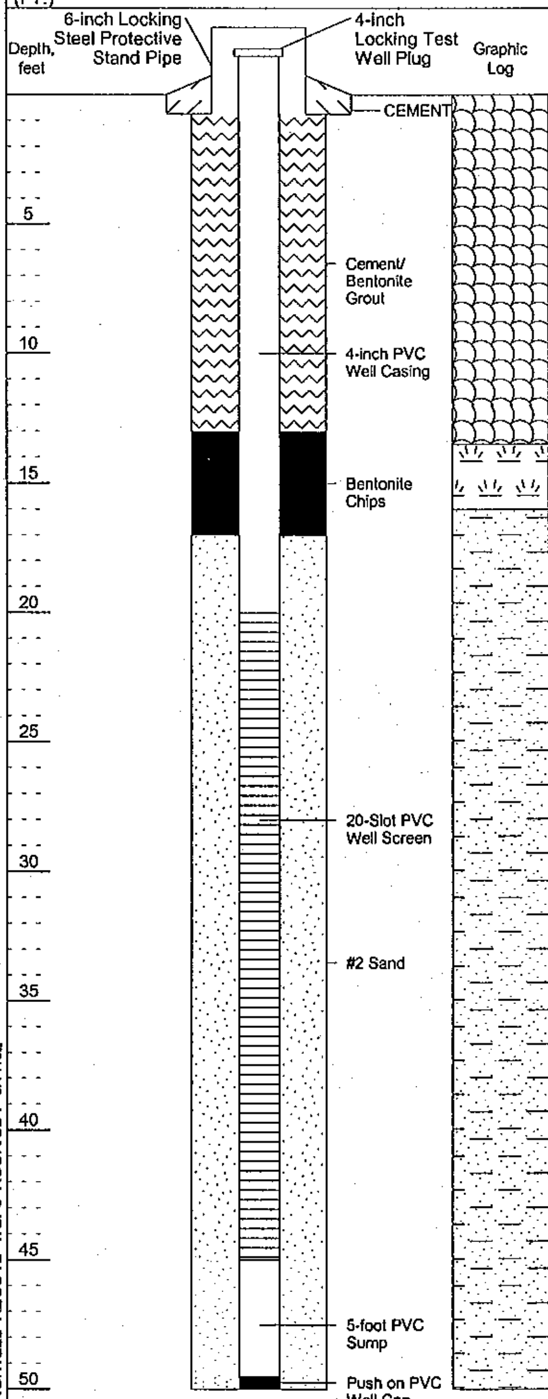
Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown to black stained fine to medium SAND, little Silt, trace coarse SAND, trace Gravel; wet (fill)			
10	Brown fine to coarse SAND, trace Silt, trace Gravel; wet (fill)		166	Odor
12	Brown fine to coarse SAND, trace Silt, trace Gravel; wet (fill)		1526	Odor
14	Brown fine to coarse SAND, trace Silt; wet (fill)		713	Odor
16	Green-gray CLAY and PEAT; moist			Thickness of peat interval interpreted from previous Site investigation
19	Brown fine SAND, little Silt, trace coarse Sand; wet		23.5	Odor
25	Brown to black fine SAND, little Silt, trace coarse Sand; wet		1029	Odor
30	Brown fine SAND, little Silt, trace coarse Sand; wet		1785	Odor, trace free product
35	Brown fine SAND, little Silt, trace coarse Sand; wet		>2000	Odor, trace free product
40	Brown fine to medium SAND, little Silt; wet		1527	Odor, trace free product
45	Brown fine to medium SAND, little Silt; wet		>2000	Odor, trace free product
50				Bottom of well 50 feet below land surface

ROUX
ROUX ASSOCIATES, INC.
Environmental Consulting & Management

1377 Motor Parkway
Islandia, NY 11749
Telephone: 631-232-2600
Fax: 631-232-9898

WELL CONSTRUCTION LOG

WELL NO. RW-42	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA Off Site 12th Street Sidewalk		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 5/17/02-5/17/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.) GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown to black stained fine to medium SAND; little Silt, trace coarse SAND, trace Gravel; wet (fill)			
12	Brown to black fine to medium SAND, trace Gravel, trace Silt, trace Coarse Sand; wet (fill)		>2000	Odor
14	PEAT; moist			Thickness of peat interval interpreted from previous Site investigation
16	Brown fine to coarse SAND, trace Silt, trace Gravel; wet		>2000	
20	Gray-brown fine to medium SAND, little Silt, trace coarse Sand; wet		>2000	Odor
25	Gray-brown fine to medium SAND, little Silt, trace coarse Sand; wet		520	Odor
30	Gray-brown fine to medium SAND, little Silt, trace coarse Sand; wet		54.9	Odor, free product
35	Gray-brown fine SAND, little Silt, trace coarse Sand; wet		280	Odor, free product
40	Gray-brown fine to coarse SAND, little Silt; wet		>2000	Odor, free product
45	Gray-brown fine to coarse SAND, little Silt; wet		>2000	Odor, free product
50				Bottom of well 50 feet below land surface

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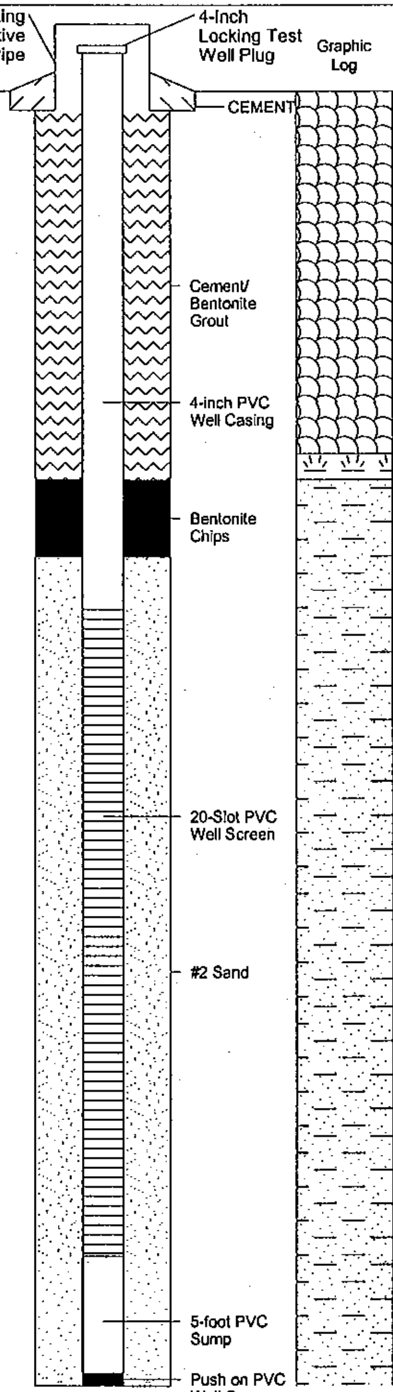
WELL CONSTRUCTION LOG

WELL NO. RW-43	NORTHING	EASTING
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York
APPROVED BY G. Tyers	LOGGED BY M. Kroll	
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA Off Site 12th Street Sidewalk

DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 5/20/02-5/20/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.) GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown to black stained fine to medium SAND, little Silt, trace coarse SAND, trace Gravel; wet (fill)			
12	Grey to light brown fine to medium SAND, some Silt, little Clay; wet		268	Slight odor, some staining
14	PEAT		>2000	Slight odor, some staining
15	Brown fine to coarse SAND, some Silt; wet		>2000	
20	Brown fine to medium Sand and Silt, some Clay, trace Gravel; wet		907	Odor
25	Brown fine to medium Sand and Silt, some Clay, trace Gravel; moist		1235	Odor
30	Brown fine to coarse SAND, some Silt and Clay; wet		>2000	Odor
35	Brown fine to coarse SAND, some Silt and Clay; wet		1226	Odor
40	Brown fine to coarse SAND, some Silt and Clay; wet		>2000	Odor
45	Brown fine to coarse SAND, some Silt and Clay; wet		>2000	Odor
50				Bottom of well 50 feet below land surface

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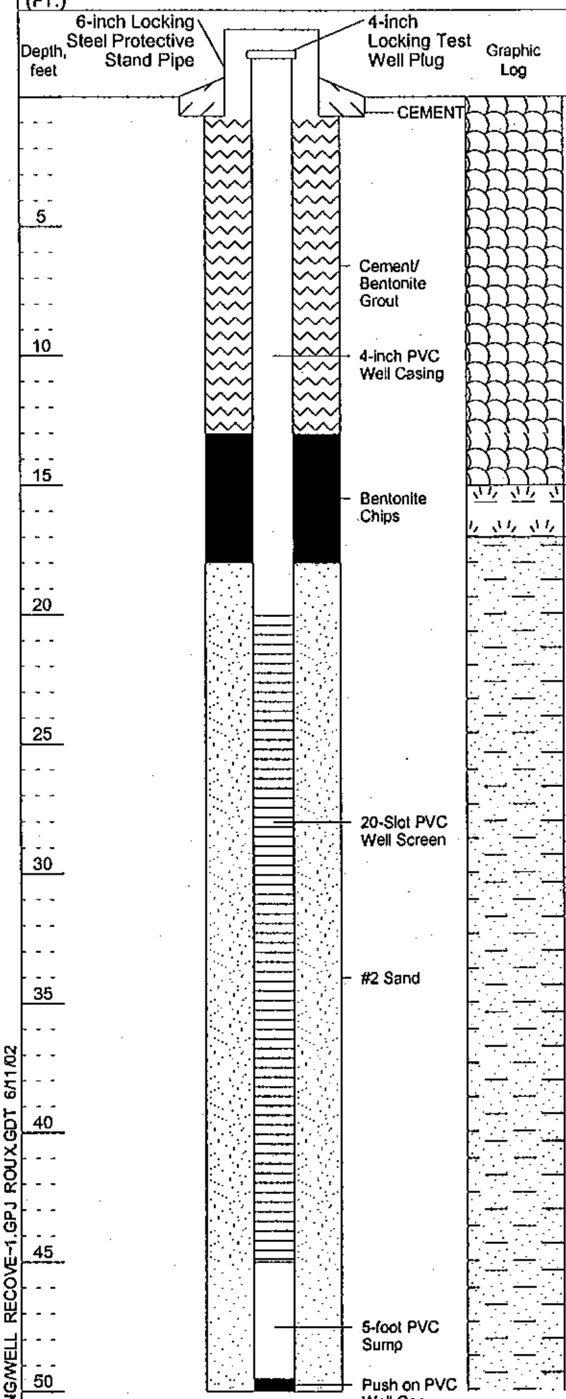
WELL CONSTRUCTION LOG

WELL NO. RW-44	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA Off Site 12th Street Sidewalk		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 5/21/02-5/21/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 25.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN / GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown fine to coarse SAND, trace Silt and Gravel; wet (fill)		32.7	
13.5	Brown gray fine to medium SAND, little Silt; wet		0.0	
15	Brown PEAT and green-gray Clay			
17	Brown fine SAND, some Silt, trace coarse Sand and Gravel; wet		3.7	
25	Brown fine SAND, some Silt, trace coarse Sand and Gravel; wet		41.7	
30	Brown fine SAND, some Silt; wet		45.3	Organic odor
35	Brown fine SAND, little silt, trace coarse Sand; wet		77.2	
38				Odor
40	Brown fine SAND, some Silt; wet		137	Odor
45	Brown fine SAND, some Silt; wet		87.6	
48				Odor, free product
50				Bottom of well 50 feet below land surface

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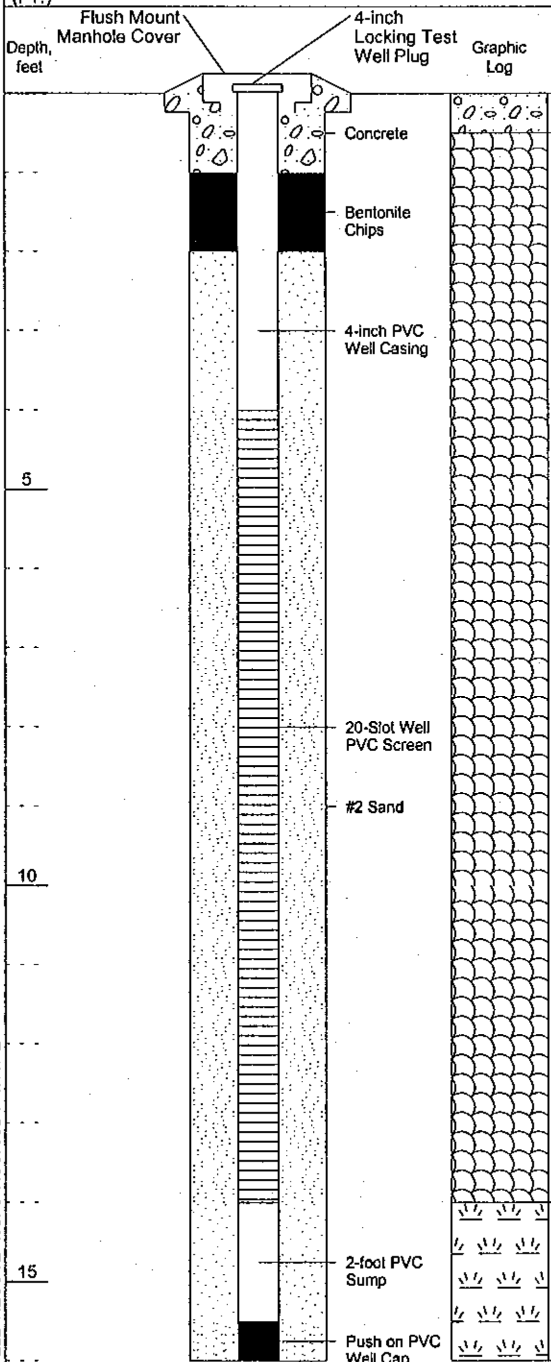
WELL CONSTRUCTION LOG

WELL NO. RW-1S	NORTHING	EASTING		
PROJECT NO./NAME 92401Y03 / FC Gowanus former MGP Site		LOCATION 124-136 2nd Avenue Brooklyn, New York		
APPROVED BY G. Tyers	LOGGED BY D. Moss			
DRILLING CONTRACTOR/DRILLER Aquifer Drilling & Testing, Inc. / L. Adams		GEOGRAPHIC AREA Off Site 12th Street Sidewalk		
DRILL BIT DIAMETER/TYPE 6.25-in. / Auger	BOREHOLE DIAMETER 10-inches	DRILLING EQUIPMENT/METHOD CME-75 / HSA	SAMPLING METHOD 2" Split Spoon	START-FINISH DATE 4/22/02-4/22/02
CASING MAT./DIA. SCH 40 PVC / 4-inch	SCREEN: TYPE Slotted	MAT. SCH 40 PVC TOTAL LENGTH 10.0	DIA. 4-inch	SLOT SIZE 20-Slot
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK #2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
	Concrete			
	Brown fine to coarse SAND, little Silt, trace Gravel, trace Concrete; dry to wet at 3 feet (fill)			
5	Brown fine to coarse SAND, little Silt, trace Gravel; wet (fill)		12.1	Odor
10	Brown fine to coarse SAND, little Silt, trace Gravel; wet (fill)		23.8	Odor
15	PEAT and green-grey CLAY; moist			
				Bottom of well at 16 feet below land surface

BORING/WELL RECOVE~1.GPJ ROUX.GDT 6/11/02

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WELL CONSTRUCTION LOG

WELL NO.	NORTHING	EASTING
RW-2S		

PROJECT NO./NAME	LOCATION
92401Y03 / FC Gowanus former MGP Site	124-136 2nd Avenue Brooklyn, New York

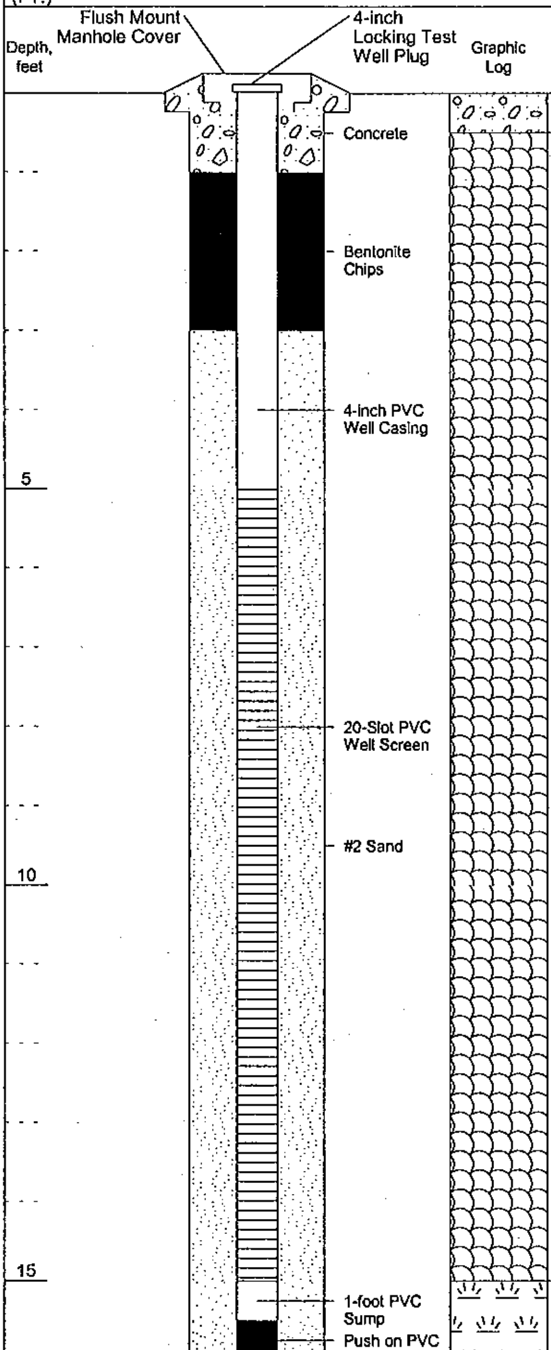
APPROVED BY	LOGGED BY	
G. Tyers	D. Moss	

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
Aquifer Drilling & Testing, Inc. / L. Adams	Off Site 12th Street Sidewalk

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
6.25-in. / Auger	10-inches	CME-75 / HSA	2" Split Spoon	4/22/02-4/22/02

CASING MAT./DIA.	SCREEN: TYPE	MAT.	TOTAL LENGTH	DIA.	SLOT SIZE
SCH 40 PVC / 4-inch	Slotted	SCH 40 PVC	10.0	4-inch	20-Slot

ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GW SURFACE	GRAVEL PACK
			/		#2



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Concrete			
	Brown fine to coarse SAND, little Silt, little Gravel, trace Concrete; dry to wet at 3 feet (fill)			
5	Brown fine to coarse SAND, little Silt, little Gravel; wet (fill)		28.6	
10	Brown fine to coarse SAND, little Silt, little Gravel; wet (fill)		27.2	Odor and sheen
15	PEAT and green-grey CLAY; moist			
				Bottom of well at 16 feet below land surface

Appendix D

Excavation Work Plan

AECOM Environment

Excavation Work Plan

(Appendix D of the Interim Site Management Plan)

Metropolitan Former MGP Site
Kings County, Brooklyn, New York
NYSDEC Site Number: 224046
Order on Consent Index #: A2-0552-0606

Contents

List of Tables

List of Acronyms

ASP	Analytical Services Protocol
C&D	Construction and Demolition
CCS	Composite Cover System
CFR	Code of Federal Regulations
COCs	Constituents of Concerns
DOT	Department of Transportation
EC	Engineering Controls
EWP	Excavation Work Plan
HASP	Health and Safety Plan
IC	Institutional Controls
ISMP	Interim Site Management Plan
MGP	Manufactured Gas Plant
NYC	New York City
NYCRR	New York Codes Rules and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
PPE	Personal Protective Equipment
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
TCLP	Toxicity Characteristics Leaching Procedures
USEPA	United Stated Environmental Protection Agency

VOCs	Volatile Organic Compounds

1.0 Notification

At least 30 days prior to the start of any activity, that is anticipated to encounter former Manufactured Gas Plant (MGP)-related impacts within the Interim Site Management Plan (ISMP) Site Area, the ISMP Site Area property owner or their representative will notify the New York State Department of Environmental Conservation (NYSDEC) and National Grid. Table 1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of Site-related contact information is provided in Appendix B of the ISMP.

Table 1: Notifications*

Henry Willems, NYSDEC Project Manager	(518) 402-9473, htwillem@gw.dec.state.ny.us
Gardiner Cross, NYSDEC Regional HW Engineer	518-402-9473, gwcross@gw.dec.state.ny.us
Brian Bermingham, National Grid Project Manager	718-608-5102, Brian.Bermingham@nationalgrid.com
Pete Cox, AECOM Project Manager	978-905-2168, pete.cox@aecom.com

* Note: Notifications are subject to change and will be updated as necessary.

Following notification by the ISMP Site Area property owner, National Grid will generate the notification to NYSDEC via a Notice of Intrusion letter. This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for ISMP Site Area re-grading, intrusive elements or utilities to be installed below the composite cover system (CCS), estimated volumes of MGP-related impacted soil to be excavated and any work that may impact an interim engineering control (EC);
- Whether proposed activities will require dewatering, proposed containment of dewatering liquids and planned disposal options for dewatering liquids;
- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work;
- A summary of the applicable components of this Excavation Work Plan (EWP);
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix E of this ISMP;
- Identification of disposal facilities for potential waste streams; and

- Identification of sources of any anticipated backfill, along with all required chemical testing result

2.0 Excavation Work Plan

All site work on non-CCS areas (see Figure 3-1 of the ISMP) and surface intrusive work shall be performed in compliance with 29 CFR 1910.120. The property owner representative shall use an Occupational Safety and Health Administration (OSHA) trained Site Supervisor and HAZWOPER-trained workers to complete non-CCS area site work and surface intrusive work.

Note: The existing and future access conditions were taken into account in the development of the procedures, methods, and controls discussed in this section.

2.1 Soil Screening Methods

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed by a qualified environmental professional contracted by National Grid during all site work on non-CCS areas, any surface intrusive work, or into known or potential MGP-related impacts. All site activities on non-CCS areas of the ISMP Site Area will require instrument-based soil screening (for dust). Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, regardless of when the invasive work is performed.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused as soil beneath the CCS or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Section 2.4 of this Plan.

2.2 On-site Material Management

2.2.1 Soil

Visually or olfactory impacted material should be placed in roll-off containers, drums, or stockpiled on plastic and maintained within a secure location around the work area; stockpiled material shall be covered for protection from precipitation and to prevent material from becoming airborne. It is anticipated that the material will be transported to National Grid approved off-site disposal facility. Material collected in drums will be properly labeled and covered for off-loading to a secure area. The material will then be characterized by either the property owner’s contractor/representative or National Grid for subsequent disposal.

Soil stockpiles containing known or suspected MGP-related impacts will be continuously encircled with a berm and/or silt fence. Contaminated water draining from the soils containing known or suspected impacts will be collected from inside the bermed area and disposed of off-site in an appropriate manner. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles containing known or suspected MGP-related impacts will be kept covered at all times with appropriately anchored tarps..

Stockpiles containing known or suspected MGP-related impacts will be inspected at a minimum once each day and after every storm event. Damaged tarp covers will be promptly replaced Results of inspections will be recorded in a logbook, maintained at the project site, and available for inspection by the NYSDEC. Stockpiled material not being used will be removed within 30 days following disposal facility characterization.

2.2.2 Groundwater

Remedial investigation data indicates that the water table is approximately 1.9 to 10 feet below current ground surface. Therefore, groundwater may be encountered. In the event that it is necessary, the property owner's contractor/representative will provide sufficient means to remove groundwater from the excavation in drums, tanks, or other appropriate containment. All groundwater shall be considered impacted and properly disposed.

2.3 Materials Excavation and Load-Out

A qualified environmental professional contracted by National Grid or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material. The owner of the property and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements within the ISMP Site Area will be investigated by the property owner's contractor/representative. It will be determined whether a risk or impediment to the planned work under this ISMP is posed by utilities or easements within the ISMP Site Area.

Excavated soil shall be segregated (e.g., on plastic or by containerization) from surface soils regardless of its level of impact.

After the completion of soil removal and any other surface intrusive activities, a demarcation layer, consisting of orange snow fencing material or equivalent material will be placed in excavation areas along the sidewalls and excavation bottom to separate backfill from existing soils.

All waste derived from excavation or other intrusive activities will be either stockpiled or placed in appropriate containers (e.g., 55-gallon steel drums, 20-cubic yard roll off containers, 4,000 gallon Baker tanks) and grouped by environmental matrix (soil or water). Construction and demolition (C&D) material, including personal protection equipment (PPE), that has been in contact with impacted soil and/or groundwater shall be containerized, separately unless approved by the impacted material disposal facility.

All removed soil and water will be characterized using the laboratory analyses and sampling frequency specified by the disposal facility. The analyses to be performed may include, but not be limited to, the following, depending on the medium and the selected disposal facility:

- Total Metals by United States Environmental Protection Agency (USEPA) Method 6010B (Mercury 7470A)
- Total Petroleum Hydrocarbons (DRO and GRO) by USEPA Method 8015 modified
- Polychlorinated biphenyl (PCBs) by USEPA 8082
- Toxicity Characteristics Leaching Procedure (TCLP) ZHE Extraction – USEPA Method 1311
- TCLP VOC – USEPA Method 8260B

- TCLP SVOC – USEPA Method 8270C
- TCLP Resource Conservation and Recovery Act (RCRA) Metals – USEPA Method 6010B (Mercury 7470A)
- Corrosivity – USEPA Method 9045C
- Ignitability/Flashpoint – USEPA SW-846 Method 1010A
- Reactive Cyanide and Reactive Sulfide by USEPA SW-846 Chapter 7, Sections 7.3.3.2/7.3.4.2
- Total Organic Halogens – USEPA SW-846 Method 9020B

Loaded vehicles leaving the ISMP Site Area will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site, as appropriate. The property owner’s contractor/representative will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the ISMP Site Area until the activities performed under this section are complete. Water, sand or soil derived from the truck decontamination area will be handled in the same manner specified in Section 2.1 and 2.2.

Locations where vehicles enter or exit the project site shall be inspected daily for evidence of off-site soil tracking.

The property owner’s contractor/representative will be responsible for ensuring that all egress points for truck and equipment transport from the ISMP Site Area are clean of dirt and other materials derived from the ISMP Site Area during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to ISMP Site Area-derived materials.

2.4 Materials Transport Off-Site

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

At a minimum, trucks should have an impermeable tarp, competent cover systems, and functional tailgates to prevent leakage of liquids. Trucks transporting impacted soils shall be lined with 12-mil polyethylene sheeting large enough to fully cover the top of the load. The truck covers shall be an impermeable soil cover. Additional automatic mesh tarps will be used to secure the liners. Loose-fitting canvas-type truck covers or mesh covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

Truck transport routes shall be in accordance with all New York City (NYC) Department of Transportation (DOT) and New York State (NYS) DOT approved roadways. It is the responsibility of the property owner’s contractor to follow all applicable state, local, and municipal rules, regulations, and guidelines (including NYCDOT and NYSDOT) regarding truck routes.

All trucks loaded with MGP-related impacted materials will exit the vicinity of the ISMP Site Area using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the project site will be kept clean of dirt and other materials during ISMP Site Area remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

2.5 Materials Disposal Off-Site

All soil/fill/solid waste excavated and removed from areas known to have MGP-related impacts will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this ISMP Site Area is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from the ISMP Site Area will not occur without formal NYSDEC approval.

Stockpiled and segregated soils will be transported to a National Grid-approved thermal desorption disposal facility designated by National Grid at the time of disposal.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C&D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Interim Status Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

2.6 Materials Reuse On-Site

All MGP-related impacted material exposed and removed as part of the work within the ISMP Site Area shall be disposed off-site as detailed in this EWP.

All other material removed from the ISMP Site Area will require NYSDEC approval prior to any reuse on-site. The property owner’s contractor/representative will ensure that procedures defined for materials reuse in this ISMP are followed and that unacceptable material does not remain on-site. Impacted on-site material, including historic fill, petroleum residuals, and MGP-related impacts contaminated soil, that is approved by the NYSDEC for reuse on-site will be placed below a demarcation layer or impervious surface, and will not be reused within the CCS, within landscaping berms, or as backfill for subsurface utility lines.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the project site will not be reused on-site.

2.7 Fluids Management

All impacted liquids to be removed from the ISMP Site Area, including but not limited to, excavation dewatering, decontamination waters, groundwater monitoring well purge and development waters, and DNAPL will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the ISMP Site Area, and will be managed off-site, unless prior approval is obtained from NYSDEC.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a State Pollution Discharge Elimination System permit.

2.8 Cover System Restoration

After the completion of soil removal and any other invasive activities the CCS will be restored in a manner that complies with the ISMP. The existing CCS is comprised of fill, asphalt pavement, concrete covered sidewalks, and concrete building foundations. The demarcation layer, consisting of orange snow fencing material, white geotextile, or equivalent material will be placed to provide a visual reference to the top of the MGP-related impacted zone, the zone that requires adherence to special conditions for disturbance of MGP-related impacted soils defined in this ISMP. If applicable, figure 3-1 of the ISMP will be updated to show the revised MGP-related impacted area. The property owner shall not change the type of cover system following excavation without prior written permission from National Grid. A figure showing the modified surface will be included in an updated ISMP.

2.9 Backfill from Off-Site Sources

All materials proposed for import onto the ISMP Site Area will be approved by National Grid's qualified environmental professional and NYSDEC and will be in compliance with provisions in this ISMP prior to receipt at the ISMP Site Area. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager and National Grid allowing a minimum of 5 business days for review.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the ISMP Site Area.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in ISMP. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for the ISMP Site Area, will not be imported onto the IMP Site Area without prior approval by NYSDEC. Solid waste will not be imported onto the ISMP Site Area. Additionally all imported soils must meet 6NYCRR Part 375 Restricted Use Commercial soil cleanup objectives.

Trucks entering the project site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

2.10 Stormwater Pollution Prevention

Barriers and hay bale checks will be installed around the entire perimeter of the construction area and will be inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the project site and available for inspection by the NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the ISMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

2.11 Excavation Contingency Plan

If underground tanks or other previously unidentified contaminant sources are found during subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (total analyte list metals; total compound list (TCL) volatiles and semi-volatiles, TCL pesticides, and polychlorinated biphenyls), unless the Site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive work will be promptly communicated by phone to NYSDEC’s Project Manager and National Grid. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline.

In the event that potential MGP-related impacts are encountered at unexpected depth or locations, ISMP Site area activities will be suspended and National Grid will be notified. National Grid will evaluate the observed conditions and cooperate with the property owner and/or developer to minimize any delays to the extent reasonably feasible. National Grid may determine that laboratory testing is required to evaluate the observed impacts for chemical concentrations and characteristics. If the encountered materials are determined to be associated with MGP-related materials, then the materials will be segregated and stockpiled for disposal.

2.12 Equipment Decontamination

All hand tools and heavy equipment that comes in contact with impacted material will be decontaminated at the end of the work shift, day, when moving to new areas, or anytime it is deemed necessary. Decontamination should be accomplished using industry standard means and methods which may include high pressure washing/steam cleaning equipment, brushes, solvents and/or surfactants. All decontamination related wastes (impacted water, solids and PPE) should be managed appropriately and disposed of off-site at an approved facility.

2.13 Health and Safety

The property owner's contractor/representative shall develop and utilize site health and safety protocols consistent with the attached HASP (Appendix E of the ISMP). The intention of the health and safety program at the ISMP Site Area is to protect the public, site workers, contractor / property owner representative(s) while they secure/monitor the excavation, utility/maintenance and other Construction Workers during execution of their work, and the environment.

The ISMP and the HASP were developed primarily to handle activities that involve excavation (i.e., replacement/inspection of utilities, etc.) at the ISMP Site Area. While comprehensive, this ISMP and attached HASP cannot anticipate all potential future scenarios for invasive work on the ISMP Site Area.

2.14 Community Air Monitoring Plan

Air sampling stations will be placed upgradient and downgradient of generally prevailing wind conditions. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations.

Exceedances of action levels listed in the Community Air Monitoring Plan (Appendix E of the ISMP) will be reported to NYSDEC and NYSDOH Project Managers.

2.15 Odor Control Plan

Fugitive emissions can be generated from a variety of activities including excavation, drilling, and dewatering and/or from the temporary staging of materials for characterization, consolidation, and scheduling for transportation.

Due to the Compounds of Concern (COCs) associated with the remedial activities at former MGP sites; fugitive emissions can take the form of volatile organic compounds (VOC's), odor, and/or dust. Dust can be entrained with low levels of high molecular weight constituents, while VOC's can volatilize into ambient air. Odor emissions may result from the atmospheric exposure of contaminated media. Contamination may be present in soils and groundwater. The potential for odor generation from groundwater is less than that from solids. The constituent concentrations associated with these odors are typically less than the levels that potentially pose a health risk as the odor threshold of COC's are typically less than health based action levels.

This odor control plan is capable of controlling emissions of nuisance odors off-site. If nuisance odors are identified at the project site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the property owner's contractor/representative, and any measures that are implemented will be discussed in the ISSR.

All necessary means will be employed to prevent on- and off-site nuisances.

A three-tiered set of controls are proposed for this Plan:

- Level I - Built into the design of the Plan and includes proactive measures to minimize the effect of fugitive emissions. Level 1 includes air monitoring to ensure that levels of VOC's and dust are under site-specific action levels.
- Level II – Procedures that are implemented in response to specific increases in fugitive emissions, but are not likely to have a significant impact in the schedule of site activities.
- Level III – More aggressive procedures, also initiated in response to specific increases in fugitive emissions that are likely to have a more significant impact on production schedule and site activities.

The Site Manager will be required to progressively implement these options until emission sources are controlled and ambient concentrations no longer have the potential to pose a health risk.

2.15.1 Level I Controls

Level 1 Controls are built into the design of the field activities and involve physical controls, site layout, and scheduling.

Physical Controls

The simplest form of physical control is the use of visual barrier cloth on the site perimeter fencing. The resistance caused by the visual barrier will elevate the discharge point of emissions leaving the site to the top of the perimeter fence and will promote better mixing and dispersion. Another form of simple physical control is the required use of tarps on trucks that move or transport impacted material.

All stockpiles of impacted material should be covered, if left inactive for a period of more than 2 hours.

All trucks used for off-site transport should have tarps in place to cover impacted material as detailed in Section 2.3. On-site haul routes should be routinely wetted to control dust using a hose, sprinkler, or dedicated water truck.

Site Layout

The dispersion of fugitive emissions is controlled by meteorological conditions and their impact generally decreases with distance from the source. If possible, transfer/storage areas will be placed either downwind or significantly upwind of off-site receptors.

The height of the stockpiles should be lower than the top of the perimeter fencing (8 feet) to utilize the benefit of the barrier cloth. If stockpiles must be staged near the fence line (within 100 feet), they should be less than 8-feet in height.

Scheduling

Every effort should be made to minimize the amount of time that potentially MGP-related impacted material is stored on-site. Appropriate strategies involve the in-place precharacterization of soils to be excavated and the sampling of stockpiles as soon as they are placed. Efficient scheduling/coordination of operations can also limit the impact of active emission sources. Close coordination of excavation activities can decrease the surface area of disturbed material, thereby reducing the size of the emission source. A smaller source area can facilitate the implementation of additional controls, if required.

2.15.2 Level II Controls

Air monitoring will routinely be performed at the fence line of the project site as delineated in the Community Air Monitoring Plan (Appendix E of the ISMP) during all work activities. The results will be compared to site-specific action levels for VOC's and total particulates.

Level II controls will be enacted if the exceedance is confirmed or odors are detected at the fence line. If the action levels are exceeded, additional monitoring will be conducted to confirm the result. Level II controls will be enacted if the exceedance is confirmed. The Site Manager must then work through the applicable list of site controls until the fence line monitoring results for all parameters are determined to be less that their associated action levels. Specific Level II controls are discussed below.

Suppressing Agents

Several agents that can be applied over emissions sources have been determined to be effective in controlling emissions. These include odor suppressant foam for VOC mitigation and water spray for dust suppression.

The following suppressing agents have been identified for use but additional agents may be used or substituted for other proven agents such as odex, hydromulch, or ecosorb.

Odor Suppressant Foam

Odor suppressant foam can provide immediate, localized control of VOC and odor emissions. The foam is created by the injection of air into a foam concentrate/water mixture using a Pneumatic Foam Unit. The foam is applied via a hose to cover source areas to a depth of 3 to 6 inches. Foam (Rusmar AC-600 or equivalent) is a short term remedy and can be actively used to control VOC and odor emissions from active excavations/stockpiles, and during the loading of trucks. It is shipped as a concentrate and diluted with water on-site. Under normal conditions, this foam can last for several hours. However, it has been observed to degrade quickly in direct sunlight or precipitation so it must be applied liberally and frequently to all areas that require odor control.

Water Spray

A spray of water can be used to minimize the amount of dust created. A water hose is effective for controlling dust over a small area, while lawn sprinklers or a dedicated water truck may be more efficient for extended control of large areas or on-site haul routes.

Tarps

Tarps can provide effective control for source areas that are likely to be inactive for extended periods of time. To be effective, the size of the source area should be controlled such that it can be covered using a single tarp. Rolls of 12-mil polyethylene will be used to cover inactive stockpiles. Tarps will also be used for covering exposed soils loaded into trucks. All trucks will be lined with 6 mil polyethylene sheeting, the liners will be large enough to overlap and fully cover the top of the load. Additional automatic mesh tarps will be used to secure the liners.

2.15.3 Level III Controls

Level III controls are to be implemented when Level II controls have been exhausted and ambient concentrations of emissions continue to exceed the site-specific action levels. Each of the control options listed in this subsection has the potential to significantly affect the schedule/production rate of site activities. These delays may be required periodically to ensure that acceptable levels of fugitive emissions are maintained, and are preferable to a complete work cessation to control an emission event.

Production/Schedule

It may be necessary to reduce the excavation rate to reduce the surface area of disturbed media or slow the generation rate of stockpiles. These activities would result in smaller source areas that could be more effectively controlled using Level II techniques.

Meteorological Conditions

It may be necessary to limit certain activities to those periods when preferred meteorological conditions exist, such as wind direction or low temperatures are present.

Relocation of Activities

Another option is cease work and move the remedial activities to lesser-impacted areas until adequate control measures can be implemented or more favorable meteorological conditions return. In addition, it may be beneficial to temporarily relocate material loading and transfer activity areas to other areas of the site or within subsurface excavations to utilize the natural dispersion of emissions in the atmosphere, or shelter from the wind.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on- site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

2.16 Dust Control Plan

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.

- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

2.17 Other Nuisances

A plan for rodent control will be developed and utilized by the contractor prior to and during clearing and grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

2.18 Quality Assurance/Quality Control Sampling

Field and laboratory quality control (QC) samples will be collected and analyzed to document the accuracy and precision of analytical samples that will require submittal to NYSDEC, if any. The Quality Assurance (QA)/QC samples include trip blanks, field equipment blanks, field duplicates and matrix spikes, and matrix spike duplicates. The data quality level for the investigation will be consistent with procedures outlined in the NYSDEC Analytical Services Protocol (ASP) July 2005 methodologies. A full ASP Category B data package will be prepared by the laboratory for all samples. The data will be reviewed, and a qualified chemist will prepare a Data Usability Summary Report.

Waste characterization samples do not have to meet the QA/QC sampling requirements described in the above paragraph.

Appendix E

Example Health and Safety Plan and Community Air Monitoring Plan

Environment

Prepared for:
National Grid
Brooklyn, New York

Submitted by:
AECOM
Manhattan, NY
March 2017

HEALTH AND SAFETY PLAN

Appendix E of the Interim Site Management Plan

Former Metropolitan Works MGP Site
Brooklyn, New York
NYSDEC Site No.: 224046
Order on Consent Index #: A2-0552-0606

Emergency Information and Hazard Assessment

Site Activities – Former Metropolitan Works MGP Site
Brooklyn, New York

Hospital: **New York Methodist Hospital**

Address: **506 Sixth St, Brooklyn, NY**

Phone #: 718.780.5500

Directions from the Former Metropolitan Works MGP site to New York Methodist Hospital

- ***Start out going NORTHEAST on 2nd AVE toward 10th ST (0.1 mi)***
- ***Turn RIGHT onto 9th ST. (0.9 mi)***
- ***Turn LEFT onto 8th AVE.(0.1 mi)***
- ***Turn LEFT on 6th ST. (0.1 mi)***
- ***End at 506 6th Street, Brooklyn, NY 22326***

When using any driving directions or map, it's a good idea to do a reality check and make sure the road still exists, watch out for construction, and follow all traffic safety precautions. This is only to be used as an aid in planning.

Emergency References

For critical injuries, dial 911 and/or seek treatment at the identified local Emergency Room

Ambulance: 911

Fire: 911

Police: 911

Underground Utilities – www.call811.com

DigNet of New York City and Long Island
Phone: (800) 272-4480
http://www.dignetynewyork.com/

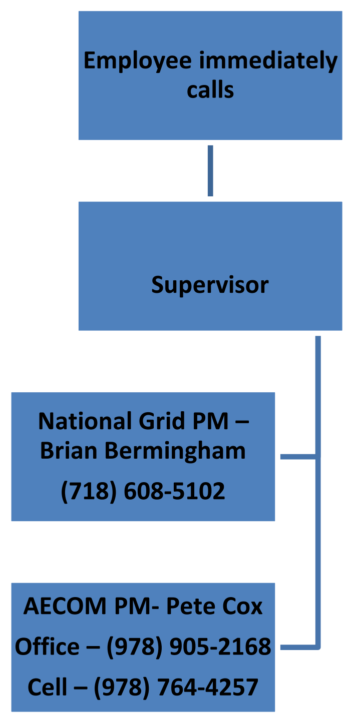
Emergency Chemical Information – InfoTrac (800) 535-5053

Poison Control Center – http://www.aapcc.org/
(800) 222-1222

Emergency Contact Phone Tree

Key Personnel:

National Grid PM – Brian Bermingham
AECOM PM – Pete Cox



AECOM Medical Records and Medical Consultant

In the event of a non-critical injury, and once preliminary reporting been completed, if the injured employee desires/needs to speak with a medical professional to consult on the nature of their injury and treatment options, employees may contact WorkCare directly if they have not be directed to call WorkCare, been contacted by WorkCare directly, or they have been unable to speak directly with any of the personnel identified in the Emergency Contact Phone Tree provided above.

Work Care North
Alameda, CA 94502
Telephone: 510-748-6900
Fax: 510-748-6915

Emergency Muster Point

The escape route from the site and an emergency muster point will be determined and provided to all workers during the project mobilization, and will be noted in the space below.

Hazard Assessment

Task-Specific Hazard Assessment – Physical & Chemical

Hazard	General Site Hazard	Soil Boring & MW Installation	Soil Sampling	Groundwater Sampling	Utility Work	Excavation
Animals	√	√	√	√	√	√
Cold	√	√	√	√	√	√
Concrete Coring	√	√			√	√
Corrosive Liquids	√		√	√	√	√
Drilling	√	√				
Dust	√	√	√		√	√
Exposure to Chemical Hazards	√	√	√	√	√	√
Falling	√	√	√	√	√	√
Heat	√	√	√	√	√	√
Heavy Equipment	√	√			√	√
Insects	√	√	√	√	√	√
Lifting	√	√	√	√	√	√
Noise	√	√			√	√
Overhead Materials	√	√			√	√
Overhead Utilities	√	√			√	√
Pinch Points	√	√	√	√	√	√
Poisonous Plants	√	√	√	√	√	√
Rotating Equipment	√	√			√	√
Sharp Objects	√	√	√	√	√	√
Splashing Liquids	√	√	√	√	√	√
Traffic	√	√	√	√	√	√
Tripping	√	√	√	√	√	√
Underground Utilities	√	√			√	√
Vehicle Operations	√	√	√	√	√	√
Weather	√	√	√	√	√	√

Chemical Hazards

Chemical Name	PEL[1]	TLV[2]	VP[3]	VD[4]	SG[5]	SOL[6]	FP[7]	LEL[8]	UEL[9]
Benzene	1	0.5	75	2.8	0.88	<1	12	1.2	7.8
Ethyl Benzene	100	100	7	4	0.88	<1	55	0.8	6.7
Hydrogen Cyanide	10	4.7 STEL	630	.94	0.69	100	0	5.6	40
Naphthalene	10	10	0.08	4.4	1.15	<1	174	0.9	5.9
Toluene	200	50	21	4	0.87	<1	40	1.1	7.1
Xylene	100	100	9	4	0.86	<1	81	1.1	7.0

1 Permissible Exposure Limit in ppm
2 Threshold Limit Value in ppm
3 Vapor Pressure in mm Hg
4 Vapor Density (air = 1)
5 Specific Gravity (water = 1)
6 Solubility in Water in %
7 Flash Point in °F
8 Lower Explosive Limit in % by volume
9 Upper Explosive Limit in % by volume
NA = Not Applicable
? = Not known
C = Ceiling limit not to be exceeded

Personal Protective Equipment

The minimum level of personal protective equipment required for field work is Level D. Level D consists of, hard hat, safety glasses, traffic safety vest, protective footwear, work gloves, and, as appropriate gloves for collection of environmental samples and hearing protection.

Additional personal protective equipment such as chainsaw chaps and sleeves, mesh face shield will be required for the cleaning and grubbing task.

PPE Item	General Site Hazard	Soil Boring & MW Installation	Excavation	Groundwater Sampling
Hard Hat	1	✓	✓	1
Traffic Vests	1	1	1	1
Steel Toed Safety Shoes	✓	✓	✓	✓
Safety Glasses with Side shields	✓	✓	✓	✓
Goggles or Face shield	2	2	2	2
Hearing Protection	3	✓	3	3
Tyvek Coveralls	4	4	4	4
Nitrile Gloves	4	4	4	4
Heavy Duty Work or Kevlar Gloves	5	5	5	5
Ivy Block® or Ivy Screen® barrier cream	6	6	6	6
Polycoated Tyvek coveralls with hood, double Nitrile gloves, rubber boots, and taped transitions.	7	7	7	7

✓ Required PPE

1 Traffic vests and hardhats are required when working within twenty feet of any public road or any private road with active traffic. Hard hats are also required when working around heavy equipment, when falling objects may cause impact injuries, or when working around energized electrical lines.

2 Goggles or a Face Shield are necessary when splashing liquid hazards are present in the work area. If tool use presents a hazard of creating high velocity object hazards, a Face Shield is recommended to protect against face and eye trauma.

3 Hearing protection should be worn around soil boring equipment if normal conversation cannot be understood.

4 Tyvek coveralls and Nitrile gloves are only required of those that are likely to come in direct contact with potentially contaminated soils and/or groundwater. Tyvek coveralls and Nitrile gloves will be worn to protect workers from poison ivy and poison oak when contact cannot be avoided.

5 Heavy duty work gloves should be worn when handling tools and equipment that present pinch point and laceration hazards. Kevlar gloves should be used when cut and laceration hazards are present.

6 Ivy Block® or Ivy Screen® barrier cream should be worn on exposed skin where there is a potential for exposure to poison ivy or oak.

7 When working in areas with high potential for excessive contact with hazardous chemicals, precautions will be taken to reduce the potential for direct dermal contact that may incorporate the use of polycoated Tyvek, double gloves, and additional protective measures based upon the permeability of the PPE chosen and the potential for chemicals of concern to degrade the selected PPE.

If the sustained PID reading exceeds 250 ppm as isobutylene or if irritating dust is encountered Level B PPE must be donned.

Air Monitoring Instruments

Task	Instrument	Action Limit and Action
All tasks involving potential exposure to contaminated soils and/or groundwater	Photoionization Detector	**5 ppm as isobutylene**; Don respiratory protection as discussed in Section 7
All tasks involving exposure to site chemicals of concern	Colorimetric detector tubes or Draeger Chip System for Benzene	**0.5 ppm Benzene** Don respiratory protection described in section 7.2
All tasks with the potential to generate dust.	Particulate meter	**>1.0 mg/m^3**; Apply dust suppression controls and don respiratory protection **>1.5 mg/m^3**; **STOP WORK** until levels are reduced below1.0 mg/m^3

Respiratory Protection

If conditions warrant Level C respirator protection in the form of half face or full face air purifying respirator with a combination organic vapors cartridge with P 100 filters will be required.

Task	Action Limit	Respiratory Protection	Level
All tasks involving potential exposure to contaminated soils and/or groundwater	5 ppm as Isobutylene for 5 minute	Half or full face mask respirator with combination organic vapor/HEPA cartridges	C
	10 ppm as Isobutylene	Full face respirator with organic vapor/HEPA cartridges	C
	50 ppm as isobutylene	Supplied air respirator, STOP WORK	B
All tasks involving potential exposure to contaminated soils and/or groundwater	0.5-10 ppm as Benzene on Draeger tube	Half or full face mask respirator with combination organic vapor/HEPA cartridges	C
	10 ppm as Benzene on Draeger tube	Full face respirator with organic vapor/HEPA cartridges	C
	50 ppm as Benzene on Draeger tube	Supplied air respirator, STOP WORK	B
All tasks with the potential to produce Dust	1.0 mg/m3 particulates in air	Half or full face mask respirator with combination organic vapor/HEPA cartridges	C
	1.5 mg/m3 particulates in air	STOP WORK and apply dust suppression techniques until levels have returned to ambient conditions	C

Job Hazard Analysis

AECOM

JHA Type: ☒ Investigation ☐ O&M ☐Office ☐ Construction	☒ New ☐ Revised	Date:
Office: Client:	Location: Former Metropolitan MGP Site, Brooklyn, New York	
Work Type: Test Pitting, Drilling and Sampling Activities	Work Activity: Test pitting with a back hoe, soil boring via direct push and HAS, monitoring well installation, soil and groundwater sampling	

Personal Protective Equipment (PPE): Minimum PPE is Level D including: hard hat, safety glasses, steel-toed boots, hearing protection as needed, and gloves as needed (type dependent on job-specific requirements). Traffic vest with reflective material/tape if needed and polycoated tyvek suits is needed.

Development Team	Position/Title	Reviewed By	Position/Title	Date

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, and notification to required contacts (e.g. site managers, clients, subcontractors, etc.). Additionally, safety meeting must be performed and documented at the beginning of each workday. Relevant forms should be updated if modifications are made in the field once work begins. Also consider weather conditions (heat, cold, rain, and lightning).

Global Site Work Safety - applies to all activities

❶ Job Steps	❷ Potential Hazard	❸ Critical Actions
Inclement Site Conditions/ Weather	Poor Lighting	• All workers should have flashlight available with spare batteries. • One line of communication should be open at all times.
	Exposure (E) to Lightning Strikes	• Fieldwork shall not be conducted when lightning can be seen or thunder heard from the work area. When lightning and/or thunder occur, employees are to cease work, perform emergency equipment shut down as needed, and then seek shelter. • Minimize contact with ground and keep body parts touching ground close together. • Follow HASP guidelines for resuming work
	E to Thunderstorms, Hurricanes	• Listen to radio announcements for updates • Visually track threatening weather, cease outdoor activities if necessary • Seek shelter.
	Heat Stress (HS)	• Monitor self and other workers when ambient temperature exceed 85°F • Wear appropriate clothing • Consume sufficient quantities of water/electrolytes to avoid dehydration • Monitor yourself and co-workers for signs of heat stress • Take frequent breaks and take shelter to cool-off if feeling signs of heat stress
	Cold Stress (CS)	• Wear adequate insulating clothing to maintain core temperatures above 36ºC • At air temperatures of 2ºC (35.6ºF) or less, if immersed in water or clothing becomes wet, immediately change clothing and get treated for hypothermia. • Cover metal handles of tools and control bars by thermal insulating material at temperatures below -1ºC (30ºF). • Protect hands with mittens if the air temperature is -17.5ºC (9ºF) or less. • Consume warm sweet drinks and soups to provide caloric intake and fluid volume. Limit the intake of coffee because of the diuretic and circulatory effects. • Work under constant protective observation (buddy system or supervision) at or below -12ºC (10ºF) ECT. • Monitor yourself and co-workers for signs of cold stress • Take frequent breaks and take shelter to warm if feeling signs of cold stress. Avoid conditions that induce sweating. • Minimize standing or sitting still.
Hand Safety	Hand injury	• Wear chemically protective gloves when in contact with contaminated material. • Use shears rather than utility knives to cut tubing or other materials. • Wear leather or heat-resistant gloves while performing manual work. • Avoid touching hot surfaces without proper protective equipment. • Identify and avoid pinch points • Do not grasp steel hoist cables during hoisting. • Use only appropriate tools for the task.
Ergonomic Safety	Lifting – Back and Foot injury	• Follow standard safe lifting practices. • Wear proper PPE, i.e., steel-toed shoes with metatarsals. • Use Mechanical lifting devices when ever possible. • Ensure path is clear prior to lifting and moving materials. • Ensure proper rigging.

Global Site Work Safety - applies to all activities (continued)

❶ Job Steps	❷ Potential Hazard	❸ Critical Actions
Ergonomic Safety (continued)	Overexertion (O) when lifting supplies/equipment	• Use equipment whenever possible. • Procure help when lifting awkward loads or materials that weigh greater than 60 lbs. • Use proper lifting techniques.
Tool Safety	Damaged Tools or Improper Use of Tools Injury Property damage	• Training of personnel. • Inspection and maintenance of equipment. • Use of proper tools for the work being performed.
Chemical Safety	Contact With (CW) Chemicals	• Always show precaution, follow protocol, and were proper PPE including gloves and safety glasses while handling chemicals. • Keep portable eyewash kits nearby.
	E to Toxic Substances	• All workers will be trained in expected site-specific hazards prior to beginning work on-site. • Standards and safe work practices will be developed for any newly discovered toxic hazards that are determined to be present at the site •

Mobilization

❶ Job Steps	❷ Potential Hazard	❸ Critical Actions
Arrive at the Site	Unsafe driving practices	• Review driving directions prior to departing site • Ensure seat belt is fastened • Do not use cell phone while driving • Safe driving in rain or severe weather • Obey all laws
Site Inspection	Contact With (CW) Hazardous Plants, Insects, and Animals	• Survey the surroundings before any activity for any hazardous plants and animals detailed in Section 2.5 of the HASP especially dogs, venomous insects, bees, and snakes • Use bug repellant sprays • Be aware of any coworkers with any insect bite allergies • Wear proper PPE, i.e., long sleeved shirt and long pants • Personnel to be trained in the proper procedures to be followed in the event that an animal exhibits abnormal behavior. • Seek first aid for any bites or stings (insect, snake, or otherwise) • Provide medications to the SHSO for any sting/bite allergies you may have
	Slip, Trip, and Fall on same level (FS) or to lower level (FL)	• Maintain a clean work area and good housekeeping practices by drying wet surfaces, cleaning up muddy areas, and keeping unnecessary equipment and supplies out of walkways. • Inspect tread on steel-toed boots for signs of wear and replace as necessary • When carrying field equipment maintain clear view of footing • Wear steel-toed boots that extend over the ankle • Never run while on the job site • Use backpacks for moving gear around the site to keep hands free. • Be aware of slippery conditions. • No work after dusk, without proper overhead lighting.

Mobilization (Continued)

❶ Job Steps	❷ Potential Hazard	❸ Critical Actions
Equipment Set-up	Struck by (SB) Heavy Equipment	• Ensure backup alarms are operable • Never approach equipment without establishing eye contact with operator • Establish protocol for hand and arm signals
	Damaged Tools or Improper Use of Tools • Injury • Property damage	• Training of personnel. • Inspection and maintenance of equipment. • Use of proper tools for the work being performed.
	Overhead lines or obstructions	• Check all locations for overhead obstructions
	CW electrical energy	• Use operable ground fault circuit interrupters (GFCI's) for any tool. • Inspect sampling equipment for frayed cords, damaged parts, etc. at the start of each day.
	Hand injury	• Use shears rather than utility knives to cut tubing or other materials. • Wear leather or heat-resistant gloves while performing manual work. • Avoid touching hot surfaces without proper protective equipment. • Identify and avoid pinch points • Do not grasp steel hoist cables during hoisting. • Use only appropriate tools for the task.
	Lifting – Back and Foot injury	• Follow standard safe lifting practices. • Wear proper PPE, i.e., steel-toed shoes. • Use Mechanical lifting devices when ever possible. • Ensure path is clear prior to lifting and moving materials. • Ensure proper rigging.
	Mechanical Hazards – Pinch Points/Sharp edges	• Care should be taken when working around heavy equipment. These items feature sharp/hard edges that present cutting, scraping, and impalement hazards. • Identify and label pinch points on equipment

Investigative Activities

❶ Job Steps	❷ Potential Hazard	❸ Critical Actions
Setup soil, groundwater, and soil gas sampling locations	Underground utilities	• "Call before you dig" NY one call (Long Island) • Discuss utility situation with PM and Client before beginning any work.
Geoprobe® soil boring advancement, test pit digging and monitoring well installation	Safety equipment in Drill Rig not in place or operating	• Perform an initial and weekly inspection of heavy equipment.
	SB Heavy Equipment/ Heavy equipment operations	• Ensure backup alarms are operable • Ensure that emergency shut off button works on equipment • Keep proper clearance from equipment • Be aware of excavator swing radius • Establish eye contact with operator(s) prior to approaching equipment • Listen for backup indicators • Operators should always wear seat belts while equipment is running • Operators must be aware of their surroundings at all times • Establish protocol for hand and arm signals • Do not climb on equipment; use proper stepping features and/or ladder that is braced properly. • Complete a drill rig inspection form before starting work to ensure there are no leaking hoses or damaged equipment.
	Mechanical Hazards - Pinch Points/Sharp edges	• Work at a safe distance from moving parts of the drill rig. • Ensure that equipment guards (whip guards) are in place and secure. • Ensure that personnel are aware of and familiar with the potential hazards of rotary equipment being used. • Keep hands and loose clothing away from rotating augers and drill stem.

Investigative Activities (continued)		
❶ Job Steps	❷ Potential Hazard	❸ Critical Actions
Geoprobe soil boring installation, and monitoring well installation (continued)	Noise	• Implement the two (2) feet rule, if shouting is required to be heard within two (2) feet of other personnel hearing protection is required. • Impulsive or impact noise must not exceed 140 db peak sound level. • Use engineering controls where applicable. • Use of hearing protection during drilling operations is required.
	Eye injury from flying debris or dust	• Wear protective eyewear. • Keep away from air rotary sample collection ports (e.g. cyclone samplers or diverters).
	Fire	• Have fire extinguishers on equipment. • Use fire watch as conditions warrant and as required by the hot work permit. • Obtain a hot work permit when using an external air compressor.
	Chemical exposure by inhalation or direct contact	• Position the drill rig and personnel upwind of drilling location, as practicable. • Provide air monitoring in the work area. • Personnel to use Modified Level D PPE (initially) with upgrade as needed. • Place drill cuttings into drums/containers and keep drums/containers closed as practicable during drilling. • Wear safety glasses.
Sampling Collection, Preparation, and Shipment		
Collect soil and groundwater samples	E to toxic substances • Dermal contact with contaminated media • Ingestion of contaminated media	• Be alert during sampling to avoid splashing. • Wear proper PPE including protective gloves, protective coveralls, and safety glasses. • On exposure, rinse immediately with fresh water • Compliance with SOW/SOPs regarding the collection of samples. • Training of personnel. • Practice good personal hygiene and implementation of decontamination procedures using disinfectant.
	Mechanical Hazards – Pinch Points/Sharp edges/Impalement	• Care should be taken when working around sampling equipment. • Identify pinch points on equipment and include in the STAR form
	Slip, Trip, and FS on wet surfaces, over equipment, non stabilized surfaces and Weak or Narrow Embankments	• Wear appropriate slip-resistant boots with a steel toe. • Only the necessary personnel should be in the area of operation. • Always return equipment to proper storage location. • Avoid embankment edges. • Avoid positioning personnel downhill of equipment on embankments • Personnel to be cognizant of potential collapse of embankments. • Personnel to be cognizant of loose slopes.
	Caught Between (CB) pinch points	• When opening and closing bottle lids, be aware of pinch points. • Wear proper PPE including protective gloves, protective coveralls, and safety glasses. • Always keep attention focused on work.
	Lifting – Back and Foot injury	• Get assistance when lifting or moving heavy items if needed.
	Chemical Hazards - spills	• Exercise proper placement, handling, and storage of the chemical preservatives used during the sampling event. • Read associated MSDS • Ensure that the chemical/contaminated material is stored in a secondary containment device so that an unscheduled release of the chemical/contaminated material cannot occur.

Sampling Collection, Preparation, and Shipment (continued)

❶ Job Steps	❷ Potential Hazard	❸ Critical Actions
Collect soil and groundwater samples (continued)	O by repeated motion	• Take breaks during sampling mixing. • Change personnel every four hours, if feeling tired. • Maintain good ergonomics.
	CW electrical energy	• Use operable GFCIs for any tool. • Keep electrical equipment away from wet surfaces and water. • Inspect sampling equipment for frayed cords, damaged parts, etc. at the start of each day.
Soil gas sampling	E to soil gas	• Measure for VOCs using a PID. • Respirator should be available for upgrade to Level C PPE
Secure samples in coolers for shipment	• Broken glass • Cross contamination	• Ensure sample bottles are securely packed in the cooler using bubble wrap and other packing materials.
Moving sample coolers	Heavy lifting	• Use proper technique or get help.
Ship samples to lab via FedEx	• Traffic Accident • Personal Injury	• Do not rush to get samples to FedEx. • Plan sampling activities to give adequate time to package samples and drop them off to Fed Ex location (if needed).

Test Pitting

Excavation/Backfilling of Test Pit	Chemical Exposure by Inhalation or Direct Contact	• Position the excavator and personnel upwind of excavation location, as practicable. • Provide air monitoring in the work area. • Upgrade PPE to use of respirator as needed. • Cover excavated soil stockpile, as practicable, until test pit is backfilled or excavated soil is disposed of. • Wear safety glasses.
	Noise	• Implement the two (2) feet rule, if shouting is required to be heard within two (2) feet of another then hearing protection is required. • Impulsive or impact noise must not exceed 140 db peak sound level. • Use engineering controls where applicable. • Use of hearing protection during excavation operations is required.
	Dust	• Use engineering controls (water truck) to the extent possible to wet down soils prior to excavation and backfill activities.
	Overhead/Underground Utilities	• Review available maps and have utilities located. • Ensure that overhead clearances for heavy equipment are within required limitations.
	Decon/Contact with High Pressure Water	• Direct pressure spray wand away from people and keep hands and feet away from discharge. • Personnel performing decon to wear full-face shield, gloves, rubber boots and tyvek or polycoated tyvek.

Demobilization

Decon sample preparation area and sampling tools	E and CW with airborne mists or vapors	• Always show precaution, follow protocol, and wear proper PPE including gloves and safety glasses while handling chemicals • Keep portable eyewash kits nearby
Decon sample preparation area and sampling tools (continued)	Chemical Hazards - spills	• Exercise proper placement, handling, and storage of the chemical solutions used during decontamination. • Read associated MSDS • Ensure that decontamination is carried out in a secondary containment device so that an unscheduled release of the contaminated decon water cannot occur.
	E to toxic substances • Dermal contact with contaminated media • Ingestion of contaminated media	• Be alert during decontamination to avoid splashing. • Wear proper PPE including protective gloves, protective coveralls, and safety glasses. • On exposure, rinse immediately with fresh water. • Training of personnel.
	Cross-contamination	• Wash your hands prior to touching your food or other “clean” materials that may be tainted by what is on your hands.
Closing drums of soil cuttings	• Heavy lifting • Cut or pinch from drum ring	• Use proper technique or get help. • Wear leather work gloves.

Job Hazard Analysis

JHA Type: ☐ Investigation ☐ O&M ☐Office ☒ Construction	☒ New ☐ Revised	Date

Office: Client: National Grid USA Location: Former Metropolitan MGP Site, Brooklyn, New York

Work Type: Excavation	Work Activity: Excavation and backfilling on the National Grid and Offsite Properties, loading and transport of impacted materials, dewatering, water treatment and discharge, excavation soil (if required) and water sampling

Personal Protective Equipment (PPE):

Minimum PPE is Level D including: hard hat, safety glasses or goggles, steel-toed boots, high visibility safety vest, hearing protection as needed, and gloves as needed (type dependent on job-specific requirements).

Additional PPE may be required in the Health & Safety Plan (HASP). Also refer to the HASP for air monitoring, and emergency procedures.

Development Team	Position/Title	Reviewed By	Position/Title	Date

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, and notification to required contacts (e.g. site managers, clients, subcontractors, etc.). Additionally, safety meeting must be performed and documented at the beginning of each workday. Relevant forms should be updated if modifications are made in the field. Also consider weather conditions (heat, cold, rain, lightning).

❶ Job Steps	❷ Potential Hazard	❸ Critical Actions
1. General Site Safety	Hand injury	• Use shears rather than utility knives whenever practical. • Wear leather or heat-resistant gloves while performing manual work. • Avoid touching hot surfaces without proper protective equipment. • Identify and avoid pinch points • Use only appropriate tools for the task.
	Slip, Trip, and Fall on same level or to lower level	• Maintain a clean work area and good housekeeping practices by drying wet surfaces, cleaning up muddy areas, and keeping unnecessary equipment and supplies out of walkways. • Inspect tread on steel-toed boots for signs of wear and replace as necessary • When carrying field equipment maintain clear view of footing • Never run while on the job site • Use backpacks for moving gear around the site to keep hands free. • Be aware of slippery conditions.
	Lifting – Back and Foot injury	• Follow standard safe lifting practices. • Wear proper PPE, i.e., steel-toed shoes with metatarsals. • Use Mechanical lifting devices whenever possible. • Ensure path is clear prior to lifting and moving materials.
	Overexertion when lifting supplies/equipment	• Use equipment whenever possible. • Procure help when lifting awkward loads or materials that weigh greater than 60 lbs. • Use proper lifting techniques.
	Contact with electrical energy	• Use operable GFCIs for any tool. • Inspect electrical equipment for frayed cords,

		damaged parts, etc. at least once a week.
	Heat Stress	• Monitor self and other workers when ambient temperature exceed 85°F • Wear appropriate clothing • Consume sufficient quantities of water/electrolytes to avoid dehydration • Monitor yourself and co-workers for signs of heat stress • Take frequent breaks and take shelter to cool-off if feeling signs of heat stress
	Fall to Lower Level (from trailers, equipment)	• Limit walking on elevated surface • Clean mud from boots prior to walking on trailers • Only rental company personnel to remove equipment off of low boy trailers (should equipment be rented)
	Trip/Slip/Fall on Same Level	• Establish and enforce housekeeping protocol
	Safety equipment not in place or operating	• Perform an initial and weekly inspection of heavy equipment
2. Equipment Mobilization	Struck by Heavy Equipment Fall to Lower Level (from trailers, equipment) Trip/Slip/Fall on Same Level Safety equipment not in place or operating	• Ensure backup alarms are operable • Never approach equipment without establishing eye contact with operator • Establish protocol for hand and arm signals • Limit walking on elevated surface • Clean mud from boots prior to walking on trailers • Only rental company personnel to remove equipment off of low boy trailers (should equipment be rented) • Establish and enforce housekeeping protocol • Perform an initial and weekly inspection of heavy equipment
3. Excavation	Struck by Heavy Equipment/ Heavy equipment operations	• Ensure backup alarms are operable • Keep proper clearance from equipment • Be aware of excavator swing radius • Establish eye contact with operator(s) prior to approaching equipment • Listen for backup indicators • Operators should always wear seat belts while equipment is running • Operators must be aware of their surroundings at all times • Establish protocol for hand and arm signals
	Fall to Lower Level (from trailers, equipment)	• Limit walking on elevated surface • Clean mud from boots prior to walking on trailers • Only rental company personnel to remove equipment off of low boy trailers (should equipment be rented)
	Trip/Slip/Fall on Same Level	• Establish and enforce housekeeping protocol
	Safety equipment not in place or operating	• Perform an initial and weekly inspection of heavy equipment

3. Excavation	Hydrocarbon exposure/ Chemical exposure and Dust exposure	• Perform air monitoring prior to entering excavation area (MultiRae meter) • Continue to monitor periodically throughout the day • Properly document all calibration activities and readings performed on the proper sheets • Continue to monitor periodically throughout the day • Properly document all calibration activities and readings performed on the proper sheets
	Noise	• Use hearing protection and make sure it is inserted properly
	Sidewall instability	• Carefully examine the condition of the sidewall prior to approaching the edge • Signs of instability: look for active sloughing of soils, water seepage in the sidewall, and the presence of tension cracks in the surface above the side wall • Never stand in the excavation immediately adjacent to a side wall • If it is necessary to enter the excavation, always select a sloped route that is not too steep and proceed slowly
	Uneven ground	• Wear steel-toed boots that extend over the ankle • Never run while on the job site
	Underground utilities	• Check utility plans and expose if necessary prior to work
4. Loading haul trucks	Heavy equipment operation	• Keep proper clearance from equipment • Be aware of loaders rapid movements • Establish eye contact with operator(s) and truck drivers prior to approaching equipment • Listen for backup indicators
	Impacted Soil Exposure	• Wear splash proof PPE over Nomex coveralls when spraying trucks • Don face shield prior to spraying trucks
	Falling material	• Never stand on the opposite side of a trailer that is being loaded; material may spill over the side
Truck decontamination	Impacted Soil Exposure	• Wear splash proof PPE over Nomex coveralls when spraying trucks • Don face shield prior to spraying trucks
	Slips, trips, falls	• Exposed liner in sump area is very slippery, extreme caution must be used • Never run around the decon area • The decon area will be kept in an order fashion
	Heavy equipment operation	• Never approach a truck until it comes to a complete stop • Truck driver and decon personnel must make eye contact prior to approaching the truck or before truck movement is initiated • Driver shall sound the horn once prior to pulling out to serve as a warning to decon personnel • Decon personnel shall give a visual indication that all is clear prior to the driver

		pulling out of the decon area
	Falling material	• Decon personnel shall take care to avoid standing directly under the trailer as they try to remove pieces of sludge that may be lodged on the truck. • Use extension poles to remove loose material overhead
Backfill excavation	Heavy equipment operations	• Keep proper clearance from equipment • Be aware of heavy truck traffic • Establish eye contact with operator(s) prior to approaching equipment • Listen for backup indicators • To the maximum extent possible, remain clear of confined areas in which multiple pieces of equipment are operating
	Noise	• Use hearing protection and make sure it is inserted properly
	Uneven ground – backfilled ground may be very uneven, padfoot compactor leaves a rough uneven	• Wear steel-toed boots that extend over the ankle • Never run while on the job site; caution should be used while traversing backfilled areas
Soil Sampling (If Needed)	Chemical exposure and Dust exposure	• Perform air monitoring prior to entering excavation area (dust monitor and PID) • Continue to monitor periodically throughout the day • Properly document all calibration activities and readings performed on the proper sheets
	Entering excavations	• NEVER enter an excavation deeper than 4 feet bgs!!! Sampling in deep excavations will be conducted using the backhoe. • Maintain a safe distance from where the current excavation is being conducted. • Be sure the operators are aware of your location at all times. • Always wear proper PPE including gloves while sampling.
Truck/Vehicle Traffic	Contact with Pedestrian and Road Traffic	• Ensure all site personnel are wearing orange safety vests. • If necessary, employ flagmen on Public Street.
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Job Hazard Analysis

AECOM

JHA Type: ☐ Investigation ☐ O&M ☐Office ☒ Construction	☒ New ☐ Revised	Date:
Office: Client:	Loc: Former Metropolitan Works MGP Site, Brooklyn, NY	
Work Type: Demolition	Work Activity: Various Demolition	

Personal Protective Equipment (PPE):

Minimum PPE is Level D including: Safety glasses, Steel toed boots, hard hat, Leather gloves, orange safety vest, face shield, hear protection (plugs and/or muffs)

Additional PPE may be required in the Health & Safety Plan (HASP). Also refer to the HASP for air monitoring, and emergency procedures. Please refer to Excavation JHA for additional site-specific requirements.

Development Team	Position/Title	Reviewed By	Position/Title	Date

❶ Job Steps	❷ Potential Hazard	❸ Critical Actions
Jack-Hammering Concrete (hand operated hammer)	1. Flying Debris	• Wear appropriate PPE: hardhat with face shield, safety glasses, leather gloves, steel-toed boots, full body clothing.
	2. Noise	• Wear appropriate hearing protection in areas where decibel levels are > 85db • Be sure to use the hearing protection properly (either plugs, muffs or both)
	3. Vibration/ergonomic hazards	• Where appropriate footwear and gloves to lessen the effects of vibration on the body • Take frequent breaks: share the task with coworkers. • Use proper body positioning, avoid straining the back when moving the hammer
	4. Steel reinforcement bar removal	• Wear proper hand protection (leather gloves)

Hammering Concrete using backhoe/excavator hammer attachment	1. Flying Debris 2. Noise 3. Heavy Equipment Operation	• Wear appropriate PPE: hardhat with face shield, safety glasses, leather gloves, steel-toed boots, full body clothing. • Wear appropriate hearing protection in areas where decibel levels are > 85db • Be sure to use the hearing protection properly (either plugs, muffs or both) • Keep proper clearance from equipment • Be aware of excavator or backhoe swing radius • Establish eye contact with operator(s) prior to approaching equipment • Listen for backup indicators • To the maximum extent possible, remain clear of confined areas in which multiple pieces of equipment are operating • Operators should always wear seat belts while equipment is running • Operators must be aware of their surroundings at all times
Loading debris onto trucks	1. Heavy Equipment Operation 2. Manually handling/moving concrete and steel debris 3. Heavy Equipment (Truck Traffic)	• Keep proper clearance from equipment • Be aware of excavator or backhoe swing radius • Establish eye contact with operator(s) prior to approaching equipment • Listen for backup indicators • To the maximum extent possible, remain clear of confined areas in which multiple pieces of equipment are operating • Operators should always wear seat belts while equipment is running • Operators must be aware of their surroundings at all times • Avoid hand injuries by wearing proper hand protection (leather gloves are recommended) • Do not attempt to lift more than you're capable of lifting safety • If debris is too large to handle, employ heavy equipment to move it. • Wear appropriate eye protection, hard hat, and steel-toed boots • Keep proper clearance from moving trucks • Maintain eye contact with drivers or communicate your actions with them • Listen for backup indicators • Stay clear of areas around the truck while they are being loaded with debris; falling debris could cause serious injury or a fatality.

AECOM

Americas

Underground Utility and Subsurface Installation Clearance Checklist

S3NA-417-FM2

Location:		**Project #:**
Contractor:		**Client:**
Date:	**Time:**	**Weather:**
Inspector:		**Project Manager:**

Notes:

Questions must be answered prior to any intrusive subsurface work. DO NOT DISTURB GROUND if you have answered "No" or "N/A" to any of the questions without the approval of the AECOM Project Manager.

Any variance from these procedures must be approved by the District General Manager or District SH&E Manager.

			Yes	No	N/A
I.	**Permits and Access Agreements**				
1.	Have all appropriate permits been identified and obtained (e.g., drilling, encroachment, working near railroads, etc.)?		☐	☐	☐
2.	Have all client requirements, including client permits been identified and obtained?		☐	☐	☐
3.	If working off-site is(are) site access agreement(s) executed?		☐	☐	☐
II.	**General Health and Safety**				
1.	Has a Health and Safety Plan been prepared for AECOM employees?		☐	☐	☐
2.	Do on-site personnel have required-level PPE?		☐	☐	☐
3.	Do on-site personnel have required-level of training?		☐	☐	☐
III.	**Identification and Mapping of Utility and Subsurface Structures**				
1.	Is a Site Plan showing the proposed subsurface locations and utility locations attached to this check list?		☐	☐	☐
2.	Have utilities and subsurface installations been investigated as being present, including the following:		☐	☐	☐
	a.	Steam, gas and electric?	☐	☐	☐
	b.	Sewer and water?	☐	☐	☐
	c.	Subterranean tunnels?	☐	☐	☐
	d.	Fiber optics (Note routine utility geophysical survey will not identify fiber optic cables)?	☐	☐	☐
	e.	Traffic control cables?	☐	☐	☐
	f.	Others (identify)?	☐	☐	☐
3.	Have all Federal/State/Provincial/Territorial and other "One Call" providers marked their facilities or otherwise notified they do not have any facilities near the proposed subsurface/intrusive locations?		☐	☐	☐
4.	Has the Federal/State/Provincial/Territorial or other "One Call" provider identified what utilities and underground structures are *not* included in their provider system (e.g., non-utility underground structures)?		☐	☐	☐

Questions must be answered prior to any intrusive subsurface work. DO NOT DISTURB GROUND if you have answered "No" or "N/A" to any of the questions without the approval of the AECOM Project Manager.

Any variance from these procedures must be approved by the District General Manager or District SH&E Manager.

	Yes	No	N/A
5. Has a utility locating contractor performed geophysical and/or other surveys of the proposed subsurface/intrusive locations?	☐	☐	☐
6. Were all circuits on during subsurface checks if the checks were for identifying energized lines (e.g., circuits on timers or light sensing switches)?	☐	☐	☐
7. Are overhead utilities or obstructions present that may prevent the safe operation of drilling/excavation equipment and, if present, has the AECOM Overhead Electrical Line Acknowledgement Form been signed?	☐	☐	☐
8. Was there visual verification that each of the proposed locations does not lie on a line connecting two similar manhole covers (e.g., sanitary sewer or storm drain)?	☐	☐	☐
9. Was there visual verification that the ground in the vicinity of each of the proposed subsurface locations has not subsided, been excavated and patched, give the appearance it may be covering a former trench (e.g., linear cracks, sagging curbs, linear re-pavements) and do not lie on a line with any water, gas, electrical meters, utility cleanouts, or other utility boxes in the surrounding areas?	☐	☐	☐
IV. Site Walk			
1. Has a site walk been performed that includes the following:	☐	☐	☐
a. Reviewing all planned intrusive locations?	☐	☐	☐
b. Adjusting locations away from subsurface utilities and installations?	☐	☐	☐
c. Determining the appropriate utility clearance activities for each location?	☐	☐	☐
d. Determining the presence and location of overhead utilities and obstructions?	☐	☐	☐
e. Walk around perimeter of the site to observe physical hazards?	☐	☐	☐
f. Walk around 50 feet (15 meters) from perimeter of the site to observe physical hazards?	☐	☐	☐
g. Walk around 50 feet (15 meters) radius from each proposed subsurface intrusion location?	☐	☐	☐
V. Proposed Subsurface Investigation Locations*			
1. Are all of the proposed subsurface locations at least 5 feet (1.5 meters) from any subsurface utility?	☐	☐	☐
2. Are all of the proposed subsurface locations at least 7 feet (2.1 meters) from the pad surrounding any underground storage tanks (USTs) shown on the Site Plan?	☐	☐	☐
3. Are all of the proposed subsurface locations at least 5 feet (1.5 meters) from any subsurface utilities shown on the Public Right-of-Way street improvements?	☐	☐	☐
4. Are all proposed subsurface locations requiring a drill rig for installation at least 10 feet (3 meters) from any energized overhead power line (or further based on line voltage)?	☐	☐	☐
5. Are all of the proposed subsurface locations at least 5 feet (1.5 meters) from any subsurface utilities identified during any geophysical survey performed using ground-penetrating radar (GPR) in conjunction with other technology?	☐	☐	☐

** These set back distances are a minimum; government regulations and utility requirements may dictate a greater set back distance.*

Questions must be answered prior to any intrusive subsurface work. DO NOT DISTURB GROUND if you have answered "No" or "N/A" to any of the questions without the approval of the AECOM Project Manager.

Any variance from these procedures must be approved by the District General Manager or District SH&E Manager.

	Yes	No	N/A
VI. Utility Clearance Investigation Location Confirmation*			
1. Have subsurface locations been hand cleared as follows? Hand clearance should be extended if locations of deep utilities and structures are not known. In non-urban areas hand clearing should be conducted if possible.	☐	☐	☐
a. For soil borings/monitoring wells excavate to a minimum of 5 feet (1.5 meters) below ground surface using non-mechanical methods.	☐	☐	☐
b. For soil gas sampling excavated to 1 foot (0.3 meter) below grade or below the bottom of a concrete floor prior to the installation of soil gas sample probe points?	☐	☐	☐

* *Exceptions to requirements of the utility clearance process include the following: sites where extensive utility mapping has been completed and/or where extensive activities have already been performed; locations where facility layout is well documented and understood; and sites or portions of large sites where utilities are known not to exist currently or to not have ever existed throughout the life of the facility, property or site.*

Contents

List of Appendices

1.0 Introduction

1.1 AECOM Environment Safety Policy

AECOM Environment (AECOM) is committed to providing our employees with a safe and healthy work environment. It is not only our obligation to each other, but also a sound business practice to do so. Work related injuries and illnesses cause needless pain and suffering, cost money, and adversely affect our reputation with our clients. It is our firm belief that all work related injuries and illnesses are preventable, and it is therefore our goal to have a workplace that is free from occupational injuries and illnesses. Every attempt shall be made to eliminate the possibility of injuries and illnesses. No aspect of the company's activities, including expediency and cost, shall take precedence over the health and safety of our employees.

1.1.1 Maximum Duration of the Work Day for Field Activities

An employee may not work a shift that exceeds 16 hours in duration. For the purpose of this policy, the work shift includes time spent at lunch on break, and driving to and from the site. If an employee works more than one shift during the course of a calendar day, the total number of hours worked in that day cannot exceed 16 hours. If work is to be done continuously in ambient air temperatures of less than 20^{o}F, the Site Safety Officer and Field Manager will use a guideline of limiting work shifts to 10 hours in duration, including 8 hours working outdoors and 2 hours of time spent at lunch, breaks, and travel. Refer to Section 5.15, Cold Stress, for further work day guidelines.

1.1.2 Short Service Employee

A Short Service Employee (SSE) is an employee with fewer than three months experience working supervised on field projects or an employee who has not completed required training or received required certifications.

Short Service Employees will not be assigned to this project unless they are supervised on site by a qualified person.

1.2 Health and Safety Plan (HASP)

This Health and Safety Plan (HASP) is required as an element of the remedial program at the Former Metropolitan Work Manufactured Gas Plant (MGP) site (site) under the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program administered by the NYS Department of Environmental Conservation (NYSDEC). The HASP is appended to the Interim Site Management Plan [(ISMP), AECOM, 2017] as Appendix E which was developed in accordance with Order on Consent Index A2-0552-0606, Site Number 224046, which was executed in 2007.

It is important to note that:

- This HASP as a part of the ISMP details site-specific implementation procedures that are required by the ISMP;

- Failure to comply with this ISMP is also a violation of the Order on Consent (Index Number A2-0552-0606, Site Number 224046) for the site, and thereby cause for applicable penalties.

1.2.1 HASP Purpose

The purpose of this HASP is to identify hazards associated with the site and specify engineering and administrative controls and personal protective equipment necessary to mitigate the risks associated with these hazards. This HASP addresses the hazards recognized prior to writing or updating the documents. As new hazards are encountered, a Job Hazard Assessment (JHA) or Job Safety Analysis (JSA) must be conducted and the results input into the HASP.

This HASP also assigns responsibilities for the implementation of safety programs on this project and defines monitoring and emergency response planning specific to the project.

1.2.2 HASP Applicability

This site-specific Health and Safety Plan (HASP) has been developed by AECOM. It establishes the health and safety procedures required to minimize potential risk to field personnel and contractor personnel involved with:

- Ground intrusive activities including utility work, boring completion, monitoring well installation, and excavation; and

- Activities related to implementation of the ISMP including soil vapor intrusion and groundwater monitoring.

Future contractors working directly for National Grid or other property owners shall develop their own site-specific HASP. This HASP can be used as a template to develop the future site-specific HASP. Based on future changes to State and Federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP will be updated and re-submitted.

This HASP only pertains to the tasks that are listed in Section 3.0 of the ISMP. A task specific HASP or addendum to this HASP will be developed at a later date for any other subsequent investigative/remedial activities at the project site.

This HASP has been written to comply with the requirements of the Occupational Safety and Health Administration (OSHA) Personal Protective Equipment Standard (29 CFR 1910.132) for all activities and the OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120) for tasks where there are potential exposures to subsurface contaminants. All activities covered by this HASP must be conducted in complete compliance with this HASP and with all applicable federal, state, and local health and safety regulations. Personnel covered by this HASP who cannot or will not comply will be excluded from site activities.

This plan will be distributed to each employee involved with the proposed activities at the sSite, including subcontractor employees. Each employee must sign a copy of the attached health and safety plan sign-off sheet (see Attachment A).

1.3 Organization/Responsibility

1.3.1 Project Manager

The project manager (PM) is the individual who has the primary responsibility for ensuring the overall health and safety of this project. As such, the PM is responsible for ensuring that the requirements of this HASP are implemented. Some of the PM's specific responsibilities include:

- Assuring that all personnel to whom this HASP applies, including subcontractors, have received a copy of it;
- Providing adequate authority and resources to the on-site SSO to allow for the successful implementation of all necessary safety procedures;
- Supporting the decisions made by the SSO;
- Maintaining regular communications with the SSO;
- Coordinating the activities of all subcontractors and ensuring that they are aware of the pertinent health and safety requirements for this project,
- In the event that an incident occurs, leading the incident investigation to identify root causes, corrective actions and lessons learned; and
- Conducting random project audits.

1.3.2 Site Safety Officer

The SSO will be on-site during all activities covered by this HASP. The SSO is responsible for enforcing the requirements of this HASP once work begins. The SSO has the authority to immediately correct all situations where noncompliance with this HASP is noted and to immediately stop work in cases where an immediate danger is perceived. Some of the SSO's specific responsibilities include:

- Assuring that all personnel to whom this HASP applies, including all subcontractors, have reviewed this HASP, and submitted a completed copy of the HASP review and acceptance form (Attachment A);
- Assuring that all personnel to whom this HASP applies have attended a pre-entry briefing and any subsequent safety meetings that are conducted during the implementation of the program;
- Maintaining a high level of health and safety consciousness among employees implementing the proposed investigative activities;
- Securing Work Permits. The SSO must determine what, if any, work permits must be secured from the facility prior to the commencement of activities. If required, the SSO must determine how long the work permit is good for and verify that all the provisions of the work permit can be met by AECOM and its subcontractors.
- Procuring the air monitoring instrumentation required and performing air monitoring for investigative activities;
- Procuring and distributing the PPE and safety equipment needed for this project for AECOM employees;
- Verifying that all PPE and health and safety equipment used by AECOM is in good working order;
- Verifying that AECOM contractors are prepared with the PPE, respiratory protection and safety equipment required for this program;
- Preparing an initial Job Safety Analysis (JSA) during the initial mobilization and revising the Job Safety Analysis if conditions or tasks change and communicating with all workers the results of the Job Safety Analysis. See attachment B for a JSA form. The JSA will be reviewed daily by all workers and updated as needed.
- Notifying the PM of all noncompliance situations and stopping work in the event that an immediate danger situation is perceived;

- Monitoring and controlling the safety performance of all personnel within the established restricted areas to ensure that required safety and health procedures are being followed;
- Conducting accident/incident investigations and preparing accident/incident investigation reports;
- Conducting the pre-entry briefing prior to beginning work and subsequent safety meetings as necessary; and
- Initiating emergency response procedures in accordance with Section 11.0 of this HASP.

1.3.3 Field Personnel

All field personnel covered by this HASP are responsible for following the health and safety procedures specified in this HASP and for performing their work in a safe and responsible manner. Some of the specific responsibilities of the field personnel are as follows:

- Assess each task prior to beginning work on that task for hazards and necessary precautions.
- Assess the work area for changing conditions and new hazards and address the hazards;
- Stop work and initiate corrective actions if work site hazards create unacceptable risk;
- Reading this HASP in its entirety prior to the start of on-site work;
- Submitting a completed HASP Review and acceptance form (Attachment A)to the AECOM SSO prior to the start of work;
- Attending the required pre-entry briefing prior to beginning on-site work and any subsequent safety meetings that are conducted during the implementation of the program;
- Bringing forth any questions or concerns regarding the content of the HASP to the PM or the SSO prior to the start of work;
- Reporting all Incidents, injuries and illnesses, regardless of their severity, to the AECOM SSO; and,
- Complying with the requirements of this HASP and the requests of the SSO.

On Site, AECOM will have responsibility for safety of its employees during the work performed at the Site. AECOM's field representative will have a cell phone available to contact the appropriate local authorities, in the event of an emergency. Contractors field representative will be available for communication with the AECOM PM and National Grid representatives.

1.4 SH&E Expectations

Commitment to safety, health, and environmental excellence requires that all work proceed only after it is safe and environmentally sound to do so. The responsibility for ensuring that this takes place rests with every worker present at this property. Effectively meeting these responsibilities depends upon open communication between individuals and their supervisors prior to work beginning, and – in certain cases – after safety, health and/or environmental issues are identified. Completing a Job Hazard Analysis (JHA) to aid in planning safe work performance will be an integral part of meeting safety, health and environment (SHE) expectations.

The safety and health of onsite personnel will take precedence over cost and schedule considerations for all project work. All personnel have the authority to STOP WORK if they see a potential or actual hazard that may threaten the safety of people or the environment. Upon stopping work, the SSO must be immediately notified and provided with information regarding the nature of the safety, health or environmental concern. The SSO should meet with the worker with the intent of resolving the worker's concerns. Once the concerns are resolved to the satisfaction of the worker, work can proceed.

If the concerns are not resolved to the satisfaction of the worker and/or the SSO, work does not proceed. The AECOM RSM will be contacted to obtain assistance in resolving the concerns. Using his/her expertise, safety, health, and environmental rules, regulations, and procedures, the AECOM RSM will attempt to resolve the matter with all parties involved. Work will not resume until this criterion is met.

1.5 Management of Change/Modification of the HASP

1.5.1 Management of Change

The procedures in this HASP have been developed based on site history, previous site investigations, and completed remedial activities. Every effort has been made to address the chemical and physical hazards that may be encountered by personnel during site activities. However, unanticipated site-specific conditions or situations may occur during the implementation. As such, this HASP must be considered a working document that is subject to change to meet the needs of this dynamic project.

1.5.2 HASP Modification

Should significant information become available regarding potential on-site hazards, it will be necessary to modify this HASP. All proposed modifications to this HASP must be reviewed and approved by the AECOM RSM before such modifications are implemented. Any significant modifications must be incorporated into the written document as addenda and the HASP must be reissued. The AECOM PM will ensure that all personnel covered by this HASP receive copies of all issued addenda. Sign-off forms will accompany each addendum and must be signed by all personnel covered by the addendum. Sign-off forms will be submitted to the AECOM PM. The HASP addenda should be distributed during the daily safety meeting so that they can be reviewed and discussed. Attendance forms will be collected during the meeting.

1.5.3 Job Hazard Analysis (JHA)

AECOM and/or AECOM's contractors will prepare a Job Hazard Analysis (JHA) for each task to be performed prior to commencing work. The use of new techniques will be reviewed and if new hazards are associated with the proposed changes, they will be documented and evaluated on the JHA form. An effective control measure must also be identified for each new hazard. JHA forms will be reviewed by the SSO prior to being implemented. Once approved, the completed forms will be reviewed with all field staff during the daily safety meeting. A blank JHA form is presented as Attachment B.

1.5.4 Employees Working Alone

Employees working alone at project sites will review the JHA for their tasks as they are conducting their daily overview and reconnaissance of the site. After completing the JHA review/revision and site reconnaissance, the employee should call the Project Manager and report any new hazards or site conditions observed.

2.0 Site Description and History

2.1 Site Description

The Historical MGP Site extended from 2nd avenue to the Gowanus Canal along 12th Street in Brooklyn, New York. The Previously Remediated Area was located on 124-136 2nd Avenue and included Block 1007 Lots 1 (parking lot, 1 11th Street), 118 (Lowes, 118 2nd Avenue), 219 (parking lot, 12th Street), and 220 (Lowes, 73 12th Street). The Site is located south of 12th Street between 2nd Avenue and Hamilton Place and between 11th Street Basin and Gowanus Expressway west of Hamilton Place in Brooklyn, New York and included Block 1007 and lot 172 (former Pathmark, 1 12th Street), Block 1025 lots 18 (12th Street Extension), 1 (parking lot, no address), 16 (parking lot, 42 12th Street), 20 (parking lot, no address), 100 (vacant lot, 50 12th Street), 26 (commercial business, 12 12th Street), and New York City Right of Ways (ROW).

The ISMP Site Area is an approximate 4.2-acre area and is bounded by the 11th Street basin, former 11th Street, and Lowes parking lot to the north, portion of a vacant parking lot and 13th Street to the south, commercial businesses and Lowes to the east, and the Gowanus Canal to the west.

2.2 Site History

The area prior to development of the MGP was a tidal marshland that extended to the east of the current location of 2nd Avenue. Before the mid-1840s, the creek and its tributaries were dammed and used primarily to power tide mills (USEPA, 2012). By the mid-1840s, Brooklyn was rapidly growing and the Gowanus marshes were considered to be a detriment to local development (USEPA, 2012). The Gowanus Canal served as an open sewer when it was initially constructed in the late 1860s (USEPA, 2012). By the late 1870s, sewers entering the canal carried a combination of household waste, industrial effluent, and stormwater runoff (USEPA, 2012). By the 1880s the canal was constructed to its current configuration.

The Historic MGP Site was operated by the Metropolitan Gas and Light Company as early as 1872. Around the spring of 1883, the eight gas companies of Brooklyn had been reduced by consolidation or by the purchase of a controlling portion of their stock by the Fulton Municipal Gas Company which had the backing of the Standard Oil Trust. The Fulton Municipal Gas Company (“Fulton Municipal”) began undercutting its competitors until a number of companies agreed to settlement terms with Fulton Municipal. This intense competition was referred to by the media at the time as a “gas war”. As a result of the 1883 Gas Wars in Brooklyn, the Metropolitan Gas Light Company agreed to stop producing gas and instead buy naphtha or ‘water gas’ supplied by Fulton Municipal. The fact that Metropolitan was buying gas from Fulton Municipal may explain why available maps dating from 1886 show the MGP site as being “used for storage only”. Shortly thereafter, the Standard Oil Trust held approximately one-third of the stock in Metropolitan. In 1892, the Directors of Metropolitan had decided it would be more economical to make its own gas rather than continue purchasing it from Fulton Municipal and resumed its manufacturing once again. The 1893 Brown’s Directory identifies the process used to manufacture gas changed from the Tessie du Motay, the patent for which was held by the Standard Oil Trust, to the Wilkinson process.

Historical records suggest that the Historic MGP Site operated a coal carbonization process until sometime prior to 1889, by when the plant appears to have been converted to a carbureted water gas process, and included oil storage tanks located east of Holder No. 2. In general, there were two classifications of holders: relief holders, where gas was held and cooled prior to purification, and distribution holders, where purified gas was held. A hand-written note on Brooklyn Union Gas Company drawing 1G120, dated 1909 and revised in 1935, states that in 1935, the Metropolitan Works between 12th and 13th Streets was demolished, and some buildings south of 12th Street, including Holder No. 5 continued to operate as “Brooklyn Union Gas Company 12th Street Holder Station.” The 12th Street Holder Station is identified on all aerial Historic MGP Site figures. By 1950, the northeastern portion (Block 1007, Lot 118) of the Historic MGP Site was listed as housing the US Post Office Garage and Repair shop, with some former MGP structures (e. g., Holder No. 4 and a boiler house) located closer to the Gowanus Canal on the western portion of the Historic MGP Site. The southern portion of the Historic MGP Site, also identified as the 12th Street Holder Station, still housed Holder No. 5 and the exhaust house, with the parcel listed as a storage area for old electric cables.

The 1969 Sanborn map indicates Brooklyn Union Gas Company as the owner of parcels on Block 1025 (the 12th Street Holder Station), where Holder No. 5 was still shown to be present. All other above ground structures related to the former MGP operations are no longer present. The 1969 Sanborn map also shows a food products warehouse present adjacent to the Gowanus Canal, on current Block 1007, Lot 172. By 1977, the Sanborn map indicated that all structures from the former MGP had been removed from the surface of the Historic MGP Site. Sanborn maps from 1982 through 1996 show no major changes in the Historic MGP Site usage, with the US Postal Service (now demolished) and formerly present in the current Lowes property (Block 1007, Lots 1, 118, 219, and 220), the food products warehouse (till recently a Pathmark Supermarket), and parking covering the footprint of the former MGP on Block 1007, Lots 16, 18, 172, and 269. The portion of the MGP south of 12th Street, also identified as the 12th Street Holder Station, on Block 1025, Lot 26 was developed into a two story building which remains present. The building housed a former maintenance garage and is currently used for mixed retail and office space.

Other historical non-MGP businesses operated within or adjacent to the Historic MGP Site including the former Brooklyn Alcatraz Asphalt Company, the former Cranford Asphalt Company, and the Bayside Coal and Fuel Oil Company.

2.3 Contaminants of Concern

Contaminants of concern in the soil and groundwater include:

- Volatile Organic Compounds (VOCs), primarily Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)
- Semi Volatile Organic Compounds (SVOCs), primarily naphthalene and low molecular weight PAHs
- Cyanide, bound to iron to form ferric-ferrocyanide, is a component of some MGP-related impacts
- Petroleum Residuals
- Nonaqeous Phase Liquids (NAPL)

3.0 Chemical Hazard Assessment and Control

3.1 Chemical Contaminants of Concern

Typical wastes associated with former Holder operations could include VOCs such as BTEX, polycyclic aromatic hydrocarbons (PAHs), NAPL, cyanide complexes and compounds, and certain trace metals associated with ash and clinkers.

3.1.1 BTEX

Petroleum is a highly complex mixture of aliphatic and aromatic hydrocarbons. Benzene, toluene, ethylbenzene, and xylene are natural but minor components of fuel oils, kerosene and diesel fuels. Gasoline contains higher quantities of these aromatic hydrocarbons.

Exposure to the vapors of BTEX above their respective permissible exposure limits (PELs) as an 8-hr time weighted average (TWA) may produce irritation of the mucous membranes of the upper respiratory tract, nose and mouth. Overexposure may also result in the depression of the central nervous system. Symptoms of such exposure include drowsiness, headache, fatigue and euphoria. Chronic and prolonged overexposure to the vapors of benzene may cause damage to the blood-forming organs and is known to cause leukemia in humans.

Gasoline is typically 1 – 2% benzene. The PEL for benzene is 1 ppm. The ACGIH has set a TLV for Benzene at 0.5 ppm; however, for this project the SSO will use the OSHA PEL's and will utilize an action level of one half the PEL for various responses. Benzene is considered to be a carcinogen by the ACGIH.

The PELs for ethylbenzene and xylene are 100 ppm. The PEL for toluene is 200 ppm. The American Conference of Governmental Industrial Hygienists (ACGIH) have recommended a threshold limit value of 50 ppm for toluene.

3.1.2 Petroleum Hydrocarbons

Petroleum hydrocarbons are generally considered to be of moderate to low toxicity. Federal or recommended airborne exposure limits have not been established for the vapors of petroleum hydrocarbons. However, inhalation of low concentrations of the vapor may cause mucous membrane irritation. Inhalation of high concentrations of the vapor (which would only be likely to occur in confined spaces where the liquid had been significantly heated) may cause extensive pulmonary edema. Chronic direct skin contact with the liquid may produce skin irritation as a result of defatting.

3.1.3 Volatile Organic Compounds (VOCs & SVOCs)

VOCs refer to a group of volatile compounds or mixtures that are relatively stable chemically and that exists in the liquid state at temperatures of approximately 32° to 82°F.

VOCs are typically organic solvents used for extracting, dissolving, or suspending materials such as fats, waxes, and resins that are not soluble in water. The removal of the solvent from a solution permits the recovery of the solute intact with its original properties. Solvents are used in paints, adhesives, glues coatings, and degreasing/ cleaning agents.

SVOCs are less volatile chemicals that tend to persist in the environment.

Inhalation and percutaneous absorption are the primary routes of exposure. Organic compounds are metabolized or they accumulate in the lipid-rich tissues such as the liver, fat cells, or the nervous system.

Solvent inhalation by workers can cause effects ranging from an alcohol-like intoxication to narcosis and death from respiratory failure. Symptoms that include drowsiness, headache, dizziness, dyspepsia, and nausea.

3.1.4 Dust

Dust generated during coring or cutting of concrete, boring, or excavations can be hazardous to the respiratory system and irritating to the eyes. Dust can also carry the contaminants of concern potentially exposing workers by skin contact and inhalation. The ACGIH has established an eight-hour exposure limit for dust at 3 mg/M^3. The concentrations of the chemicals of concern in the soil are low enough that inhalation of dust would not by itself be an exposure hazard. However contamination of skin and clothing can provide additional exposures. Therefore the generation and contact with dust should be minimized.

Water or other methods should be used to control dust during dusty operations; however care must be used to prevent electrical shock if electric tools are used in the same area. If dusts become irritating and engineering controls such as the application of water cannot be used, respirators should be donned as discussed in Section 7.

3.1.5 NAPL

Typical coal gasification byproduct (NAPL) constituents are referred to as polycyclic aromatic hydrocarbon (PAH) compounds. Repeated contact with PAH compounds may cause photosensitization of the skin, producing skin burns after subsequent exposure to ultra-violet light. Repeated contact with certain PAHs has been associated with the development of cancer.

Of the PAH compounds typically present at former Holder sites, naphthalene is typically present at higher concentrations than the other compounds. Naphthalene is easily detected due to its characteristic moth-ball like odor. The inhalation of high concentrations of naphthalene vapor may result in nausea, vomiting, abdominal pain and irritation of the bladder. Prolonged overexposure may result in renal shut down.

Phenolic compounds are often associated with MFP-related NAPL. Phenolics are generally strong irritants that can have a corrosive effect on the skin and can also penetrate the skin. Chronic overexposure to phenol and phenolic compounds may result in liver and kidney damage.

3.1.6 Benzo(a)Pyrene

The toxicological properties of this chemical have not been fully investigated. However, the chemical is a suspect carcinogen and is recognized as a carcinogen in California. Contact with dust containing Benzo(a)pyrene can cause skin, respiratory tract, and eye irritation.

3.1.7 Naphthalene

Inhalation of dust or vapors can cause headache, nausea, vomiting, extensive sweating, and disorientation. The predominant reaction is delayed intravascular hemolysis with symptoms of anemia, fever, jaundice, and kidney or liver damage.

Contact with Naphthalene can irritate the skin and, prolonged contact, may cause rashes and allergy. "Sensitized" individuals may suffer a severe dermatitis.

3.1.8 Cyanide

Cyanide present in soil or groundwater normally exists as a salt with various metals. Unless the pH is low no hydrogen cyanide is expected. Hydrogen cyanide and the common salts of cyanide will penetrate intact skin. All skin surfaces that could come in contact with contaminated water or soil must be protected.

Cyanide when inhaled, ingested or absorbed through skin reacts with the muscle cells preventing them from using oxygen in the blood. The result is that the muscles cease to function and the oxygen level in the blood reaches saturation. The saturated blood causes the victim to become flushed and the lips and fingernails become very red. CPR is not affective on victims of cyanide poisoning. Get medical attention immediately if cyanide poisoning is suspected.

3.1.9 Metals

Common toxic metals found at industrial sites include Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, Silver and Zinc. The metal contaminate level at this site is expected to be below worker health and safety levels of concern.

Metals can enter the body by:

- Ingesting small amounts present in food and water
- Drinking contaminated water near manufacturing or waste sites
- Drinking contaminated water or a beverage that has been stored in metal containers or flows through pipes that have been coated with zinc to resist rust
- Breathing zinc particles in the air at manufacturing sites.

Many of these metals are required in trace amounts for normal human metabolic process. Harmful health effects generally begin at levels from 10-15 times the Recommended Daily Amount (in the 1 to 250 mg/day range). Doses in this range can cause irritability, hypertension, stomach cramps, nausea, and vomiting.

Breathing large amounts of the metals (as dust or fumes) can cause a specific short-term disease called metal fume fever. This is believed to be an immune response affecting the lungs and body temperature.

3.2 Summary of Hazardous Properties of Potential Contaminants

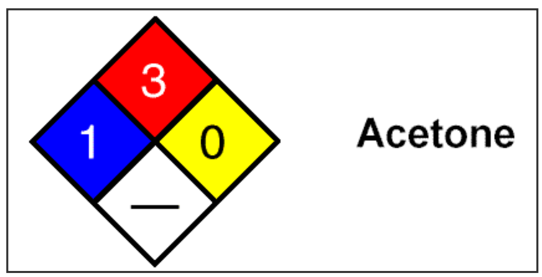
Chemical Name	PEL[1]	TLV[2]	VP[3]	VD[4]	SG[5]	SOL[6]	FP[7]	LEL[8]	UEL[9]
Benzene	1	0.5	75	2.8	0.88	<1	12	1.2	7.8
Toluene	200	50	21	4	0.87	<1	40	1.1	7.1
Ethyl Benzene	100	100	7	4	0.87	<1	55	0.8	6.7
Xylene	100	100	9	4	0.86	<1	81	1.1	7.0
Benzo(a)Pyrene	?	?	<1	NA	NA	<1	>300	NA	NA
Cyanide	**	***	630	0.95	0.69	100	0	5.6	40
Naphthalene	10	10	1	4.4	1.2	<1	189	0.9	5.9

[1] Permissible Exposure Limit in ppm
[2] Threshold Limit Value in ppm
[3] Vapor Pressure in mm Hg
[4] Vapor Density (air = 1)
[5] Specific Gravity (water = 1)
[6] Solubility in Water in %
[7] Flash Point in °F
[8] Lower Explosive Limit in % by volume
[9] Upper Explosive Limit in % by volume
NA = Not Applicable
? = Not known
C = Ceiling limit not to be exceeded

3.3 Hazard Substances Brought On Site by Contractor

A site safety data sheet (SSDS) must be available for each hazardous substance that contractors bring on the property. This includes solutions/chemicals that will be used to decontaminate equipment, foam to prevent odors, and gases needed to calibrate air monitoring equipment.

In addition, all containers of hazardous materials must be labeled in accordance with OSHA's Hazard Communication Standard. Either the original manufacturer's label or an NFPA 704M label specific for the material (as shown at the right) is considered to be an acceptable label.



3.4 Chemical Exposure and Control

3.4.1 Chemical Exposure Potential

Employees can be exposed by inhalation to the chemicals of concern during the excavation, decontamination, and sampling activities. Another route of potential exposure to the contaminants of concern is via direct dermal contact with soils and groundwater during excavation or sampling.

Although highly unlikely, exposure to all of the contaminants of concern can occur via ingestion (hand-to-mouth transfer). The decontamination procedures described in Section 9.0 address personal hygiene issues that will limit the potential for contaminant ingestion.

3.4.2 Chemical Hazard Control

The chemical hazards associated with the investigative and sampling activities can be controlled in several ways, including:

By performing air monitoring (Section 6) in the worker's breathing zone to determine exposure to the chemicals of concern during the intrusive work or sampling. If exposures exceed the action levels, respiratory protection as discussed in Section 7, will be donned.

To avoid direct dermal contact with contaminated media, protective clothing, as described in Section 7 will be required when excavating, collecting samples, and decontaminating excavation or sampling equipment.

3.5 Hazardous Waste Management

Waste generated as a result of investigation activities or excavation will be containerized local to the point of generation, sampled for characterization purposes and secured prior to off-site transportation and disposal. Upon receipt of analytical results, the project team will work with the Client to properly characterize, profile and dispose of the waste(s).

4.0 Physical Hazards and Controls

4.1 Back Safety

Using the proper techniques to lift and move heavy pieces of equipment is important to reduce the potential for back injury. The following precautions should be implemented when lifting or moving heavy objects:

- Bend at the knees, not the waist. Let your legs do the lifting;
- Do not twist while lifting;
- Bring the load as close to you as possible before lifting;
- Be sure the path you are taking while carrying a heavy object is free of obstructions and slip, trip and fall hazards;
- Use mechanical devices to move objects that are too heavy to be moved manually; and,
- If mechanical devices are not available, ask another person to assist you.

4.2 Concrete and Asphalt Coring & Cutting

Cutting and coring concrete and asphalt can involve numerous hazards. The noise generated as a result of the tools used, and adequate hearing protection is necessary when conditions outlined in the Noise section below are encountered. Tools used which can include drills and saws, must be appropriately guarded to prevent hands, PPE, and other objects from being caught-up in the moving parts and drawing employees in. Dust may also be generated while cutting concrete and either respiratory protection or dust suppression will need to be utilized to prevent exposure. Additional consideration must be given chemical hazard concerns that may exist in the materials underlying the concrete.

4.3 Corrosive Liquids

Site activities may require the use of corrosive liquids for preserving samples once collected, identifying substances in the field, or as part of system operations and maintenance. When corrosive liquids are identified in the work area, PPE upgrades will need to include an appropriate glove to mitigate the hazard, protective eye wear to guard against splashing liquids, and the potential need for poly-coated Tyvek to be worn. Additionally, the job task will be analyzed to determine if splashing and spilling can be minimized through the use of special equipment or procedures. Examples include using a funnel, identifying an alternative substance for use, and more.

4.4 Drilling Hazards

Use of a drill rig to advance soil borings and install monitoring wells will require all personnel in the vicinity of the operating rig to wear steel-toed boots, hard hats, hearing protection and safety eyewear. Personnel shall not remain in the vicinity of operating equipment unless it is required for their work responsibilities. Drill rigs are considered to be heavy equipment, and therefore precautions must be incorporated into job activities when working in close proximity to drill rigs. In addition the wearing the PPE that has been determined to be necessary for the project, employees will need to ensure that Drill Rig Operators conduct inspections of the drill rig on a daily basis. A drill rig inspection is included in Attachment D as a reference. Focal points of the inspection should include checking hydraulic lines, tools and drilling equipment, emergency stop switches, and other parts of the equipment to insure that they are maintained in a safe operating condition.

Employees will also consider the staging their work area so that they are not within the shadow of the drill rig's mast. Working within this area creates a potential to be contacted by the drill rig if it were to tip over on its side. Likewise, when establishing a drilling location, the rig shall be positioned so that it won't clip overhead power lines should it tip over.

Additionally, the following safety requirements must be adhered to:

- All drill rigs and other machinery with exposed moving parts must be equipped with an operational emergency stop device. Drillers and geologists must be aware of the location of this device. This device must be tested prior to job initiation and periodically thereafter.
- The driller must never leave the controls while the tools are rotating unless all personnel are kept clear of rotating equipment.
- A long-handled shovel or equivalent must be used to clear drill cuttings away from the hole and from rotating tools. Hands and/or feet are not to be used for this purpose.
- A remote sampling device must be used to sample drill cuttings if the tools are rotating or if the tools are readily capable of rotating. Samplers must not reach into or near the rotating equipment. If personnel must work near any tools, which could rotate, the driller must shut down the rig prior to initiating such work.
- Driller's Drillers, helpers and geologists must secure all loose clothing, long hair, or jewelry when in the vicinity of drilling operations.
- Only equipment, that has been approved by the manufacturer, may be used in conjunction with drilling equipment Pins that protrude excessively from augers shall not be allowed
- No person shall climb the drill mast while tools are rotating.
- No person shall climb beyond 6 feet above ground on the drill mast without the use of ANSI-approved fall protection (approved belts, lanyards and a fall protection slide rail) or portable ladder that meets the requirements of OSHA standards.
- When using the rig's hoist to lift or move objects other than the equipment associated with the direct push operation, an assessment of the force required to perform the lift and the rig's design specifications must be made to determine whether the lift can be made safely. In all cases personnel must not be in line with the cable when it is under tension.
- If drilling operations are to be performed within an enclosed space proper procedures must be followed to prevent the accumulation of carbon monoxide within the work area.
- Open doors and windows and provide ventilation to the outside.
- Employ the use of a mechanical ventilation system, i.e. blower or fan, appropriately sized for the room to circulate fresh air.
- Connect equipment exhaust points to hoses that can be direct ventilated to an outside area.

4.4.1 Rotary Auger & Rotating Parts

Exposure to rotating parts can occur when working near the drilling rig or the internal combustion engine. All rotating parts should be covered with guards to prevent access by workers. When performing maintenance activities that require the rotating parts to be exposed, workers should not allow loose clothing, hands, or tools to approach the rotating parts. Guards must be replaced as soon as possible after completing the maintenance task.

Operation of drilling equipment also creates hazards associated with pinch points and rotating equipment. Employees will evaluate work procedures to avoid placing their body and extremities in the path of rotating equipment and tools to avoid being struck by moving equipment, tools and machinery. Similarly, these hazards also create pinch point hazards where the body and extremities, especially the hands, can be caught in moving equipment and crushed. Employees will evaluate equipment and tool use procedures to identify pinch points and develop procedures to avoid placing body parts in a position where they can be caught in moving equipment, tools and machinery.

4.4.2 Direct Push Hazards

Use of the Direct Push System to advance soil borings and collect soil samples will require all personnel in the vicinity of the operating unit to wear steel-toed boots, hardhats, hearing protection and safety eyewear. Personnel shall not remain in the vicinity of operating equipment unless it is required for their work responsibilities. Additionally, the following safety requirements must be adhered to:

- A remote vehicle ignition is located on the control panel of the Geoprobe unit. This allows the operator to start and stop the vehicle engine from the rear. This device must be tested prior to job initiation and periodically thereafter. All employees should be aware of how to access and operate the rear ignition.
- The driller must never leave the controls while the probe is being driven.
- Drillers, helpers and geologists must secure all loose clothing when in the vicinity of drilling operations.
- The Geoprobe vehicle shall not be moved any distance with the probe in the extended position. Check for clearance at roof or the vehicle before folding the Geoprobe out of the carrier vehicle.
- Be sure the parking brake is set, or vehicle wheels have been chocked, before probing.
- Never allow the derrick foot to be lifted more than 6" off of the ground surface.
- Deactivate hydraulics when adding or removing probe rods, anvils or any tool in the hammer.
- Verify that all threaded parts are completely threaded together before probing.

4.4.2.1 Cuts and Lacerations

Geoprobe soil samples are collected in acetate liners that must be cut open in order to collect the sample. Additionally, tubing will need to be cut to facilitate groundwater sampling. Additional tasks for the job may also pose laceration hazards. Tube-cutters are available and should be used to eliminate this hazard. However, if it is necessary to use knives or blades, follow the safety precautions listed below:

- Keep your free hand out of the way
- Secure the acetate liner so it won't roll or move while you are cutting
- Use only sharp blades; dull blades require more force which results in less knife control
- Pull the knife at an angle to your body; pulling motions are easier to manage
- Don't put your knife in your pocket
- Use a hooked knife (i.e. linoleum knife) or a utility knife with a self-retracting blade
- Wear leather or Kevlar® gloves when using knives or blades.

4.4.3 Sonic Drilling

Use of a Sonic Drill Rig to advance soil borings, collect soil samples and/or install monitoring wells will require all personnel in the vicinity of the operating unit to wear steel-toed boots, hardhats, hearing protection and safety eyewear. Personnel shall not remain in the vicinity of operating equipment unless it is required for their work responsibilities. Additionally, the following safety requirements must be adhered to:

- A remote vehicle ignition may be located on the control panel of the Drill Rig. This allows the operator to start and stop the vehicle engine from the rear. This device must be tested prior to job initiation and periodically thereafter. All employees should be aware of how to access and operate the rear ignition.
- The driller must never leave the controls while the probe is being driven.
- Drillers, helpers and geologists must secure all loose clothing when in the vicinity of drilling operations.
- The Drill Rig shall not be moved any distance with the mast in the extended position. Check for clearance at roof or the vehicle before folding the Rig out of the carrier vehicle.
- Be sure the parking brake is set, vehicle wheels have been chocked and/or outrigger stabilizers have been positioned before drilling.
- Never allow the derrick foot to be lifted more than 6" off of the ground surface.
- Deactivate hydraulics when adding or removing rods, anvils or any tool in the hammer.
- Verify that all threaded parts are completely threaded together before drilling.

4.4.4 Soil Loading Machinery

Heavy equipment including excavators and soil loading machinery will be used to excavate impacted soils. Heavy equipment at the project site requires all employees working in the exclusion zone to wear ANSI-approved hard hats, steel-toed safety shoes/boots, safety glasses and hearing protection, as well as traffic vests as indicated above.

Operators will inspect the equipment daily before use to ensure safe operating conditions and to determine that the brakes and operating systems are in proper working condition and that all required safety devices are in place and functional (i.e., reverse gear alarms are working properly).

All personnel will place the spotter within close proximity to the operating machinery. When working around heavy equipment, employees should:

- Make sure that the operator is aware of your presence/activities;
- Stay in the operator's line of sight, don't work in his/her blind spot;
- Approach areas where equipment is operating from a direction visible to the operator;
- Be aware of the swing radius of the excavator;
- Do not walk or work underneath loads handled by digging equipment;
- Do not ride in buckets of loaders;
- Stand away from soil stockpile areas to avoid being struck by any spillage or falling materials.; and,
- Develop a series of hand signals to facilitate communication with the operator.

4.5 Trench/Excavation Cave-In or Collapse

The excavation depths vary depending on the activity to be completed. In some instances the proposed depths exceed five feet. Under no circumstances is the project team to enter an unshored or unsloped excavation greater than five feet in depth. If samples need to be collected, they will be collected from the bucket of the backhoe or by using a remote sampling device.

4.6 Driving Safety

Drivers must be licensed to drive the class of vehicle they are operating and trained in defensive driving. Only AECOM personnel may drive AECOM vehicles or vehicles rented for AECOM business; client, subcontractor, or other work-related personnel may ride. Drivers and passengers must comply with all traffic laws and posted signs, and will not operate a vehicle if under the influence of impairing medication, alcohol, or any other substance.

Make sure that the following basic safe driving practices are followed at all times while working on this project:

- Always wear a seat belt while operating a motor vehicle or while traveling as a passenger.
- Obey speed limits and local traffic laws at all times.
- Obtain proper directions to the site in advance and take the route that is most likely to be free of known traffic hazards (e.g., congestion, construction, etc.) and that avoids travel through potentially dangerous neighborhoods.
- Abstain from distractions while driving (e.g., the use of cell phones, eating/drinking, reading maps, etc.) If necessary, stop the vehicle and pull over to perform such activities safely. AECOM policy is engine on, cell phone off. You must **NOT** operate a vehicle while talking on your cell phone, regardless of “hands free” or not. If you receive a call, pull over to answer it. **DO NOT** allow other distractions to interfere with your safe operation of the vehicle.
- Do not operate a motor vehicle if you are tired and/or have not had sufficient rest. AECOM’s H&S policy 1.2 limits the maximum length of the workday to 16 hours for fieldwork. This limit includes the time spent driving to/from a site.
- All unattended personnel transport vehicles will not be allowed to idle, and must be turned off when not in use.

4.6.1 Planning / Preparation

- Prior to departure, check traffic reports, weather conditions, road construction, and road closures. If necessary, develop an alternate route and new, approved JMP (Journey Management Plan).
- Prior to entering the vehicle, inspect the vehicle.
- Leave early to allow for contingencies.

4.6.2 DOT

If you are to operate a vehicle exceeding 10,000 pounds (or vehicle and trailer with a combined weight over 10,000 pounds), or you are to transport greater than 1,000 pounds of hazardous materials, you MUST comply with DOT regulations. These are NOT addressed in this HASP; contact the H&S Department if this applies.

4.6.3 Secure Packing

Do not move your vehicle unless all equipment and supplies are secured. Items and material which may roll, slide, or move about in your vehicle while traveling are a major hazard. Secure the load!

4.6.4 Emergency Procedures

Always move out of traffic if possible; even if those in front of you have stopped. Stopping on an active highway can precipitate being hit from the rear. If you must stop on an active roadway, leave at least one car length in front of you, and watch the rear mirror, so you can ease up if someone behind can't stop. Keep your flashers on in this situation. If you are the only driver coming to a stop on an active roadway, leave the flashers on and when safe to do so, exit the car and get to a safe location.

If you must stop due to vehicle failure, etc. try to coast out of traffic. Put on your flashers, and tie a white handkerchief, etc. on the driver's side door or mirror. If you remain in the vehicle, lock the doors. Use your cell phone to summon help.

4.7 Flying Objects Hazards

Activities involving the use of power tools, drilling rigs, and hand tools, among other activities, can create flying object hazards where objects can become projectiles. When flying objects represent projectiles employees need to use equipment that is appropriately guarded to minimize the creation of projectile hazards, and also use the appropriate PPE including hard hats, safety goggles, face shields to prevent projectiles from causing injuries to employees.

4.8 Hand Safety

4.8.1 Glove Selection

To protect onsite workers from hand injuries, the following gloves will be used for when performing a specific duty:

Brightly colored gloves will be used to help emphasize and easily locate the hands. It is recommended that the color of gloves be changed monthly to draw attention to the hands.

Pinch points are found between a moving object and a stationary object, or between two continuously moving objects. Yellow hand stickers will be placed on equipment to remind workers of pinch points.

4.8.2 Working with Glassware

Glass bottles, laboratory equipment, and VOA vials can break and cause lacerations and puncture wounds. The follow preventive measures should be taken to reduce the potential for broken glassware.

- Package all glassware such that there is no glass to glass contact during transportation or storage;
- Assume that any time glass strikes another object it is damaged;
- Inspect all glassware for cracks, scratches, and other damage before using;
- Lids and caps should be "finger tight" unless there is a torque specification and you use a torque wrench;
- Never fill a glass container (other than VOA vials with a septum) liquid full, always leave an air space to buffer thermal expansion of the liquid; and
- Avoid rapid temperature changes when filling glass containers.

Glass often has flaws that cannot be detected by visual inspection and the force needed to open and tighten lids can cause these flaws to fracture the glass. Any time force is applied to glass, workers should wear leather or preferably Kevlar® gloves. Kevlar® glove liners are available for use under Nitrile or cotton gloves.

4.8.3 Hand Tools

Rules for the safe use of hand tools:

- Select the right size tool for the job. Don’t use “cheaters” and avoid pulling old tools from the waste stream. There’s a reason why they were thrown away!
- All hand tools must be in safe condition.
- Handles must be sound, straight and tight-fitting.
- Always inspect tools before use and replace or repair worn or damaged tools.
- Always keep the cutting edges sharp and never test a cutting edge with your finger.
- When working on an elevated surface (ladder, truck, scaffold), ensure your tools are secure. Falling tools can cause serious injury.
- Always carry your tools correctly and never put sharp or pointed tools in your pocket.
- When carrying hand tools, always point the cutting edge to the ground.
- Always keep your tools in a dry place to prevent rust.
- Cutting tools must be kept sharp and properly shaped.
- Secure work pieces prior to cutting or drilling.
- Keep the unused hand and other people away from the tool.

4.8.4 Specific Tool Use

4.8.4.1 Screwdrivers

Most screwdrivers are not designed to be used on electrical equipment. Use an insulated screwdriver for electrical work.

Do not hold an object in the palm of one hand and press a screwdriver into it; place the object on a bench or table. Never hammer with a screwdriver. Never use a screwdriver with a broken handle, bent or burred blade, etc.

4.8.4.2 Pliers

Do not use pliers as a substitute for hammers, wrenches, pry bars, etc. Use insulated pliers when doing electrical work. Inspect the pliers frequently to make certain that they are free of breaks or cracks.

Use the right type of pliers for the specific task – adjustable, locking (Vise Grip®), standard, bolt size fit, pipe wrench.

4.8.4.3 Hammers

Use the correct hammer for the specific type of striking work (task) to be done. Always wear safety glasses when using a hammer to strike an object. Always use the claw portion of a hammer to remove nails and not as a pick or awl. Have an unobstructed view and swing when using a hammer. Watch for overhead interference on back and forward swing. Use a good grip and use something other then your hand to hold a nail when starting hammering. Check for defects on the handle and head before using. If the hammer head shows signs of mushrooming, replace it immediately.

Handles may be wood, tubular/solid steel or fiberglass. Replace any hammer with a loose handle before the head flies off and causes injury to you or someone else. Tighten loose handles with the proper wedges; never use nails or staples for wedges. If a steel or fiberglass handle is loose replace it, since it is more difficult to repair than a wooden one. Some fiberglass handles can be tightened with the aid of a repair kit with epoxy materials.

4.8.4.4 Wrenches

Select the correct size of wrench for the job. Never use a pipe wrench as a wrench handle extension. Too much leverage can ruin a tool and cause injury.

To avoid sudden slips, stand in a balanced position and always pull on the wrench instead of pushing against the fixed jaw, particularly when a pinch point is created. Wear gloves when using a wrench in a confined space.

Whenever possible use a box end wrench instead of an open end wrench to avoid slipping.

4.8.4.5 Chisels

Always wear safety goggles or a face shield when using a chisel. Drive chisels outward and away from your body. Do not use chisels to pry. Keep edges sharp for most effective work and protect when not in use. Driven tools (chisels, punches, etc.) must be dressed to remove any mushrooming. Use the proper hammer when using a chisel.

4.8.4.6 Knives

Always perform a thorough Job Safety Analysis (JSA) to define the proper cutting tool for the task.

Always place the item to be cut on a solid surface, attempt to hold the cut item without your hand and cut in a direction away from the body and hand.

Always keep hands and body clear of the knife stroke. Always keep the cutting tool blades sharp.

Make sure there is plenty of open space around you when using any cutting tool.

Use the following safer tools in replace of fixed open blade knives (FOBK) whenever possible:

- Self-retracting utility knives
- Guarded utility knives
- Shears, snips, and/or scissors
- Concealed blade cutters
- Pipe cutters
- Specialty cutters (e.g. Geoprobe Acetate Liner Cutter)
- Ratcheting tools

4.8.5 Power Tools

To prevent hazards associated with the use of power tools, workers should observe the following general precautions:

- Never carry a tool by the cord or hose.
- Never yank the cord or the hose to disconnect it from the receptacle.
- Keep cords away from heat, oil and sharp edges.
- Disconnect tools when not using them, before servicing or cleaning them and when changing accessories such as blades, bits and cutters.
- If a tool is only temporarily being removed from the power source and the cord is not in the immediate control of the user, it is strongly suggested that a cord plug lockout be used to prevent the tool from accidentally being re-plugged in.
- Secure work with clamps or vise, freeing up both hands to operate the tool.
- Avoid accidental starting. Do not hold fingers on the switch button when carrying a plugged-in tool.
- Keep tools sharp and clean for best performance.
- Wear appropriate clothing. Loose clothing or jewelry can become caught in moving parts.
- Keep all guards in place.

4.8.6 Electric Tools

A variety of power tools may also be used during the proposed activities. When using portable tools that are electrically powered, follow the safety precautions listed below:

- Check to see that electrical outlets used to supply power during field operations is of the three wire grounding type.
- Extension cords used for field operations should be of the three wire grounding type and designed for hard or extra-hard usage. This type of cord uses insulated wires within an inner insulated sleeve and will be marked S, ST, STO, SJ, SJO or SJTO.
- NEVER remove the ground plug blade to accommodate ungrounded outlets.
- Do not use extension cords as a substitute for fixed or permanent wiring. Do not run extension cords through openings in walls, ceilings or floors.
- Protect the cord from becoming damaged if the cord is run through doorways, windows or across pinch points.
- Examine extension and equipment cords and plugs prior to each use. Damaged cords with frayed insulation or exposed wiring and damaged plugs with missing ground blades MUST BE REMOVED from service immediately.
- All portable or temporary wiring which is used outdoors or in other potentially wet or damp locations must be connected to a circuit that is protected by a ground fault circuit interrupter (GFCI). GFCI's are available as permanently installed outlets, as plug-in adapters and as extension cord outlet boxes. DO NOT CONTINUE TO USE A PIECE OF EQUIPMENT OR EXTENSION CORD THAT CAUSES A GFCI TO TRIP.
- When working in flammable atmospheres, be sure that the electrical equipment being used is approved for use in Class I, Division I atmospheres.

- Do not touch a victim who is still in contact with current. Separate the victim from the source using a dry, nonmetallic item such as a broomstick or cardboard box. Be sure your hands are dry and you are standing on a dry surface. Turn off the main electrical power switch and then begin rescue efforts.

4.9 Heavy Equipment

The use of heavy equipment for earth moving work poses potential hazards to employees. Such equipment can cause trauma injuries to the operator or nearby workers. It may also roll over, or fall on sloped ground or unstable soil. AECOM personnel are to remain clear of operating heavy equipment to the extent feasible.

Operators of earth moving equipment must be experienced or trained in the use of the equipment. They must inspect the equipment each day before use to assure that it is in safe operational condition. The equipment must be set up in a stable configuration, with the outriggers fully extended and supported on stable soil to prevent rollover. The rear swing-radius must be barricaded to prevent injuries to persons passing behind the equipment.

When employees must work near the equipment, eye contact and clear communication must be maintained.

4.10 Heavy Equipment – Drill Rigs

Drill rigs are considered to be heavy equipment, and therefore precautions must be incorporated into job activities when working in close proximity to drill rigs. In addition the wearing the PPE that has been determined to be necessary for the project, employees will need to ensure that Drill Rig Operators conduct inspections of the drill rig on a daily basis. A drill rig inspection is included in Attachment D as a reference. Focal points of the inspection should include checking hydraulic lines, tools and drilling equipment, emergency stop switches, and other parts of the equipment to insure that they are maintained in a safe operating condition.

Employees will also consider the staging their work area so that they are not within the shadow of the drill rig's mast. Working within this area creates a potential to be contacted by the drill rig if it were to tip over on its side. Likewise, when establishing a drilling location, the rig shall be positioned so that it won't clip overhead power lines should it tip over.

4.11 Insects, Spiders, Wasps and Bees

Employees are encouraged to review AECOM SHE SOP 509 – Biological Hazards Injury & Illness Prevention, for detailed discussion on working around insects within the workplace and procedures that can be used to minimize and prevent exposure.

4.11.1 Ticks

Ticks are bloodsuckers, attaching themselves to warm-blooded vertebrates to feed. Deer ticks are the most common carriers of Lyme disease, a bacterial infection that is transmitted to humans through the bite of the tick.

Personnel should carefully inspect themselves each day for the presence of ticks or any rashes. This is important since prompt removal of the tick can prevent disease transmission. Female deer ticks are about one-quarter inch in length and are black and brick red in color. Males are smaller and all black.

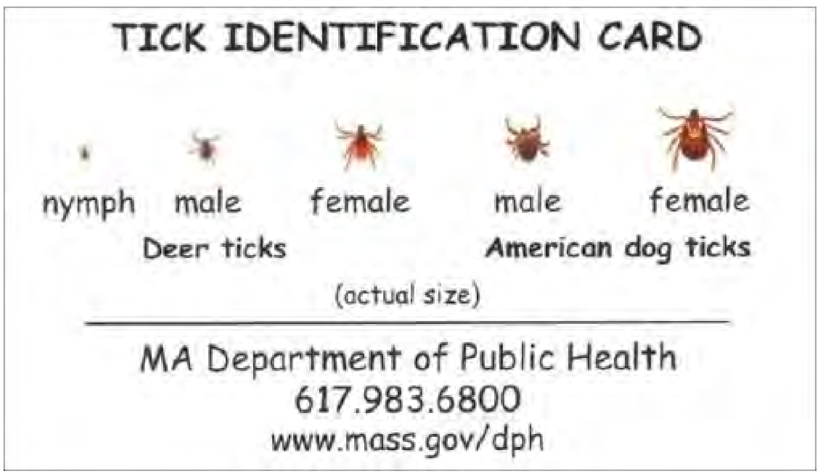
Removal of the tick is important in that the tick should not be crushed and care must be taken so that the head is also removed. If the head is not completely removed or if the tick is allowed to remain for days feeding on human blood, a condition known as tick paralysis can develop, this is due to a neurotoxin that the tick apparently injects while engorging. This neurotoxin acts upon the spinal cord causing loss of coordination, weakness and paralysis.

One characteristic symptom of Lyme disease is a bulls-eye rash that develops around the bite site. The rash appears in about 60-80% of all Lyme disease cases. Contact your OHSC immediately if you develop such a rash.

Tick season typically lasts from April through October; peak season is May through July; seasons can very depending on climate. Wear light-colored clothing (easier to spot ticks) with long sleeves and make sure that shirts are tucked into pants and pants are tucked into socks or boots. Ticks have a tendency to crawl upwards. These procedures will make it more difficult for a tick to reach your skin.

Studies have determined that repellants containing DEET as a main ingredient are most effective against mosquitoes and ticks. DEET can be directly applied to the exposed skin of adults and/or clothing. Products containing DEET can't be used with Fire Resistant Clothing (FRC) as it diminishes the garments' capacity to resist ignition in a fire. Permethrin is another repellent; however, it can only be directly applied to clothing.

The pictogram below, provided by the Massachusetts Department of Public Health, can be used to identify ticks and depicts the approximate actual size of ticks.



4.11.2 Mosquitoes

Mosquitoes, carriers of the West Nile Virus, Yellow Fever and other diseases, are indigenous to the area. As mentioned above, DEET is an effective mosquito repellent and is recommended. Although concentrated DEET formulations protect longer than those that are more dilute, little improvement is offered by concentrations of the active ingredient higher than 50 percent. Adverse effects, though documented, are infrequent and are generally associated with gross overuse of the product. Users should avoid the temptation to apply the most concentrated product available. The transient protection offered by more dilute preparations can be extended by reapplication. When using DEET care should be taken to reapply the repellant when its effectiveness wears off.

4.11.3 Spiders

Spiders and wasps may be found in derelict buildings, sheltered areas, and even on open ground. Exercise care when collecting samples and avoid reaching into areas where visibility is limited. If bitten by a spider, notify a co-worker or someone who can help if you should you have an allergic reaction or develop other symptoms related to spider venom. Stay calm and treat the area with ice or cold water.

Seek medical attention if you have any reactions to the bite such as developing a rash, excessive swelling or pain at the site of the bite or sting or any swelling or numbness beyond the site of the bite.

4.11.4 Wasps and Bees

Wasps (hornets and yellow-jackets) and bees (honeybees and bumblebees) are common insects that may pose a potential hazard to the field team if work is performed during spring, summer or fall. Bees normally build their nests in the soil. However, they use other natural holes such as abandoned rodent nests or tree hollows. Wasps make a football-shaped, paper-like nest either below or above the ground. Yellow-jackets tend to build their nests in the ground but hornets tend to build their nests in trees and shrubbery. Bees are generally more mild-mannered than wasps and are less likely to sting. Bees can only sting once while wasps sting multiple times because their stinger is barbless. Wasps sting when they feel threatened. By remaining calm and not annoying wasps by swatting, you lessen the chance of being stung.

Wasps and bees inject a venomous fluid under the skin when they sting. The venom causes a painful swelling that may last for several days. If the stinger is still present, carefully remove it with tweezers or y scraping a credit card or other blunt object against the sting site in the opposite direction in which the stinger is embedded. Some people may develop an allergic reaction, i.e. anaphylaxis, to a wasp or bee sting. If such a reaction develops, seek medical attention at once. Persons who are allergic to bee and wasp stings should carry an epinephrine pen, e.g., epi-pen, with them that is prescribed by a doctor and used to help abate swelling that occurs due to their allergy. Even if an employee utilizes their epi-pen, they still need to seek medical attention for follow-up care and observation.

4.12 Noise Exposure

The use of drilling equipment can expose the field team to noise levels that exceed the OSHA PEL of 90 dB for an 8-hour day. Exposure to noise can result in the following:

- Temporary hearing losses where normal hearing returns after a rest period;
- Interference with speech communication and the perception of auditory signals;
- Interference with the performance of complicated tasks; and,
- Permanent hearing loss due to repeated exposure resulting in nerve destruction in the hearing organ.

Since personal noise monitoring will not be conducted during the proposed activities, employees must follow this general rule of thumb: If the noise levels are such that you must shout at someone two (2) feet away from you, you need to be wearing hearing protection. Employees can wear either disposable earplugs or earmuffs but all hearing protection must have a minimum noise reduction rating (NRR) of 27 dB.

4.13 Overhead Materials

Overhead materials can include objects, tools, utilities, equipment and machinery that are, or have the potential to be, elevated above the work area. Overhead materials pose a significant safety risk because of the force that can be generated when they fall and strike an employee. Special attention should be paid when setting up a work area to evaluate the potential for overhead materials to cause traumatic blunt force trauma. Consideration must be given to potential for these overhead objects to be contacted during the course of work by AECOM employees and Subcontractors, and what the result of contacting these overhead materials will be.

If possible, the work area should be adjusted or moved so that no overhead materials present a hazard. Likewise, if the object overhead can be relocated to remove the hazard, that is the preferred course of mitigation. When the hazard can't be eliminated, then protective measures to shield the employees from being struck by falling objects should be taken. As a last resort, and as part of the minimum PPE for site work, employees working in areas where falling objects pose a hazard will wear a hard hat.

4.14 Pinch Points

The use of hand tools, mechanical equipment, heavy machinery and more can create pinch points within the working area. Pinch points can be recognized when moving objects are present in the work space in close proximity to employees, and it is reasonable to assume that a part of the employee's body can be caught between the moving objects. Pinch points will be considered when performing a Job Safety Analysis for the task being performed and recommendations will be made to reduce the potential for body parts to become caught in moving parts, including but not limited to:

- The use of PPE, e.g. gloves, boots, etc, to protect exposed body parts;
- Guarding machinery and equipment to prevent body parts from being caught in the moving objects;
- Using tools as an extension of the body to avoid placing body parts in the path of harm. When tools are used as an extension of the body consideration will be given to how the tool may become a hazard if it is caught within moving parts.

4.15 Poisonous Plants

Employees are encouraged to review AECOM SHE SOP 509 – Biological Hazards Injury & Illness Prevention, for detailed discussion on working around poisonous plants within the workplace and procedures that can be used to minimize and prevent exposure.

All undeveloped property potentially has poison ivy, oak, or sumac growing in areas where vegetation is not controlled. These plants can also be found in cultivated and landscaped areas. Perform a hazard analysis appropriate for the working conditions and consider the existence of poisonous plants. Use appropriate PPE to prevent exposure, including but no limited to, full length clothing, Tyvek coveralls, and dermal barrier creams.

Poison Ivy • Grows in West, Midwest, Texas, East. • Several forms – vine, trailing shrub, or shrub. • Three leaflets (can vary 3-9). • Leaves green in summer, red in fall. • Yellow or green flowers. • White berries.	 
Poison Oak • Grown in the East (NJ to Texas), Pacific Coast. • 6-foot tall shrubs or long vines. • Oak-like leaves, clusters of three. • Yellow berries.	 
Poison Sumac • Grows in boggy areas, especially in the Southwest and Northern states. • Shrub up to 15 feet tall. • Seven to 13 smooth-edged leaflets. • Glossy pale yellow or cream-colored berries.	 
Giant Hogweed • Grows in the East; present in eastern Nassau County, NY. • Invasive and introduced Asian weed. • “Umbelliferous” plant looks like a giant carrot or parsnip plant. • Parasol-shaped flower cluster. • Grows up to 15-feet in height with 5-foot wide leaves. • Poisonous sap causes Phytophotodermatitis (psoralen chemicals react to UV). • Causes blistering and dermal lesions. • Avoid leaves and flowers.	

If you must enter areas containing such plants, wear protective clothing, such as Tyvek® coveralls, Nitrile or latex gloves, and boot covers. The use of a barrier cream such as Ivy Block can prevent the active agent in poisonous plants from affecting skin and Tecnu cleansing wipes can remove the plant oil from exposed skin.

Avoid using mowers and weed trimmers in areas where poison ivy and oak are likely. Additional care should be taken during early winter after the leaves have fallen from the poisonous plants; the poison still exists in the vines and stubble remaining above the ground. Wash any contaminated skin immediately with cold water and mild soap.

4.16 Slips, trips and fall hazards

On any work area, it is expected that the ground might be uneven. The ground surface might be unreliable due to settling. Surface debris might be present and wet or swampy areas can exist.

Employees should walk around, not over or on top of debris or trash piles. When carrying equipment, identify a path that is clear of any obstructions. It might be necessary to remove obstacles to create a smooth, unobstructed access point to the work areas on site.

During the winter months, snow shovels and salt crystals or calcium chloride should be kept on site to keep work areas free of accumulated snow and ice. Furthermore, use sand or other aggregate material to help keep work surfaces from being slippery, especially where salt/calcium chloride cannot be used. In addition, make sure work boots have soles that provide good traction. When walking on ice is necessary crampons or Yaktrax® should be used.

Maintaining a work environment that is free from accumulated debris is the key to preventing slip, trip and fall hazards at construction sites. Essential elements of good housekeeping include

- Orderly placement of materials, tools and equipment;
- Placing trash receptacles at appropriate locations for the disposal of miscellaneous rubbish;
- Prompt removal and secure storage of items that are not needed to perform the immediate task at hand; and,
- Awareness on the part of all employees to walk around, not over or on, equipment that might have been stored in the work area.

4.17 Splashing Liquids

Groundwater sampling activities can produce splashing hazards in the work area. Employees will use techniques that minimize the production of splashing hazards while handling liquids, including groundwater, sample container preservatives, decontamination solutions and any other liquids in the work area. Employees will also evaluate the working tasks to consider the use of goggles while working with liquids.

4.18 Traffic Safety

4.18.1 Transportation Plan

A transportation plan would be prepared for the Site as per the Excavation Work Plan (Appendix A of the ISMP). This plan would addresses requirements for accessing the project Site, limitations of public use of the streets or sidewalks adjacent to the project Site, securing any necessary permits to use and/or close public streets and sidewalks, and the need for flaggers and signage when traffic flow will be impeded on public streets.

4.18.2 Basic Procedures

To make certain that motorists are aware of our presence, all employees who are potentially exposed to traffic hazards should wear orange or yellow ANSI Class II or III safety vests. Work area should be delineated with traffic cones, or other suitable warning barriers, to prevent motorists from inadvertently driving through. As for vests, cones or other barrier materials should be reflectorized if work will be performed during dusk or evening hours. Where it is not feasible to implement such procedures, a standby observer should be assigned to warn the work crew of any impending traffic hazards.

4.18.3 Work On/Adjacent to Public Roadways

For projects that involve potential exposure to traffic on or adjacent to public roadways, consult the "**Work Zone Traffic Control" handbook**, under "Traffic Control" on AECOM's H&S Website, at the following web address: http://intranet.AECOM.com/healthweb.

The handbook was developed by the State of Maine DOT and provides examples of traffic control applications for typical road work situations (e.g., closure of one lane of a two lane road, stationary work on the shoulder of a road, mobile work along the shoulder of a road, etc.). Although it was written to reflect the basic requirements of Part VI of the Federal Highway Administration's (FHWA) Manual of Uniform Traffic Control Devices (MUTCD), this handbook is not a regulatory document. Since specific requirements will vary from state to state, and within a state, by county, city or town.

4.18.4 Flagging/Redirecting Traffic

Specific requirements exist when traffic must be redirected around a work area that is on or adjacent to a public roadway. In certain locations only police officers may redirect traffic. As a minimum, OSHA requires that flaggers be formally trained in accordance with the requirements specified in ANSI D6.1-1971. As a result, AECOM personnel should not redirect traffic on public roadways.

http://www.atssa.com/cs/flagger

When traffic must be redirected, and the local police do not perform that role, a traffic control firm should be hired (these are frequently listed in the yellow pages under "safety").

4.19 Utility Hazards

4.19.1 Underground Utilities

Law requires that a utility clearance be performed prior to initiation of any subsurface work.

Dig Net of New York City and Long island
(800) 272-4480 or http://www.dignetnycli.com/

Call to request a mark-out of natural gas, electric, telephone, cable television, water and sewer lines in the proposed drilling locations. In many locations, a separate location request must be submitted to the municipality providing potable water, sanitary and storm sewerage. Work will not begin until the required utility clearances have been performed.

Utility clearance organizations typically do not mark-out underground utility lines that are located on private property. As such, the drilling contractor must exercise due diligence and try to identify the location of any private utilities on the property being investigated. AECOM can fulfill this requirement in several ways, including:

- Obtaining as-built drawings for the areas being investigated from the property owner;

- Visually reviewing each proposed soil boring locations with the property owner or knowledgeable site representative;
- Performing a geophysical survey to locate utilities;
- Hiring a private line locating firm to determine the location of utility lines that are present at the property;
- Identifying a no-drill zone; or
- Hand digging in the proposed soil boring locations if insufficient data is available to accurately determine the location of the utility lines.

The client or property owner may have specific requirements and procedures for underground utility clearance.

4.19.2 Overhead Utilities

All overhead lines will be considered “energized” unless properly de-energized, grounded and tested by the utility company before working within the clearance distance as defined below. The AECOM SSO must observe de-energizing process and reconfirm that the lines are de-energized on a daily basis.

Any vehicle or mechanical equipment that is capable of having parts of its structure elevated near energized overhead lines shall be operated so that a minimum clearance of 10 feet is maintained at all times. This 10 foot distance shall be increased a minimum of 0.4 inches for each 1 kV over 50 kV. If the voltage of the overhead line is unknown, maintain a clearance distance of 35 feet from ground projection of the nearest power line to the vehicle. Any work within the clearance distance must be approved by the Regional Health and Safety Manager and the utility company.

Precautions must be taken when handling lengths of pipe or tubing that can approach overhead power and utility lines. When working with pipe or tubing, maintain a distance equal to the length of pipe plus the clearance distance defined above.

4.20 Weather

4.20.1 Inclement Weather

The Site Safety Officer will check the weather forecast for the project area each morning prior to mobilization. Predicted weather conditions will be included in the Job Safety Analysis. Weather changes should initiate a review and update of the JSA as necessary.

Severe weather can occur with little warning. The employee must be aware of the potentials for lightning, flash flooding and high wind events.

Be Prepared, Know What is Coming your Way

- Listen to the radio for severe weather alerts.
- Check the Storm Prediction Center's web page for alerts and warnings.

http://www.spc.noaa.gov/products/wwa/

- Pay attention to the weather in your area, up wind of your location, and in the watershed up stream from your location.
- When in the field, be aware of the route you must take to get to shelter.

- When working in low areas be aware of the potential for flash flooding and the route to higher ground.

4.20.2 Heat Stress

4.20.2.1 Types of Heat Stress

Heat related problems include heat rash, fainting, heat cramps, heat exhaustion and heat stroke. Heat rash can occur when sweat isn't allowed to evaporate; leaving the skin wet most of the time and making it subject to irritation. Fainting may occur when blood pools to lower parts of the body and as a result, does not return to the heart to be pumped to the brain. Heat related fainting often occurs during activities that require standing erect and immobile in the heat for long periods of time. Heat cramps are painful spasms of the muscles due to excessive salt loss associated with profuse sweating.

Heat exhaustion results from the loss of large amounts of fluid and excessive loss of salt from profuse sweating. The skin will be clammy and moist and the affected individual may exhibit giddiness, nausea and headache.

Heat stroke occurs when the body's temperature regulatory system has failed. The skin is hot, dry, red and spotted. The affected person may be mentally confused and delirious. Convul¬sions could occur. EARLY RECOGNITION AND TREATMENT OF HEAT STROKE ARE THE ONLY MEANS OF PREVENTING BRAIN DAMAGE OR DEATH. A person exhibiting signs of heat stroke should be removed from the work area to a shaded area. The person should be soaked with water to promote evaporation. Fan the person's body to increase cooling.

Increased body temperature and physical discomfort also promote irritability and a decreased attention to the performance of hazardous tasks.

4.20.2.2 Early Symptoms of Heat-Related Health Problems:

decline in task performance	excessive fatigue
incoordination	reduced vigilance
decline in alertness	muscle cramps
unsteady walk	dizziness

4.20.2.3 Susceptibility to Heat Stress Increases due to:

lack of physical fitness	obesity
lack of acclimatization	drug or alcohol use
increased age	sunburn
dehydration	infection

People unaccustomed to heat are particularly susceptible to heat fatigue. First timers in PPE need to gradually adjust to the heat.

4.20.2.4 The Effect of Personal Protective Equipment

Sweating normally cools the body as moisture is removed from the skin by evaporation. However, the wearing of certain personal protective equipment (PPE), particularly chemical protective coveralls (e.g., Tyvek), reduces the body's ability to evaporate sweat and thereby regulate heat buildup. The body's efforts to maintain an acceptable temperature can therefore become significantly impaired by the wearing of PPE.

4.20.2.5 Measures to Avoid Heat Stress:

The following guidelines should be adhered to when working in hot environments:

- Establish work-rest cycles (short and frequent are more beneficial than long and seldom).
- Identify a shaded, cool rest area.
- Rotate personnel, alternative job functions.
- Water intake should exceed sweat produced. Most workers exposed to hot conditions drink less fluids than needed because of an insufficient thirst. **DO NOT DEPEND ON THIRST TO SIGNAL WHEN AND HOW MUCH TO DRINK.** Consume enough liquid to force urination every two hours. In humid climates ice water or ice should be consumed to help maintain normal body temperature since evaporation does not provide an efficient mechanism for heat removal.
- Eat light meals before and during work shifts. Avoid highly salted foods.
- Drink sports drinks such as Gatorade® diluted 1:1 with water.
- Save most strenuous tasks for non-peak heat hours such as the early morning or at night.
- Avoid alcohol during prolonged periods of heat. Alcohol will cause additional dehydration.
- Avoid double shifts and/or overtime.

The implementation and enforcement of the above mentioned measures will be the joint responsibility of the Project Manager and health and the Site Safety Officer. Potable water and fruit juices should be made available each day for the field team.

4.20.2.6 Heat Stress Monitoring Techniques

Site personnel should regularly monitor their heart rate as an indicator of heat strain by the following method:

Radial pulse rates should be checked by using fore-and middle fingers and applying light pressure top the pulse in the wrist for one minute at the beginning of each rest cycle. If the pulse rate exceeds 110 beats/minute, the next work cycle will be shortened by one-third and the rest period will be kept the same. If, after the next rest period, the pulse rate still exceeds 110 beats/minute, the work cycle will be shortened again by one-third.

4.20.3 Cold Stress

4.20.3.1 Type of Cold Stress

Cold injury is classified as either localized, as in frostbite, frostnip or chilblain; or generalized, as in hypothermia. The main factors contributing to cold injury are exposure to humidity and high winds, contact with wetness and inadequate clothing.

The likelihood of developing frostbite occurs when the face or extremities are exposed to a cold wind in addition to cold temperatures. The freezing point of the skin is about 30o F. When fluids around the cells of the body tissue freeze, skin turns white. This freezing is due to exposure to extremely low temperatures. As wind velocity increases, heat loss is greater and frostbite will occur more rapidly.

4.20.3.2 Symptoms of Cold Stress

The first symptom of frostbite is usually an uncomfortable sensation of coldness, followed by numbness. There might be a tingling, stinging or aching feeling in the affected area. The most vulnerable parts of the body are the nose, cheeks, ears, fingers and toes.

Symptoms of hypothermia, a condition of abnormally low body temperature, include uncontrollable shivering and sensations of cold. The heartbeat slows and can become irregular, the pulse weakens and the blood pressure changes. Pain in the extremities and severe shivering can be the first warning of dangerous exposure to cold.

Maximum severe shivering develops when the body temperature has fallen to 95o F. Productive physical and mental work is limited when severe shivering occurs. Shivering is a serious sign of danger. Immediately remove any person who is shivering from the cold.

4.20.3.3 Methods to Prevent Cold Stress

When the ambient temperature, or a wind chill equivalent, falls to below 40o F (American Conference of Governmental Industrial Hygienists recommendation), site personnel who must remain outdoors should wear insulated coveralls, insulated boot liners, hard hat helmet liners and insulated hand protection. Wool mittens are more efficient insulators than gloves. Keeping the head covered is very important, since 40% of body heat can be lost when the head is exposed. If it is not necessary to wear a hard hat, a wool knit cap provides the best head protection. A facemask may also be worn.

Persons should dress in several layers rather than one single heavy outer garment. The outer piece of clothing should ideally be wind and waterproof. Clothing made of thin cotton fabric or synthetic fabrics such as polypropylene is ideal since it helps to evaporate sweat. Polypropylene is best at wicking away moisture while still retaining its insulating properties. Loosely fitting clothing also aids in sweat evaporation. Denim is not a good protective fabric. It is loosely woven which allows moisture to penetrate. Socks with a high wool content are best. If two pairs of socks are worn, the inner sock should be smaller and made of cotton, polypropylene or similar types of synthetic material that wick away moisture. If clothing becomes wet, it should be taken off immediately and a dry set of clothing put on.

If wind conditions become severe, it might become necessary to shield the work area temporarily. The SSO and the PM will determine if this type of action is necessary. Heated break trailers or a designated area that is heated should be available if work is performed continuously in the cold at temperatures, or equivalent wind chill temperatures, of 20o F.

Dehydration occurs in the cold environment and can increase the susceptibility of the worker to cold injury due to significant change in blood flow to the extremities. Drink plenty of fluids, but limit the intake of caffeine

4.20.4 Work/Rest Cycles for Cold Weather

If wind chill temperatures fall below minus 25o F, breaks from the cold will occur at a rate of one every hour. If wind chill temperatures fall below minus 45o F, all work will cease and persons will be required to go indoors. Also see Section 1.1.1 regarding shift duration. However, these guidelines can be modified at any time based on actual site conditions and professional judgment rendered by either the Field Manger and/or SSO. For example, the Field Manger and/or SSO will evaluate field crew fitness; the condition of their cold-weather gear, including boots; and will observe employees alertness, including fatigue and rate of cold tolerance/acclimation.

If weather conditions warrant, portable tents might become necessary to shield the work area from wind, rain, snow, etc. The SSO and the Field Manager will determine if this type of action is necessary. However, under no conditions will the tents be heated and as a precautionary measure, a

Photoionization Detector (PID) with a 10.6 ev lamp will be used to monitor the breathing zone of personnel inside the tent. See Section 6 for action levels based on PID readings. A JSA should be prepared and discussed with all workers detailing the precautions for working in these cold weather conditions.

4.21 Well Development and Groundwater Monitoring

During purging and development of borings into monitoring wells, the PPE indicated in Section 7 below will be worn to avoid chemical contact / exposure, as well as physical trauma. Bailing wells requires proper gloves, eye protection, and possibly protective coveralls to prevent splashing. Back and lifting precautions outlined in Section 5.1 shall be used to avoid ergonomic injuries.

4.22 Confined Spaces

Confined Space entry may be required for personnel to enter vaults or manholes in the work areas. The following procedures must be followed in an event confined space entry is necessary. Proper permits must be obtained and regulatory agencies notified prior to performing a confined space entry.

When working in industrial settings, it is common to need to enter a confined space to make observations, collect samples, or perform other duties. AECOM employees or subcontractors must not enter any confined space containing a hazard.

A confined space is defined as any space that meets the following criteria:

- Is not designed for human occupancy
  - excludes vehicles, elevator cabins etc,
  - includes elevator shafts and wells, tanks, vaults, etc.
- Is large enough to physically enter with the whole body, and
- Has a restricted exit path (you must climb over pipes, through man ways, etc.)

If the confined space contains any hazard, entry may only be made if permitted in writing by the space owner or the Regional Health and Safety Manger, the entry is monitored by an observer, and with the prior written approval of the Regional Health and Safety Manager.

Typical hazards include but are not limited to:

- Flammable materials
- Toxic materials
- Corrosive materials
- Exposed electrical circuits
- Falls greater than six feet
- Moving machinery
- Oxygen deficient atmosphere

If there is any doubt about whether a space meets the above criteria, call the Health and Safety Staff.

4.23 Hot Work

Prior to initiation of any hot work procedures, a “Hot Work Permit” (Attachment E) must be approved by a National Grid representative and the SSHO.

5.0 Air Monitoring

The site has some NAPL impacts dating from the site's historical use as an MGP. As such, the contaminants of concern are VOCs, SVOCs and metals. The primary VOCs of concern are BTEX. The primary SVOCs of concern are PAHs. Heavy metals like lead, arsenic, and mercury are also present in shallow soils on-site. Airborne dust is also a concern and must be monitored due to its ability to co-transport contaminants and because of its nuisance properties. Odors, though not necessarily indicative of high contaminant concentrations, could create a nuisance and will be monitored and controlled to the extent practicable

5.1 Monitoring

5.1.1 VOC Monitoring

A photoionization detector (PID), such as a RaeSystems MiniRae 2000 PID equipped with a 10.6 ev lamp or equivalent, will be used to screen the breathing zone of employees during all subsurface investigations as Site and off-Site area conditions warrant but no less than at least once every hour. If breathing zone concentrations of total VOCs are sustained (5 minutes) above 5 ppm (calibrated to isobutylene), a measurement will be made for the presence of benzene using a colorimetric detector tube, e.g. Draeger or Sensydine, or a Draeger Chip system equipped with the appropriate constituent monitoring chip, shall be used to confirm the presence and concentration of site-specific chemicals of concern. In the absence of benzene, respiratory protection will be donned if total VOC concentration is sustained at 25 units as indicated by the PID. If benzene is present at concentrations of 1 ppm or more as indicated by the detector tube, respiratory protection will be donned. Requirements for respiratory protection are outlined in Section 6.2 of this HASP.

5.1.2 Dust/Particulate Monitoring

Dust control measures, as described in this HASP, will be implemented to prevent and/or control the concentration of airborne dust levels during the subsurface activities. A MIE Data-Ram total dust monitor, or its equivalent, will be used to monitor the effectiveness of these engineering controls and to determine if measures to mitigate the dust are effective and/or if respiratory protection is required.

An action level of 0.15 mg/m^3 has been established for total dust (sustained within the breathing zone for 15-minutes) and is based on the PEL for PAHs. The total dust monitor will be used to determine that total dust levels within the established restricted areas are maintained below this action level. The readings will be taken at the locations within the restricted area, and during the time periods, which are likely to represent worst case conditions. The determination of worst case will be made by the SSO and will be dependent upon such variables as the type of work being performed and number of personnel or level of activity in the zone.

Task	Instrument	Action Limit and Action
All tasks involving potential exposure to contaminated soils and/or groundwater	Photoionization Detector	**5 ppm as isobutylene**; Don respiratory protection as discussed in Section 7
All tasks involving exposure to site chemicals of concern	Colorimetric detector tubes or Draeger Chip System for Benzene	**0.5 ppm Benzene** Don respiratory protection described in section 7.2
All tasks with the potential to generate dust.	Particulate meter	**>1.0 mg/m^3**; Apply dust suppression controls and don respiratory protection **>1.5 mg/m^3**; **STOP WORK** until levels are reduced below1.0 mg/m^3

5.2 Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) has been developed for the site. The site is located in a commercial community. This CAMP presents methods and procedures that will be used to provide protection for the downwind residences and businesses by assuring that the work activities do not spread constituents off-site through the air.

The community air monitoring will be performed around the project site perimeter and will measure the concentrations of organic vapors and dust. Air monitoring will be continuous during the activities. Monitoring will be conducted prior to mobilization to establish a baseline. The CAMP developed as per the NYSDEC DER-10 (NYSDEC, January 2010) is attached as Attachment C.

5.3 Personal Air Sampling

The need for personal air sampling is not anticipated by AECOM during the activities covered by this HASP. The Project Manager can prescribe personal air sampling based on observations or concerns recognized during the project.

5.4 Calibration and Recordkeeping

Equipment will be calibrated in accordance with AECOM's standard operating procedures. A log of the calibrations and readings will be kept in the field notebook. Daily calibration information will also be recorded in the field notebook.

6.0 Personal Protective Equipment

Personal protective equipment (PPE) will be worn during these activities to prevent on-site personnel from being injured by the safety hazards posed by the project site and/or the activities being performed. In addition, chemical protective clothing will be worn to prevent direct dermal contact with the project site's chemical contaminants. The following table describes the PPE to be worn for certain specific tasks. At a minimum, steel toe safety shoes, safety glasses with side shields, and nitrile or NAPL-resistant gloves will be worn when working in the areas with remaining contamination as detailed in the ISMP

6.1 Personal Protective Equipment

PPE Item	Environmental Monitoring	Excavation and Utility Work	Sample Collection
Hard Hat	✓	✓	✓
Steel Toed Safety Shoes	✓	✓	✓
Safety Glasses with Sideshields	✓	✓	✓
ANSI-approved Class II Traffic Vest	✓	✓	✓
Outer Nitrile Gloves with inner Latex liners			✓
Kevlar gloves			
Hearing Protection	✓	✓	✓

✓ Required PPE

6.2 Engineering Controls to Prevent Exposure to Contaminants of Concern

Engineering controls will be used by the Contractor to control dusts, vapors and odors both inside the structure and at the project site perimeter, if necessary. If the engineering controls are unsuccessful at controlling employee exposures within the structure to below the action limits defined in Section 5.1.1 and 5.1.2 of this HASP, then Level C respiratory protection will be required.

6.3 Respiratory Protection

Although not likely, respiratory protection as described below will be required if worker breathing zone PID concentrations are sustained above the action levels in the following table.

Task	Action Limit	Respiratory Protection	Level
All tasks involving potential exposure to contaminated soils and/or groundwater	5 ppm as Isobutylene for 5 minute 10 ppm as Isobutylene 50 ppm as isobutylene	Half or full face mask respirator with combination organic vapor/HEPA cartridges Full face respirator with organic vapor/HEPA cartridges **STOP WORK**	C C
All tasks involving potential exposure to contaminated soils and/or groundwater	0.5-10 ppm as Benzene on Draeger tube 10 ppm as Benzene on Draeger tube 50 ppm as Benzene on Draeger tube	Half or full face mask respirator with combination organic vapor/HEPA cartridges Full face respirator with organic vapor/HEPA cartridges **STOP WORK**	C C
All tasks with the potential to produce Dust	1.0 mg/m^3 particulates in air 1.5 mg/m^3 particulates in air	Half or full face mask respirator with combination organic vapor/HEPA cartridges **STOP WORK** and apply dust suppression techniques until levels have returned to ambient conditions	C C

Respiratory protection (half or full face mask respirator with combination organic vapor/HEPA cartridges) should also be donned if odors become objectionable at any time or if respiratory tract irritation is noticed.

All employees who are expected to don respiratory protection must have successfully passed a qualitative or quantitative fit-test within the past year for the brand, model and size respirator they plan to don.

If worn, respirators will be cleaned after each use with respirator wipe pads and will be stored in plastic bags after cleaning. Respirators will be thoroughly cleaned using disinfectant material within one week following any respirator use. Refer to the cleaning instructions provided with the respirator or specified by Appendix B-2 to the OSHA regulations at 29 CFR 1910.134.

6.4 Other Safety Equipment

The following is a list of additional safety items that may need to be available at the project site depending on the facility activity level, proximity to emergency assistance and other factors:

- Portable, hand-held eyewash bottles,
- First aid kit,
- Type A-B-C Fire extinguisher,
- Fire blanket,
- Emergency telephone and, if available, two-way radio on facility frequency,
- Emergency air horn,
- Drinking water, ice and cups,

- Caution tape or traffic cones,
- High visibility traffic vests (if working near vehicle traffic),
- Traffic cones or barricades,
- Flashlight/lantern, and
- Spill containment kit.

7.0 Site Control

To prevent both exposure of unprotected personnel and migration of contamination due to tracking by personnel or equipment, hazardous work areas will be clearly identified and decontamination procedures will be required for personnel and equipment leaving those areas.

7.1 Designation of Zones

AECOM designates work areas or zones as suggested in the "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities," NIOSH/OSHA/USCG/EPA, November 1985. They recommend that the areas surrounding each of the work areas to be divided into three zones:

- Exclusion or "Hot" Zone
- Contamination Reduction Zone
- Support Zone

7.1.1 Exclusion Zone

An exclusion zone will be established around the work area. The perimeter of the exclusion zone will be marked with caution tape, traffic cones or other identifier so that employees, visitors, and client or host employer personnel are aware of the work being conducted.

All AECOM and contractor personnel entering these work areas must wear the prescribed level of protective equipment.

7.1.2 Contamination Reduction Zone

A decontamination zone will be established adjacent to each work area. Personnel will remove contaminated gloves and other disposable items in this area and place them in a plastic bag until they can be properly disposed of.

7.1.3 Support Zone

At this site the support zone will include the area outside of the exclusion zone.

7.1.4 Site Access Control

The public will be restricted from the project site and monitoring well locations (during monitoring) by fences, barricade tape, traffic cones, and/or signs.

7.1.5 Parking and Staging Areas

Parking will be restricted to areas that have been cleared of tall grass and combustible material. Vehicles parked on the public streets will be marked with cones both in front of and behind the vehicle.

7.1.6 Pedestrian Walkways

Pathways within the work areas will be kept clear of obstructions. Public pathways will be clearly marked to provide access to the business onsite and protect the public from the hazards of the project.

7.2 General Site Safety Practices

The following measures are designed to augment the specific health and safety guidelines provided in this plan.

- The "buddy system" will be used at all times by all field personnel. No one is to perform field work alone. Standby team member must be intimately familiar with the procedures for initiating an emergency response. If an employee will be alone in a work area, they will develop a procedure to contact their Supervisor or PM on a regular schedule to confirm that the employee is safe. Subcontractors working on-site with AECOM employees can help fulfill the role of a Buddy while site activities are occurring.
- Eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited in the immediate work area and the decontamination zone. Water and Ice may be consumed in all areas to prevent heat stress but precautions must be taken to prevent contamination of the water and ice.
- Smoking is prohibited in all work areas. Matches and lighters are not allowed in these areas.
- Hands must be thoroughly washed upon leaving the work area and before eating, drinking or any other activities.
- Beards or other facial hair that interfere with respirator fit are prohibited.
- The use of alcohol or illicit drugs is prohibited during the conduct of field operations.
- All equipment must be decontaminated or properly discarded before leaving the site in accordance with the project work plan.
- Parking and pedestrian areas will be established and communicated to all workers.

8.0 Decontamination

8.1 Personal Decontamination

Proper decontamination is required of all personnel before leaving the site. Decontamination will occur within the contamination reduction zone.

Regardless of the type of decontamination system required, a container of potable water and liquid soap should be made available so employees can wash their hands and face before leaving the site for lunch or for the day.

8.2 PPE Decontamination

Disposable PPE, such as Tyvek coveralls, gloves, etc. will be removed in the decon zone and placed in garbage bags. Final disposal of contaminated PPE will be in accordance with the work plan.

If worn, respirators assigned to an individual will be cleaned after each use with respirator wipe pads and will be stored upright in plastic bags. Respirators will be thoroughly cleaned using disinfectant material within one week following any respirator use. Respirators that have the potential to be shared by employees within the workplace will be completely dismantled and thoroughly cleaned after each use. Refer to the cleaning instructions provided with the respirator or specified by Appendix B-2 to the OSHA regulations at 29 CFR 1910.134.

8.3 Equipment Decontamination

Equipment will be decontaminated prior to being moved to other locations. Decontamination procedures will be specified in the Field Sampling and Analysis Plan (FSAP).

9.0 Medical Monitoring and Training Requirements

Each worker subject to this HASP shall have copies of documentation that the requirements for training, medical surveillance, and respirator use are current. Copies of these documents shall be made available to any owner or their representative upon request.

9.1 Medical Monitoring

All personnel performing activities covered by this HASP must be active participants in a medical monitoring program that complies with 29 CFR 1910.120(f). Each individual must have completed an annual surveillance examination and/or an initial baseline examination within the last year prior to performing any work on the site covered by this HASP.

9.2 Health and Safety Training

9.2.1 HAZWOPER

All personnel performing activities covered by this HASP must have completed the appropriate training requirements specified in 29 CFR 1910.120 (e). Each individual must have completed an annual 8-hour refresher training course and/or initial 40-hour training course within the last year prior to performing any work on the sites covered by this HASP.

9.2.2 Pre-Entry Briefing/Tailgate Meetings

Prior to the commencement of daily project activities, a pre-entry briefing or tailgate meeting will be conducted by the SSO to review the specific requirements of this HASP, review and revise the JSA, discuss Incidents, Near Misses and lessons learned from the previous day's activities, and discuss site conditions that have changed since the previous day or trip to the site. Attendance at the daily tailgate meeting is mandatory for all personnel covered by this HASP at the site and must be documented on the attendance form provided in Attachment F. HASP sign-off sheets should also be collected at the time of the tailgate meetings. All documentation should be maintained in the project file.

The pre-entry briefing must be completed for each new employee before they begin work at the site. Short safety refresher meetings will be conducted, as needed, throughout the duration of the project.

10.0 Emergency Response

OSHA defines emergency response as any "response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual-aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result in an uncontrolled release of a hazardous substance." This section is written to comply with the requirements of 29 CFR 1910.38 (a).

The basic elements of an emergency evacuation plan include:

- employee training
- alarm systems
- escape routes
- escape procedures
- critical operations or equipment
- rescue and medical duty assignments
- designation of responsible parties
- emergency reporting procedures
- methods to account for all employees after evacuation

10.1 Spill Response

Employees are only authorized to respond to incidental spills and releases of hazardous substances. The following criteria must be met for a spill to be considered incidental with the employee having the ability to respond to the spill:

- Quantity of spilled material is minimal enough where additional, third party assistance is not needed to manage the spill
- Material is not immediately threatening to impact an open water way
- The conditions of the spill do not present a hazardous condition that is immediately dangerous to life and health (IDLH)
- The employee responding has:
  - received training on proper spill response techniques relative to the spilled material
  - full knowledge of what has been spilled and the proper clean up techniques to be used
  - the means to protect themselves against exposure to harmful conditions caused by the spill including the necessary PPE
  - the means to containerize and dispose of the spilled material properly

Employees may be equipped with the following materials, assembled into a spill response kit, to manage incidental workplace spills:

- Absorbent pads or media, i.e. speedy-dry, kitty litter
- Broom and dust pan to clean up spent granular spill control media or impacted earth

- Shovel to clean up impacted earth or create a dam or dyke to prevent the spill area from increasing
- Disposal drums and over-pack drums
- Appropriate waste identification labels
- Appropriate PPE

If a spill is not considered incidental, then additional assistance will be sought to aid in clean-up. The responding employee shall contact the Project Manager and provide initial notification of the release. The Project Manager will then notify the client representative and determine a suitable course of action. Chem-trec may be contacted to provide additional support in responding to a spill. Consideration will need to be given to whether or not the spill is deemed to be a reportable quantity (RQ) by the EPA, if the National Spill Response Center needs to be contacted due to surface water impact, and if local, state or federal agencies need to be contacted to provide information related to public health threats and environmental impact.

All spills must be reported to the AECOM PM and RSM, with the PM providing notification to the client representative, no matter how small the spill is. After initial response actions have been completed an incident investigation will be performed to determine the root causes of the incident and corrective actions, and lessons learned shall be shared to prevent future reoccurrence. Once the response is complete, the responding employee will also conduct an inventory of supplies used during the response effort and re-stock any used response equipment that could not be decontaminated and reused.

10.2 Employee Training

Employees must be instructed in the site-specific aspects of emergency evacuation. On-site refresher or update training is required anytime escape routes or procedures are modified or personnel assignments are changed.

10.3 Alarm System/Emergency Signals

An emergency communication system must be in effect at all sites. The simplest and most and effective emergency communication system in many situations will be direct verbal communications. Each site must be assessed at the time of initial site activity and periodically as the work progresses. Verbal communications must be supplemented anytime voices can not be clearly perceived above ambient noise levels (i.e., noise from heavy equipment; drilling rigs, backhoes, etc.) and anytime a clear line-of-sight can not be easily maintained amongst all AECOM personnel because of distance, terrain or other obstructions.

Verbal communications will be adequate to warn employees of hazards associated with the immediate work area. The property is occupied but AECOM may not have access to facility phones. Therefore, AECOM will bring a portable phone to the site to ensure that communications with local emergency responders is maintained, when necessary.

10.4 Escape Routes and Procedures

The escape route from the site and an emergency muster point will be determined and provided to all workers during the project mobilization.

Prior to mobilizing to a new project area, the Site Safety Officer or his designee will confirm that the escape routes are clear and lead to a safe area.

10.5 Employee Accounting Method

The SSO is responsible for identifying all AECOM personnel on-site at all times. AECOM and its subcontract employees will notify the SSO when they enter and leave the site. The SSO will account for all AECOM and its subcontract employees following an evacuation.

10.6 Injuries and Illnesses

The phone numbers of the police and fire departments, ambulance service, and local hospital are provided in the emergency reference sheet on page 1. This sheet will be posted in the site vehicle.

10.6.1 First Aid

Minor injuries will be treated on site using materials from the first aid kit or other local sources. All cuts and abrasions will be cleaned with potable water and a clean dressing applied. The injured employee will be evaluated at the end of the work day and the following day when the employee arrives at the project site to determine whether the wound has started the healing process. The wound will be protected from contamination during the project activities.

10.6.2 Professional Treatment

In the event an injury or illness requires more than first aid treatment, the SSO will accompany the injured person to the medical facility and will remain with the person until release or admittance is determined. The escort will relay all appropriate medical information to the on-site project manager and the RSM.

If the injured employee can be moved from the accident area, he or she will be brought to the CRZ where their PPE will be removed. If the person is suffering from a back or neck injury the person will not be moved and the requirements for decontamination do not apply. The SSO must familiarize the responding emergency personnel about the nature of the site and the injury. If the responder feels that the PPE can be cut away from the injured person's body, this will be done on-site. If this not feasible, decontamination will be performed after the injured person has been stabilized.

10.7 Designation of responsible parties

The SSO is responsible for initiating emergency response. In the event the SSO can not fulfill this duty, the alternate SSO will take charge.

10.8 Emergency Response Drills

A table-top run through of the evacuations procedures will be conducted the first day on the site and reviewed with all workers arriving on site after that date.

Emergency Response drills and subsequent personnel briefings on evacuation procedures will be documented in the safety briefing agenda or briefing notes.

10.9 Incident Reporting and Investigation

Any incident (other than minor first aid treatment) resulting in injury, illness or property damage requires an Incident investigation and report. The investigation should be conducted as soon as emergency conditions are under control. The purpose of the investigation is not to attribute blame but to determine the pertinent facts so that repeat or similar occurrences can be avoided. An Incident investigation form is presented in Attachment G of this HASP. The injured employee's supervisor, the Project Manager, and the RSM should be notified immediately of the injury.

If a subcontractor employee is injured, they are required to notify the SSO. Once the incident is under control, the subcontractor will submit a copy of their company's Incident investigation report to the SSO.

Attachment A

Health and Safety Plan Receipt and Acceptance Form

Health and Safety Plan Acceptance Form

Former Metropolitan Works MGP Site
Brooklyn, New York

I have reviewed a copy of the Health and Safety Plan prepared for the above-referenced site and activities. I have read and understood its contents and I agree that I will abide by its requirements.

Name: ______________________________

Signature: ______________________________

Date: ______________________________

Representing: ______________________________

Attachment B

EHS Field Forms

Blank Job Hazard Analysis Form

Job Hazard Analysis

JHA Type: ☐ Investigation ☐ O&M ☐Office ☒ Construction		☒ New ☐ Revised	Date:
Office: Client:	Loc:		
Work Type:	Work Activity:		
Personal Protective Equipment (PPE):			

Development Team	Position/Title	Reviewed By	Position/Title	Date

❶ Job Steps	❷ Potential Hazard	❸ Critical Actions

Health and Safety Plan Pre-Entry Briefing Attendance Form

Health and Safety Pre-Entry Briefing Attendance Form

Interim Site Management Plan
Former Metropolitan Works MGP Site
Brooklyn, New York

Conducted by:		**Date Performed:**	
List of Daily Activities/Tasks	1.		
	2.		
	3.		
	4.		
Topics Discussed:	1. Review of the content of the HASP (Required 1st day; applicable sections ongoing)		
	2.		
	3.		
	4.		

Printed Name	Signature	Representing

Drill Rig Inspection Form

Drill Rig Inspection Log

Project Name: ______________________ Project Number: ______________________

Date: ______________________ Subcontractor Inspected: ______________________

Site Manager: ______________________ ______________________

General Safety		
Safety Officer Designated for Job:	☐ Yes	☐ No
Name:		
Safety Meeting Performed (Daily)	☐ Yes	☐ No
Personal Protective Equipment (PPE)		
Hard Hats	☐ Yes	☐ No
Safety Glasses	☐ Yes	☐ No
Steel Toed Boots	☐ Yes	☐ No
Hearing Protection	☐ Yes	☐ No
Work Gloves	☐ Yes	☐ No
Orange Work Vests	☐ Yes	☐ No
Traffic Cones and Signs	☐ Yes	☐ No
Other	☐ Yes	☐ No
Disposal of PPE in Proper Waste Containers (if applicable)	☐ Yes	☐ No
Comments:		
Daily Inspections of Drill Rig:		
Structural Damage, Loose Bolts	☐ Yes	☐ No
Proper Tension in Chain Drives	☐ Yes	☐ No
Loose or Missing Guards, Fluid Leaks	☐ Yes	☐ No
Damaged Hoses and/or Damaged Pressure	☐ Yes	☐ No
Gages and Pressure Relief Valves	☐ Yes	☐ No
Comments:		

Check and test all safety devices such as:		
Emergency shutdown switches, at least daily	☐ Yes	☐ No
All gages and warning lights and ensure control levers are functioning properly	☐ Yes	☐ No
First Aid and fire extinguishers on drill rig	☐ Yes	☐ No
Back up alarm functioning properly	☐ Yes	☐ No
Comments:		

Drill Crew Training Requirements:		
40-hour OSHA Training	☐ Yes	☐ No
8-hour Annual Refresher Training	☐ Yes	☐ No
Drill Rig Training/Safe Operating Practices	☐ Yes	☐ No
First Aid/CPR	☐ Yes	☐ No
Emergency Procedures	☐ Yes	☐ No
Emergency Phone Numbers Posted	☐ Yes	☐ No
Site Orientation	☐ Yes	☐ No
Health and Safety Plan Review	☐ Yes	☐ No
Comments:		

Housekeeping:		
Suitable storage for tools, materials, and supplies	☐ Yes	☐ No
Pipes, drill rods, casing, and augers stacked on racks to prevent rolling and sliding	☐ Yes	☐ No
Platforms and other work areas free of debris materials and obstructions	☐ Yes	☐ No
Comments:		

Hand Tools:		
Tools in good condition	☐ Yes	☐ No
Broken tools discarded and replaced	☐ Yes	☐ No
Right tool used for the right job	☐ Yes	☐ No
Comments:		

Drilling Operations:		
Mast or derrick down when moving rig	☐ Yes	☐ No
Overhead obstructions identified before mast is raised	☐ Yes	☐ No
Drill rig stabilized using leveling jacks or solid cribbing	☐ Yes	☐ No
Secure and lock derrick	☐ Yes	☐ No
Comments:		

Overhead and Buried Utilities:		
Buried utilities identified and marked	☐ Yes	☐ No
Safe distance of drill rig from overhead power lines	☐ Yes	☐ No
Comments:		

Wire Line Hoists Wire Rope and Hardware:		
Inspection for broken wires where reduction in rope diameter, wire diameter, fatigue, corrosion, damage from gear jamming, crushing, bird caging, kinking	☐ Yes	☐ No
Inspect and lubricate parts daily	☐ Yes	☐ No
Comments:		

Auger Operations - What to look for:

- A system of responsibility between the operator and the tool handler when connecting and disconnecting auger sections and inserting and removing auger fork.
- During connecting and disconnecting auger sections and inserting auger for the tool, handler should position himself away from the auger column while it is rotating.
- When securing the auger to the power coupling, pin should be inserted and tapped into place using a hammer or other similar device.
- Tool hoist should be used to lower second section of auger into place.
- Both operators should be clear of auger as it is being lifted into place.
- Long-handled shovel should be used to move dirt away from auger.

Overall Summary:

Hot Work Permit Form

Hot Work Permit

Permit Valid
For 1 Work Day

Site Name: ________________________ **Project Number**:______________________
H&S Officer:________________________ **Client**:________________________

Hot Work Description:____
____
____

Workers/Welders Conducting Hot Work:____

Permits Must be Completed in its Entirety Before Hot Work Begins

	Yes	No
Has project supervisor been notified of intended Hot Work?		
Does client representative need to be notified of the intended Hot Work?		
Will Hot Work impact the general public, clients, or operation employees?		
Will the intended Hot Work need to be coordinated with other contractors who may be working on the site to make them aware of any hazards and the scope of work to be performed?		
Have hazardous energy sources been identified, isolated, and locked out – tagged out before the start of the project?		
Will Hot Work be conducted within a confined space?		
All testing equipment (i.e., CGI, oxygen meter, etc.) and firefighting equipment (i.e., extinguisher, etc.) have been checked to ensure proper operation and calibration before the start of this project?		
Has a fire watch been designated and on station?		
Have coatings on metal surfaces been tested for ignitability and flame spread?		
Has the area been cleared of all flammable materials?		
Have all fuel sources been identified and protected?		
Has the area been restricted with proper barriers and signs?		
Has the area been tested to be certain that atmosphere is 0% LEL before starting Hot Work?		
Have flame sensitive areas and equipment (including cylinders and gas delivery lines) exposed to slag and sparks been protected by flame resistant blankets or removed from the area?		
Have all equipment and hoses been protected from falling metal structures and debris?		

Have escape routes been identified before starting work?		
Is ventilation equipment needed? Type needed:		

The Following Protective Equipment Will be Required:

	Yes	No		Yes	No
Welding Goggles/Shield Tint			Supplied Air Respirator		
Safety Boots			Head Protection		
Leather gloves			Safety Harness		
Hearing Protection			Welding Leathers – Top		
APR Cartridge			Welding Leathers - Bottom		

Permit Valid for 1 Work Day

The following procedures will be applicable prior to Hot Work on tanks or other types of enclosed structures. (Check all that apply and fill in appropriate information)

- ☐ Ventilate to 0% LEL
- ☐ Confined Space Entry Permit
- ☐ Mechanical Ventilation Required
- ☐ Cold Cut Only Method Allowed:______________________________________
- ☐ Hot Cutting Permitted Method Allowed:__________________________________

Inert to <____________________________% Oxygen

Approvals:

____
Date

____
National Grid Representative

____
Site Safety Officer

____
Fire Watch

____
Performed Hot Work Employee

File Permit in Project Work File and Health and Department

Injury/Exposure Report

Supervisor's Report of Incident

1. Seek immediate medical attention if necessary.
2. Employee must report **all** incidents to their supervisor **immediately**.
3. Supervisor calls the Incident, Injury and Near Miss Reporting Line at **(800) 348-5046**.

Section 1 - Organization Information

Region: ☐West ☐ Midwest ☐ Southwest/Mountain ☐ Southeast ☐ Mid-Atlantic ☐ Northeast	District:	Section/Dept Number:
Business Line: ☐ Infrastructure-Water ☐ Infrastructure-Transportation ☐ Infrastructure-Energy & Power ☐ PDD-Facilities ☐ PDD-Design ☐ Environmental		Office Name:
Client Name:		Project Number:
Project Name:		

Section 2 - Type of Incident (SRI Sections to be Completed)

☐ Injury/ illness (Sections 3, 4, and 7)	☐ Vehicle Incident (Sections 3, 4, 5, and 7)	☐ Property Damage (Sections 3, 4, 6 and 7)	☐Environmental Spill/Release ☐ (Sections 3, 4, and 7)
☐ Regulatory Inspection or Notification: (Sections 3, 4,7)			☐ Other (describe)

Section 3 – Contact/Incident Information

Employee/Claimant Name:		Employee Job Title:	☐ Full-Time Employee ☐ Subcontractor/Subconsultant ☐ Temp Agency Employee ☐ Part-Time Employee ☐ Third Party Employee
Work Phone:	Cell Phone:	Home Phone:	Employee Number:
Date/Time of Incident:		Date/Time Reported to Supervisor:	
Street Address of Incident or approximately:		City:	State/Zip:
Body Part Injured:		Type of Treatment: Medical/hospital or doctor ☐ First Aid Only ☐	
Medical Facility Contact Info: (Name, Address, Phone)			

Section 4 - Descriptions of Incident *(employee, supervisor and witness statements)*

Employee Description of Incident: *(use additional paper if necessary)*	
Employee Signature:	**Date and Time:**

Supervisor Description of Incident: (*Supervisor signs in Section 7*) (*use additional paper if necessary*)

Witness Name :	Witness Address:	Witness Phone No.:
Witness Description of the Incident: (*use additional paper if necessary*)		
Witness Signature:		***Date and time:***

Section 5 - Vehicle Incident Information **(fill out for motor vehicle incidents only)**

5a - AECOM Driver Name:		Drivers License #:	State Issued:	Expiration Date:	
Vehicle Year:	Make:	Model:	Color:	License Plate:	State:
VIN Number:					
AECOM Vehicle was:	☐ AECOM Owned ☐ Leased	☐ Rented ☐ Personal Vehicle	**Who was involved?**	☐ AECOM Vehicle(Section 5a) ☐ Another Vehicle(Section 5b)	☐ Pedestrian ☐ Property
Use of Vehicle at Time of Incident: ☐ Office Visit ☐ Site Visit ☐ Client Meetings ☐ Field Work ☐ Personal ☐ Other__________			Vehicle Type: ☐ Commercial Motor Vehicle ☐ Non Commercial Motor Vehicle		

5b - Name of Other Driver:		Address:	City:	State/Zip:	
Work Phone:			Cell Phone:		
Date of Birth:	Drivers License #:		State Issued:	Expiration Date:	
Vehicle Year:	Make:	Model:	Color:	License Plate:	State:
VIN Number, Insurance Company Name, Insurance Policy Number:					

If *Vehicle Owner* is different from driver then complete owner's contact information	Owner Name:	
	Address, City, State, Zip:	
	Work Phone:	Cell Phone:
Authorities contacted? ☐ Yes ☐ No	If so, who responded?	
Citations Issued? ☐ Yes ☐ No	Type of Citation:	Person Cited:

Section 6 - General Liability (***Fill out for property damage only***)

Description of damaged property:	
Where can the property be seen?	
Property Owner Name:	
Address, City, State, Zip:	
Work Phone:	Cell Phone:

Section 7- Signatures

Supervisor

Print Name:	Signature:	Date:	Telephone:

Office/Location Manager

Print Name:	Signature:	Date:	Telephone:

Regional SH&E Manager

Print Name:	Signature:	Date:	Telephone:
Comments:			

Attention: This form must be completed and forward to the Regional SH&E Manager within one (1) business day following the occurrence of the incident.

Attachment C

Community Air Monitoring Plan

Environment

Prepared for:
National Grid
Brooklyn, New York

Submitted by:
AECOM
Manhattan, NY
March 2017

Community Air Monitoring Plan

Former Metropolitan Works MGP Site
Brooklyn, New York
NYSDEC Site No.: 224046
Order on Consent Index #: A2-0552-0606

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1.0 Introduction

This document provides the Community Air Monitoring Plan (CAMP) that will be implemented during any ground intrusive activities covered under the Interim Site Management Plan [(ISMP); AECOM, March 2017] for the Former Metropolitan Manufactured Gas Plant (MGP) Site (Site) located at 124 - 136 2nd Avenue in Brooklyn, New York. The Site was the former location of a MGP that was operated by Brooklyn Union Gas Company (BUG), a predecessor company to National Grid from the late 1880s until approximately 1938. This CAMP has been prepared by AECOM Environment (AECOM) on behalf of National Grid to present the methods and procedures that will be used to evaluate air quality in the immediate vicinity of intrusive activities and provide protection to potential off-site receptors.

The ISMP Site Area within the Site includes all or portion of Block 1007, Lot 172 and 269 and Block 1025, Lots 10, 16, 18, 20, and 100, and a portion of Hamilton Place between 12th Street and 13th Street on the King's County Tax Map . The ISMP Site Area is an approximate 4.2-acre area and is bounded by the 11th Street basin, former 11th Street, and Lowes parking lot to the north, portion of a vacant parking lot and 13th Street to the south, commercial businesses and Lowes to the east, and the Gowanus Canal to the west. The owner(s) of the parcels within the ISMP Site Area at the time of issuance of this ISMP are Team Slope LLC and the City of New York for the ROWs (Hamilton Place).

The objectives of this CAMP are to:

- Ensure that the airborne concentrations of constituents of concern (COC) are minimized to protect human health and the environment.
- Provide an early warning system so that potential emissions can be controlled on Site at the source.
- Measure and document the concentrations of airborne COC to confirm compliance with regulatory limits.

The community air monitoring will be performed around the Site perimeter, and will measure the concentrations of organic vapors and dust during all ground-intrusive activities (excavation, utility work, test pitting, soil boring, and well installations).

This CAMP is Attachment C of the site-specific Health and Safety Plan (HASP). The HASP is Appendix E of the ISMP and is directed primarily toward protection of on-site workers within the designated work zones.

2.0 Constituents of Concern and Action Levels

The Site is known to have soil and groundwater impacts dating from the Site's historical use as MGP. As such, the constituents of concern are volatile and semi-volatile organic compounds (VOCs and SVOCs). The primary VOCs of concern are benzene, ethylbenzene, toluene, and xylene (BTEX compounds). VOCs are more volatile than SVOCs and are generally of greater concern when monitoring the air quality during subsurface activities.

Airborne dust is also a concern and must be monitored and controlled due to its ability to co-transport adsorbed constituents and because of its nuisance properties.

Odors, though not necessarily indicative of high constituent concentrations, could create a nuisance (especially when working within or in close proximity to existing buildings and building entrances) and will be monitored and controlled to the extent practicable.

State and federal regulatory agencies have provided action levels for many of these constituents. The action levels are the allowable airborne concentrations above which respiratory protection or other health and safety controls are required. For work at the Site, the following levels should not be exceeded for more than 15 consecutive minutes at the downwind perimeter of the Site:

- Benzene 1 part per million (ppm)
- Total VOCs 5 ppm
- Dust 100 micrograms per cubic meter ($\mu g/m^3$)

The action levels cited here are above (in addition to) the background ambient (upwind) concentration.

3.0 Air Monitoring Equipment and Methods

Air quality monitoring will be performed for total VOCs, benzene, and dust as outlined below.

Two perimeter locations will be established each day and an air monitoring technician will check the instrumentation at each of these locations frequently during the work. Typically there will be monitoring locations at one upwind site perimeter location and one downwind perimeter location. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. Field personnel will be prepared to monitor multiple locations in the event that there is little wind or if the wind direction changes frequently.

The monitoring instruments will be calibrated at the start of each workday, and again during the day if the performance of an instrument is in question.

3.1 Volatile Organic Compounds and Benzene Monitoring

3.1.1 Ambient Air Monitoring

VOC monitoring will be performed using three field photoionization detectors (PIDs) (RAE Systems MiniRAE or equivalent). The monitoring instruments will be checked by a technician every 15 minutes, and the real-time measurements recorded. The PIDs will be equipped with an audible alarm to indicate exceedance of the action level.

A 15-minute running average concentrations will be calculated, which can then be compared to the action levels. If real-time measurements of total VOCs indicate that the action level is exceeded, the benzene concentration will also be determined at that location using benzene-specific colorimetric tubes. The data will be downloaded at the end of each day, and monitoring records will be kept at the Site during the work in case there is an inquiry or complaint.

PID measurements will be made at one upwind and one downwind location around the work area. The locations of the instruments may be changed during the day to adapt to changing wind directions.

3.2 Particulate (dust) Monitoring

Particulate (dust) monitoring will be performed during intrusive activities (i.e., excavation, drilling) at the Site. Two particulate monitors (TSI DustTrak or equivalent) will be used for continuous real-time dust monitoring. The monitoring instruments will be checked by a technician every 15 minutes, and the real-time measurements recorded. A 15-minute average concentration will be determined. The data will be downloaded at the end of each day, and monitoring records will be kept at the site during the work in case there is an inquiry or complaint.

Measurements will be made at one upwind and one downwind location around the work area. The locations of the instruments may be changed during the day to adapt to changing wind directions. In addition, fugitive dust migration will be visually assessed during all Site activities, and the observations will be recorded.

4.0 Emission Control Plan

4.1 Ambient Air

Odor, vapor, and dust control will be required for this project due to the close proximity of commercial buildings and public roadways and sidewalks. Figure 4-1 provides a response chart for the monitoring and control of vapor emissions. Table 4-1 provides a list of emergency contacts.

- If the ambient air concentration of total VOC levels at the downwind perimeter of the work area or exclusion zone exceeds 5 ppm (or the benzene level exceeds 1 ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor levels readily decreases (per instantaneous readings) below 5 ppm (and the benzene level drops below 1 ppm) over background, work activities can resume with continued monitoring.
- If total VOC levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm (or the benzene level persists over 1 ppm) over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions until the concentrations drop below the action levels, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

Site perimeter particulate concentrations will also be monitored continuously. In addition, dust migration will be visually assessed during all work activities.

- If the downwind particulate level is 100 $\mu g/m^3$ greater than the background (upwind perimeter) level for a 15-minute period, or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work may continue with dust suppression techniques provided that downwind particulate levels do not exceed 150 $\mu g/m^3$ above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind particulate levels are greater than 150 $\mu g/m^3$ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind particulate concentration to within 150 $\mu g/m^3$ of the upwind level and in preventing visible dust migration.

Typical emission control measures may include:

- Apply water for dust suppression;
- Relocate operations, if applicable; and
- Reassess the existing control measures.

Figure 4-1 Vapor Emission Response Chart

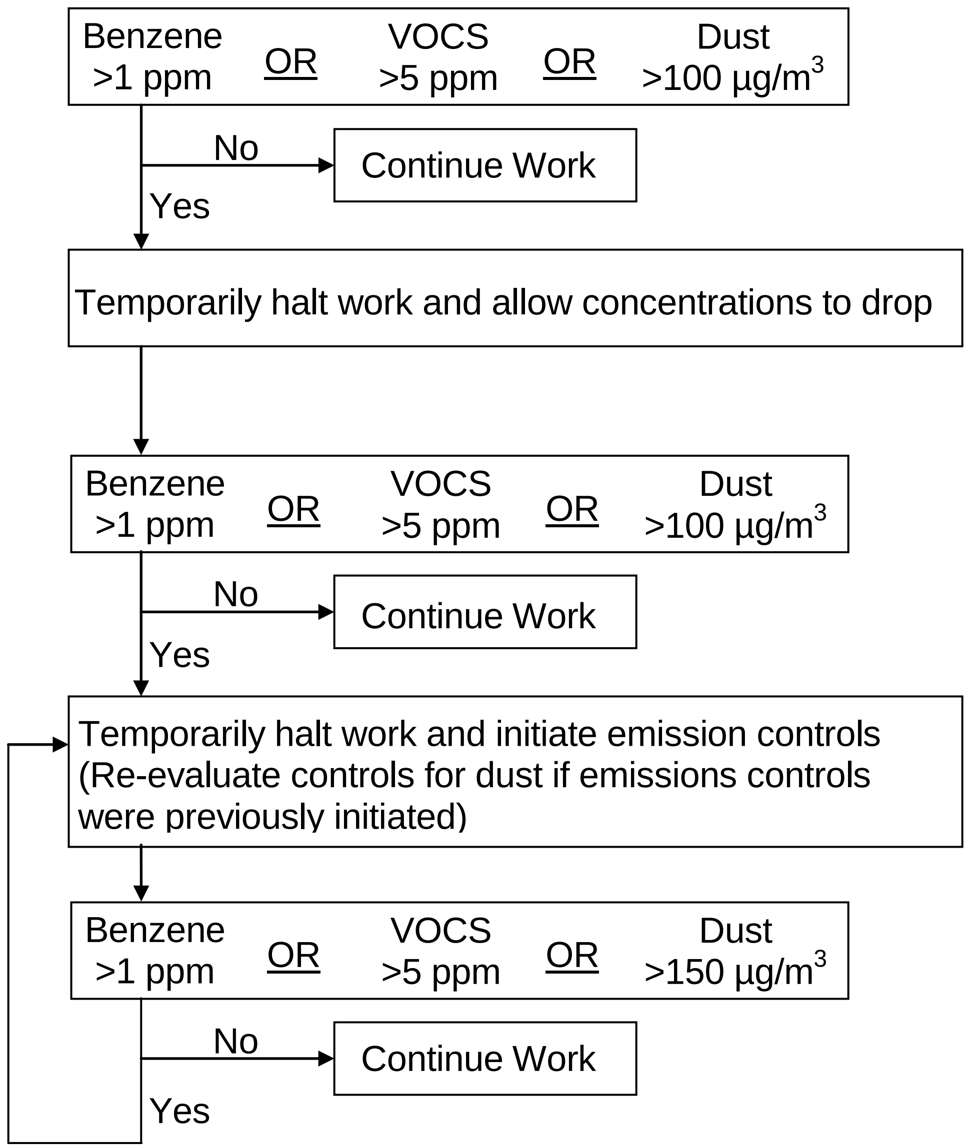

Table 4-1 Emergency Contacts and Telephone Numbers

Fire:	911	
Police:	911	
Ambulance:	911	
AECOM Environment Contacts	Pete Cox	(978) 764-4257 cell
National Grid Contacts	Brian Bermingham	(718) 608-5102 office

5.0 Odor Control Procedures

This section outlines the procedures to be used to control odors that may be generated during the ground intrusive activities. The intrusive activities at the Site may generate odors: excavation, test pitting, drilling, utility work, and subsurface soil borings/monitoring well installations. The remainder of this section is intended to provide Site managers, representatives of NYSDEC and New York State Department of Health (NYSDOH), and the public with information summarizing typical odor control options, and to provide some guidance for their implementation. A description of potential sources of odors and methods to be used for odor control is presented in the following sections.

5.1 Potential Sources of Odors

Generally, the residuals encountered at MGP sites are well defined. They are related to nonaqeous phase liquids (NAPL), and principally contain VOCs, polynuclear aromatic hydrocarbons (PAHs), and a number of inorganic constituents, including metals. Constituents indicative of MGP-related residuals or petroleum products can produce odor emissions during investigation activities when they are unearthed in soil borings/well installations or during excavation or utility work. When this occurs, VOCs and light-end SVOCs can volatilize into the ambient air. Some MGP-related residuals can cause distinctive odors that are similar to mothballs, roofing tar, or asphalt driveway sealer. However, the constituent concentrations generally associated with these odors are typically significantly less than levels that might pose a potential health risk. It is important to note that the CAMP will provide for continual monitoring of VOCs and dust during the fieldwork to monitor for any potential release of constituents which may pose a threat to health.

5.2 Odor Monitoring

The field investigation personnel will record observations of odors generated during the implementation of the subsurface work. When odors attributable to the uncovering of impacted media are generated in the work area during intrusive activities such as excavation or soil borings, observations will also be made at the down-wind limit of the Site, in order to assess the potential for off-site odors. The down-wind odor monitoring will be performed in conjunction with the vapor and dust monitoring program described in this CAMP.

Upon detection of odors at the Site perimeter, Site controls, starting in the work area, will be implemented. The Site controls described in the following sections will be used to assist with odor mitigation to minimize, and to prevent where practicable, the off-site migration of odors. Due to the short distances between any work area at the Site and the property line or nearby potential receptors, Site controls will be implemented proactively when odors are detected in the breathing zone at any work area.

5.3 General Site Controls

Several general excavation or drilling procedure Site controls that will be implemented include:

- Every effort will be made to minimize the amount of time that impacted material is exposed to ambient air at the Site.
- For excavations, it may be possible to move some amount of soil around within the footprint of the excavation in order to minimize the amount of soil removal and subsequent stockpiling of

impacted soil at the ground surface. The use of in-excavation stockpiling of excavated soil will be evaluated on a case-by-case basis, and will only be performed with the approval of the NYSDEC field representative, and will be completed only if it does not impede the collection of subsurface soils or the full delineation of the subsurface features being investigated.

- Drill cuttings from the soil borings will be containerized as soon as possible during completion of each soil boring.
- Loading of excavated debris or soil that has been found by the Site manager to be unsuitable material to return to excavation may generate odors. Every effort will be made to complete this work as quickly as possible and to keep these materials covered at all times.
- Meteorological conditions are also a factor in the generation and migration of odors. Some Site activities may be limited to times when specific meteorological conditions prevail, such as when winds are blowing away from a specific receptor.

5.4 Secondary Site Controls

If substantial odors still present an issue following implementation of the above procedures, secondary controls will be enacted. The field representative should work through the applicable list of secondary controls until the perimeter odor issues are resolved. The field representative should work closely with National Grid and NYSDEC during this task, if present. Final selection of controls will be dependent on field conditions encountered. Secondary controls include the following:

- For stockpiled impacted soil, temporary tarps or polyethylene covers will be used to control odors.
- The placement of portable barriers close to small active source areas (excavations) can elevate the discharge point of emissions to facilitate dispersion and minimize the effect on downwind receptors. The barriers can be constructed using materials such as plastic “Jersey barriers”, or fence poles and visual barrier fabric/plastic. The barriers are placed as temporary two or three-sided structures around active excavation or other intrusive areas, oriented such that the barriers are placed on the upwind and downwind sides of the source. If only one side of the source can be accessed, then the barrier should be placed on the downwind side.
- Two agents that can be sprayed over impacted soil have been determined to be effective in controlling emissions. They include odor suppressant solution (BioSolve™), and hydro-mulch. These agents may be used where tarps cannot be effectively deployed over the source material, or where tarps are ineffective in controlling odors:
  - BioSolve™ can provide immediate, localized control of odor emissions. Information regarding the preparation and use of BioSolve™ is provided in Appendix A.
  - Hydromulch - Although it is unlikely that it will be necessary, a modified hydromulch slurry may be used to cover inactive sources for extended periods of time (up to several days). The hydromulch, typically cellulose fibers (HydroSealR) is modified by mixing a tackifier (glue) with the mulch and water to form a slurry. It is applied using a standard hydroseed applicator to a thickness of ¼ inch. The material forms a sticky, cohesive, and somewhat flexible cover. Reapplication may be necessary if the applied layer becomes desiccated or begins to crack.

5.5 Record Keeping and Communication

Similar to readings recorded during the monitoring specified in the CAMP, all odor monitoring results will be recorded in the field log book or other air monitoring forms, and be available for review by the agencies upon request.

The field representative, in consultation with National Grid, will also provide information on odor monitoring and odor management to residents of the neighborhood should they inquire. In the event that odors persist after these efforts, work will be temporarily discontinued until a mutually agreeable solution with National Grid, NYSDEC, and NYSDOH staff can be worked out which allows the work to be completed while minimizing the off-site transport of nuisance odors.

6.0 Documentation and Reporting

Data generated during perimeter air monitoring will be recorded in field logs and summarized daily in spreadsheets. The electronic measurements from the PIDs and dust meters will be downloaded each day, reviewed, and archived. Exceedances of the action levels, if any, and the actions to be taken to mitigate the situations, will be discussed immediately with the on-site representatives. Summaries of all air monitoring data will be provided to NYSDEC and NYSDOH in electronic format, as requested.

Appendix A

Vapor Suppression Information

BioSolve®
Hydrocarbon Mitigation Technology

...Is Making A Difference!

VAPOR SUPPRESSION / ODOR CONTROL

BioSolve® offers a relatively simple and cost effective method of suppressing Odors and VOC release from soils, during excavation, loading, stockpiling, etc. The following guidelines will apply to the most common situations encountered on site.

In most cases a 3% BSW solution (1 part **BioSolve®** concentrate to 33 parts water) will be adequate to keep vapor emissions within acceptable limits and control fugitive odor problems on contact. Although, some sites may only require a 2% solution, up to a 6% solution may be recommended on sites with elevated levels or particularly difficult/ mixed stream contaminants are present.

The **BioSolve®** solution should be applied evenly to the soil surface in sufficient quantity to saturate the surface area. As a general rule, use 1-3 litres of **BioSolve®** solution to 1 square metre of surface area. (1 gallon of **BioSolve®** per solution will cover approximately 4-sq. yd. of soil surface area) **BioSolve®** is a water-based surfactant that will apply like water.

BioSolve®, in its concentrated form, is a viscous liquid material that must be diluted with water. A fluorescent red tracing dye is present in the formula allowing **BioSolve®** to be detected during application. Once diluted, **BioSolve®** can be applied with virtually any equipment that can spray water. **BioSolve®** will not harm equipment or clog pipes. For large sites, applicators such as water truck, portable agricultural sprayers, foam inductors & pressure sprayers can be used. For smaller jobs, garden sprayers, water extinguishers or a garden hose with a fertiliser attachment on the nozzle can be used effectively. This characteristic makes **BioSolve®** very adaptable and much most convenient to use in almost any situation. **BioSolve®** is equally effective when used with all types of water (soft, hard, salt or potable).

On stockpiled soil or other soil that will be left undisturbed, a single application of **BioSolve®** to the exposed surfaces may last up to 10 to 14 days or more (depending on environmental conditions). **BioSolve®,** when applied, will form a "cap" of clean soil. If the soil is not disturbed, via weather, movement, etc. this "cap" will remain functional. During excavation, loading or other movement of the soil, it may be required to spray an additional amount of **BioSolve®** to the freshly exposed surface area to keep emissions at an acceptable level.

In case of an extremely high level of emissions, or if the soil is heavily contaminated, it may be necessary to increase the strength of the **BioSolve®** solution or apply more solution per square metre to reduce emissions adequately. It is important that the site be monitored regularly and that the **BioSolve®** solution be reapplied if and when necessary to insure that VOC emissions and odors remain under control.

BioSolve® is packaged and readily available in 55 gallon (208 liter) drums, 5 gallon (19 liter) pails and in 4X1 gallon (3.8 liter X 4) cases. Contact The Westford Chemical Corporation® Toll Free @ 1-800-225-3909, via e-mail at info@biosolve.com or your Local BioSolve distributor for pricing.

BioSolve® ***should only be used in accordance with all regulatory rules and regulations.***

This material is made available or use by professionals or persons having technical skill to be used at the own discretion and risk. These protocols are guidelines only and may need to be modified to site specific conditions. Nothing included herein is a warrantee or to be taken as a license to use **BioSolve** without the proper permits, approvals, etc. of the appropriate regulatory agencies, nor are the protocols provided as instructions for any specific application of **BioSolve**.

SOIL VAPOR SUPPRESSION UTILIZING BIOSOLVE

BioSolve is being utilized by numerous environmental consultants, response contractors, and fire departments to suppress VOC's & LEL's as well as problem odors. BioSolve encapsulates the source of the vapor rather than temporarily blanketing it like a foam or other physical barrier. Vapor reduction is so fast and effective that BioSolve is used to comply with the tough emission standards regulated by each State.

BioSolve offers a relatively simple and cost effective method of suppressing VOC vapor release from soils during excavation, loading, stockpiling… The following guidelines will apply to the most common situations encountered on site.

In most cases a 3% solution of BioSolve will be adequate to keep vapor emissions within acceptable limits. Dilute BioSolve concentrate with water at a ratio of 1 part BioSolve to 33 parts water to make a 3% solution.

The BioSolve solution should be applied evenly to the soil surface in sufficient quantity to dampen the surface well, (as a general rule, 1 gallon of BioSolve solution will cover approximately 4 sq. yd. of soil surface area). BioSolve is not a foam, it is a surfactant based product that will apply like water. The solution may be applied with a hand sprayer, high pressure power sprayer, water truck, etc., whichever method best suits the site and/or conditions.

NOTE: In the case of extremely high emission levels and/or very porous soil it may be necessary to increase the strength of the BioSolve solution (6%) or apply more per sq. yd. to reduce emissions adequately. On stockpiled soil or other soil that will be undisturbed, a single application of BioSolve to the exposed surfaces may last 10-14 days or more. During excavation, loading, or other movement of soil it may be necessary or required to spray each freshly exposed surface to keep emissions below acceptable levels.It is important that the site be monitored regularly and the BioSolve solution be reapplied if/when necessary to insure that vapor emissions remain at or below acceptable standards.

MATERIAL SAFETY DATA SHEET

THE WESTFORD CHEMICAL CORPORATION®
P.O. Box 798
Westford, Massachusetts 01886 USA

Ref. No.: 2001
Date: 1/1/2002

Phone: (978) 392-0689
Phone: (508) 878-5895
Emergency Phone-24 Hours: 1-800-225-3909

Fax: (978) 692-3487
Web Site: http://www.BioSolve.com
E-Mail: info@BioSolve.com

SECTION I - IDENTITY

Name:	**BioSolve®**
CAS #:	138757-63-8
Formula:	Proprietary
Chemical Family:	Water Based, Biodegradable, Wetting Agents & Surfactants
HMIS Code:	Health 1, Fire 0, Reactivity 0
HMIS Key:	4 = Extreme, 3 = High, 2 = Moderate, 1 = Slight, 0 = Insignificant

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SECTION II - HAZARDOUS INGREDIENTS

Massachusetts Right to Know Law or 29 C.F.R. (Code of Federal Regulations) 1910.1000 require listing of hazardous ingredients.

This product does not contain any hazardous ingredients as defined by CERCLA, Massachusetts Right to Know Law and California's Prop. 65.

SECTION III - PHYSICAL - CHEMICAL CHARACTERISTICS

Boiling Point	: 265°F	Specific Gravity	: 1.00 +/-.01
Melting Point	: 32°F	Vapor Pressure mm/Hg	: Not Applicable
Surface Tension- 6% Solution	: 29.1 Dyne/cm at 25°C	Vapor Density Air = 1	: Not Applicable
Reactivity with Water	: No	Viscosity - Concentrate	: 490 Centipoise
Evaporation Rate	: >1 as compared to Water	Viscosity - 6% Solution	: 15 Centipoise
Appearance	: Clear Liquid unless Dyed	Solubility in Water	: Complete
Odor	: Pleasant Fragrance	pH	: 9.1+/-.3
Pounds per Gallon	: 8.38		

SECTION IV - FIRE AND EXPLOSION DATA

Special Fire Fighting Procedures	: None	Flammable Limit	: None
Unusual Fire and Explosion Hazards	: None	Auto Ignite Temperature	: None
Solvent for Clean-Up	: Water	Fire Extinguisher Media	: Not Applicable
Flash Point	: None		

SECTION V - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be taken in Handling and Storage: Use good normal hygiene.
Precautions to be taken in case of Spill or Leak -

Small spills, in an undiluted form, contain. Soak up with absorbent materials.
Large spills, in an undiluted form, dike and contain. Remove with vacuum truck or pump to storage/salvage vessel. Soak up residue with absorbent materials.

Waste Disposal Procedures -

Dispose in an approved disposal area or in a manner which complies with all local, state, and federal regulations.

SECTION VI - HEALTH HAZARDS

Threshold Limit Values: Not applicable
Signs and Symptoms of Over Exposure-

Acute : Moderate eye irritation. Skin: Causes redness, edema, drying of skin.
Chronic: Pre-existing skin and eye disorders may be aggravated by contact with this product.

Medical Conditions Generally Aggravated by Exposure: Unknown
Carcinogen: No
Emergency First Aid Procedures -

Eyes: Flush thoroughly with water for 15 minutes. Get medical attention.
Skin: Remove contaminated clothing. Wash exposed areas with soap and water. Wash clothing before reuse. Get medical attention if irritation develops.
Ingestion: Get medical attention.
Inhalation: None considered necessary.

SECTION VII - SPECIAL PROTECTION INFORMATION

Respiratory Protection	: Not necessary	Local Exhaust Required	: No
Ventilation Required	: Normal	Protective Clothing	: Gloves, safety glasses Wash clothing before reuse.

SECTION VIII - PHYSICAL HAZARDS

Stability	: Stable	Incompatible Substances	: None Known
Polymerization	: No	Hazardous Decomposition Products	: None Known

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SECTION IX - TRANSPORT & STORAGE

DOT Class	: Not Regulated/Non Hazardous		
Freeze Temperature	: 28°F	Storage	: 35°F-120°F
Freeze Harm	: None (thaw & stir)	Shelf Life	: Unlimited Unopened

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SECTION X - REGULATORY INFORMATION

The Information on this Material Safety Data Sheet reflects the latest information and data that we have on hazards, properties, and handling of this product under the recommended conditions of use. Any use of this product or method of application, which is not described on the Product label or in this Material Safety Data Sheet, is the sole responsibility of the user. This Material Safety Data Sheet was prepared to comply with the OSHA Hazardous Communication Regulation and Massachusetts Right to Know Law.

Attachment D

Site Safety Data Sheets

.....Alconox

SPI Supplies Division
Structure Probe, Inc.
P.O. Box 656 West Chester, PA 19381-0656 USA
Phone: *1-(610)-436-5400* ***Fax:*** *1-(610)-436-5755*
E-mail: *spi3spi@2spi.com*
WWW: http://www.2spi.com
Manufacturer's CAGE: 1P573

Material Safety Data Sheet

SPI #01200-AB and #01200A-AB Alconox® Powdered Detergent

Section 1: Identification

Date Effective........... November 14, 2005 (most recent revision)

Chemical Name/Synonyms... On Label: Alconox®

Chemical Family.......... Anionic powdered detergent

Emergencies
Contacting CHEMTREC:

24 Hour Emergency Use Only #'s...
Worldwide phone: 1-(703)-527-3887
Worldwide FAX: 1-(703)-741-6090
Toll-free phone: 1-(800)-424-9300 USA only

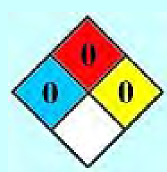
Product or Trade Name.... SPI #01200-AB and #01200A-AB Alconox® Powdered Detergent

CAS #. Not applicable

Chemical Formula......... Not applicable

Section 2 Composition Component Name CAS # OSHA OSHA ACGIH ACGIH

No hazardous ingredients in Alconox Powdered Detergent as defined by the OSHA Standard and Hazardous Substance List 29 CFR 1910 Subpart Z.

Hazardous Material Information System USA	**Health**	**0**	**National Fire Protection Association USA**	
	Fire Hazard	**0**		
	Reactivity	**0**		

	Personal Protection			

NFPA (National Fire Protection Association) Rating (Scale 0-4):
HEALTH=0 FLAMMABILITY=0 REACTIVITY=0 OTHER=0 Not known

Section 3: Hazard Identification

Routes of entry
Inhalation? Yes
Skin? No
Ingestion? Yes

Health Hazards (Acute and chronic):
Inhalation of powder may prove locally irritating to mucous membranes.
Ingestion may cause discomfort and/or diarrhea. Eye contact may prove irritating.

Carcinogenicity:
NTP? No
IARC Monographs? No
OSHA Regulated? No

Section 4: First Aid Measures

Signs and Symptoms of Exposure:
Exposure may irritate mucous membranes. May cause sneezing.

Medical conditions generally aggravated by exposure: Not established. Unnecessary exposure to this product or any industrial chemical should be avoided.

Respiratory conditions may be aggravated by powder if air borne.

Emergency and First Aid Procedures:

Eyes: Immediately flush eyes with copious amounts of water for minimum 15 minutes. Call physician.

Skin: Flush with plenty of water.

Ingestion: Drink large quantities of water or milk. Do not induce vomiting. If vomiting occurs re-administer fluids. See a physician for discomfort.

Section 5: Fire Fighting Measures

NFPA Rating: Not known

Extinguishing Media
Suitable/Not suitable:

SMALL FIRE: Use DRY chemical powder, water, foam, carbon dioxide

LARGE FIRE: Use extinguishing media suitable for the surrounding materials.

Special firefighting procedures:
Self-contained positive pressure breathing apparatus and protective clothing should be worn when fighting fires involving chemicals.

Unusual Fire/Explosion Hazards: None

Hazardous thermal decomposition products: None known.

Protection of fire fighters: No special measures are required.

Flammable Limits:
LEL: No data
UEL: No data

Section 6: Accidental Release Measures

Personal precautions: No special precautions

Environmental Precautions and Clean Up Methods:
Material foams profusely. Recover as much as possible and flush remainder to sewer. Material is biodegradable.

Section 7: Handling and Storage

Material should be stored in a dry area to prevent caking.

Section 8: Exposure Controls and Personal Protection

Engineering controls: Normal ventilation is normally required when handling or using this product. Avoid conditions that could produce dusting.

Personal Protective Equipment

Respiratory system: Dust mask recommended but not required.

Skin and body: Laboratory coat recommended but not required.

Hands: Impervious gloves recommended

Eyes: Goggles are recommended, especially when handling solutions irrespective of what they might be.

Other: Wash hands before eating, drinking, or smoking.

Section 9: Physical and Chemical Properties

Physical State and Appearance: White powder interspersed with cream colored flakes.

Odor: None

Boiling Point: Not applicable

Melting Point: Not applicable

Density (water = 1): Not applicable

Solubility: Appreciable, to 10% at ambient conditions.

Octanol/water partition coefficient: Not available

pH: Not known

Flash Point: None

Flammability: Non-flammable

Autoignition temperature: Not applicable

Section 10: Stability and Reactivity

Chemical Stability: The product is stable

Hazardous polymerization: Will not occur

Conditions to Avoid: None

Hazardous Products of Deposition: May release CO_2 on burning.

Reactions with Air and Water:
Does not react with air, water or other common materials.

Section 11: Toxicological Information

Summary: Not considered to be toxic to humans or animals.

Skin Effects: Can be locally irritating

Eye Irritation: Can be irritating to the eyes

Inhalation: Dust can be irritating to mucous membranes

Sensitization: Not known

Chronic toxicity: There is no known effect from the chronic exposure to this product.

Section 12: Ecological Information

Exotoxicity: Not know but it is expected to be low because the material is biodegradable.

Environmental Fate: It is biodegradable.

Bioaccumulation: Not expected to occur (because the material is biodegradable).

Section 13: Disposal Considerations

This material is NOT classified as a hazardous material by RCRA. Use only licensed transporters and permitted disposal facilities and conform to all laws.

Recycle to process, if possible.

Germany water class: VCI WGK: No products were found.

Methods of disposal; waste of residues; contaminated packaging:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

Proper Shipping Name: Non-Regulated, No dangerous cargo

DOT Hazard Class: Non-Regulated, No dangerous cargo

UN/NA ID: Non-Regulated, No dangerous cargo

Packing Group: Not Applicable

Labels: Not Regulated

Marine Pollutant: No

NAER Guidebook: Not Regulated

DOT Status: Not Regulated

Land-Road/Railway:
ADR/RID Class: No dangerous cargo

Sea:
IMDG Class: No dangerous cargo

Air:

IATA-DGR Class: No dangerous cargo

Section 15: Regulatory Information

TSCA: All components of this product are listed on the TSCA 8(b) inventory. If identified components of this product are listed under the TSCA 12(b) Export Notification Rule, they will be listed below.

TSCA 12(b) Component Listed under TSCA Section

SARA Title 3: Section 313 Information/Emissions Reporting (**40 CFR 372**):

Component Reporting Threshold

SARA-Section 311/312:

No components present in this product are subject to the reporting requirements of this statute.

CERCLA Hazardous Substances and their Reportable Quantities:

Component Reportable Quantity

EU Regulations: Risk Phrases: This product is not classified according to the EU regulations.

Safety Phrases: Not applicable

Contains: Not applicable

California Prop. 65:

Proposition 65 requires manufacturers or distributors of consumer products into the State of California to provide a warning statement if the product contains ingredients for which the State has found to cause cancer, birth defects or other reproductive harm. If this product contains an ingredient listed by the State of California to cause cancer or reproductive toxicity, it will be listed below:

None found

Section 16: Other Information

Disclaimer of Liability:

Caution! Do not use SPI Supplies products or materials in applications involving implantation within the body; direct or indirect contact with the blood pathway; contact with bone, tissue, tissue fluid, or blood; or prolonged contact with mucous membranes. Products offered by SPI Supplies are not designed or manufactured for use in implantation in the human body or in contact with internal body fluids or tissues. SPI Supplies will not provide to customers making devices for such applications any notice, certification, or information necessary for such medical device use required by US FDA (Food and Drug Administration) regulation or any other statute. SPI Supplies and Structure Probe, Inc. make no representation, promise, express warranty or implied warranty concerning the suitability of these materials for use in implantation in the human body or in contact with internal body tissues of fluids.
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The information and recommendations set forth above are taken from sources believed to be accurate as of the date hereof, however SPI Supplies and Structure Probe, Inc. make no warranty with respect to the accuracy of the information or the suitability of the recommendations, and assume no liability to any user thereof. The information contained in this sheet does not constitute a hazard assessment and should not be used in place of the user's own assessment of work place risks as required by other health and safety legislation. Be aware of the Structure Probe, Inc. Copyright Policy. Structure Probe, Inc. grants a nonexclusive license to make unlimited copies of this safety sheet for internal use only. Quite obviously, this information would pertain only to this material when purchased from SPI Supplies as product from other sources, with other ingredients and impurity levels could have substantially different properties.

Thursday February 22, 2007

Worldwide Distributors, Representatives, and Agents

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: **NON-FLAMMABLE GAS MIXTURE**

- Document Number: 002103

PRODUCT USE: For general analytical/synthetic chemical uses.
SUPPLIER/MANUFACTURER'S NAME: AIRGAS INC.
ADDRESS: 259 North Radnor-Chester Road, Suite 100
Radnor, PA 19087-5283
BUSINESS PHONE: 1-610-687-5253
EMERGENCY PHONE: 1-800-949-7937
International: 1-423-479-0293
DATE OF PREPARATION: April 22, 2001

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA		NIOSH	OTHER
			TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	ppm
Isobutylene	115-11-7	1 ppm - 1.7%	There are no specific exposure limits for Isobutylene. Isobutylene is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					
Air	25635-88-5	Balance	There are no specific exposure limits applicable to Air.					
Air is a mixture of gases. The primary components of air, and the approximate concentration of each component, are listed below								
Nitrogen	7727-37-9	79%	There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					
Oxygen	7782-44-7	21%	There are no specific exposure limits for Oxygen					

NE = Not Established. See Section 16 for Definitions of Terms Used.
NOTE (1): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a colorless, odorless, non-flammable gas. The main health hazards associated with releases of this gas are related to the high pressure within the cylinder. Air, the main component of this product, is generally considered non-flammable, however, Air will support combustion. The flammable component of this gas mixture is below the LEL. A cylinder rupture hazard exists when this product, which is under pressure, is subjected to heat or flames. Emergency responders must wear personal protective equipment appropriate for the situation to which they are responding.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of over-exposure for air is by inhalation at elevated or reduced pressure.

INHALATION: This product is non-toxic. Air, the main component of this product, is necessary for life.

OTHER POTENTIAL HEALTH EFFECTS: Contact with rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms**. Over-exposure to this product may cause the following health effects:

ACUTE: The most significant hazards associated with compressed air is the pressure hazard. Contact with rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside.

CHRONIC: There are currently no known adverse health effects associated with chronic exposure to this gas.

TARGET ORGANS: ACUTE: Respiratory system under ambient low pressure conditions. Central nervous system under ambient high pressure conditions. CHRONIC: None expected.

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus equipment should be worn.

Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s). Remove victim(s) to fresh air, as quickly as possible. In case of eye contact which leads to irritation, immediately flush eyes with copious amounts of water for at least 15 minutes. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Only trained personnel should administer supplemental oxygen.

In case of frostbite, place the frostbitten part in warm water. DO NOT USE HOT WATER. If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area in the armpit. Encourage victim to gently exercise the affected part while being warmed. Seek immediate medical attention.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Acute or chronic respiratory conditions, as well as disorders involving the "Target Organs", as listed in Section 3 (Hazard Information), may be aggravated by overexposure to the components of this product.

RECOMMENDATIONS TO PHYSICIANS: Administer oxygen as soon as possible, following exposure.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not applicable.
AUTOIGNITION TEMPERATURE: Not applicable.
FLAMMABLE LIMITS (in air by volume, %):
Lower (LEL): Not applicable.
Upper (UEL): Not applicable.

5. FIRE-FIGHTING MEASURES (Continued)

FIRE EXTINGUISHING MATERIALS: Non-flammable gas. Use extinguishing media appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: When involved in a fire, this material may decompose and produce toxic gases including carbon monoxide and carbon dioxide. Additionally, when involved in fire, the cylinders may rupture.

Explosion Sensitivity to Mechanical Impact: Not Sensitive.
Explosion Sensitivity to Static Discharge: Not Sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move fire-exposed cylinders from area, if it can be done without risk to fire-fighters. Withdraw immediately in case of rising sounds from venting pressure relief devices or any discoloration of tanks or cylinders due to a fire.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a release, clear the affected area, protect people, and respond with trained personnel. Minimum Personal Protective Equipment should be **Level D: safety glasses, and mechanically-resistant gloves. Level B, which includes the use of Self-Contained Breathing Apparatus, should be worn when oxygen levels are below 19.5% or are unknown.** Locate and seal the source of the leaking gas. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in place or remove it to a safe area and allow the gas to be released there.

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: Do not eat or drink while handling chemicals.

STORAGE AND HANDLING PRACTICES: Cylinders should be stored in dry, well-ventilated areas away from sources of heat. Compressed gases can present significant safety hazards. Store containers away from heavily trafficked areas and emergency exits.

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: Protect cylinders against physical damage. Store in cool, dry, well-ventilated, fireproof area, away from flammable or combustible materials and corrosive atmospheres. Store away from heat and ignition sources and out of direct sunlight. Do not store near elevators, corridors or loading docks. Do not allow area where cylinders are stored to exceed 52°C (125°F). Isolate from incompatible materials including flammable materials (see Section 10, Stability and Reactivity), which can burn violently. Use only storage containers and equipment (pipes, valves, fittings to relieve pressure, etc.) designed for the storage of Air. Do not store containers where they can come into contact with moisture. Cylinders should be stored upright and be firmly secured to prevent falling or being knocked over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting. Never tamper with pressure relief devices in valves and cylinders. The following rules are applicable to situations in which cylinders are being used:
Before Use: Move cylinders with a suitable hand-truck. Do not drag, slide or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap in-place until cylinder is ready for use.
During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment.
After Use: Close main cylinder valve. Replace valve protection cap. Mark empty cylinders “EMPTY”.
NOTE: Use only DOT or ASME code containers. Earth-ground and bond all lines and equipment associated with this product. Close valve after each use and when empty. Cylinders must not be recharged except by or with the consent of owner. For additional information refer to the Compressed Gas Association Pamphlet P-1, *Safe Handling of Compressed Gases in Containers*. Additionally, refer to CGA Bulletin SB-2 “*Oxygen Deficient Atmospheres*”.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged out safely. Purge gas handling equipment with inert gas (i.e. nitrogen) before attempting repairs. Always use product in areas where adequate ventilation is provided.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation.
RESPIRATORY PROTECTION: Maintain Oxygen levels above 19.5% in the workplace. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).
EYE PROTECTION: Splash goggles, face-shields or safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133, or Canadian Standards.
HAND PROTECTION: Wear mechanically-resistant gloves when handling cylinders of this product. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.
BODY PROTECTION: Use body protection appropriate for task. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR.

9. PHYSICAL and CHEMICAL PROPERTIES

The following information is for **Air**, the main component of this product , unless otherwise stated:
RELATIVE VAPOR DENSITY: 1 EVAPORATION RATE (nBuAc = 1): Not applicable.
SPECIFIC GRAVITY: Not applicable. FREEZING POINT: -216.2°C (-357.2°F)
SOLUBILITY IN WATER: 1.49% (v/v) BOILING POINT @ 1 atmos: -194.3°C(-317.8°F)
VAPOR PRESSURE, mmHg @ 20°C:. pH: Not applicable.
EXPANSION RATIO: Not applicable. VAPOR PRESSURE: Not applicable.
SPECIFIC VOLUME: 13.3 ft^3/lb; (0.833 m^3/kg) ODOR THRESHOLD: Not applicable.
COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

The following information is pertinent to this gas mixture:
APPEARANCE, ODOR AND COLOR: This product is a colorless, odorless gas.
HOW TO DETECT THIS SUBSTANCE (warning properties): There are no distinctive properties to this product. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

10. STABILITY and REACTIVITY

STABILITY: Normally stable.
DECOMPOSITION PRODUCTS: None known.
MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE. Air (the main component of this product) is not compatible with fuels, in that air will support combustion. The Isobutylene component of this mixture is incompatible with Strong oxidizers (e.g., chlorine, bromine pentafluoride, oxygen, oxygen difluoride, and nitrogen trifluoride).
HAZARDOUS POLYMERIZATION: Will not occur.
CONDITIONS TO AVOID: Contact with incompatible materials and exposure to heat, sparks and other sources of ignition. Cylinders exposed to high temperatures or direct flame can rupture or burst.

PART III *How can I prevent hazardous situations from occurring?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology data are for the components of this gas mixture present at a level greater than 1 mole %:
ISOBUTYLENE:
LC50 (Inhalation-Rat) 620 gm/m3/4 hours LC50 (Inhalation-Mouse) 415 gm/m3/2 hours

SUSPECTED CANCER AGENT: No component of this gas mixture is found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC, and therefore is not considered to be, nor suspected to be, cancer causing agents by these agencies.

IRRITANCY OF PRODUCT: Contact with rapidly expanding gases can cause frostbite and damage to exposed skin and eyes.
SENSITIZATION OF PRODUCT: No component of this product is a skin or respiratory sensitizer.
REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.
Mutagenicity: This product is not reported to cause mutagenic effects in humans.
Embryotoxicity: This product is not reported to cause embryotoxic effects in humans.
Teratogenicity: This product is not reported to cause teratogenic effects in humans.

Reproductive Toxicity: This product is not reported to cause adverse reproductive effects in humans.
A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.
BIOLOGICAL EXPOSURE INDICES: Biological Exposure Indices (BEIs) have been determined for the components of this product are as follows:

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: This gas will be dissipated rapidly in well-ventilated areas.
EFFECT OF MATERIAL ON PLANTS or ANIMALS: No adverse effect is anticipated to occur to plant-life, except for frost produced in the presence of rapidly expanding gases.
EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence of an adverse effect of this product on aquatic life is currently available.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Product removed from cylinder must be disposed of in accordance with appropriate U.S. Federal, State and local regulations or with regulations of Canada and its Provinces. Return cylinders with residual product to Airgas, Inc. Do not dispose of locally.

14. TRANSPORTATION INFORMATION

THIS GAS MIXTURE IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.
PROPER SHIPPING NAME: Compressed gases, n.o.s. (Air, Isobutylene)
HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Compressed Gas)
UN IDENTIFICATION NUMBER: UN 1956
PACKING GROUP: Not Applicable
DOT LABEL(S) REQUIRED: Compressed Gas
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 126
TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This gas mixture is considered as dangerous goods, per regulations of Transport Canada. Use the above information for the preparation of Canadian Shipments.

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:
U.S. SARA REPORTING REQUIREMENTS: The components of this gas mixture are not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for this material. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.
U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.
U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.
OTHER U.S. FEDERAL REGULATIONS: Not applicable.
U.S. STATE REGULATORY INFORMATION: The components of this gas mixture are covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: None.
California - Permissible Exposure Limits for Chemical Contaminants: None.
Florida - Substance List: Isobutylene. **Illinois - Toxic Substance List:** None.
Kansas - Section 302/313 List: None.
Minnesota - List of Hazardous Substances: Isobutylene.
Massachusetts - Substance List: None.
Missouri - Employer Information/Toxic Substance List: None.
New Jersey - Right to Know Hazardous Substance List: Isobutylene.
North Dakota - List of Hazardous Chemicals, Reportable Quantities: None.
Pennsylvania - Hazardous Substance List: Isobutylene.
Rhode Island - Hazardous Substance List: None.
Texas - Hazardous Substance List: None.
West Virginia - Hazardous Substance List: None.
Wisconsin - Toxic and Hazardous Substances: None.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the California Proposition 65 Lists.

LABELING: **CAUTION:** HIGH PRESSURE GAS.
MAY ACCELERATE COMBUSTION.
Keep oil and grease away.
Use equipment rated for cylinder pressure.
Close valve after each use and when empty.
Use in accordance with the Material Safety Data Sheet.

FIRST-AID: **IF INHALED**, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
IN CASE OF FROSTBITE, obtain immediate medial attention.
DO NOT REMOVE THIS PRODUCT LABEL.

ADDITIONAL CANADIAN REGULATIONS:
CANADIAN DSL INVENTORY: The components of this product are listed on the DSL Inventory.
OTHER CANADIAN REGULATIONS: Not applicable.
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: The components of this product are not on the CEPA Priorities Substances Lists.
CANADIAN WHMIS SYMBOLS: **Class A:** Compressed Gases

16. OTHER INFORMATION

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc.
9163 Chesapeake Drive, San Diego, CA 92123-1002
858/565-0302

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. AirGas, Inc. assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, AirGas, Inc. assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent.

EXPOSURE LIMITS IN AIR:

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **TLV -** Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average **(TWA)**, the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level **(C)**. Skin absorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration. **PEL -** Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health **-** This level represents a concentration from which one can escape within 30- minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. **O**ccupational **S**afety and **H**ealth **A**dministration (**OSHA**). NIOSH issues exposure guidelines called **R**ecommended **E**xposure **L**evels (**REL**s). When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93 °C [100-200 °F]); **3** (Class IB and IC flammable liquids with flash points below 38 °C [100 °F]); **4** (Class IA flammable liquids with flash points below 23 °C [73 °F] and points below 38 °C [100 °F]). Reactivity Hazard: **0** (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).

PERSONAL PROTECTIVE EQUIPMENT CODES: B: Gloves and goggles; **C:** Gloves, goggles, rubber apron (appropriate body protection); **D:** Gloves, goggles, faceshield; rubber apron (appropriate body protection);. **X:** Special attention should be given to PPE Selection.

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). Flash Point – Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL – the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:
Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD50** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC50** – Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m3** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information: EC is the effect concentration in water.

REGULATORY INFORMATION:
This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act **(SARA)**; the Canadian Domestic/Non-Domestic Substances List **(DSL/NDSL)**; the U.S. Toxic Substance Control Act **(TSCA)**; Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act **(CERCLA or Superfund)**; and various state regulations.

Appendix F

Quality Assurance Project Plan

Prepared for:
National Grid
Brooklyn, New York

Quality Assurance Project Plan

(Appendix F of the Interim Site Management Plan)

Metropolitan Former MGP Site
Brooklyn, New York
NYSDEC Site No.: 224046
Order on Consent Index #: A2-0552-0606

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List of Acronyms

%R	Percent recovery
ASP	Analytical services program
ASTM	American Society for Testing Materials
CAMP	Community Air Monitoring Plan
CAR	Corrective Action Request
CLP	Contract laboratory program
COC	Chain of custody
CRDLs	Contract Required Detection Limits
CRQLs	Contract Required Quantitation Limits
DQOs	Data quality objectives
DUSR	Data Usability Summary Report
EDD	Electronic data deliverable
ELAP	Environmental Laboratory Accreditation Program
GC/MS	Gas Chromatography/Mass Spectroscopy
HASP	Health and safety plan
LIMS	Laboratory information management system
MDLs	Method detection limits
MGP	Manufactured gas plant
MS	Matrix spike
MSD	Matrix spike duplicate
NIST	National Institute of Standards and Technology
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PA	Preliminary assessment
PID	Photoionization detector
PQL	Practical quantitative limit
QA	Quality assurance
QAO	Quality assurance officer
QAPP	Quality Assurance Project Plan
QC	Quality control
RI	Remediation Investigation
RPD	Relative percent difference
SOPs	Standard operating procedures
TCLP	Toxicity characteristics leaching procedure
USEPA	United States Environmental Protection Agency
VOA	Volatile organic analysis
VOCs	Volatile organic compounds

1.0 Introduction

This Quality Assurance Project Plan (QAPP) details the protocols and procedures that will be followed during any ground intrusive and monitoring activities covered under the Interim Site Management Plan [(ISMP); AECOM, 2017] for the National Grid Metropolitan former manufactured gas plant (MGP) site. The purpose of these protocols and procedures is to ensure that all project activities will be performed in a manner consistent with the data quality objectives (DQOs) established for the project and all data collected during the RI are precise, accurate, representative, comparable, and complete.

1.1 Project description

This document is required as an element of the remedial program at the Site under the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program administered by the New York State Department of Environmental Conservation (NYSDEC). The Site was investigated in accordance with Order on Consent Index A2-0552-0606, Site Number 224046 [NYSDEC, 2007], which was executed in March 2007. The Site location and layout is shown on Figures 1-1 and 1-2 of the ISMP.

The remedial investigation identified Site soil and groundwater as impacted with MGP-related residuals. This FSAP was developed as an appendix (Appendix F) to the ISMP which was prepared to manage MGP-related soil and groundwater impacts at the Site in perpetuity or until extinguishment of the Environmental Easement in accord with NYS Environmental Conservation Law (ECL) Article 71, Title 36.

This document was prepared by AECOM, on behalf of National Grid, in accord with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation [(DER-10); DEC, 2010] and the guidelines provided by NYSDEC.

1.2 Scope of work

The scope of work covered under this QAPP is details in the ISMP and includes but is not limited to:

- Pre-investigation coordination (i.e., access agreements)
- Utility clearance
- Mobilization
- Surface soil sampling and analysis (if applicable)
- Soil boring advancement, subsurface soil sampling and analysis
- Excavation of test pits, soils sampling, and analysis
- Development and landscaping work
- Monitoring well installation and development
- Groundwater sampling and analysis
- Aquifer slug testing at selected locations
- Sub-slab soil vapor and indoor air sampling and analysis
- Investigation-derived waste management
- Community air monitoring
- Site survey

- Data validation evaluation, and reporting

1.3 Data quality objectives

DQOs are qualitative and quantitative statements to ensure that data of known and appropriate quality are obtained during sampling and analysis activities. Data may be used to achieve the overall objectives of the project. These objectives are to:

- Identify potentially impacted material during any ground intrusive activity:
  - data will identify Site-related constituents in soil and groundwater.
  - data will be collected using a systematic method to delineate the perimeter of Site-related impacts.
  - analytical methods will be of sufficient sensitivity that method detection limits (MDLs) and practical quantitation limits (PQLs) measure constituent concentrations at or below constituent NYSDEC guidance values.
- Perform a soil vapor and indoor air survey in accordance with New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York. The DQOs for vapor intrusion data include:
  - data will identify MGP-related constituents in soil vapor and indoor air (if present)
  - data will be collected using a systematic method to determine whether vapor intrusion of MGP-related impacts is occurring
  - analytical methods will be of sufficient sensitivity to meet a minimum PQL of at most one part per billion.

1.3.1 Data quality levels

There are five analytical levels of data quality which may be used to accomplish these Site objectives. They are typically designated as follows:

- Level I – Field screening or analysis using portable instruments, calibrated to non-compound specific standards
- Level II – Field analysis using portable instruments, calibrated to specific compounds
- Level III – Non-Contract Laboratory Program (CLP/ASP) laboratory methods
- Level IV – ASP-CLP Routine Analytical Services methods
- Level V – Non-standard analytical methods.

To meet the specific objectives of this project, Levels I and III data quality levels will be utilized.

1.3.1.1 Level I – field screening methods

These tests, which are quantitative and/or semi-quantitative, are classified as field screening evaluations, even though they typically are not used for site characterization purposes.

Soil and soil headspace screening will be conducted using a photoionization detector (PID) to determine the soil boring interval(s) that will be submitted for analytical laboratory analysis.

In addition, as part of the Health and Safety Plan (HASP) and the Community Air Monitoring Plan (CAMP), worker safety and ambient air quality may be monitored using one or more of a variety of field screening tests. Applicable equipment may include but not be limited to: a PID, Draeger tubes, and personal monitors to test for volatile organic vapors, or a combustible gas indicator to test for explosive potential. Worker health and safety requirements are specified in the HASP.

1.3.1.2 Level III – Non-Contract Laboratory Program (CLP/ASP) laboratory methods

Samples will be analyzed according to the required United States Environmental Protection Agency (USEPA) SW-846, ASTM, and USEPA Compendium air methods described in the most recent editions of the USEPA reference methods (see section 7.0). Data will be analyzed using Level III Non-Contract Laboratory Program (CLP/ASP) laboratory methods; however, the laboratory will provide Level IV data packages for all data including hazardous waste classification data. Laboratory data will be reported in the New York State Analytical Services Program (ASP) Category B deliverables format. This level of data quality will ensure the generation of legally and technically defensible data for project use. The laboratory performing the analysis of samples will be certified for the specific parameters pursuant to NYSDOH ELAP Certification program.

2.0 Project organization

Field activity may be completed for National Grid by an environmental contractor (the Contractor), who will arrange for analytical services and provide an onsite field representative to perform the soil logging, soil sampling, surveying, and groundwater sampling. The Contractor will also perform the data interpretation and reporting tasks.

Key contacts for this project are as follows:

National Grid Project Manager:
Brian Berminghan
Address: 287 Maspeth Avenue, Brooklyn, NY
Telephone: (718) 608-5102

NYSDEC Project Manager:
Name: Section Chief
Address: New York State Department of Environmental Conservation
Site Control Section, Bureau of Technical Support
625 Broadway Albany, New York 12233-7014
Telephone: (518) 402-9662
Fax: (518) 402-9679

3.0 Quality assurance/quality control objectives for measurement of data

3.1 Introduction

The quality assurance and quality control (QA/QC) objectives for all measurement data include precision, accuracy, representativeness, completeness, and comparability. These objectives are defined in following subsections. They are formulated to meet the requirements of the USEPA SW-846. The analytical methods and their Contract Required Quantitation Limits (CRQLs) and Contract Required Detection Limits (CRDLs) are provided in Section 7.

3.2 Precision

Precision is an expression of the reproducibility of measurements of the same parameter under a given set of conditions. Specifically, it is a quantitative measurement of the variability of a group of measurements compared to their average value (USEPA, 1987). Precision is usually stated in terms of standard deviation, but other estimates such as the coefficient of variation (relative standard deviation), range (maximum value minus minimum value), relative range, and relative percent difference (RPD) are common.

For this project, field sampling precision will be determined by analyzing coded duplicate samples (labeled so that the laboratory does not recognize them as duplicates) for the same parameters, and then, during data validation (Section 8), calculating the RPD for field duplicate sample results.

Analytical precision will be determined by the laboratory by calculating the RPD for the results of the analysis of internal QC duplicates and matrix spike duplicates. The formula for calculating RPD is as follows:

$$RPD = \frac{|V1 - V2|}{(V1 + V2)/2} \times 100$$

where:

RPD = Relative Percent Difference

V1, V2 = The two values to be compared

|V1 - V2| = The absolute value of the difference between the two values

(V1 + V2)/2 = The average of the two values

For soil samples, the data quality objectives for analytical precision, calculated as the RPD between duplicate analyses, is presented in Table 3-1.

The same is presented for groundwater in Table 3-2 and air samples in Table 3-3.

Table 3-1 Quality Control Limits For Soil Samples

Analytical	Analytical Method [(a)]	Matrix Spike (MS) Compounds	Laboratory Accuracy and Precision			Surrogate Compounds	Surrogate Recovery (%)
			MS/MSD [(b)] Recovery (%)	MS/MSD RPD [(c)] (%)	LCS [(d)] Recovery (%)		
VOCs [(e)]	8260B	1,1-Dichloroethane	77-139	20	50-150	Toluene-d8	63-124
		Trichloroethene	81-129	20	82-113	Bromofluorobenzene	50-133
		Benzene	83-135	20	81-118	1,2-Dichloroethane-d4	54-142
		Toluene	79-140	20	81-115		
		Chlorobenzene	80-141	20	83-114		
SVOCs [(f)]	8270C	Phenol	42-105	20	48-96	Nitrobenzene-d5	28-110
		2-Chlorophenol	52-107	20	54-92	2-Fluorobiphenyl	32-109
		1,4-Dichlorobenzene	40-101	20	57-86	Terphenyl-d14	30-150
		N-Nitroso-di-n-propylamine	63-97	20	49-99	Phenol-d5	29-104
		1,2,4-Trichlorobenzene	42-98	20	57-93	2-Fluorophenol	23-104
		4-Chloro-3-methylphenol	60-100	20	57-92	2,4,6-Tribromophenol	24-112
		Acenaphthene	65-100	20	52-97		
		4-Nitrophenol	45-95	20	24-120		
		2,4-Dinitrotoluene	56-104	20	61-101		
		Pentachlorophenol	33-111	20	32-102		
		Pyrene	49-120	20	53-103		
PCBs (as Aroclors)	8082	Aroclor-1016	55-128	20	67-121	TCMX	44-141
		Aroclor-1260	58-140	20	78-128	DCB	34-145
Pesticides	8081A	4,4'-DDD	35-165	20	86-133	TCMX	30-158
		4,4'-DDE	50-144	20	80-130	DCB	30-161
		4,4'-DDT	23-170	20	72-141		
		Aldrin	57-145	20	84-133		
		alpha-BHC	37-154	20	81-136		
		beta-BHC	51-161	20	83-132		
		delta-BHC	43-159	20	77-131		
		gamma-BHC (Lindane)	48-159	20	83-135		
		alpha-Chlordane	44-156	20	88-132		
		gamma-Chlordane	61-147	20	87-135		

Analytical	Analytical Method [a]	Matrix Spike (MS) Compounds	Laboratory Accuracy and Precision			Surrogate Compounds	Surrogate Recovery (%)
			MS/MSD [b] Recovery (%)	MS/MSD RPD [c] (%)	LCS [d] Recovery (%)		
Pesticides (cont.)	8081A	Dieldrin	41-154	20	81-129		
		Endosulfan II	52-151	20	85-132		
		Endosulfan sulfate	32-162	20	76-135		
		Endrin	31-165	20	82-134		
		Endrin aldehyde	48-152	20	85-134		
		Endrin ketone	70-141	20	87-132		
		Heptachlor	41-155	20	85-132		
		Heptachlor epoxide	44-160	20	86-132		
		Methoxychlor	44-163	20	82-137		
		Toxaphene	50-150	20	50-150		
Herbicides	8151A	2,4,5-TP (Silvex)	47-128	20	47-128	2,4-DCAA	50-130
		2,4,5-T	72-130	20	72-130		
		2,4-D	55-122	20	55-122		
Inorganics [h]	6010B	Inorganic Analyte	75-125 [i]	20 [j]	80-120	NA	NA
	6020		75-125 [i]	20 [j]	80-120	NA	NA
	7471A		75-125 [i]	20 [j]	80-120	NA	NA
	ASTM D4282-02 (free cyanide)		75-125 [i]	20 [j]	90-110	NA	NA

Notes

(a) Analytical Methods: USEPA SW-846, 3rd edition, Revision 1, November 1990, any subsequent revisions shall supersede this information
(b) Matrix Spike/Matrix Spike Duplicate
(c) Relative Percent Difference
(d) Laboratory Control Sample
(e) Target Compound List Volatile Organic Compounds
(f) Target Compound List Semivolatile Organic Compounds
(g) Limits are advisory only
(h) Target Analyte List Inorganics (metals and cyanide)
(i) Matrix spike only
(j) Laboratory duplicate RPD
NA - Not Applicable

Table 3-2 Quality Control Limits for Water Samples

Analytical	Analytical Method [a]	Matrix Spike Compounds	Laboratory Accuracy and Precision			Surrogate Compounds	Surrogate Recovery (%)
			MS/MSD [b] Recovery (%)	MS/MSD RPD [c] (%)	LCS [d] Recovery (%)		
VOCs [e]	8260B	1,1-Dichloroethane	55-139	20	55-139	Toluene-d8	83-117
		Trichloroethene	55-138	20	61-138	Bromofluorobenzene	74-123
		Benzene	85-121	20	66-125	1,2-Dichloroethane-d4	75-124
		Toluene	83-123	20	68-121		
		Chlorobenzene	85-119	20	70-122		
SVOCs [f]	8270C	Phenol	11-48	20	10-100	Nitrobenzene-d5	30-120
		2-Chlorophenol	35-99	20	41-91	2-Fluorobiphenyl	35-111
		1,4-Dichlorobenzene	49-88	20	53-91	Terphenyl-d14	26-135
		N-Nitroso-di-n-propylamine	55-127	20	54-116	Phenol-d5	30-77
		1,2,4-Trichlorobenzene	62-105	20	59-104	2-Fluorophenol	30-78
		4-Chloro-3-methylphenol	12-125	20	46-97	2,4,6-Tribromophenol	27-118
		Acenaphthene	68-99	20	63-101		
		4-Nitrophenol	10-89	20	10-78		
		2,4-Dinitrotoluene	61-99	20	67-106		
		Pentachlorophenol	39-107	20	33-100		
		Pyrene	72-112	20	64-108		
PCBs (as Aroclors)	8082	Aroclor-1016	30-150	20	65-126	TCMX	42-133
		Aroclor-1260	36-147	20	76-131	DCB	30-141
Pesticides	8081A	4,4'-DDD	55-177	20	86-134	TCMX	30-150
		4,4'-DDE	54-126	20	89-126	DCB	45-131
		4,4'-DDT	55-160	20	74-138		
		Aldrin	57-167	20	83-131		
		alpha-BHC	63-178	20	87-136		
		beta-BHC	50-150	20	88-131		
		delta-BHC	98-131	20	78-128		
		gamma-BHC (Lindane)	89-138	20	86-133		
		alpha-Chlordane	69-144	20	88-131		
		gamma-Chlordane	76-126	20	92-133		

Analytical	Analytical Method [a]	Matrix Spike Compounds	Laboratory Accuracy and Precision			Surrogate Compounds	Surrogate Recovery (%)
			MS/MSD [b] Recovery (%)	MS/MSD RPD [c] (%)	LCS [d] Recovery (%)		
Pesticides (cont.)	8081A	Dieldrin	72-136	20	81-132		
		Endosulfan I	84-127	20	91-132		
		Endosulfan II	79-138	20	90-129		
		Endosulfan sulfate	84-134	20	99-130		
		Endrin	75-143	20	87-130		
		Endrin aldehyde	62-160	20	95-133		
		Endrin ketone	87-135	20	90-130		
		Heptachlor	63-131	20	85-131		
		Heptachlor epoxide	82-125	20	89-132		
		Methoxychlor	76-161	20	88-139		
		Toxaphene	50-150	20	50-150		
Herbicides	8151A	2,4,5-TP (Silvex)	48-140	20	48-140	2,4-DCAA	45-140
		2,4,5-T	60-145	20	60-145		
		2,4-D	60-138	20	60-138		
Inorganics [h]	6010B	Inorganic Analyte	75-125 [i]	20 [j]	80-120	NA	NA
	6020		75-125 [i]	20 [j]	80-120	NA	NA
	7470A		75-125 [i]	20 [j]	80-120	NA	NA
	9012 (cyanide)		75-125 [i]	20 [j]	80-120	NA	NA

Notes

(a) Analytical Methods: USEPA SW-846, 3rd edition, Revision 1, November 1990, any subsequent revisions shall supersede this information
(b) MS/MSD = Matrix Spike/Matrix Spike Duplicate
(c) RPD = Relative Percent Difference
(d) LCS = Laboratory Control Sample
(e) Target Compound List Volatile Organic Compounds
(f) Target Compound List Semivolatile Organic Compounds
(g) Limits are advisory only
(h) Target Analyte List Inorganics (metals and cyanide)
(i) Matrix spike only
(j) Laboratory duplicate RPD
NA - Not Applicable

Table 3-3 Quality Control Limits For Air Samples

Analytical Parameter	Analytical Method [(a)]	Analyte Compounds	LCS [(d)] Recovery (%)	Duplicate RPD [(c), (e)] (%)	Laboratory Accuracy and Precision			
					MS/MSD [(b)] Recovery (%)	MS/MSD RPD [(c)] (%)	Surrogate Compounds	Surrogate Recovery (%)
VOCs	TO-15 Mod.	Acetone	60-140	25	NA	NA	Toluene-d8 Bromofluorobenzene 1,2-Dichloroethane-d4	70-130 70-130 70-130
		Bromodichloromethane	60-140	25				
		Butadiene, 1,3-	60-140	25				
		Carbon Disulfide	60-140	25				
		Chloro-1-Propene, -3 (Allyl Chloride)	60-140	25				
		Chlorodibromomethane	60-140	25				
		Cumene	60-140	25				
		Dichloroethylene, Trans-1,2-	60-140	25				
		Dioxane, 1,4-	60-140	25				
		Hexane	60-140	25				
		Methyl Ethyl Ketone	60-140	25				
		Methyl Isobutyl Ketone	60-140	25				
		Methyl Tert-Butyl Ether (MTBE)	60-140	25				
		Naphthalene	60-140	25				
		Propylbenzene, N-	60-140	25				
		Tribromomethane (Bromoform)	60-140	25				
		Cyclohexane	60-140	25				
		2-Hexanone	60-140	25				
		4-Ethyltoluene	60-140	25				
		Ethanol	60-140	25				
		Heptane	60-140	25				
		2-Methylpentane	60-140	25				
		Isopentane	60-140	25				
		2,3-Dimethylpentane	60-140	25				
		2,2,4-Trimethylpentane	60-140	25				
		Indene	60-140	25				
		Indan	60-140	25				
		Thiopene	60-140	25				
		2-Propanol	60-140	25				
		Tetrahydrofuran	60-140	25				

Analytical Parameter	Analytical Method [(a)]	Analyte Compounds	LCS [(d)] Recovery (%)	Duplicate RPD [(c), (e)] (%)	Laboratory Accuracy and Precision			
					MS/MSD [(b)] Recovery (%)	MS/MSD RPD [(c)] (%)	Surrogate Compounds	Surrogate Recovery (%)
VOCs	TO-15 Mod.	Benzene	70-130	25	NA	NA	Toluene-d8 Bromofluorobenzene 1,2-Dichloroethane-d4	70-130 70-130 70-130
		Bromomethane	70-130	25				
		Carbon Tetrachloride	70-130	25				
		Chlorobenzene	70-130	25				
		Chloroethane	70-130	25				
		Chloroform	70-130	25				
		Dibromoethane, 1,2- (Ethylene Dibromide)	70-130	25				
		Dichlorobenzene, 1,2-	70-130	25				
		Dichlorobenzene, 1,3-	70-130	25				
		Dichlorobenzene, 1,4-	70-130	25				
		Dichlorodifluoromethane (Freon 12)	70-130	25				
		Dichloroethane, 1,1-	70-130	25				
		Dichloroethane, 1,2-	70-130	25				
		Dichloroethylene, 1,1-	70-130	25				
		Dichloroethylene, Cis-1,2-	70-130	25				
		Dichloromethane (Methylene Chloride)	70-130	25				
		Dichloropropane, 1,2-	70-130	25				
		Dichloropropene, Cis-1,3-	70-130	25				
		Dichloropropene, Trans-1,3-	70-130	25				
		1,2-Dichloro-1,1,2,2,-tetrafluoroethane	70-130	25				
		Ethyl Benzene	70-130	25				
		Fluorotrichloromethane (Freon 11)	70-130	25				
		Methyl Chloride	70-130	25				
		Styrene	70-130	25				
		Tetrachloroethane, 1,1,2,2-	70-130	25				
		Tetrachloroethylene (PCE)	70-130	25				
		Toluene	70-130	25				
		Trichloro-1,2,2-Trifluoroethane, 1,1,2-	70-130	25				
		Trichlorobenzene, 1,2,4-	70-130	25				

Analytical Parameter	Analytical Method [(a)]	Analyte Compounds	LCS [(d)] Recovery (%)	Duplicate RPD [(c), (e)] (%)	Laboratory Accuracy and Precision			
					MS/MSD [(b)] Recovery (%)	MS/MSD RPD [(c)] (%)	Surrogate Compounds	Surrogate Recovery (%)
VOCs	TO-15 Mod.	Trichloroethane, 1,1,1- Trichloroethane, 1,1,2- Trimethylbenzene, 1,3,5- Vinyl Chloride m,p-xylene o-xylene Hexachlorobutadiene alpha-chlorotoluene	70-130 70-130 70-130 70-130 70-130 70-130 70-130 70-130	25 25 25 25 25 25 25 25	NA	NA	Toluene-d8 Bromofluorobenzene 1,2-Dichloroethane-d4	70-130 70-130 70-130
Fixed Gas	ASTM D1945 Mod.	Helium	75-125	30	NA	NA	NA	NA

Notes

(a) USEPA, 1999. Compendium Method TO-15, Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared-Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS). January 1999.

American Society of Testing Materials, 2003. D1945-03. Standard Test Method for Analysis of Natural Gas by Gas Chromatograph, 2003.

(b) Matrix Spike/Matrix Spike Duplicate

(c) Relative Percent Difference

(d) Laboratory Control Sample

(e) Laboratory duplicate RPD

NA - Not Applicable

3.3 Accuracy

Accuracy is a measure of the degree of agreement of a measured value with the true or expected value of the quantity of concern (Taylor, 1987), or the difference between a measured value and the true or accepted reference value. The accuracy of an analytical procedure is best determined by the analysis of a sample containing a known quantity of material, and is expressed as the percent of the known quantity which is recovered or measured. The recovery of a given analyte is dependent upon the sample matrix, method of analysis, and the specific compound or element being determined. The concentration of the analyte relative to the detection limit of the analytical method is also a major factor in determining the accuracy of the measurement. Concentrations of analytes which are close to the detection limits are less accurate because they are more affected by such factors as instrument "noise". Higher concentrations will not be as affected by instrument noise or other variables and thus will be more accurate.

Sampling accuracy may be determined through the assessment of the analytical results of field blanks and trip blanks for each sample set. Analytical accuracy is typically assessed by examining the percent recoveries of surrogate compounds that are added to each sample (organic analyses only), and the percent recoveries of matrix spike compounds added to selected samples and laboratory blanks. Additionally, initial and continuing calibrations must be established and be within method control limits. Instrument and method analytical accuracy can then be determined for any sample set.

Accuracy is normally measured as the percent recovery (%R) of a known amount of analyte, called a spike, added to a sample (matrix spike) or to a blank (blank spike). The %R is calculated as follows:

$$\%R = \frac{SSR - SR}{SA} \times 100$$

where:

%R = Percent recovery
SSR = Spike sample result: concentration of analyte obtained by analyzing the sample with the spike added
SR = Sample result: the background value, i.e., the concentration of the analyte obtained by analyzing the sample
SA = Spiked analyte: concentration of the analyte spike added to the sample

The acceptance limits for accuracy for each parameter are presented in Tables 3-1, 3-2, and 3-3.

3.4 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter which is most concerned with the proper design of the sampling program (USEPA, 1987). Samples must be representative of the environmental media being sampled. Selection of sample locations and sampling procedures will incorporate consideration of obtaining the most representative sample possible.

Field and laboratory procedures will be performed in such a manner as to ensure, to the degree that is technically possible, that the data derived represents the in-place quality of the material sampled. Every effort will be made to ensure that chemical compounds will not be introduced into the sample via sample containers, handling, and analysis. Decontamination of sampling devices and digging equipment will be performed between samples as outlined in Appendix C of the RI Work Plan. Analysis of field blanks, trip blanks, and method blanks will also be performed to monitor for potential sample contamination from field and laboratory procedures.

The assessment of representativeness also must consider the degree of heterogeneity in the material from which the samples are collected. Sampling heterogeneity will be evaluated during data validation through the analysis of coded field duplicate samples. The analytical laboratory will also follow acceptable procedures to assure the samples are adequately homogenized prior to taking aliquots for analysis, so the reported results are representative of the sample received.

Chain-of-custody procedures will be followed to document that contamination of samples has not occurred during container preparation, shipment, and sampling. Details of blank, duplicate and chain-of-custody procedures are presented in Sections 4 and 5.

3.5 Completeness

Completeness is defined as the percentage of measurements made which are judged to be valid (USEPA, 1987). The QC objective for completeness is generation of valid data for at least 90 percent of the analyses requested. Completeness is defined as follows for all sample measurements:

$$\%C = \frac{V}{T} \times 100$$

where:

%C = Percent completeness
V = Number of measurements judged valid
T = Total number of measurements

3.6 Comparability

Comparability expresses the degree of confidence with which one data set can be compared to another (USEPA, 1987). The comparability of all data collected for this project will be ensured by:

- Using identified standard methods for both sampling and analysis phases of this project
- Requiring traceability of all analytical standards and/or source materials to the USEPA or National Institute of Standards and Technology (NIST)
- Requiring that all calibrations be verified with an independently traceable standard from a source other than that used for calibration (if applicable)
- Using standard reporting units and reporting formats including the reporting of QC data
- Performing a complete data validation on all of the analytical results, including the use of data qualifiers in all cases where appropriate
- Requiring that all validation qualifiers be considered any time an analytical result is used for any purpose

These steps will ensure all future users of either the data or the conclusions drawn from them will be able to judge the comparability of these data and conclusions.

4.0 Sampling program

4.1 Introduction

The sampling program will provide data concerning the presence and the nature and extent of contamination of groundwater, soil, soil vapor and air. This section presents sample collection procedures, sample container preparation procedures, sample preservation procedures, sample holding times, and field QC sample requirements. Sample matrices and the anticipated number of environmental and QC samples to be collected are given in Table 4-1. Actual numbers of sampling may change based on field conditions.

4.2 Sample collection

Soil, groundwater, and air samples will be collected at the Site. The location and frequency of sampling and the methods selected for field procedures and laboratory analysis are described in detail in the RI Work Plan.

4.3 Sample container preparation and sample preservation

All sample containers will be new and will meet the specifications required by the USEPA. Copies of the sample container QC analyses will be provided by the laboratory for each container lot used for sample collection. The containers will be labeled and the appropriate preservatives will be added. The container requirements are shown in Tables 4-2, 4-3, and 4-4.

Samples shall be preserved according to the preservation techniques given in Tables 4-2 through 4-4. Preservatives will be added to the sample bottles by the laboratory prior to their shipment in sufficient quantities to ensure that proper sample pH is met. Following sample collection, the sample bottles should be placed on ice in the shipping cooler, cooled to 4 ± 2 ºC with ice and delivered to the laboratory within 48 hours of collection. Chain-of-custody (COC) procedures are described in Section 5.

4.4 Sample holding times

The sample holding times for organic and inorganic parameters are given in Tables 4-2 through 4-4 and must be in accordance with the NYSDEC ASP requirements. Holding times for Toxicity Characteristic Leaching Procedure (TCLP) samples are given in Table 4-5. The NYSDEC ASP holding times must be strictly adhered to by the laboratory. Any holding time exceedances must be reported to National Grid.

4.5 Field quality control samples

To assess field sampling and decontamination performance, two types of "blanks" will be collected and submitted to the laboratory for analyses. In addition, the precision of field sampling procedures will be assessed by collecting coded field duplicates and matrix spike/matrix spike duplicates (MS/MSDs). The blanks will include the following.

- Trip Blanks – A trip blank will be prepared before the sample containers are sent by the laboratory. The trip blank will consist of a 40-ml VOA vial containing distilled, deionized water, which accompanies the other water sample bottles into the field and back to the laboratory. A trip blank will be included with each shipment of water samples for volatiles analysis. The trip blank will be analyzed for volatile organic compounds to assess any contamination from sampling, transport, storage, and internal laboratory procedures.

- Rinseate Blanks – Rinseate blanks will be taken at a minimum frequency of one per 20 field samples per sample matrix. Rinseate blanks are used to determine the effectiveness of the decontamination procedures for sampling equipment. It is a sample of reagent water provided by the laboratory that has passed through a decontaminated bailer or other sampling apparatus. It is usually collected as a last step in the decontamination procedure, prior to taking an environmental sample. The rinseate blank may be analyzed for all or some of the parameters of interest.

The duplicates collected to assess field/laboratory precision will consist of the following.

- Coded Field Duplicate – To determine the representativeness of the sampling methods, coded field duplicates will be collected. The samples are termed "coded" because they will be labeled in such a manner that the laboratory will not be able to determine that they are field duplicate samples. This will eliminate any possible bias that could arise. Field duplicates will be taken at a minimum frequency of one per 20 field samples per sample matrix.

- Matrix Spike/Matrix Spike Duplicate (MS/MSD) – MS/MSD samples (MS/MSD for organics; MS and laboratory duplicate for inorganics) will be collected at a frequency of one pair per 20 field samples. MS/MSD samples are used to assess the effect of the sample matrix on the recovery of target compounds or target analytes. The advisory acceptance limits for MS/MSD %R and RPDs are given in Tables 3-1 and 3-2.

Table 4-1 Summary of Samples and Analyses

Matrix (a)	Parameter	Analytical Method	Field Samples				QC Blanks		Total
			Field Samples	Field Duplicate	MS/MSD(b) (Total)	Sub-Total	Trip Blank	Rinse Blank	
Surface Soil Samples	VOCs	EPA SW 8260B (NY ASP OLM04.2)	18	-	-	18	-	-	18
	TCL VOCs + 10	EPA SW 8260B (NY ASP OLM04.2)	4	1	1	6	1	1	8
	SVOCs	EPA SW 8270C (NY ASP OLM04.2)	18	-	-	18	-	-	18
	TCL SVOCs + 20	EPA SW 8270C (NY ASP OLM04.2)	4	1	1	6	-	1	7
	Free Cyanide	ASTM Method D4282-02 (Microdiffusion) (extraction by EPA Method 9013A)	22	1	1	24	-	1	25
	RCRA 8 Metals	EPA SW 6010B/6020/7471A Series (NY ASP ILM04.1)	18	-	-	18	-	-	18
	TAL Metals	EPA SW 6010B/6020/7471A Series (NY ASP ILM04.1)	4	1	1	6	-	1	7
	PCBs (as Aroclors)	EPA SW 8082 (NY ASP Category B)	4	1	1	6	-	1	7
	Pesticides	EPA SW 8081A (NY ASP Category B)	4	1	1	6	-	1	7
	Herbicides	EPA SW 8151A (NY ASP Category B)	4	1	1	6	-	1	7
Subsurface Soil Samples	VOCs	EPA SW 8260B (NY ASP OLM04.2)	33	1	1	35	2	1	38
	TCL VOCs + 10	EPA SW 8260B (NY ASP OLM04.2)	8	1	1	10	1	1	12
	SVOCs	EPA SW 8270C (NY ASP OLM04.2)	33	1	1	35	-	1	36
	TCL SVOCs + 20	EPA SW 8270C (NY ASP OLM04.2)	8	1	1	10	-	1	11
	Free Cyanide	ASTM Method D4282-02 (Microdiffusion) (extraction by EPA Method 9013A)	41	2	2	45	-	2	47
	RCRA 8 Metals	EPA SW 6010B/6020/7471A Series (NY ASP ILM04.1)	33	1	1	35	-	1	36
	TAL Metals	EPA SW 6010B/6020/7471A Series (NY ASP ILM04.1)	8	1	1	10	-	1	11
	PCBs (as Aroclors)	EPA SW 8082 (NY ASP Category B)	8	1	1	10	-	1	11
	Pesticides	EPA SW 8081A (NY ASP Category B)	8	1	1	10	-	1	11
	Herbicides	EPA SW 8151A (NY ASP Category B)	8	1	1	10	-	1	11
Groundwater Samples	VOCs	EPA SW 8260B (NY ASP OLM04.2)	13	-	-	13	-	-	13
	TCL VOCs + 10	EPA SW 8260B (NY ASP OLM04.2)	7	1	1	9	1	1	11
	SVOCs	EPA SW 8270C (NY ASP OLM04.2)	13	-	-	13	-	-	13
	TCL SVOCs + 20	EPA SW 8270C (NY ASP OLM04.2)	7	1	1	9	-	1	10
	Total Cyanide	EPA SW 9012/9010A (NY ASP ILM04.1)	20	1	1	22	-	1	23

Matrix [a]	Parameter	Analytical Method	Field Samples				QC Blanks		Total
			Field Samples	Field Duplicate	MS/MSD[b] (Total)	Sub-Total	Trip Blank	Rinse Blank	
Groundwater Samples (cont.)	RCRA 8 Metals	EPA SW 6010B/6020/7470A Series (NY ASP ILM04.1)	13	-	-	13	-	-	13
	TAL Metals	EPA SW 6010B/6020/7470A Series (NY ASP ILM04.1)	7	1	1	9	-	1	10
	PCBs (as Aroclors)	EPA SW 8082 (NY ASP Category B)	7	1	1	9	-	1	10
	Pesticides	EPA SW 8081A (NY ASP Category B)	7	1	1	9	-	1	10
	Herbicides	EPA SW 8151A (NY ASP Category B)	7	1	1	9	-	1	10
Soil Gas Samples	VOCs + Naphthalene	EPA TO-15	4	1	-	5	-	1	6
Indoor Air Samples	VOCs + Naphthalene	EPA TO-15	4	-	-	4	-	-	4
Ambient Air Samples	VOCs + Naphthalene	EPA TO-15	1	-	-	1	-	-	1
Waste Characterization (solids)	TCLP VOCs	EPA SW 1311/8260B (NY ASP OLM04.2)	5	-	-	5	-	-	5
	TCLP SVOCs	EPA SW 1311/8270C (NY ASP OLM04.2)	5	-	-	5	-	-	5
	TCLP Metals	EPA SW 1311/6010B/7470A (NY ASP ILM04.1)	5	-	-	5	-	-	5
	Total PCBs	EPA SW 8082 (NY ASP Category B)	5	-	-	5	-	-	5
	Total Petroleum Hydrocarbons	DRO: EPA SW 8015 modified GRO: EPA SW 8015 modified	5	-	-	5	-	-	5
	Corrosivity	EPA SW Method 9045C	5	-	-	5	-	-	5
	Ignitability	EPA SW Method 1010A	5	-	-	5	-	-	5
	Reactive Cyanide and Sulfide	EPA SW Chapter 7, Sections 7.3.3.2 and 7.3.4.2	5	-	-	5	-	-	5
	Total Organic Halogens	EPA SW Method 9020B	5	-	-	5	-	-	5

Notes

TCL - Target Compound List

TAL - Target Analyte List

TCLP – Toxicity Characteristic Leaching Procedure

(a) Number of samples is approximate and for information purposes only.

(b) Matrix spike / matrix spike duplicate for organic analyses; matrix spike and laboratory duplicate for inorganic analysis.

Table 4-2 Soil and Waste Sample Containerization and Holding Times

Analysis	Bottle Type	Preservation [a]	Holding Time [b]
Volatile Organic Compounds (VOCs)	Wide-mouth glass w/ Teflon lined cap	Cool to 4ºC	10 days
Extractable Organic Compounds [c]	Wide-mouth glass w/ Teflon lined cap	Cool to 4ºC	10 days*
Metals	Wide-mouth plastic or glass	Cool to 4ºC	6 months, except mercury (26 days)
Cyanide (free)	Wide-mouth plastic	Cool to 4ºC	10 days
TCLP Organic Compounds	Wide-mouth glass w/ Teflon lined cap	Cool to 4ºC	See Table 4-5
TCLP Metals	Wide-mouth plastic or glass	Cool to 4ºC	See Table 4-5
Total Petroleum Hydrocarbons (TPH)	DRO: Clear glass GRO: Clear glass	DRO: Cool to 4^{o}C GRO: Cool to 4^{o}C	DRO: 7 days to extraction/40 days to analysis GRO: 14 days
Corrosivity	Clear glass	None	Analyze ASAP
Ignitability	Clear glass	None	Analyze ASAP
Reactive Cyanide and Sulfide	Clear glass	None	Analyze ASAP
Total Organic Halogens	Amber glass	pH < 2 with H_2SO_4, Cool to 4^{o}C, Dark	28 days

Notes

(a) All samples to be preserved with ice during collection and transport

(b) Days from verified time of sample receipt (VTSR).

(c) Semivolatile organic compounds, PCBs, pesticides, herbicides.

* Sohxlet or sonication procedures for extraction and concentration of soil/waste samples for SVOCs must be completed within 5 days of VTSR. Sohxlet or sonication procedures for extraction and concentration of soil/sediment/waste samples for PCBs must be completed within 5 days of VTSR. Extracts of soil samples must be analyzed within 40 days of extraction.

Table 4-3 Water Sample Containerization and Holding Times

Analysis	Bottle Type	Preservation [(a)]	Holding Time [(b)]
Volatile Organic Compounds (VOCs)	(2) 40 mL glass vial with Teflon septum	Cool to 4ºC	10 days
Extractable Organic Compounds [(c)]	1000 mL glass w/ Teflon-lined cap	Cool to 4ºC	5 days*
Metals	1000 mL plastic bottle	Nitric Acid to pH < 2 Cool to 4ºC	6 months, except mercury (26 days)
Cyanide	500 mL plastic bottle	NaOH to pH > 12 Cool to 4ºC	10 days

Notes

(a) All samples to be preserved in ice during collection and transport.

(b) Days from validated time of sample receipt (VTSR)

(c) Semivolatile organic compounds, PCBs, pesticides, herbicides

* Continuous liquid-liquid extraction is the required extraction for water samples for SVOCs. Continuous liquid-liquid extraction and concentration of water samples for SVOC analysis must begin within 5 days and be completed within 7 days of VTSR. Extracts of water samples must be analyzed within 40 days of extraction.

Table 4-4 Soil Gas, Indoor, and Ambient Air Sample Containerization and Holding Times

Analysis	Bottle Type	Preservation	Holding Time (b)
Volatile Organic Compounds (VOCs)	6 L Summa® canister (a)	NA	30 days
Fixed Gases (Helium)	6 L Summa® canister (a)	NA	30 days

Notes

(a) Stainless steel SUMMA® canisters must be certified clean by the laboratory using TO-15 § 8.4.1. The canisters will be delivered to the field with a pressure of 28-30” Hg. Canisters received with a vacuum pressure less than 25” Hg will not be used.

(b) Days from date of sample collection. The holding time for the TO-15 analysis is 30 days. The holding time for an evacuated canister is 30 days. After 30 days, unused canisters must be exchanged for recently cleaned canisters.

Table 4-5 TCLP[(a)] Sample Holding Times

Analytical Parameter	From: Sample Collection To: TCLP Extraction*	From: TCLP Extraction To: Preparative Extraction	From: Preparative Extraction To: Determinative Analysis
Volatiles	7 days	NA	7 days
Semivolatiles	5 days	7 days	40 days
PCBs (as Aroclors)	5 days	7 days	40 days
Mercury	5 days	NA	28 days
Metals (except Mercury)	180 days	NA	180 days

Notes:
NA - Not Applicable.
(a) Toxicity Characteristic Leaching Procedure.

*Times shown are from verified time of sample receipt (VSTR).

5.0 Sample tracking and custody

5.1 Introduction

This section presents sample custody procedures for both the field and laboratory. Implementation of proper custody procedures for samples collected in the field is the responsibility of field personnel. Both laboratory and field personnel involved in collection and transfer of samples will be trained as to the purpose and procedures for sample custody prior to implementation.

Evidence of sample traceability and integrity is provided by COC procedures. These procedures document the sample traceability from the selection and preparation of the sample containers by the laboratory, to sample collection, to sample shipment, to laboratory receipt and analysis. The sample custody flowchart is shown in Figure 5-1. A sample is considered to be in a person's custody if the sample is:

- In a person's possession
- Maintained in view after possession is accepted and documented
- Locked and tagged with Custody Seals so that no one can tamper with it after having been in physical custody
- In a secured area which is restricted to authorized personnel

5.2 Field sample custody

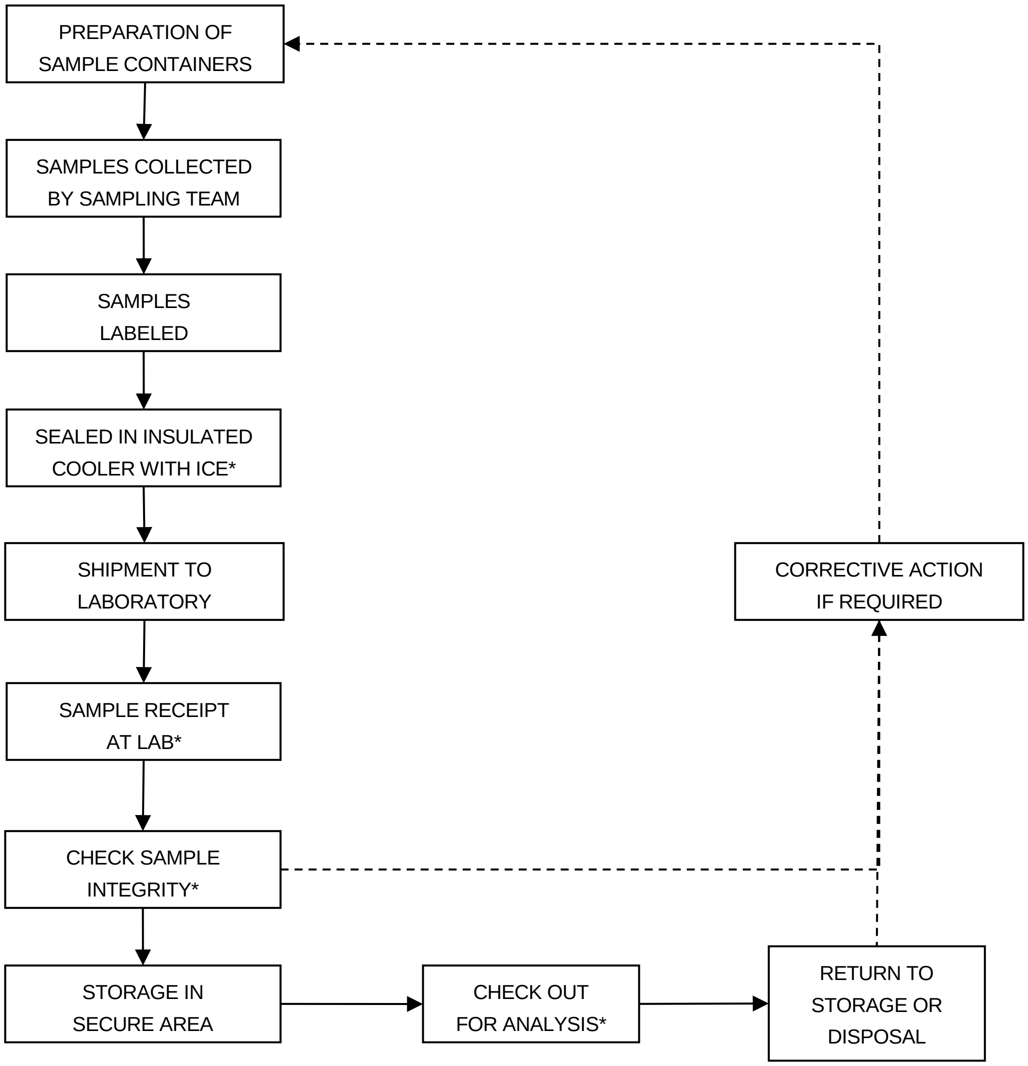
A COC record (Figure 5-2 or similar) accompanies the sample containers from selection and preparation at the laboratory, during shipment to the field for sample collection and preservation, and during the return to the laboratory. Triplicate copies of the COC must be completed for each sample set collected.

The COC lists the field personnel responsible for taking samples, the project name and number, the name of the analytical laboratory to which the samples are sent, and the method of sample shipment. The COC also lists a unique description of every sample bottle in the set. If samples are split and sent to different laboratories, a copy of the COC record will be sent with each sample.

The REMARKS space on the COC is used to indicate if the sample is a matrix spike, matrix spike duplicate, or any other sample information for the laboratory. Since they are not specific to any one sample point, trip and field blanks are indicated on separate rows. Once all bottles are properly accounted for on the form, a sampler will write his or her signature and the date and time on the first **RELINQUISHED BY** space. The sampler will also write the method of shipment, the shipping cooler identification number, and the shipper airbill number on the top of the COC. Errors in field records will be crossed out with a single line in ink and initialed by the author.

One copy of the COC is retained by sampling personnel and the other two copies are put into a sealable plastic bag and taped inside the lid of the shipping cooler. The cooler lid is closed, custody seals provided by the laboratory are affixed to the latch and across the back and front lids of the cooler, and the person relinquishing the samples signs their name across the seal. The seal is taped, and the cooler is wrapped tightly with clear packing tape. It is then relinquished by field personnel to personnel responsible for shipment, typically an overnight carrier. The COC seal must be broken to open the container. Breakage of the seals before receipt at the laboratory may indicate tampering. If tampering is apparent, the laboratory will contact the Project Manager, and the sample will not be analyzed.

Figure 5-1 Sample Custody Flowdown



*Requires Sign-Off On Chain-Of-Custody.

Figure 5-2 Chain-Of-Custody Record

CHAIN OF CUSTODY RECORD

Client Name	Purchase Order	Analyses Requested	Turnaround Time: Standard: ___ Other: ___ Rush: 24 Hr ___ 48 Hr ___
Address	Phone/Fax #		Compliance Monitoring: Yes: ___ No: ___
City State Zip	Report Attention:		Lab Use Only Sub-Sample
Sampled by:	Signature:		

Date Sampled	Time Sampled	Sample Type *	Sample Identification	Preservative* See Key Below	Number of Containers									Remarks	pH <2	pH >12

Signature	Print Name	Company	Date	Time
Relinquished By:				
Received By:				
Relinquished By:				
Received By:				
Relinquished By:				
Received By Laboratory:				

Custody Seal Intact
Yes ____ No ____ None ____

Sample Temperature

Degrees C ________

Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The analytical results associated with this COC apply only to the samples as they are received by the laboratory. The liability of the laboratory is limited to the amount paid for the report.
Terms: Net thirty days on approved credit.

** KEY:* Sample Type: 1=Drinking Water, 2=Surface Water, 3=Ground Water, 4=Waste Water, 5=Soil, 6=RCRA, 7=Other
Preservative: 1=NaOH, 2=NaOH + ZnOAC, 3=HNO3, 4=H2SO4, 5=Na2S2O3, 6=None, 7=Other

SEM COC Form Revised 02/01

5.3 Laboratory sample custody

The Project Manager or Field Team Leader will notify the laboratory of upcoming field sampling activities and the subsequent shipment of samples to the laboratory. This notification will include information concerning the number and type of samples to be shipped as well as the anticipated date of arrival.

The following laboratory sample custody procedures will be used:

- The laboratory will designate a sample custodian who will be responsible for maintaining custody of the samples and for maintaining all associated records documenting that custody.
- Upon receipt of the samples, the custodian will check cooler temperature, and check the original COC documents and compare them with the labeled contents of each sample container for correctness and traceability. The sample custodian will sign the COC record and record the date and time received.
- Care will be exercised to annotate any labeling or descriptive errors. In the event of documentation or sample integrity issues, the laboratory will immediately contact the Project Manager or Field Team Leader as part of the corrective action process. A qualitative assessment of each sample container will be performed to note any anomalies, such as broken or leaking bottles. This assessment will be recorded as part of the incoming COC procedure.
- The soil, water, and air samples will be stored in a secured area until analyses commence, at a temperature of approximately 4 ± 2 ˚C if required.
- A laboratory tracking record will accompany the sample or sample fraction through final analysis for control.

A copy of the tracking record will accompany the laboratory report and will become a permanent part of the project records.

6.0 Calibration procedures

6.1 Field instruments

All field analytical equipment will be calibrated immediately prior to each day's use. The calibration procedures will conform to manufacturer's standard instructions and are described in the Appendix C of RI Work Plan. This calibration will ensure that the equipment is functioning within the allowable tolerances established by the manufacturer and required by the project. Records of all instrument calibration will be maintained by the Field Team Leader. Copies of all the instrument manuals will be maintained onsite by the Field Team Leader.

Calibration procedures for instruments used for monitoring health and safety hazards (e.g., photoionization detector [PID] and explosimeter) are provided in the HASP. More frequent calibration may be needed depending on conditions encountered in the field.

6.2 Laboratory instruments

The laboratory will follow all calibration procedures and schedules as specified in the sections of the USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods given in Section 7.

7.0 Analytical procedures

7.1 Introduction

Soil, water, and waste samples will be analyzed according to the USEPA SW-846 "*Test Methods for Evaluating Solid Waste*," November 1986, 3rd edition and subsequent updates. Air and soil gas samples will be analyzed according to the USEPA Compendium Method TO-15, *Determination of VOCs in Air Collected in Specially Prepared-Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)*, January 1999 and helium (fixed gas) analyses will be performed using American Society for Testing Materials (ASTM), Method 1945 modified. The methods to be used for the laboratory analysis of water and soil samples are presented in Tables 7-1 and 7-2. The soil gas and ambient air samples will be analyzed by USEPA Method TO-15 as presented in Table 7-3. These methods were selected because they attain the quantitation limits and DQOs required by the project, which are compiled on Tables 7-1 through 7-3.

Table 7-1 Project Quantitation Limits for Soil and Water

CAS No.	Analysis/Compound	Method	Quantitation Limits		State of New York Standards	
			Water (µg/L)	Soil (µg/kg)	Water [(a)] (µg/L)	Soil [(b)] (µg/kg)
Volatile Organics						
71-55-6	1,1,1-Trichloroethane	SW8260B	5	5	5	800
79-34-5	1,1,2,2-Tetrachloroethane	SW8260B	5	5	5	600
79-00-5	1,1,2-Trichloroethane	SW8260B	5	5	1	
76-13-1	1,1,2-Trichlorotrifluoroethane	SW8260B	5	5	5	
75-34-3	1,1-Dichloroethane	SW8260B	5	5	5	200
75-35-4	1,1-Dichloroethene	SW8260B	5	5	5	400
120-82-1	1,2,4-Trichlorobenzene	SW8260B	5	5	5	3400
96-12-8	1,2-Dibromo-3-Chloropropane	SW8260B	5	5	0.04	
106-93-4	1,2-Dibromoethane	SW8260B	5	5	0.0006	
95-50-1	1,2-Dichlorobenzene	SW8260B	5	5	3	7900
107-06-2	1,2-Dichloroethane	SW8260B	5	5	0.6	100
78-87-5	1,2-Dichloropropane	SW8260B	5	5	1	
541-73-1	1,3-Dichlorobenzene	SW8260B	5	5	3	1600
106-46-7	1,4-Dichlorobenzene	SW8260B	5	5	3	8500
78-93-3	2-Butanone	SW8260B	25	25	50	300
591-78-6	2-Hexanone	SW8260B	25	25	50	
108-10-1	4-Methyl-2-Pentanone	SW8260B	25	25		1000
67-64-1	Acetone	SW8260B	25	25	50	200
71-43-2	Benzene	SW8260B	5	5	1	60
75-27-4	Bromodichloromethane	SW8260B	5	5	50	
75-25-2	Bromoform	SW8260B	5	5	50	
74-83-9	Bromomethane	SW8260B	5	5	5	
75-15-0	Carbon Disulfide	SW8260B	5	5		2700
56-23-5	Carbon Tetrachloride	SW8260B	5	5	5	600
108-90-7	Chlorobenzene	SW8260B	5	5	5	1700
75-00-3	Chloroethane	SW8260B	5	5	5	1900
67-66-3	Chloroform	SW8260B	5	5	7	300
74-87-3	Chloromethane	SW8260B	5	5	5	
156-59-2	cis-1,2-Dichloroethene	SW8260B	5	5	5	
10061-01-5	cis-1,3-Dichloropropene	SW8260B	5	5	0.4	
110-82-7	Cyclohexane	SW8260B	5	5		
124-48-1	Dibromochloromethane	SW8260B	5	5	50	
75-71-8	Dichlorodifluoromethane	SW8260B	5	5	5	
100-41-4	Ethyl Benzene	SW8260B	5	5	5	5500
98-82-8	Isopropylbenzene	SW8260B	5	5	5	
79-20-9	Methyl Acetate	SW8260B	5	5		
1634-04-4	Methyl tert-butyl Ether	SW8260B	5	5		
108-87-2	Methylcyclohexane	SW8260B	5	5		
75-09-2	Methylene Chloride	SW8260B	5	5	5	100
100-42-5	Styrene	SW8260B	5	5	930	
10061-02-6	t-1,3-Dichloropropene	SW8260B	5	5	0.4	
127-18-4	Tetrachloroethene	SW8260B	5	5	5	1400
108-88-3	Toluene	SW8260B	5	5	5	1500
156-60-5	trans-1,2-Dichloroethene	SW8260B	5	5	5	300
79-01-6	Trichloroethene	SW8260B	5	5	5	700
75-69-4	Trichlorofluoromethane	SW8260B	5	5	5	

CAS No.	Analysis/Compound	Method	Quantitation Limits		State of New York Standards	
			Water (µg/L)	Soil (µg/kg)	Water [(a)] (µg/L)	Soil [(b)] (µg/kg)
Volatile Organics (continued)						
75-01-4	Vinyl Chloride	SW8260B	5	5	2	200
136777-61-2	m/p-Xylenes	SW8260B	10	10	5	1200
95-47-6	o-Xylene	SW8260B	5	5	5	
Semivolatile Organics						
92-52-4	1',1-Biphenyl	SW8270C	10	330	5	
108-60-1	2,2'-oxybis(1-Chloropropane)	SW8270C	10	330	5	
95-95-4	2,4,5-Trichlorophenol	SW8270C	10	330		100
88-06-2	2,4,6-Trichlorophenol	SW8270C	10	330		
120-83-2	2,4-Dichlorophenol	SW8270C	10	330		400
105-67-9	2,4-Dimethylphenol	SW8270C	10	330		
51-28-5	2,4-Dinitrophenol	SW8270C	10	330		200
121-14-2	2,4-Dinitrotoluene	SW8270C	10	330	5	
606-20-2	2,6-Dinitrotoluene	SW8270C	10	330	5	1000
91-58-7	2-Chloronaphthalene	SW8270C	10	330	10	
95-57-8	2-Chlorophenol	SW8270C	10	330		800
91-57-6	2-Methylnaphthalene	SW8270C	10	330		36400
95-48-7	2-Methylphenol	SW8270C	10	330		100
88-74-4	2-Nitroaniline	SW8270C	10	330	5	430
88-75-5	2-Nitrophenol	SW8270C	10	330		330
91-94-1	3,3'-Dichlorobenzidine	SW8270C	10	330	5	n/a
65794-96-9	3+4-Methylphenols	SW8270C	10	330		900
99-09-2	3-Nitroaniline	SW8270C	10	330	5	500
534-52-1	4,6-Dinitro-2-methylphenol	SW8270C	10	330		
101-55-3	4-Bromophenyl-phenyl ether	SW8270C	10	330		
59-50-7	4-Chloro-3-methylphenol	SW8270C	10	330		240
106-47-8	4-Chloroaniline	SW8270C	10	330	5	220
7005-72-3	4-Chlorophenyl-phenyl ether	SW8270C	10	330		
100-01-6	4-Nitroaniline	SW8270C	10	330	5	
100-02-7	4-Nitrophenol	SW8270C	10	330		100
83-32-9	Acenaphthene	SW8270C	10	330	20	50000
208-96-8	Acenaphthylene	SW8270C	10	330		41000
98-86-2	Acetophenone	SW8270C	10	330		
120-12-7	Anthracene	SW8270C	10	330	50	50000
1912-24-9	Atrazine	SW8270C	10	330	7.5	
56-55-3	Benzo(a)anthracene	SW8270C	10	330	0.002	224
50-32-8	Benzo(a)pyrene	SW8270C	10	330	ND	61
205-99-2	Benzo(b)fluoranthene	SW8270C	10	330	0.002	1100
191-24-2	Benzo(g,h,i)perylene	SW8270C	10	330		50000
207-08-9	Benzo(k)fluoranthene	SW8270C	10	330	0.002	1100
100-52-7	Benzaldehyde	SW8270C	10	330		
111-91-1	bis(2-Chloroethoxy)methane	SW8270C	10	330	5	
111-44-4	bis(2-Chloroethyl)ether	SW8270C	10	330	1	
117-81-7	bis(2-Ethylhexyl)phthalate	SW8270C	10	330	5	50000
85-68-7	Butylbenzylphthalate	SW8270C	10	330	50	50000
105-60-2	Caprolactam	SW8270C	10	330		
86-74-8	Carbazole	SW8270C	10	330		
218-01-9	Chrysene	SW8270C	10	330	0.002	400
53-70-3	Dibenzo(a,h)anthracene	SW8270C	10	330		14

CAS No.	Analysis/Compound	Method	Quantitation Limits		State of New York Standards	
			Water (µg/L)	Soil (µg/kg)	Water [a] (µg/L)	Soil [b] (µg/kg)
Semivolatile Organics (continued)						
132-64-9	Dibenzofuran	SW8270C	10	330		6200
84-66-2	Diethylphthalate	SW8270C	10	330	50	7100
131-11-3	Dimethylphthalate	SW8270C	10	330	50	2000
84-74-2	Di-n-butylphthalate	SW8270C	10	330	50	8100
117-84-0	Di-n-octyl phthalate	SW8270C	10	330	50	50000
206-44-0	Fluoranthene	SW8270C	10	330	50	50000
86-73-7	Fluorene	SW8270C	10	330	50	50000
118-74-1	Hexachlorobenzene	SW8270C	10	330	0.04	410
87-68-3	Hexachlorobutadiene	SW8270C	10	330	0.5	
77-47-4	Hexachlorocyclopentadiene	SW8270C	10	330	5	
67-72-1	Hexachloroethane	SW8270C	10	330	5	
193-39-5	Indeno(1,2,3-cd)pyrene	SW8270C	10	330	0.002	3200
78-59-1	Isophorone	SW8270C	10	330	50	4400
91-20-3	Naphthalene	SW8270C	10	330	10	13000
98-95-3	Nitrobenzene	SW8270C	10	330	0.4	200
621-64-7	N-Nitroso-di-n-propylamine	SW8270C	10	330		
86-30-6	N-Nitrosodiphenylamine	SW8270C	10	330	50	
87-86-5	Pentachlorophenol	SW8270C	10	330		1000
85-01-8	Phenanthrene	SW8270C	10	330	50	50000
108-95-2	Phenol	SW8270C	10	330		30
129-00-0	Pyrene	SW8270C	10	330	50	50000
Metals						
7429-90-5	Aluminum	6010B / 6020	50	5000	2000	SB
7440-36-0	Antimony	6010B / 6020	25	2500	6	SB
7440-38-2	Arsenic	6010B / 6020	10	1000	50	7500
7440-39-3	Barium	6010B / 6020	50	5000	2000	300000
7440-41-7	Beryllium	6010B / 6020	3	300	3	160
7440-43-9	Cadmium	6010B / 6020	3	300	5	1000
7440-70-2	Calcium	6010B / 6020	1000	100000		SB
7440-47-3	Chromium	6010B / 6020	5	500	100	10000
7440-48-4	Cobalt	6010B / 6020	15	1500	5	30000
7440-50-8	Copper	6010B / 6020	10	1000	1000	25000
7439-89-6	Iron	6010B / 6020	50	5000	600	2000000
7439-92-1	Lead	6010B / 6020	6	600	50	400 [c]
7439-95-4	Magnesium	6010B / 6020	1000	100000	35000	SB
7439-96-5	Manganese	6010B / 6020	10	1000	600	SB
7440-02-0	Nickel	6010B / 6020	20	2000	200	13000
7440-09-7	Potassium	6010B / 6020	1000	100000		SB
7782-49-2	Selenium	6010B / 6020	10	1000	20	2000
7440-22-4	Silver	6010B / 6020	5	500	100	SB
7440-23-5	Sodium	6010B / 6020	1000	100000		SB
7440-28-0	Thallium	6010B / 6020	20	2000	0.5	SB
7440-62-2	Vanadium	6010B / 6020	20	2000		150000
7440-66-6	Zinc	6010B / 6020	20	2000	5000	20000
7439-97-6	Mercury	7471A	0.2	10	1.4	100
Inorganics						
n/a	Cyanide, Free	ASTM D4282- [illegible]		60		
n/a	Cyanide, Total	9012 / 9010A	10		400	

CAS No.	Analysis/Compound	Method	Quantitation Limits		State of New York Standards	
			Water (µg/L)	Soil (µg/kg)	Water [(a)] (µg/L)	Soil [(b)] (µg/kg)
Pesticides						
72-54-8	4,4'-DDD	8081	0.05	1.7	0.3	2900
72-55-9	4,4'-DDE	8081	0.05	1.7	0.2	2100
50-29-3	4,4'-DDT	8081	0.2	1.7	0.2	2100
309-00-2	Aldrin	8081	0.05	1.7	ND	41
319-84-6	alpha-BHC	8081	0.05	1.7	0.01	110
319-85-7	beta-BHC	8081	0.2	1.7	0.04	200
319-86-8	delta-BHC	8081	0.05	1.7	0.04	300
58-89-9	gamma-BHC (Lindane)	8081	0.05	1.7	0.05	60
5103-71-9	alpha-Chlordane	8081	0.05	1.7		540
5566-34-7	gamma-Chlordane	8081	0.05	1.7		540
57-74-9	Chlordane	8081	0.5	17	0.05	540
60-57-1	Dieldrin	8081	0.05	1.7	0.004	44
959-98-8	Endosulfan I	8081	0.05	1.7		900
33213-65-9	Endosulfan II	8081	0.05	1.7		900
1031-07-8	Endosulfan sulfate	8081	0.05	1.7		1000
72-20-8	Endrin	8081	0.05	1.7	ND	100
7421-93-4	Endrin aldehyde	8081	0.05	1.7	5	
53494-70-5	Endrin ketone	8081	0.05	1.7	5	
76-44-8	Heptachlor	8081	0.05	1.7	0.04	100
1024-57-3	Heptachlor epoxide	8081	0.05	1.7	0.03	20
72-43-5	Methoxychlor	8081	0.05	1.7	35	
8001-35-2	Toxaphene	8081	0.5	17	0.06	
PCB's						
12674-11-2	Aroclor-1016	8082	0.5	17	0.09* Applies to the sum of the PCBs	1000 (total surface soil) 10000 (total subsurface soil)
11104-28-2	Aroclor-1221	8082	0.5	17		
11141-16-5	Aroclor-1232	8082	0.5	17		
53469-21-9	Aroclor-1242	8082	0.5	17		
12672-29-6	Aroclor-1248	8082	0.5	17		
11097-69-1	Aroclor-1254	8082	0.5	17		
11096-82-5	Aroclor-1260	8082	0.5	17		
37324-23-5	Aroclor-1262	8082	0.5	17		
11100-14-4	Aroclor-1268	8082	0.5	17		
Herbicides						
93-72-1	2,4,5-TP (Silvex)	8151	2	67	0.26	700
n/a	2,4,5-T	8151	2	67		1900
n/a	2,4-D	8151	2	67		500
94-80-4	2,4-DB	8151	2	67		

Notes:

N/A - Not Applicable

SB - soil background

ND - not detected

(a) - Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, NYSDEC, October 1993, reissued June 1998

(b) - Determination of Soil Cleanup Objectives and Cleanup Levels, NYSDEC, January 24, 1994

(c) - EPA Guidance on Residential Lead-Based Paint, Lead Contaminated Dust, and Lead Contaminated Soil, July 14, 1994

Table 7-2 Practical Quantitation Limits (PQLs) for TCLP

Compound	SW-846 Analysis	Water (µg/L)
TCLP Volatile Organic Compounds		
Benzene	1311 / 8260B	25
Carbon Tetrachloride	1311 / 8260B	25
Chloroform	1311 / 8260B	25
1,2-Dichloroethane	1311 / 8260B	25
1,1-Dichloroethene	1311 / 8260B	25
2-Butanone	1311 / 8260B	125
Tetrachloroethene	1311 / 8260B	25
Trichloroethene	1311 / 8260B	25
Vinyl Chloride	1311 / 8260B	25
TCLP Semivolatile Organic Compounds		
2-Methylphenol	1311 / 3510 / 8270B	10
3 & 4-Methylphenol	1311 / 3510 / 8270B	10
1,4-Dichlorobenzene	1311 / 3510 / 8270B	10
2,4-Dinitrotoluene	1311 / 3510 / 8270B	10
Hexachlorobutadiene	1311 / 3510 / 8270B	10
Hexachloroethane	1311 / 3510 / 8270B	10
Hexachlorobenzene	1311 / 3510 / 8270B	10
Nitrobenzene	1311 / 3510 / 8270B	10
Pentachlorophenol	1311 / 3510 / 8270B	10
Pyridine	1311 / 3510 / 8270B	10
2,4,5-Trichlorophenol	1311 / 3510 / 8270B	10
2,4,6-Trichlorophenol	1311 / 3510 / 8270B	10
TCLP Metals		
Arsenic	1311 / 3010 / 6010B	10
Barium	1311 / 3010 / 6010B	50
Cadmium	1311 / 3010 / 6010B	3
Chromium	1311 / 3010 / 6010B	5
Lead	1311 / 3010 / 6010B	6
Selenium	1311 / 3010 / 6010B	10
Silver	1311 / 3010 / 6010B	5
Mercury	7470A	0.2
TCLP Pesticides		
Chlordane	1311 / 8081A	0.5
Endrin	1311 / 8081A	0.05
Heptachlor (and its hydroxide)	1311 / 8081A	0.05
Lindane	1311 / 8081A	0.05
Methoxychlor	1311 / 8081A	0.05
Toxaphene	1311 / 8081A	0.5
TCLP Pesticides		
2,4-D	1311 / 8151A	2
2,4,5-TP Silvex	1311 / 8151A	2

Notes:
ND - Not Determined

Table 7-3 Project Quantitation Limits for Air

Analysis / Compound	Method	Quantitation Limits Soil Gas/Air ($\mu g/M^3$)
Fixed Gases		
Helium	ASTM D1945 mod.	16360 (0.01%)
Volatile Organics [1]		
Freon 12	TO-15 Mod.	0.81
Freon 114	TO-15 Mod.	1.14
Chloromethane	TO-15 Mod.	0.34
Vinyl Chloride	TO-15 Mod.	0.42
Bromomethane	TO-15 Mod.	0.63
Chloroethane	TO-15 Mod.	0.43
Freon 11	TO-15 Mod.	0.92
1,1-Dichloroethene	TO-15 Mod.	0.64
Freon 113	TO-15 Mod.	1.26
Methylene Chloride	TO-15 Mod.	0.56
1,1-Dichloroethane	TO-15 Mod.	0.66
cis-1,2-Dichloroethene	TO-15 Mod.	0.64
Chloroform	TO-15 Mod.	0.81
1,1,1-Trichloroethane	TO-15 Mod.	0.89
Carbon Tetrachloride	TO-15 Mod.	1.03
Benzene	TO-15 Mod.	0.52
1,2-Dichloroethane	TO-15 Mod.	0.66
Trichloroethene	TO-15 Mod.	0.89
1,2-Dichloropropane	TO-15 Mod.	0.76
cis-1,3-Dichloropropene	TO-15 Mod.	0.74
Toluene	TO-15 Mod.	0.61
trans-1,3-Dichloropropene	TO-15 Mod.	0.74
1,1,2-Trichloroethane	TO-15 Mod.	0.89
Tetrachloroethene	TO-15 Mod.	1.11
1,2-Dibromoethane (EDB)	TO-15 Mod.	1.26
Chlorobenzene	TO-15 Mod.	0.76
Ethyl Benzene	TO-15 Mod.	0.71
m,p-Xylene	TO-15 Mod.	0.71
o-Xylene	TO-15 Mod.	0.71
Styrene	TO-15 Mod.	0.69
1,1,2,2-Tetrachloroethane	TO-15 Mod.	1.13
1,3,5-Trimethylbenzene	TO-15 Mod.	0.81
1,2,4-Trimethylbenzene	TO-15 Mod.	0.81
1,3-Dichlorobenzene	TO-15 Mod.	0.98
1,4-Dichlorobenzene	TO-15 Mod.	0.98
alpha-Chlorotoluene	TO-15 Mod.	0.85
1,2-Dichlorobenzene	TO-15 Mod.	0.98
1,2,4-Trichlorobenzene	TO-15 Mod.	6.12
Hexachlorobutadiene	TO-15 Mod.	8.69
Propylene	TO-15 Mod.	1.4
1,3-Butadiene	TO-15 Mod.	1.77

Analysis / Compound	Method	Quantitation Limits Soil Gas/Air ($\mu g/M^3$)
Acetone	TO-15 Mod.	1.93
Carbon Disulfide	TO-15 Mod.	2.58
trans-1,2-Dichloroethene	TO-15 Mod.	3.22
2-Butanone (MEK)	TO-15 Mod.	2.42
Hexane	TO-15 Mod.	2.9
Tetrahydrofuran	TO-15 Mod.	2.42
Cyclohexane	TO-15 Mod.	2.74
1,4-Dioxane	TO-15 Mod.	2.9
Bromodichloromethane	TO-15 Mod.	5.47
4-Methyl-2-pentanone	TO-15 Mod.	3.38
2-Hexanone	TO-15 Mod.	3.38
Dibromochloromethane	TO-15 Mod.	6.92
Bromoform	TO-15 Mod.	8.37
4-Ethyltoluene	TO-15 Mod.	4.03
Ethanol	TO-15 Mod.	1.55
Methyl tert-butyl ether	TO-15 Mod.	2.9
Heptane	TO-15 Mod.	3.38
Naphthalene	TO-15 Mod.	4.35
2-Methylpentane	TO-15 Mod.	2.9
Isopentane	TO-15 Mod.	2.42
2,3-Dimethylpentane	TO-15 Mod.	3.38
2,2,4-Trimethylpentane	TO-15 Mod.	3.86
Indene	TO-15 Mod.	3.86
Indan	TO-15 Mod.	3.86
Thiopene	TO-15 Mod.	2.74
2-Propanol	TO-15 Mod.	1.93

Notes

(1) The final quantitation limit (QL) is adjusted to reflect the initial pressurization step, dilution required to bring target analyte levels into the calibration range, and/or minimize matrix interferences

Final QL = QL * DF, DF was assumed to be 1.61 for a 6-L Canister, with 5 in. Hg Final Canister Pressure.

8.0 Data reduction, assessment, and reporting

8.1 Data reduction

Data collected during the field investigation will be reduced in accordance with SW-846 protocols and reviewed by the laboratory QA personnel. The criteria used to identify and quantify the analytes will be those specified for the applicable methods in the USEPA SW-846 and subsequent updates.

8.2 Data quality assessment

NYSDEC recommends two levels of data review. The basic review is a Data Usability Summary Report (DUSR). Current NYSDEC policy is to require this level of review for analytical data from investigations on most sites. Full data validation is called for at sites where the data will be used in litigation, or where problems are expected with data quality (such as where matrix interference is expected to be significant). The laboratory deliverables (i.e., NYSDEC ASP Category B) are the same in both cases, and a DUSR can be upgraded to full validation at a later time if necessary. For this investigation a DUSR will be performed.

Based on the results of data assessment, the validated analytical results reported by the laboratory will be assigned one of the following USEPA-defined data usability qualifiers:

- U – Not detected at given value
- UJ – Estimated not detected at given value
- J – Estimated value
- N – Presumptive evidence at the value given
- R – Result not useable
- No Flag – Result accepted without qualification

Trained and experienced data assessors, who meet NYSDEC approval criteria, will perform the data review. Résumés of people who will perform the data validation and prepare the DUSR will be provided to NYSDEC for review and approval, upon request.

8.2.1 Data usability summary report

Data for this investigation will be evaluated and qualification applied in accordance with the *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*, USEPA-540-R-07-003, July 2007 and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA-540-R-04-004, October 2004, as they applied to the analytical methods employed. A DUSR will be generated in accordance with USEPA Region II guidelines.

The DUSR will include a review and an evaluation of all the analytical results. To ensure compliance with the analytical method protocols the following parameters will be reviewed:

- Chain-of-custody forms
- Holding times
- Initial and continuing calibrations
- Blanks
- Laboratory control standards and matrix spikes

- Surrogate recoveries
- Matrix interference checks
- Field and laboratory duplicates
- Sample data

The DUSR will contain a description of the samples and parameters reviewed. Any deficiencies identified during the review will be noted and the effect on the generated data will be discussed. Any re-sampling or reanalysis recommendations will be then be made to the investigation's Project Manager. The results of the evaluation will be incorporated into the final investigative report.

8.2.2 Data validation

The determination to validate data will be made based on the presence of data anomalies, suspect data, or laboratory issues. Data will be validated and qualifications applied in accordance with *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*, USEPA-540-R-07-003, July 2007 and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA-540-R-04-004, October 2004, as they applied to the analytical methods employed. If applicable, a data validation report will be prepared and reviewed by the Quality Assurance Office (QAO) before issuance. The data validation report will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and COC procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method. A detailed assessment of each sample delivery group will follow. For each of the organic analytical methods, the following parameters will be assessed:

- Holding times
- Instrument tuning
- Instrument calibrations
- Blank results
- System monitoring compounds or surrogate recovery compounds (as applicable)
- Internal standard recovery results
- MS and MSD results
- Field duplicate results
- Target compound identification
- Result calculations
- Pesticide cleanup (if applicable)
- Compound quantitation and reported detection limits
- System performance
- Results verification

For each of the inorganic compounds, the following will be assessed:

- Holding times
- Calibrations
- Blank results

- Interference check sample
- Laboratory check samples
- Duplicates
- Matrix Spike(s)
- Furnace atomic absorption analysis QC
- ICP serial dilutions
- Results verification and reported detection limits
- Result calculations

8.3 Data reporting

The data package provided by the laboratory will contain all items discussed above in a “CLP-equivalent” format. Data quality issues will be discussed in a case narrative included with the data report. The completed copies of the COC records (both external and internal) accompanying each sample from time of initial bottle preparation to completion of analysis shall be attached to the analytical reports.

Two copies of the analytical data packages and an electronic data deliverable (EDD) will be provided by the laboratory approximately 30 days after receipt of a complete sample delivery group. The Project Manager will immediately arrange for filing one package. A second copy and the EDD will be used to generate summary tables. These tables will form the database for assessment of the site contamination condition.

The EDD format required is current format Earthsoft EQuIS® Environmental Data Management Software.

Each EDD must be formatted and copied using an MS-DOS operating system. To avoid transcription errors, data will be loaded directly into the ASCII format from the laboratory information management system (LIMS). If this cannot be accomplished, the consultant should be notified via letter of transmittal indicating that manual entry of data is required for a particular method of analysis. All EDDs must also undergo a QC check by the laboratory before delivery. The original data, tabulations, and electronic media are stored in a secure and retrievable fashion.

The Project Manager or Task Manager will maintain close contact with the QA reviewer to ensure all nonconformance issues are resolved prior to use of the data.

9.0 Internal quality control checks

QC procedures and checks are used to evaluate the precision and accuracy of analytical data. Field QC checks are used to identify potential problems associated with sample collection procedures. Laboratory QC checks are used to identify problems associated with sample preparation and analysis.

9.1 Field quality control checks

To check the quality of data from field sampling efforts, blanks and duplicate samples will be collected for analysis. Field duplicate and rinseate blank samples will be collected at a frequency of one in 20 samples. Trip blank samples will be analyzed at a frequency of one per each shipment of VOC samples. Field MS/MSD samples will be collected at a frequency of one in 20 samples. These samples will be treated as separate samples for identification, logging, and shipping purposes. Analytical results on blanks and duplicates will be reported with the data.

9.2 Laboratory quality control checks

The analytical laboratory must have an implemented QC program documented in a QA manual to ensure the reliability and validity of the analysis performed at the laboratory. All analytical procedures are documented in writing as standard operating procedures (SOPs) and each SOP must include a QC section that addresses the minimum QC requirements for the procedure. The internal QC checks differ slightly for each individual procedure, but in general the QC requirements include the following:

- Method blanks
- Reagent/preparation blanks (applicable to inorganic analysis)
- Instrument blanks
- MS/MSDs
- Surrogate spikes (organic methods only)
- Analytical spike (applicable to graphite furnace analysis)
- Laboratory control samples
- Internal standard areas for GC/MS analysis
- Mass tuning for GC/MS analysis
- Endrin/4,4'-DDT degradation checks for pesticide analysis
- Second, dissimilar column confirmation for pesticide and polychlorinated biphenyl (PCB) analysis

All data obtained will be properly recorded. The data package will include a full deliverable package capable of allowing the recipient to reconstruct QC information and compare it to QC acceptance criteria. The laboratory will reanalyze any samples associated with nonconforming quality control checks, if sufficient volume is available. It is expected that sufficient volumes/weights of samples will be collected to allow for reanalysis when necessary.

10.0 Performance and system audits and frequency

Two types of audit procedures are conducted during any environmental investigation: performance and system audits. These audits are performed on the laboratory as well as field activities. The laboratory and field auditors will be independent of the function they will be auditing. Audits will be documented and maintained by the Contractor Project Manager.

10.1 Performance audits

10.1.1 Laboratory performance audits

Laboratory performance audits are administered by the laboratory QA department on a periodic basis (e.g., semi-annually). The audit samples are used to monitor accuracy and identify and resolve problems in sample preparation and analysis techniques, which lead to the generation of nonconforming data.

The laboratory performance audits include verification of each analyst's record keeping, proper use and understanding of procedures, and accuracy evaluation. Corrective action will be taken for any performance failure noted.

10.1.2 Field performance audits

The QAO or designee will perform field performance audits of the field sample team on an annual basis at a minimum. The field team leader will review all field data. The analytical results of the field blanks and replicate samples are indirect audits of the level of performance of field activities. If a nonconformance is found in the evaluation of field QC data, corrective action will be taken to resolve the issue. The corrective action will be documented.

10.2 System audits

10.2.1 Laboratory system audits

Laboratory system audits will be conducted against the QA Manual and the administrative and method SOPs, by the laboratory QA department, on an annual basis. System audits are used to ensure that all aspects of the laboratory's QC program are effective. This involves a thorough review of all laboratory practices and documentation to confirm that work is performed according to project specifications.

Outside agency performance and system audits may be used to verify contract compliance or the laboratory's ability to meet requirements for analytical methods and documentation. Copies of current certifications and accreditations may be used in lieu of an audit by the Project Manager.

10.2.2 Field system audits

The QAO or designee shall perform field system audits of the field sampling team on an annual basis at a minimum. All field activities will be audited to ensure that the field work is being performed according to the approved work plans, QAPP, and method procedures. Accuracy, precision, and documentation clarity will be evaluated. Any time a deficiency is noted during an ongoing systems audit, the project manger or designee will inform the field staff immediately so that corrective actions may be implemented.

11.0 Preventive maintenance

11.1 Field instrument preventive maintenance

Written procedures will establish the schedule for servicing critical items in order to minimize the downtime of the measurement system(s). Field instruments will be checked and calibrated daily before use. Calibration checks will be documented on the field calibration log sheets. Critical spare parts such as tape and batteries will be kept on-site to reduce potential downtime. Backup instruments and equipment will be available on-site or within 1-day shipment to avoid delays in the field schedule.

11.2 Laboratory instrument preventive maintenance

Designated laboratory employees regularly perform routine scheduled maintenance and repair of all instruments. All maintenance that is performed is documented in the laboratory's operating records. All laboratory instruments are maintained in accordance with manufacturer's specifications. The laboratory's QA Manual specifies the typical frequency with which components of key analytical instruments or equipment will be serviced.

11.3 Records

Logs shall be established to record maintenance and service. All maintenance records will be controlled and traceable to the designated equipment, instruments, tools, or gauges. Records produced shall be reviewed, maintained, and filed by the operators at the laboratories. The QAO may audit the field maintenance records to verify complete adherence to these procedures.

12.0 Corrective action

12.1 Introduction

The following procedures have been established to ensure that conditions adverse to quality, such as malfunctions, deficiencies, deviations, and errors, are promptly investigated, documented, and corrected.

12.2 Procedure description

When a significant condition adverse to quality is noted at site, laboratory, or subcontractor location, the cause of the condition will be determined and corrective action will be taken to preclude recurrence. Condition identification, cause, reference documents, and corrective action planned to be taken will be documented and reported to the QAO, Contractor Project Manager, Field Team Leader, and involved contractor management, at a minimum. Implementation of corrective action is verified by documented follow-up action.

All project personnel have the responsibility, as part of the normal work duties, to promptly identify, report, and investigate conditions adverse to quality. Corrective actions will be initiated as follows.

- When predetermined acceptance standards are not attained
- When procedure or data compiled are determined to be deficient
- When equipment or instrumentation is found to be faulty
- When samples and analytical test results are not clearly traceable
- When quality assurance requirements have been violated
- When designated approvals have been circumvented
- As a result of system and performance audit findings
- As a result of a management assessment
- As a result of laboratory/field comparison studies
- As required by USEPA SW-846 and subsequent updates, or by the NYSDEC ASP

Project management and staff, such as field investigation teams, remedial response planning personnel, and laboratory groups, will monitor on-going work performance in the normal course of daily responsibilities. Work may be audited at the sites, laboratories, or contractor locations. Activities or documents ascertained to be nonconforming with quality assurance requirements will be documented. Corrective actions will be mandated through audit finding sheets attached to the audit report. Audit findings are logged, maintained, and controlled by the Task Manager.

Personnel assigned to quality assurance functions will have the responsibility to issue and control Corrective Action Request (CAR) Forms (Figure 12-1 or similar). The CAR identifies the out-of-compliance condition, reference document(s), and recommended corrective action(s) to be administered. The CAR is issued to the personnel responsible for the affected item or activity. A copy is also submitted to the Contractor Project Manager. The individual to whom the CAR is addressed returns the requested response promptly to the QA personnel, affixing his/her signature and date to the corrective action block, after stating the cause of the conditions and corrective action to be taken. The QA personnel maintain the log for status of CARs, confirms the adequacy of the intended corrective action, and verifies its implementation. CARs will be retained in the project file.

Any project personnel may identify issues requiring corrective action; however, the QAO is responsible for documenting, numbering, logging, and verifying the closeout action. The Contractor Project Manager will be responsible for ensuring that all recommended corrective actions are implemented, documented, and approved.

Figure 12-1 Corrective Action Form

CORRECTIVE ACTION REQUEST Number: ____________________________ Date: _____________
TO: ____ You are hereby requested to take corrective actions indicated below and as otherwise determined by you to (a) resolve the noted condition and (b) to prevent it from recurring. Your written response is to be returned to the project quality assurance manager by ________________
CONDITION:
REFERENCE DOCUMENTS:
RECOMMENDED CORRECTIVE ACTIONS:
___________ ______ __________ ________ ___________ ________ Originator Date Approval Date Approval Date
RESPONSE
CAUSE OF CONDITION
CORRECTIVE ACTION (A) RESOLUTION (B) PREVENTION (C) AFFECTED DOCUMENTS
C.A. FOLLOW-UP: CORRECTIVE ACTION VERIFIED BY: ______________________________ DATE:______________

13.0 References

American Society of Testing Materials, 2003. D1945-03. *Standard Test Method for Analysis of Natural Gas by Gas Chromatograph,* 2003.

Taylor, J. K., 1987. *Quality Assurance of Chemical Measurements*. Lewis Publishers, Inc., Chelsea, Michigan

United States Environmental Protection Agency (USEPA), 1986. SW-846 Test Method for Evaluating Solid Waste, Washington, D.C., November 1986,

USEPA, 1987. *Data Quality Objectives for Remedial Response Actions Activities: Development Process*, EPA/540/G-87/003, OSWER Directive 9355.0-7, Washington, D.C.

USEPA, 1999a. Compendium Method TO-15, Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS). January 1999.

USEPA, 1999b. USEPA Contract Laboratory Program, National Functional Guidelines for Superfund Organic Methods Data Review, July 2007.

USEPA, 2004. USEPA Contract Laboratory Program, National Functional Guidelines for Inorganic Data Review, October 2004.

Appendix G

Site Management Forms

Summary of Green Remediation Metrics for Site Management

Site Name: ______________________________ Site Code: ____________________
Address: ________________________________ City: ________________________
State: ____________ Zip Code: _________ County: ______________________

Initial Report Period (Start Date of period covered by the Initial Report submittal)
Start Date: ____________________

Current Reporting Period
Reporting Period From: ____________________ To: _________________________

Contact Information
Preparer's Name: __________________________ Phone No.: ___________________
Preparer's Affiliation: __________________________________

I. Energy Usage: Quantify the amount of energy used directly on-site and the portion of that derived from renewable energy sources.

	Current Reporting Period	**Total to Date**
Fuel Type 1 (e.g. natural gas (cf))		
Fuel Type 2 (e.g. fuel oil, propane (gals))		
Electricity (kWh)		
Of that Electric usage, provide quantity:		
Derived from renewable sources (e.g. solar, wind)		
Other energy sources (e.g. geothermal, solar thermal (Btu))		

Provide a description of all energy usage reduction programs for the site in the space provided on Page 3.

II. Solid Waste Generation: Quantify the management of solid waste generated on-site.

	Current Reporting Period (tons)	**Total to Date (tons)**
Total waste generated on-site		
OM&M generated waste		
Of that total amount, provide quantity:		
Transported off-site to landfills		
Transported off-site to other disposal facilities		

Transported off-site for recycling/reuse		
Reused on-site		

Provide a description of any implemented waste reduction programs for the site in the space provided on Page 3.

III. Transportation/Shipping: Quantify the distances travelled for delivery of supplies, shipping of laboratory samples, and the removal of waste.

	Current Reporting Period (miles)	**Total to Date (miles)**
Standby Engineer/Contractor		
Laboratory Courier/Delivery Service		
Waste Removal/Hauling		

Provide a description of all mileage reduction programs for the site in the space provided on Page 3. Include specifically any local vendor/services utilized that are within 50 miles of the site.

IV. Water Usage: Quantify the volume of water used on-site from various sources.

	Current Reporting Period (gallons)	**Total to Date (gallons)**
Total quantity of water used on-site		
Of that total amount, provide quantity:		
Public potable water supply usage		
Surface water usage		
On-site groundwater usage		
Collected or diverted storm water usage		

Provide a description of any implemented water consumption reduction programs for the site in the space provided on Page 3.

V. Land Use and Ecosystems: Quantify the amount of land and/or ecosystems disturbed and the area of land and/or ecosystems restored to a pre-development condition (i.e. Green Infrastructure).

	Current Reporting Period (acres)	**Total to Date (acres)**
Land disturbed		
Land restored		

Provide a description of any implemented land restoration/green infrastructure programs for the site in the space provided on Page 3.

Description of green remediation programs reported above (Attach additional sheets if needed)
Energy Usage:
Waste Generation:
Transportation/Shipping:
Water usage:
Land Use and Ecosystems:
Other:

CERTIFICATION BY CONTRACTOR

I, ____________________________ (**Name**) do hereby certify that I am ______________________ (**Title**) of the Company/Corporation herein referenced and contractor for the work described in the foregoing application for payment. According to my knowledge and belief, all items and amounts shown on the face of this application for payment are correct, all work has been performed and/or materials supplied, the foregoing is a true and correct statement of the contract account up to and including that last day of the period covered by this application.

____

Date **Contractor**

Appendix H

Field Sampling Plan

Field Sampling and Analytical Plan

(Appendix H of Interim Site Management Plan)

Metropolitan Former MGP Site
Brooklyn, New York
NYSDEC Site No.: 224046
Order on Consent Index #: A2-0552-0606

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1.0 Introduction

This Field Sampling and Analytical Plan (FSAP) presents the methods and procedures to be used for performing any ground intrusive, maintenance, and monitoring activities covered under the Interim Site Management Plan [(ISMP); AECOM, 2017] at the Metropolitan former manufactured gas plant (MGP) site (Site) located at 124-136 2nd Avenue in Brooklyn, New York.

1.1 Scope of Work

The scope of work at the Site covered under this FSAP includes.

- Underground utility work
- Surface/shallow subsurface soil sampling and analysis
- Soil boring advancement, subsurface soil sampling and analysis
- Excavation
- Monitoring well installation and development
- Groundwater sampling and analysis
- Indoor air and ambient air sampling and analysis
- Investigation-derived waste management
- Community air monitoring
- Data validation evaluation, and reporting

This FSAP will be modified for specialized work including:

- Sheet Pile Installation
- Confined Space Activities
- Groundwater Dewatering, Treatment, and Discharge

Any modification to the FSAP will require approval in writing from the NYSDEC. The property owner or its representative must notify National Grid of any scheduled ground intrusive work at least 15 days prior to the start of field activity.

2.0 General Field Guidelines

2.1 Site Hazards

Potential on-site surface hazards, such as sharp objects, overhead power lines, energized areas, vehicular traffic, and building hazards will be identified prior to initiation of the fieldwork. Generally, potential hazards at the site will be identified during a site reconnaissance by the project team on the first day of the investigation field activities. Additional safety measures to be undertaken for the work performed during the investigation are addressed in the Site-Specific Health and Safety Plan (HASP, Appendix E of the ISMP).

2.2 Underground Utilities

Underground utilities, including electric lines, gas lines, water lines, storm and sanitary sewers, and communication lines will be identified prior to any subsurface work. Underground utility location will be accomplished as follows:

- All Site Characterization investigation locations will be flagged or marked out with white paint.
- Dig Safely of New York (800) 272-4480 will be contacted to initiate the locating activities. 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.
- Companies with subsurface utilities present will locate and mark out all subsurface utility lines.
- Geophysical methods will be used to further evaluate the potential presence of underground utilities in the area of each proposed investigation location.
- Subsurface investigation locations will be hand cleared to five feet below ground surface (bgs) prior to advancing borings with mechanized equipment.

2.3 Field Log Books

All field activities will be carefully documented in field log books. Entries will be of sufficient detail that a complete daily record of significant events, observations, and measurements is developed. The field log book will provide a legal record of the activities conducted at the site. 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 Site 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 field 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.

At a minimum, daily field book entries will include the following information:

- Location of field activity;
- Date and time of entry;
- Names and titles of field team members on site and site contacts;
- 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 (soil, sediment, groundwater, etc.);
- Sample collection method;
- Number and volume of sample(s) taken;
- Description of sampling point(s);
- Volume of groundwater removed before sampling;
- Preservatives used;
- Analytical parameters;
- Date and time of collection;
- Sample identification number(s);
- Sample distribution (e.g., laboratory);
- Field observations;
- All field measurements made, such as volatile organic compounds (VOCs) using a PID, pH, temperature, conductivity, water level, etc.;
- References for all maps and photographs of the sampling site(s); and
- Information pertaining to sample documentation such as:
  - Bottle lot numbers;
  - Dates and method of sample shipments;
  - Chain-of-custody (COC) record numbers; and
  - Federal Express air bill number.

3.0 Field Equipment Decontamination and Management of Investigation-Derived Residuals

3.1 Decontamination Area

A temporary decontamination area lined with polyethylene sheeting will be constructed on site for use during decontamination of the excavation or drilling equipment. Water collected from the decontamination activities will be collected in 55-gallon drums or a bulk tank and managed as described in Section 3.3.

3.2 Equipment Decontamination

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

- All equipment including the backhoe bucket; drilling rig; augers; bits; rods; tools; split-spoon samplers; and tremie pipes will be cleaned with a high-pressure, hot water pressure washing unit between locations and following completion of activities.
- Tools, drill rods, and augers will be placed on polyethylene plastic sheets following pressure washing. Direct contact with the ground will be avoided.
- All earth moving equipment, the back of the drill rig and all tools, augers, and rods will be decontaminated at the completion of the work and prior to leaving the project site.

3.2.1 Sampling Equipment Decontamination

Suggested Materials:

- Potable water;
- Phosphate-free detergent (such as Alconox™);
- Distilled water;
- Aluminum foil;
- Plastic/polyethylene sheeting;
- Plastic buckets and brushes; and
- Personal protective equipment (PPE) in accordance with the HASP.

Procedures:

- Prior to sampling, all non-dedicated sampling equipment (bowls, spoons, interface probes, etc.) will be washed with potable water and a phosphate-free detergent (such as Alconox™). 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 followed by a de-ionized water rinse.
- Between rinses, equipment will 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 polyethylene plastic or aluminum foil for storage or transportation from the designated decontamination area to the sampling location.

3.3 Management of Investigation-Derived Residuals

3.3.1 Decontamination Fluids

Hot water pressure wash and decontamination fluids will be collected in 55-gallon drums or a bulk tank. The storage drums or tank will be labeled as “pending analysis – investigation-derived residual decon water” and temporarily stored in a plastic-lined containment area pending characterization and proper disposal.

3.3.2 Drill Cuttings

Drill cuttings will be contained in 55-gallon drums. The drums will be labeled as “pending analysis – investigation-derived residual – soil from drill cuttings” and temporarily stored in a plastic-lined containment area pending characterization and proper disposal.

3.3.3 Development and Purge Water

All development and purge water will be contained in 55-gallon drums or a bulk tank. The drums or tank will be labeled as “pending analysis - investigation derived residual development and purge water” and temporarily stored in a plastic-lined containment area pending characterization and proper disposal.

3.3.4 Personal Protective Equipment

All used PPE will be placed in 55-gallon drums or a lined cardboard yard box for proper disposal.

3.3.5 Dedicated Sampling Equipment

All dedicated groundwater sampling equipment will be placed in 55-gallon drums for disposal.

4.0 Soil Sampling and Well Installation Procedures

4.1 Introduction

Surface and subsurface activities to be conducted at the Site may consist of utility work; excavation; the advancement of soil borings; collection of soil samples; groundwater monitoring, soil vapor intrusion sampling, and the installation of monitoring wells. These activities will require the use of the following equipment and material:

- Field book;
- Project plans;
- PPE in accordance with the HASP;
- Stakes, flagging and marking paint;
- Plastic bags for soil screening samples;
- Stainless steel or disposable bowls and spoons/spatulas;
- Tape measure;
- Decontamination supplies;
- Water level indicator;
- Electronic oil/water interface probe
- Clear polyethylene disposable bailers (NAPL confirmation in wells);
- Polyethylene disposable bailers (well development);
- Polypropylene rope (well development);
- Waterra™ pump or other purge pump (well development);
- Submersible electric pump (well development);
- Stainless steel or glass beakers (well development);
- Turbidity meter (well development);
- Temperature, conductivity, pH meter (well development).
- PID with a 10.2 or 10.6 eV lamp;
- Digital camera;
- Clear tape, duct tape;
- Laboratory sample bottles;
- Coolers and ice; and
- Shipping supplies.

Procedures for these activities are described in the following sections.

4.2 Excavation

Excavation activities will be dictated by the Contractor hired to conduct the work and will follow the Excavation Work Plan included as Appendix D of the ISMP [AECOM, 2017]. During field activities, personnel will stand upwind of the excavation area to the extent possible. Air monitoring and odor mitigation (if necessary) will be conducted in accordance with the Community Air Monitoring Project (CAMP) and HASP. Excavation materials will be photographed and logged for future reference. Material removed from the excavation will be placed on polyethylene sheeting. The location and size of the excavation will be measured and described in the field logbook.

Visually clean soils, such as surface soils, will be segregated from soils that may be impacted. The visually clean soils may be placed back in the excavation with prior approval of the NYSDEC. At a minimum, the top 2 feet of backfilled soil will be visually clean. The excavation will be backfilled as soon as possible after completion and in general prior to the cessation of activities at the end of the day. If excavation resulted in removal of any impacted material, a demarcation layer as detailed in EWP - Appendix D of the ISMP [AECOM, 2017] will be placed over the surface prior to backfilling. Following restoration of the excavation, the excavation will be staked/marked to facilitate subsequent location by surveying crews.

4.3 Soil Sampling

4.3.1 Soil Borings

Soil borings will be advanced and sampled with a combination of either rotosonic drilling methods equipped with 4-inch diameter sampling cores or hollow-stem augers (HSAs) equipped with 2-inch or 3-inch diameter split-spoon samplers. In some instances, a direct-push (Geoprobe™) drilling rig equipped with 4-foot long, 2-inch diameter Macro-Core™ samplers may be used if there are access limitations. All drilling equipment will be decontaminated between each boring in accordance with methods specified in Section 3.2.

All locations will be properly abandoned following the collection of samples. Boreholes for the direct-push borings will be filled with bentonite chips. All rotosonic or auger soil borings not used for the construction of monitoring wells will be tremie grouted to the ground surface following the completion of the soil sampling to prevent cross-contamination of permeable zones. The borings will be filled using a cement/bentonite grout mixture with the following specifications:

- Bentonite will be powdered sodium montmorillonite furnished in moisture resistant sacks without additives.
- Cement shall be a low-alkaline Portland cement, Type I in conformance with ASTM C-150 and without additives.
- The cement/bentonite grout mixture shall be to the following proportion:
  - Three sacks (94 pounds) of Type I Portland cement;
  - 14 pounds of granular bentonite (5% mix); and
  - 25 gallons of water.

The cement will be mechanically mixed, above ground, with water from a potable water source. Bentonite will be added to ensure a lump-free consistency. The mixture will be pumped through a tremie pipe as the drill is being withdrawn.

4.3.2 Geologic Logging Methods

The field geologist will log borehole geology and headspace measurements, and any other observations (e.g., odors, NAPL, soil staining, etc.), in the field book and the Drilling Record shown in Figure 4-1, or similar form. Soil samples retrieved from the borehole will be visually described for:

1) percent recovery,
2) soil type,
3) color,
4) moisture content,
5) texture,
6) grain size and shape,
7) consistency,
8) visible evidence of staining or other hydrocarbon-related impacts, and
9) any other relevant observations.

The descriptions will be in accordance with the Unified Soil Classification System (USCS) and the American Society for Testing and Materials (ASTM) guidelines. Descriptions will also follow National Grid's internal field description guidance (National Grid, 2016).

Immediately after describing the core, a representative soil sample will be placed in a re-sealable plastic (e.g., "ziplock") 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. Soil remaining after completion of sample description, collection, and field screening will be disposed of properly.

4.3.3 Collection of Samples

The number and frequency of samples to be collected from each boring and the associated analytical parameters will be based on the field activity. The sample locations, descriptions, and depths will be recorded on the borelogs in the fieldbook.

Samples for laboratory analyses will be collected directly from the sampling spoon (test pits), acetate liners, split-spoons, and/or core barrel and placed into appropriate containers (for VOC analyses); homogenized (for non-VOC analyses); and compacted to minimize headspace and pore space. Soil used for headspace analysis will not be used for laboratory VOC analysis. The sampling equipment will be decontaminated between samples in accordance with procedures described in Section 3. Soil remaining after completion of sample description, collection, and field screening will be disposed of properly.

The sample containers will be labeled, placed in a laboratory-supplied cooler, and packed with ice. The coolers will then be shipped to the laboratory for analysis. COC procedures will be followed as outlined in the Quality Assurance Project Plan (QAPP – Appendix F of ISMP). If there is a delay of sample shipment due to insufficient samples to warrant overnight delivery, the samples will be stored in a cool, secure place with sufficient ice to maintain a temperature of 4˚ C.

4.4 Monitoring Well Installation and Development

The following methods will be used for drilling, installing, and developing the monitoring wells.

4.4.1 Overburden Monitoring Well Installation

Figure 4-2 illustrates the construction details for a typical overburden monitoring well. Specific details regarding the depth and anticipated screened interval of proposed monitoring wells will be based on the needed data and approved work plan. In general, monitoring wells will be installed according to the following specifications:

- The monitoring well borings will be advanced with either 4.25-inch inner diameter (ID) hollow-stem augers or 4-inch ID flush casing.
- Wells will be constructed with 2-inch ID, threaded, flush-joint, Schedule 40 PVC casings and screens.
- Screens will be 10-feet long with 0.01-inch slot openings (or 0.02-inch, if NAPL present) with a 2-foot DNAPL sump at the base. Alternative screen lengths up to 20 feet long may be used at the discretion of the field geologist and with the approval of NYSDEC, based on site conditions.
- The annulus around the screens will be backfilled with clean silica sand having appropriate size (e.g., Morie No. 1) to a minimum height of 2 feet above the top of the screen. Auger flights or casing will be withdrawn as sand is poured in a manner that will minimize hole collapse and bridging.
- A bentonite chip seal with a minimum thickness of 2 feet will be placed above the sand pack. The bentonite seal will be hydrated with clean, potable water before placement of grout above the seal layer.
- The remainder of the annular space will be filled with cement-bentonite grout to ground surface. The grout will be allowed to set for a minimum of 24 hours before wells are developed, although 48 hours is preferred.
- Each monitoring well will include an expandable plug and locking cap. Completion as stickup or flushmount installations will depend on the monitoring well location. All well locations will be clearly marked with appropriate stakes, flagging, or other signage to facilitate location of the wells.
- The concrete pad will be sloped to channel water away from the well, and be of sufficient dimension and depth to remain stable during freezing and thawing of the ground.
- The top of the PVC well casing and ground surface will be marked and surveyed to 0.01 foot, and the elevation will be determined relative to a fixed benchmark or datum.
- The measuring point on all wells will be on the innermost PVC casing.
- Monitoring well construction details will be recorded on the Monitoring Well Construction Log shown in Figure 4-3.
- If commercially available nested wells are considered to sample multiple aquifer depth zones in the same borehole, they will be discussed with NYSDEC prior to installation.

4.4.2 Monitoring Well Development

- A minimum of 24 hours after installation, the monitoring wells will be developed by surging and purging. Surging will be performed periodically, across the length of screen in 2-foot increments prior to, at interim periods of pumping, and immediately before the final pumping. Pumping methods may include using a centrifugal, submersible, or peristaltic pump and dedicated polyethylene tubing, using a Waterra™ positive displacement pump and dedicated polyethylene tubing, or other methods at the discretion of the field geologist.
- Water levels will be measured in each well to the nearest 0.01 foot prior to development.
- The wells will be developed until the water in the well is reasonably free of visible sediment (50 NTU if possible or until pH, temperature, and specific conductivity stabilize). A portable nephelometer will be used to make the turbidity measurement.

- Development water will be contained in 55-gallon drums and properly disposed of.

Following development, wells will be allowed to recover for at least 14 days before groundwater is purged and sampled. All monitoring well development will be performed or overseen by a field geologist and recorded in the field book.

5.0 Groundwater Sampling Procedures

5.1 Introduction

Procedures for obtaining samples of groundwater are described in this section. Groundwater samples will be collected using low-flow, low-stress purge and sampling methods.

Procedures for conducting aquifer conductivity testing are also described in this section. Aquifer conductivity testing will be done by using slug or pneumatic testing methods.

5.2 Groundwater Sampling

The number and frequency of the samples that will be collected for laboratory analysis from each well and the analytical parameters are listed in Table 4-2 of the ISMP (AECOM, 2017).

The following method will be used to collect groundwater samples from monitoring wells:

5.2.1 Required Equipment and Supplies

- Field book
- Groundwater collection records
- Project plans
- PPE in accordance with the HASP
- Electronic oil/water interface probe
- Disposable polyethylene bailers and low-flow sampling pump
- Polypropylene rope
- Temperature, conductivity, and pH meter
- Turbidity meter
- Flow-through cell
- Decontamination supplies
- Peristaltic or submersible pump capable of achieving low-flow rates (i.e., 0.5 liters per minute or less)
- Plastic tubing
- Plastic sheeting
- PID
- Clear tape, duct tape
- Coolers and ice
- Laboratory sample bottles
- Federal Express labels

5.2.2 Groundwater Purging and Sampling Method

5.2.2.1 Groundwater Purging

- Prior to sampling, the static water level and thickness of any light non-aqueous phase liquid (LNAPL) or dense non-aqueous phase liquid (DNAPL) will be measured to the nearest 0.01 foot from the surveyed well elevation mark on the top of the PVC casing with a decontaminated oil/water interface probe. If NAPL is present, the NAPL thickness will be confirmed using a clear bailer or a weighted string. The measurement will be recorded in the field book.
- The probe will be decontaminated between uses.
- Purging will be conducted using the low-flow sampling technique specified by the USEPA Region 1 in its guidance document entitled "Low-Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells".
- Groundwater from the well will be purged until field parameters (measured within a flow through cell) stabilize, up to three well volumes are removed, or 1 hour of continuous purging is performed. Field parameters are considered to be stable when three consecutive readings are within the stabilization criteria for that parameter. The stabilization criteria are as follows:
    - Turbidity within10% or below 10 NTU;
    - Conductivity within 3%;
    - Temperature within 3%;
    - pH within 0.1 unit;
    - Oxidation Reduction Potentials (ORP) within 10 mV; and
    - Dissolved Oxygen (DO) within 10%, or within 0.5 mg/L if < 1 mg/L.
- The purge rate will be approximately 0.5 liter per minute or less.
- If a well goes dry before the required volumes are removed, it will be allowed to recover, purged a second time until dry or the required volumes and parameter stabilization criteria are met, and sampled when it recovers sufficiently, and ideally to allow for collection of the entire sample volume in one purge, in accordance with low-flow sampling protocol.
- Purge water will be managed and disposed of properly.
- Peristaltic pumps will not be used to collect VOC samples.

5.2.2.2 Groundwater Sampling

- Samples will be collected using dedicated 1/4- or 3/8-inch polyethylene tubing and/or bailers.
- Prior to filling the sample bottles, the temperature, pH, conductivity, dissolved oxygen, and oxidation reduction potential (ORP) will be measured within a flow-through cell. Turbidity will be measured with a separate portable turbidity meter. All measurements will be recorded on groundwater collection record.
- Appropriate laboratory sample containers will be filled in order from most to least volatile.
- Sample vials for VOC analyses will be filled to ensure that no bubbles are in the sample.
- Each sample container will be labeled, placed in a laboratory-supplied cooler, and packed on ice to maintain a temperature of 4ºC or lower. The cooler will be shipped overnight or delivered to the laboratory for analysis.
- COC procedures will be followed as outlined in the QAPP.

- Well sampling data will be recorded on the Groundwater Sampling Record shown in Figure 5-1, or similar form.

Hydraulic Conductivity tests if performed shall be recorded on Figure 5-2.

6.0 Indoor Air Sampling

An indoor air evaluation will be performed at the Site in case of Site development or change in usage to determine conditions. The work will be performed in accordance with *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* [DOH, 2006] and the USEPA document entitled *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, Office of Solid Waste and Emergency Response* [USEPA, 2002]. Methods will also be consistent with National Grid's Draft Standard Operating Procedure for Soil Vapor Intrusion Evaluations at National Grid MGP Sites in New York State. A draft Indoor Air Sampling Plan will be submitted to NYSDEC for approval outlining the locations and frequency of the samples.

A pre-sampling survey and a product inventory will be conducted on the day of sampling. The surveys and inventories will be completed in accordance with the NYDOH guidance. The chemical inventory check will be performed at each location to document current conditions with the regard to the storage of chemicals. The previous surveys will be reviewed and any changes in conditions from the previous sampling will be noted. As with previous surveys, a screening for total volatiles will be conducted with a ppbRAE. An ambient air sample will be collected concurrently with the indoor air samples.

The methods to be used for the collection of the indoor air samples and the ambient air sample are summarized as follows:

- The indoor air sample will be collected from a minimum of two-feet above the floor surface.
- The ambient air sample will be collected at a location determined to be upwind at time of sampling.
- The indoor air and ambient air samples will be collected as an integrated (not grab) sample. A laboratory-provided flow controller fixed to a negative pressure vessel (a batch certified clean 6-liter Summa™ canister) will be used to collect the integrated sample. The controller will be a fixed-rate flow controller and the approximate length of the sample time will be set by the laboratory. The flow controllers are fitted with an internal filter to prevent particulates from entering the Summa™ Canister.
- The sample time for the canisters will be set to 8 hours. The collection of the samples in 6-liter canisters over an approximate 8-hour interval will ensure that the samples are collected at the rate specified by the NYSDOH (less than 0.2 liters per minute).
- The sample tubing will be attached to the sampling canister with Swagelok™ fittings.
- Prior to sampling, the initial vacuum in each canister will be checked prior to use to ensure mechanical integrity of the canister. The initial vacuum should be approximately 30 inches mercury (in. Hg).
- To start sampling, the canister ball valve is opened and the initial time and vacuum is recorded.
- The final vacuum should be between 10 and 4 in. Hg, with a target of 5 in. of Hg. The initial and final vacuum in each canister will be recorded on the laboratory chain-of-custody form to be returned to the laboratory with the samples. The gauges provided with the canisters are accurate only for "indication of change", and are not sufficiently accurate to provide gauge-to-gauge comparisons. The final vacuum will also be measured in the laboratory.

- Following collection of the sample, the canister will be sealed by closing the ball valve and fitting on the canister inlet. The inlet will then be capped with a laboratory-provided threaded end cap.
- Following collection of the sample, the PID will be used to obtain a final reading from the probe assembly or tubing for the concentration of total organic vapors.
- Quality assurance and quality control samples will include one field duplicate, one trip blank, a laboratory blank and laboratory quality control samples as required by the analytical method.
- The site name, sample identification, canister number, canister certification number, sampler's name, sample times and date will be recorded on a tag that is attached to each canister.
- The indoor air samples will be shipped overnight to a NY ELAP-certified laboratory for analysis.

Figure 6-1 shows a typical helium tracer and sub-slab set up. The field sampling team will record all information regarding the sampling on field forms. Copies of the field forms that will be used are included as Figures 6-2 and 6-3. Information that will be recorded will include the following: sample identification, date and times of sample collection, identity of the field personnel, sampling methods and equipment, purge volumes and rates, tracer test results, and any other relevant observations made during the sampling. A NYSDOH indoor air quality questionnaire and building inventory form will also be filled out prior to indoor air sampling (Figure 6-4).

7.0 Air Monitoring

7.1 Introduction

Two types of air monitoring will be performed during the instructive work on the Site:

1) work zone monitoring for protection of the workers performing the subsurface work; and
2) community air monitoring at the perimeter of the work zones onsite or at the property boundary for protection of the local community.

7.2 Breathing Zone Air Monitoring During Ground-Intrusive Activity

Monitoring of air in the breathing zone within the work site will be conducted periodically during all subsurface work and sampling activities.

- An organic vapor meter (OVM) equipped with a PID will be used to monitor total organic vapors in the breathing zone and borehole, and to screen the samples.
- Additional air monitoring may be required as specified in the site-specific HASP.

The PID readings will be recorded in the field book and on the boring logs during drilling activities. The procedure for the PID operation and calibration is included in HASP (Appendix E of ISMP). Note that equipment calibration will be performed as often as needed to account for changing conditions or instrument readings. The minimum frequency of calibration is specified in the HASP; more frequent calibration will be performed if erratic and/or spurious readings are observed or there are other problems with the instruments.

7.3 Community Air Monitoring

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

The procedures and action levels for community air monitoring are presented in the CAMP and in the HASP for the Site.

8.0 Field Instruments and Calibration

All field analytical equipment will be calibrated immediately prior to each day's use and more frequently if required. The calibration procedures will conform to manufacturer's standard instructions. This calibration will ensure that the equipment is functioning within the allowable tolerances established by the manufacturer and required by the project. All instrument calibrations will be documented in the project field book and in an instrument calibration log. Records of all instrument calibration will be maintained by the Field Team Leader. Copies of all 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:

- PID
- Particulate monitors
- Multi-parameter meter (pH, specific conductivity, dissolved oxygen, oxidation reduction, and temperature meter)
- Turbidity meter

8.1 Portable Photo-Ionization Detector (PID)

- The photo-ionization detector will be equipped with either a 10.2 or 10.6 eV lamp. In this configuration, the PID is capable of ionizing and detecting compounds that account for over 70% of the VOCs on the USEPA Target Compound List.
- Calibration must be performed at the beginning of each day of use with a standard calibration gas having a concentration of 100 parts per million of isobutylene. If the unit experiences abnormal perturbation or erratic readings, more frequent or additional calibration will be required.
- All calibration data must be recorded in the project field notebooks.
- A battery check must be completed at the beginning and end of each working day.
- All changes to the PID will be noted in the field notes (such as lamp or filter cleaning or replacement or change of instrument).

8.2 Multi-Parameter Meter

- Calibration of the meter (YSI or equivalent) must be performed at the start of each day of use, and after very high or low readings as required by this Plan, according to manufacturer's instructions.
- National Institute of Standards and Technology - traceable standard calibration solutions will be used (where applicable). At least one backup meter will also be present on-site in the event of a malfunction.
- The calibration data must be recorded in the project field book each time it is performed.

8.3 Turbidity Meter

- The turbidity meter must be checked at the start of each day of use according to manufacturer's instructions.

9.0 Analytical Program

9.1 Environmental Sample Analyses

The laboratory samples for each media and the chemical analyses to be performed are summarized in Table 4-2 of the ISMP.

9.1.1 Soil Analyses

Surface soil and subsurface soil samples will be analyzed for the following parameters:

- TCL VOCs by USEPA Method 8260B;
- TCL SVOCs by USEPA Method 8270C;
- TAL Metals by USEPA Method 6000-7000 Series;
- Free Cyanide with extraction by USEPA Method 9014A and analysis by ASTM Method D4282-02 (microdiffusion);
- TCL Pesticides by USEPA Method 8081A;
- TCL Herbicides by USEPA Method 8151A; and
- PCBs (as Aroclors) by USEPA Method 8082.

9.1.2 Groundwater Analyses

Similar to soils, the groundwater samples will be analyzed for the following parameters:

- TCL VOCs by USEPA Method 8260B;
- TCL SVOCs by USEPA Method 8270C;
- TAL Metals by USEPA Method 6000-7000 Series;
- Total Cyanide by USEPA Method 9014;
- TCL Pesticides by USEPA Method 8081A;
- TCL Herbicides by USEPA Method 8151A; and
- PCBs (as Aroclors) by USEPA Method 8082.

9.1.3 Indoor Air/Ambient Air Analyses

The indoor air and ambient air samples, when needed, will be analyzed for VOCs by USEPA Method TO-15 (including naphthalene). The indoor air samples will also be analyzed for helium by ASTM Method ASTM D-1945. In addition to the standard TO-15 list of compounds, several additional compounds will be analyzed for, including: 1,2,3-trimethyl benzene, 1-methylnaphthalene, 2-methylnaphthalene, tetramethylbenzene, indene, indane, thiophene , 2-methylpentane, isopentane, and 2,3-dimethylpentane.

9.1.4 Waste Characterization/Profiling

Sufficient samples (a minimum of two) will be collected during the excavation or investigation and analyzed for full RCRA Hazardous Characteristics testing to determine if materials exhibiting hazardous characteristics may be present at the site and to support waste disposal profiling purposes. The analyses to be performed may include, but not be limited to, the following, depending on the medium and the selected disposal facility:

- Total Metals by USEPA Method 6010B (Mercury 7470A);
- Total Petroleum Hydrocarbons (DRO and GRO) by USEPA Method 8015 modified;
- PCBs by USEPA Method 8082;
- TCLP ZHE Extraction by USEPA Method 1311;
- TCLP VOC by USEPA Method 8260B;
- TCLP SVOC by USEPA Method 8270C;
- TCLP RCRA Metals by USEPA Method 6010B (Mercury 7470A);
- Corrosivity by USEPA Method 9045C;
- Ignitability/Flashpoint by USEPA Method 1010A;
- Reactive Cyanide and Reactive Sulfide by USEPA SW-846 Chapter 7, Sections 7.3.3.2 and 7.3.4.2; and
- Total Organic Halogens – USEPA Method 9020B.

9.2 Field Quality Control Samples

Field quality control samples will be collected and analyzed to document the accuracy and precision of the samples. 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 Equipment Blanks: 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). One equipment blank will be collected for every 20 samples per medium collected during sampling with non-disposable sampling equipment. The samples will be collected by pouring analyte-free water, prepared in the laboratory, over decontaminated sampling equipment and collecting it in sample jars. The blanks will be collected in the vicinity of a sample location. This field blank will be analyzed for VOCs, SVOCs, PCBs, total or free cyanide (depending if the blank is from groundwater or soil sampling equipment), pesticides and herbicides, and TAL metals.
- Field Duplicates: Field duplicates are collected to determine the precision of the soil samples collected. This is achieved by homogenizing soil (for non-VOC analyses) and splitting it evenly between separate sample jars. Duplicate samples will be collected and analyzed for VOC, SVOCs, PCBs, total or free cyanide (depending if the duplicate sample is from groundwater or soil), pesticides and herbicides, and TAL metals. The minimum required number of field duplicates is one for every 20 samples per medium.
- Matrix Spikes, and Matrix Spike Duplicates (MS/MSD): 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. The minimum required number of MS/MSD samples is one for every 20 samples per medium.

9.3 Sample Location Numbering System

- Surface soil samples will be numbered consecutively beginning with SS-200 (if applicable).

- Subsurface soil borings will be numbered consecutively beginning with SB-200 (soil borings). Individual samples will also be designated with a depth code (see below).
- Monitoring wells will be numbered consecutively beginning with MW-200. Note the exceptions at locations where monitoring wells are being installed adjacent to existing monitoring wells to create well pairs or triplets.

9.4 Sample Identification

Each sample will be given a unique alphanumeric identifier in accordance with the following classification system:

Table 9-1 Sample Identification

LL* Sample Type	NN* Sample Number	N-N Depth Code	LL QC Identifier

Sample Type:	GW – Boring Groundwater Grab SB – Soil Boring SS – Surface Soil AMB – Ambient Air	MW – Monitoring Well SV – Soil Vapor IA – Indoor Air
Sample Number:	Number referenced to a sample location map.	
Depth Code:	Depth in feet of sample interval (0-0.5, 2-4, 10-12, etc.)	
QC Identifier:	TB – Trip Blank	MS – Matrix Spike
	EB – Equipment Blank	MSD–Matrix Spike Duplicate
		MB – Matrix Blank

* L = Letter * N = Number

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.

9.5 Chain-of-Custody

- A Chain-of-Custody (COC) record (Figure 9-1 or similar) will accompany the sample containers during selection and preparation at the laboratory, during shipment to the field, and during return shipment to the laboratory.
- The COC will include the sample identities of each sample container and the analytical parameters for each, and will list the field personnel that collected the samples, preservation method, the project name and number, the name of the analytical laboratory that will receive the samples, and the method of sample shipment.
- If samples are split and sent to different laboratories, such as to a specialty laboratory for fingerprint analysis, a copy of the COC record will be sent with each sample shipment.

- The COC will be completed by field personnel as samples are collected and packed for shipment.
- Erroneous markings will be crossed-out with a single line and initialed by the author.
- The REMARKS space will be used to indicate if the sample is a matrix spike, matrix spike duplicate, or matrix duplicate.
- Trip and field blanks will be listed on separate rows.
- After the samples have been collected and sample information has been listed on the COC form, the method of shipment, the shipping cooler identification number(s), and the shipper airbill number will be entered on the COC.
- Finally, a member of the sampling team will write his/her signature, the date, and time on the first RELINQUISHED BY space.
- One copy of the COC will be retained by sampling personnel. The other copy and the original will be sealed in a plastic bag and taped inside the lid of the shipping cooler.
- Sample shipments will be refrigerated at 4˚C, typically by packing with bagged ice, to preserve the samples during shipment.
- After the shipping cooler is closed, custody seals provided by the laboratory will be affixed to the latch and across the front and back of the cooler lid, and signed by the person relinquishing the samples to the shipper.
- The seal will be covered with clear tape, and the cooler lid will be secured by wrapping with packing tape.
- The cooler will be relinquished to the shipper, typically an overnight carrier.
- The COC seal must be broken to open the container. Breakage of the seals before receipt at the laboratory may indicate tampering. If tampering is apparent, the laboratory will contact the Project Manager, and the samples will not be analyzed until directed to do so.
- The samples must be delivered to the laboratory within 48 hours of collection.

9.6 Sample Documentation

The field team leader will retain a copy of the COC, and, in addition, the field team leader will ensure that the following information about each sample is recorded in the field book:

- Sample identifier;
- Identification of sampled media (e.g., soil, sediment, groundwater);
- Sample location with respect to known reference point;
- Physical description of sample location;
- Field measurements, (e.g., pH, temperature, conductivity, and water levels);
- Date and time of collection;
- Sample collection method;
- Volume of groundwater purged before sampling;
- Number of sample containers;
- Analytical parameters;
- Preservatives used; and

- Shipping information:
  - Dates and method of sample shipments;
  - COC Record numbers;
  - Federal Express Air Bill numbers; and
  - Sample recipient (e.g., laboratory name).

Figures

AECOM

Figure 4-1

Boring/Well ID:________________

Page ______ of ______

Project Name:	Drilling Company:	Surface Comp:
Project Number:	Drilling Method:	Grout (bgs):
Date Pre-Cleared:	Rig Type:	Filter Pack (bgs):
Date Started Drilling:	Casing ID:	Riser (bgs):
Date Finished Drilling:	Water Level While Drilling (bgs):	Well Screen (bgs):
Logged By:	Total Depth of Boring (bgs):	Sump (bgs):

(Note: bgs = below ground surface)

Depth Range	Blow per 6 Inch	Re-covery ft/ft	PID	Lab Sample ID	USCS	Geologic Description Method:______________________

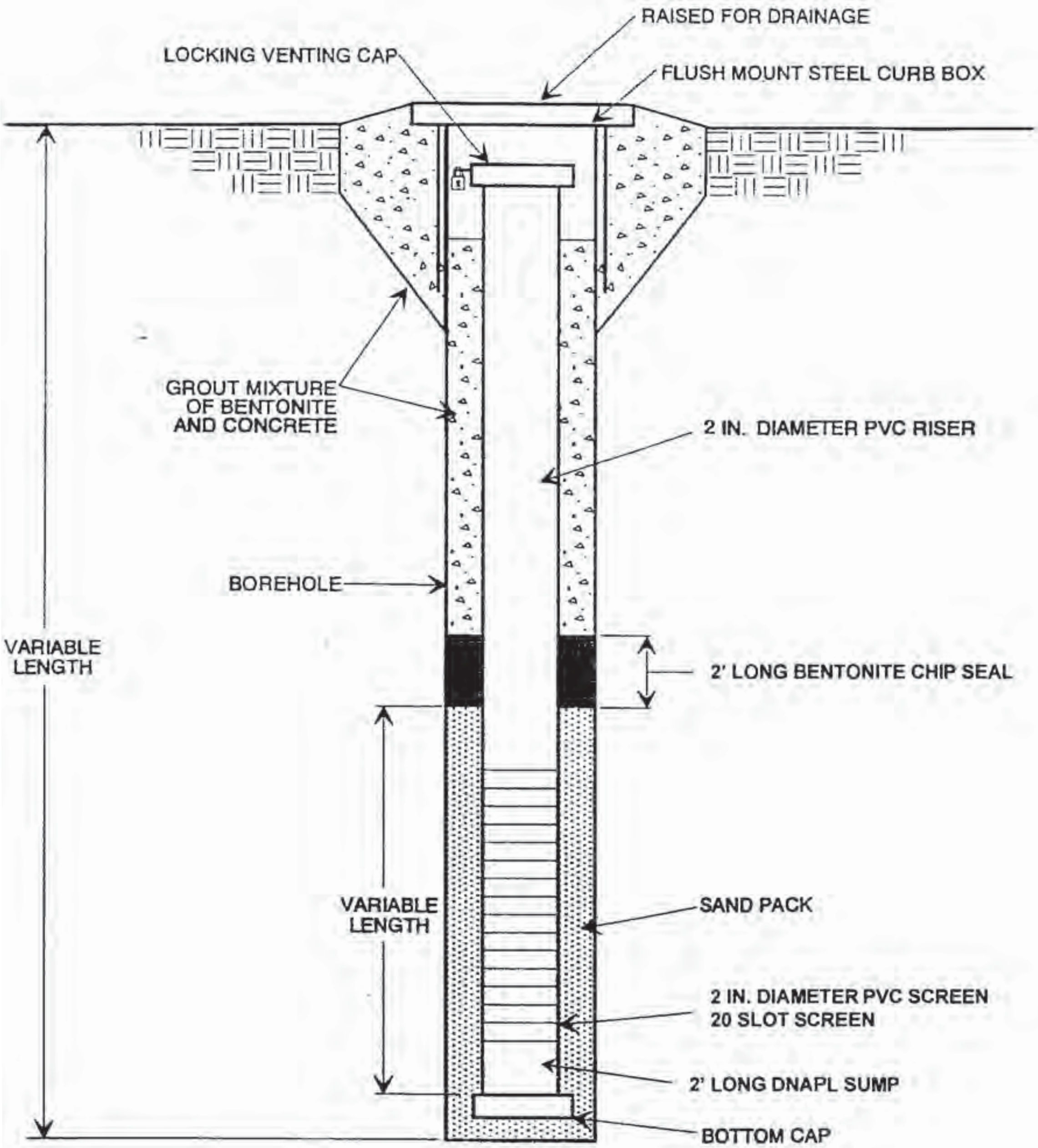
Lithology:

1.)	5.)
2.)	6.)
3.)	7.)
4.)	8.)

Comments:

Figure 4-2

TYPICAL MONITORING WELL CROSS SECTION



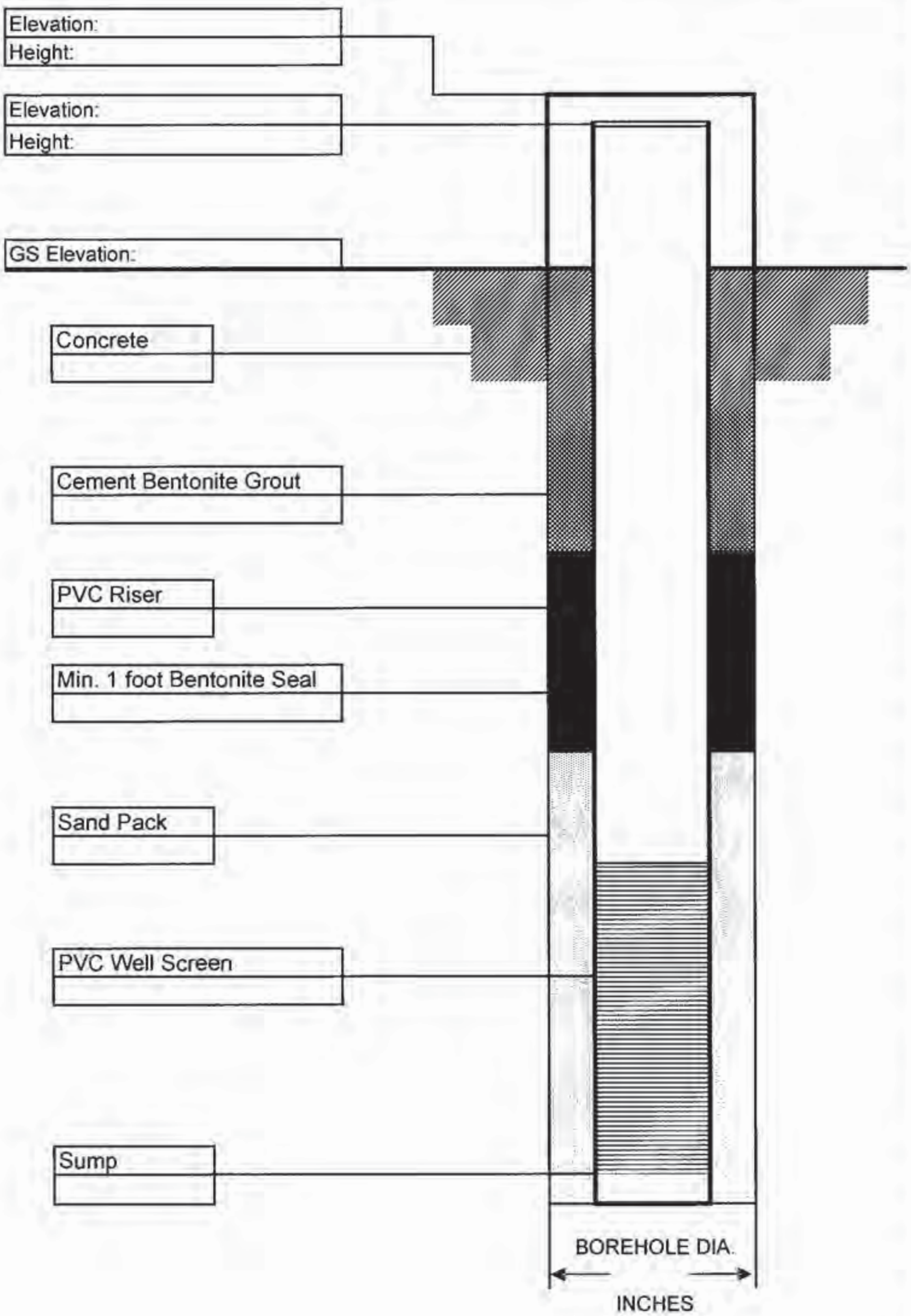
NOT TO SCALE

AECOM

Figure 4-3

WELL CONSTRUCTION LOG

WELL NO.:	FACILITY/SITE NAME:
PROJ. NO.:	CLIENT:
INSPECTOR:	DRILLING CONTACTOR:
DATE START:	DATE END:
LOCATION:	DRILLING METHOD:



PROTECTIVE CASING
Material:
Diameter:
Depth BGS:
Water Tight Seal:
Flushmount:
Weep hole:

GUARD POSTS
Material:
No. & Size:

SURFACE PAD
Composition:
Size:

RISER PIPE
Material:
Schedule:
Joint Type:
O-ring:
Diameter:

GROUT
Amt cement:
Amt bentonite:
Amt water:
Tremied:
Interval:

SEAL
Material:
Type:
Amount Used:
Interval:

FILTER PACK
Material:
Brand Name:
Amount Used:
Grain Size Dist.:
Interval:
Tremied:

SCREEN
Material:
Diameter:
Slot Size & Type:
Interval BGS:

SUMP
Interval BGS:
Bottom Cap:

BACKFILL PLUG
Material:
Setup/Hydration Time:

Figure 5-1

LOW-STRESS GROUND WATER SAMPLING FORM

Project Number: ________________
Project Name: ________________
Date: ________________
Weather: ________________

Well ID: ________________
Sample ID: ________________
Permit Number: ________________
Well Condition: ________________

PRE-PURGE INFORMATION

Protective Casing Diameter (inch): ________________
Inner Casing Diameter (inch): ________________
Inner Casing Material: ________________
Purge/Sample Method: ________________
Pump Intake Setting* (feet): ________________
PID/FID Reading of Well Headspace (ppm)
Before Cap Removal: ________________
After Cap Removal: ________________

Depth to Product* (feet): ________________
Initial Depth to Water* (feet): ________________
Product Thickness (feet): ________________
Depth to Top of Screen* (feet): ________________
Total Depth* (feet): ________________
Water Column (feet): ________________
Casing Volume (gal): ________________
DTW After Pump Installed: ________________

PURGING/SAMPLING INFORMATION

Time	Rate (gpm)	Gallons Purged	pH (SI Units)	Conductivity (µohms/cm)	Temp (°C)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mv)	Depth to Water (ft)	Comments

Start Purge Date/Time: ________________
End Purge Date/Time: ________________
Total Volume Purged (gal): ________________
Depth to Water After Purge* (feet): ________________

Pre-Sample Depth to Water* (feet): ________________
Start Sample Date/Time: ________________
End Sample Date/Time: ________________
Sampler Names: ________________

Observations During Sampling (e.g. slow recharge, turbidity, odor, sheen, PID/FID readings):

AECOM

Figure 5-1

LOW-STRESS GROUND WATER SAMPLING FORM

Sampling Sequence:

Analysis	Method	Container	Number of Bottles	Preservative	Comments
Volatile Organics					
Base/neutrals					
TPH					
Total Metals					
Dissolved Metals					
Cyanide					
Sulfate and Chloride					
Nitrate and Ammonia					
Preserved Inorganics					
Non-Preserved Inorg					
Bacteria					

Complete those analyses that apply.

Stabilization Ranges
Dissolved Oxygen: +/- 10%
Turbidity: +/- 10%
Specific Conductance: +/- 3%
Temperature: +/-3 %
pH: +/- 0.1 unit
Redox Potential: +/- 10mv

* = Measured from top of inner casing
DTW - Depth to Water
Thermo Environmental Instruments Model 580s OVM w/ 10.2 ev bulb
Water Levels Measured with an Electronic Water Level Meter
Field parameter meter calibration results are recorded in the field book.

AECOM

Figure 5-2

Well ID:

HYDRAULIC CONDUCTIVITY TEST LOG

Client: ____________ Date: ____________ Time: Start ______ am/pm
Project No: ____________ Finish ______ am/pm
Site Location: ____________
Weather Conds: ____________ Tester (s): ____________

1. WELL INFORMATION

a. Ref. Point Elev. ______ e. Total Well Depth ______ i. Screen Length ______

b. Static Depth to GW ______ f. Gravel Pack Diameter ______ j. Geology of Screened Interval

c. Time of GW reading ______ g. Water Column Height ______ (e-b)

d. Static GW Elev.(Ho) ______ (a-b) h. Casing Diameter ______

2. SLUG INFORMATION (see back for volume calculation)

a. Slug Length ______

b. Slug Diameter ______

3. DATA COLLECTION

a. Method of Data Collection: Manual ______ (see back) Electronic ______

b.Transducer Information
- Make ______
- Model ______
- Serial Number ______
- Offset ______
- Linearity ______
- Scale ______
- Coefficient ______
- Diameter/Length ______

c. Data Logging Information
- Make ______
- Model ______
- Serial Number ______
- Mode ______ (linear or logarithmic)
- Ref. Point (designation) ______ (TOC, Ground Surface, actual el
- Ref. Point value (if elev.) ______
- Positive numbers indicate increase or decrease in water level (circle one)

4. HYDRAULIC TEST INFORMATION

Start Time	Test Type (rising, falling)	Electronic File Name	Comments	End Time

5. MANUAL WATER LEVEL READINGS (as needed for control)

Time	Location	Depth to Water	Time	Location	Depth to Water

Signature ____________ Date ______

Q:\mw97\sops\7720\hydraulicconductivitytestlog.xls, page 1

Figure 5-2

6. EXPECTED WATER LEVEL DISPLACEMENT CALCULATION (optional)

a. Diameter of Slug (in) __________
b. Length of Slug (ft) __________
c. Volume/Linear ft of Slug (gal/ft from chart) __________
d. Volume of Slug (gal) __________ (b*c)
e. Diameter of Well (in) __________
f. Volume/Linear ft of Well (gal/ft from chart) __________
g. Expected Change in Water Level __________ (d/f)

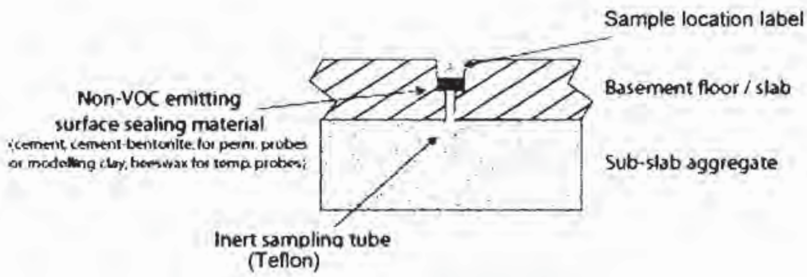
Volume / Linear Ft. of Pipe		
Diam. (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178

Note: Water column height (1-g from front page) should be greater than transducer length plus length of slug, unless well geometry prohibits.

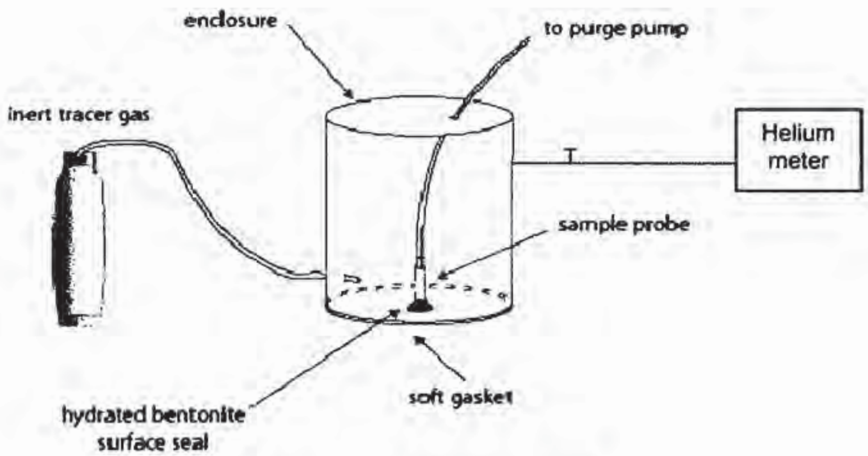
7. MANUAL WATER LEVEL MEASUREMENTS

Time (HH:MM)	Elapsed Time (min)	Depth to Water from TOC (ft)	Head, h (TOC - water depth)	h/Ho	Comments
	0			1	

q:\mw97\sops\7720\hydraulicconductivitytestlog.xls, page 2



TYPICAL SUB-SLAB SAMPLING PROBE SET UP



TYPICAL HELIUM TRACER TEST SET UP

AECOM

	TYPICAL HELIUM TRACER AND SUB-SLAB
DATE: 9/5/06 DRWN. MLR	FIGURE 6-1

Layout: FIGURE 2-2 User: astenberg Plotted: Sep 19, 2005 4:00pm Xref's: 18600X001

Soil Gas Sampling Log Sheet
Sample ID_______________

Client:_________________
Project Name:____________
Project Number:___________
Date:_____________
Sampler:_________________

Location:____
Canister Number:______________
Core Diameter:_____________ Core Material:________________
Core Length:_______________
Magnehelic Measurement: (Positive number indicates higher pressure in Core)_______
Depth of Hand Auguring:_____________
Soil Type:____
Method of Probe Advancement:___________________________
Depth of Probe Advancement:_______ Length Probe is Retracted:________

Time of Purging	PID Reading	Time of Purging	PID Reading

Starting Time:_____________ Starting Pressure:_________
Finish Time:_______________ Final Pressure:___________

Room Dimensions: Length:______ Width:_____ Height:_____

Comments:

Indoor Air/Ambient Air Sample
Sample ID_________________

Location:____
Sample ID:________________
Canister Number:___________
Starting Time:_____________ Starting Pressure:_________
Finish Time:_______________ Final Pressure:___________

Comments:

General Weather Conditions:____
Chemical Inventory:

FIGURE 6-3

FIELD SAMPLING DATA SHEET

(One Sample Per Data Sheet)

GENERAL:

PROJECT: ______________________ DATE(S) SAMPLED: ______________________

SITE: ______________________

LOCATION: ______________________ OPERATOR: ______________________

PID INSTRUMENT MODEL NO.: ______________ CALIBRATED BY: ______________________
CGI INSTRUMENT MODEL NO.: ______________ CALIBRATED BY: ______________________

TIME	CGI READING (%)	PID READING (ppm)	DRAGER TUBE (ppm)	LOCATION
1)				
2)				
3)				
4)				
5)				
6)				
7)				
8)				
9)				
10)				

CANISTER #	LOCATION	TIME

DATE/TIME	AMBIENT TEMPERATURE°	BAROMETRIC PRESSURE mm Hg	RELATIVE HUMIDITY %	COMMENTS

Data from meteorological station*

OSR-3

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH ASSESSMENT
BUREAU OF TOXIC SUBSTANCE ASSESSMENT

INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY

This form must be completed for each residence involved in indoor air testing.

Preparer's Name ______________________________ Date Prepared ______________

Preparer's Affiliation ____________________________ Phone No. ______________

1. **OCCUPANT**

Name: ______________________________

Address: ______________________________

County: ______________________________

Home Phone No. __________ Office Phone No __________

2. **OWNER OR LANDLORD:**
(If different than occupant)

Name: ______________________________

Address: ______________________________

____

Phone No. ______________________________

A. Building Construction Characteristics

Type (circle appropriate responses): Single Family Multiple Dwelling Commercial Public School

Ranch	2-Family
Raised Ranch	Duplex
Split Level	Apartment House __________ Units
Colonial	Number of floors __________
Mobile Home	Other specify ________________

Residence Age __________ General Description of Building Construction Materials ________________

Is the building insulated? Yes / No How air tight is the building? ______________________

____

____

OSR-3 (continued)

B. Basement construction characteristics (circle all that apply):

1. Full basement, crawlspace, slab on grade, other ___________
2. Basement floor: concrete, dirt, other ________
3. Concrete floor: unsealed, painted, covered, with _________
4. Foundation walls: poured concrete, block, laid up stone, other ___________
5. The basement is: wet, damp, dry___ Sump present? y / n ______ Water in sump? y / n ______
6. The basement is: finished, unfinished ______________
7. Identify potential soil vapor entry points (e.g., cracks, utility ports, etc.)
   ____
8. Describe how air tight the basement is ____
   ____

C. HVAC (circle all that apply):

1. The type of heating system(s) used in this residence is/are:

Hot Air Circulation	Heat Pump
Hot Water Radiation	Unvented Kerosene Heater
Steam Radiation	Wood stove
Electric Baseboard	Other (specify)______________________________

2. The type(s) of fuel(s) used is/are: Natural Gas, Fuel Oil, Electric, Wood, Coal Solar

   Other (specify)______________________________
3. Is the heating system's power plant located in the basement or another area? ________________
4. Is there air-conditioning? Yes / No Central Air or Window Units?

   Specify the location ____________________________
5. Are there air distribution ducts present? Yes / No
6. Describe the supply and cold air return duct work in the basement including whether there is a cold air return, the tightness of duct joints
   ____
   ____

OSR-3 (continued)

D. Potential Indoor Sources of Pollution

1. Has the house ever had a fire? Yes / No
2. Is there an attached garage? Yes / No
3. Is a vehicle normally parked in the garage? Yes / No
4. Is there a kerosene heater present? Yes / No
5. Is there a workshop, hobby or craft area in the residence? Yes / No
6. An inventory of all products used or stored in the home should be performed. Any products that contain volatile organic compounds or chemicals similar to the target compounds should be listed. The attached product inventory form should be used for this purpose.
7. Is there a kitchen exhaust fan? Yes / No Where is it vented? ____________________
8. Has the house ever been fumigated? If yes describe date, type and location of treatment.

____

E. Water and Sewage (Circle the appropriate response)

Source of Water

Public Water Drilled Well Driven Well Dug Well Other (Specify)______________

Water Well Specifications:

Well Diameter ______________________ Grouted or Ungrounted _________________

Well Depth ________________________ Type of Storage Tank _________________

Depth to Bedrock ____________________ Size of Storage Tank _________________

Feet of Casing ______________________ Describe type(s) of Treatment ___________

____

Water Quality:

Taste and/or odor problems? y / n If so, describe ____

How long has the taste and/or odor been present? ____

Sewage Disposal: Public Sewer Septic Tank Leach Field Other (Specify) ____________________

Distance from well to septic system___________Type of septic tank additive ____________________

Figure 6-4

OSR-3 (continued)

F. **Plan View**

Draw a plan view sketch for each floor of the residence and if applicable, indicate air sampling locations, possible indoor air pollution sources and PID meter readings.

OSR-3 (continued)

G. **<u>Potential Outdoor Sources of Pollution</u>**

Draw a sketch of the area surrounding the residence being sampled. If applicable, provide information on the spill location (if known), potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system if applicable, and a qualifying statement to help locate the site on a topographical map.

Figure 6-4

Household Products Inventory

Occupant / residence ______________________________

Investigator: ______________________ Date: ______________

Product description (dispenser, size, manufacturer …)	**VOC Ingredients**

Chain of Custody Record

№ 0476

AECOM

FIGURE 9-1

Project Name:	Project Number:
Send Report To:	Sampler (Print Name):
Address:	Sampler (Print Name):
	Shipment Method:
	Airbill Number:
Phone:	Laboratory Receiving:
Fax:	

Analysis Requested

Page ____ of ____

Purchase Order #: ____________

Field Sample ID	Sample Date	Sample Time	Sample Matrix	Number of Containers												Comments, Special Instructions, etc.	Lab Sample ID (to be completed by lab)

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Sample Custodian Remarks (Completed By Laboratory):

QA/QC Level		Turnaround		Sample Receipt	
Level I	☐	Routine	☐	Total # Containers Received?	
Level II	☐	24 Hour	☐	COC Seals Present?	
Level III	☐	1 Week	☐	COC Seals Intact?	
Other	☐	Other ____		Received Containers Intact?	
				Temperature?	

White: Lab Copy   Yellow: PM Copy   Pink: Field Copy   Gold: PM/QA/QC Copy

Appendix A

Field Descriptions of Samples for Former MGP Sites

Field Descriptions of Samples at Urban Impacted Sites

The intent of this document is to provide field personnel guidelines for logging soil conditions and observed impacts in a consistent and factual manner. This guidance recognizes that prejudging field conclusions regarding the potential source(s) or nature of a particular impact should be avoided and instead conclusions should be based on multiple lines of evidence (field observations, laboratory physical and chemical analyses, historic site uses, location of observed impacts, etc.).

SOIL LOGGING

- All soils are to be logged using the **Unified Soil Classification System** (ASTM D 2488 field descriptions).
- A photograph of the entire sample core should be taken. Additional photographs may be necessary to document impacted material.
- A calibrated **PID** (Photoionization Detector) should be used to screen all soil samples. PID readings should be taken every 6 inches of recovery and the interval reading should be included on the boring logs.
- The soil sample core should be scored or cut along the long axis so that the all of the soil lithology can be observed, when practical.
- **Moisture terms**: dry, moist and wet.
- **Color terms –**Color terms should be used to describe the "natural color" of the sample as opposed to staining caused by contamination (see below).
- **Representativeness –** Soil logs should include specific notes if the field representative believes that there is a possibility the soil sample being described is not representative of the interval sampled or is indicative of multiple sources of contamination.
- **Intervals for Description –** the field description should be for discrete intervals within the sampler, specifically pointing out small-scale units and changes within each sample interval. The description should also include the amount of sample recovered and note other conditions (such as a change in drilling conditions, etc.), as well as consistently adjusting the sample interval described (i.e. – identify the percentage of sample actually recovered and note any potential causes of the loss if possible) and note other conditions (such as a change in drilling conditions, etc.).

DESCRIPTION OF CONTAMINANTS

Visual Contamination Descriptors

- **NAPL** (Non Aqueous Phase Liquid) **–** a separate phase liquid that may be lighter than water (LNAPL) or denser than water (DNAPL). NAPL arises from a variety of industrial sources and can have varying consistency (viscosity) and can range from non-viscous to highly viscous (taffy-like). NAPL observations should be accompanied by applicable olfactory with smell for industrial sources (see descriptors below) and other visual observations (e.g., color and viscosity).

- **Sheen –** iridescent sheen. This is not to be used to describe a “bacterial sheen”, which can be distinguished by its tendency to break up at angles on the water surface; whereas a non-bacterial sheen will be continuous and will not break up.

- **Blebs –** discrete, spherical shaped NAPL in or on the soil matrix. Include additional descriptors to the extent practicable such as the approximate size and quantity (number of blebs or qualitative estimate) to the extent practical.

- **Coated –** soil grains are coated with NAPL – there is not sufficient NAPL present to saturate the pore spaces. Use modifiers such as light, moderate or heavy to indicate the degree of coating.

- **Saturated –** the entirety of the pore space for a sample interval is saturated with NAPL. Care should be taken to ensure that the saturation described is not related to water in the sample. Depending on the viscosity, NAPL saturated materials may freely drain from a soil sample and should be documented accordingly.

- **Stained –** visible, unnatural discoloration of the soil, with no visible free product.

- **Solid NAPL –** NAPL that is in a solid or semi-solid phase. The magnitude of the observed solid NAPL should be described (discrete granules or a solid layer).

  Other Visual Impacts and Descriptors– Other visual impacts that are not naturally occurring should also be noted along with appropriate visual descriptors. These other visual observations could include the observation of debris, wood chips, staining, anthropogenic materials, or other notable visual characteristics and general observations characterizing common urban fill. The above impacts should be described using other visual descriptors as applicable. Descriptors may include, but not be limited to, color, consistency, thickness, etc.

Olfactory Descriptors

- Note odors similar to mothballs, driveway sealer, highway paving oil or other odors that are acrid, burnt, or sulfur-like, etc.
- Other odors that are not believed to be natural should also be identified with descriptors such as organic, ammonia, sweet, chemical etc., as applicable.
- Use modifiers such as strong, moderate or slight to indicate intensity of the observed odor.
- In instances where multiple odors are present, a combination of descriptors should be used to clearly identify where these co-mingled impacts are present.

DNAPL/LNAPL

- **Density of NAPL –** a jar shake test can be performed to preliminarily determine in the field whether observed NAPL is either denser or lighter than water. Care should be taken in recording and interpreting the results, as experience indicates that the apparent result immediately following the test may change with time. Laboratory testing for density of the NAPL is recommended to confirm results. The depth at which the NAPL is encountered on soil with respect to the groundwater surface is not diagnostic and should not be used a basis for identifying the density of NAPL in the field.

- **Viscosity of NAPL –** if NAPL is present a qualitative description of viscosity should be made. The following should be used:

  Highly Viscous (taffy-like)
  Viscous (No. 6 fuel oil or bunker crude-like)
  Low viscosity (No. 2 fuel oil-like or water-like)

GROUNDWATER SAMPLING OBSERVATIONS

- Any observations of sheen, blebs, NAPL, smearing or coating of the sampling equipment, odor, etc. made during groundwater sampling are to be included in the groundwater sample collection log.

COLOR CHART (ATTACHED) For Use in Cross-Sections, Extent Maps, and Similar Interpretative Depictions

The color chart attached is intended to help visually depict the nature and location of impacts observed during an investigation. The chart would be used for new sites or sites transitioning from the Site Characterization to the Remedial Investigation phase (or are in the early stages of the Remedial Investigation phase). The colors should be included in investigation summaries on cross sections to support an understanding of the nature and extent of impacts. In addition, the colors may also be placed on boring logs (although not a requirement) in the final report. In either case, the colors will be used in interpretive depictions of nature and extent once the lines of evidence support a determination of the appropriate color selection. Since the investigation of a site is dynamic, the use of a particular color or a combination of colors may change if other lines of evidence suggest such a change is appropriate.

In instances where multiple impacts are present, a combination of colors should be used (such as a color with cross hatching) to clearly identify where these co-mingled impacts are present.

Color Descriptions of Samples at Urban Impacted Sites

Color	Description	RGB Color	Auto Cad Index
	NAPL SATURATED	255,0,0	10
	NAPL COATED MATERIAL	255,0,255	210
	SOLID NAPL	129,64,0	34
	NAPL BLEBS, GLOBS, SHEEN	255,191,0	40
	STAINING, ODOR	255,255,0	50
	INDUSTRIAL IMPACTS - (PETROLEUM OR OTHER UNNATURAL) SATURATION & SHEENS	0,191,255	140
	INDUSTRIAL IMPACTS - (PETROLEUM OR OTHER UNNATURAL) STAINING & ODORS	170,234,255	141
	WOOD CHIPS/BLUE DISCOLORATION/SULFER-LIKE ODOR	0,0,255	170
	NO OBSERVED IMPACTS	0,165,0	92

Note: In instances where multiple impacts are present, a combination of colors should be used (such as a color with cross hatching) to clearly identify where these co-mingled impacts are present.

Appendix I

Bulkhead Documentation Photographic Log

Looking Southeast towards Lowes at bridge abutment and bulkhead

Looking South towards site looking at bulkhead

Looking South towards site at bulkhead

Looking South towards site at bulkhead

Facing Southeast at Lowes looking @ sheet piling bulkhead

Looking North towards 9th St. bridge bulkhead in front of Lowes

Looking South at site MW-9 and bulkhead. 11th St. basin to the left.

Looking at entrance of 11th St. basin and bulkhead along North side of Pathmark building

11th St. basin looking East and bulkhead around it

Looking West from 11th St. basin and bulkhead to North along Lowes lot

Looking North towards 9th St. bridge bulkhead along site and Lowes

Looking Northeast towards site and Lowes and bulkhead

Looking East towards site and bulkhead

Looking South towards site and bulkhead

Looking South towards site and bulkhead

Looking South towards site and bulkhead

Looking South at site and bulkhead

Looking East at Lowes bulkhead

Looking East at Lowes bulkhead

Looking Southeast at Lowes bulkhead

Looking Southeast at Lowes bulkhead

Looking South towards site at bulkhead