Incorporated Village of Sea Cliff

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October 23, 2026

VIA ELECTRONIC MAIL

New York State Department of Environmental Conservation
Division of Environmental Remediation
Attn: Project Manager, Site V00351
Glenwood Landing Former Gas Plant Site

Re: NYSDEC Site V00351 — Glenwood Landing Former Gas Plant Site
PSC Case 24-T-0446 — Propel NY Energy Project

Request for Expedited Review and Written Determination Concerning Proposed Construction Activities, Residual Contamination, and Existing Remediation Controls

Dear Project Manager:

The Incorporated Village of Sea Cliff requests the New York State Department of Environmental Conservation's immediate review of the construction activities proposed by Propel NY Energy at the former Glenwood Landing Gas Plant property along Shore Road, adjoining Hempstead Harbor.

The New York State Public Service Commission is presently reviewing the Applicant's Environmental Management and Construction Plan (EM&CP) Phase 1, including tree clearing, temporary equipment access, and associated activities at the proposed New Shore Road Substation and Shore Road landfall. The Village has filed extensive comments identifying unresolved environmental and public-safety concerns and requesting that approval of the Shore Road work be withheld until those deficiencies are addressed.

Our review of the February 2022 NYSDEC Site Management Plan (SMP) for Site V00351 raises additional, substantial questions concerning the compatibility of Propel's proposed construction with the existing remediation program and the continuing legal obligations governing this property.

Documented Residual Contamination and Continuing Remediation Controls

The February 2022 SMP confirms that approximately 10,880 tons of contaminated soil were removed during the original remediation, but contamination was intentionally left in place and remains subject to engineering and institutional controls.

The SMP identifies historical contamination involving arsenic, mercury, PCBs, asbestos, and carcinogenic polycyclic aromatic hydrocarbons, including benzo(a)pyrene. Its discussion of remaining impacts identifies metals in Area 1B and residual PCBs, arsenic, and benzo(a)pyrene at specified excavation locations. The SMP establishes permanent protective soil-cover systems in Areas 1B and 3 and restricts activities that could disturb remaining contamination.

These are not historical concerns that disappeared when the original remediation was completed. The continued existence of an NYSDEC-approved Site Management Plan, protective covers, and recorded restrictions reflects an ongoing obligation to prevent exposure to and migration of remaining contamination.

NYSDEC Approval and Construction Requirements

Section 1.3.1 of the February 2022 SMP expressly states:

"All intrusive activities must be approved by NYSDEC."

The SMP further provides for advance notification of ground-intrusive activities, including 15 days' advance notice for activities pursuant to the Excavation Work Plan and additional requirements where changes in site use or larger-scale work are proposed.

Section 3.5 and Appendix C establish requirements concerning excavation procedures, worker protection, environmental oversight, and community air monitoring. Section 3.8 also contemplates additional investigation and potentially further remedial work when large-scale redevelopment occurs or previously inaccessible subsurface areas are disturbed.

Propel's Phase 1 plans contemplate heavy forestry equipment and the establishment of temporary access routes on steep terrain. Although the revised EM&CP Narrative states that grading is not planned during Phase 1, the original Shore Road Stormwater Pollution Prevention Plan expressly contemplates minor grading and movement of soil for equipment access. The proposed temporary access-road construction and operation also raise questions concerning soil-cover integrity, compaction, drainage, and erosion.

The Village has not been provided documentation demonstrating that the proposed construction footprint has been reconciled with the SMP's identified areas of remaining contamination, existing soil covers, and excavation restrictions. Nor have we been provided a written NYSDEC determination concerning the applicability of the SMP to the proposed Phase 1 activities.

Direct Proximity to Tappen Beach and Hempstead Harbor

Of particular concern, Section 2.1 of the February 2022 SMP expressly identifies Tappen Beach as the property's northern boundary, while Section 2.2.1 identifies the adjoining public beach and marina.

Nevertheless, Propel's revised EM&CP Phase 1 Appendix G-1, §2.2, states that no recreational areas are located in the vicinity of its construction workspaces.

The Village specifically challenged this apparent factual error in its recent PSC filing.

The proximity of this previously contaminated property to an established public beach, marina, playground, athletic facilities, and Hempstead Harbor makes it essential that potential contaminant-exposure and migration pathways be accurately identified and evaluated.

The SMP also describes stormwater infrastructure conveying runoff toward Hempstead Harbor and regional groundwater movement in the same direction. Disturbance of contaminated soil or damage to existing protective systems could create additional pathways for contaminants to migrate through dust, sediment, surface runoff, or drainage.

An accurate assessment of the environmental consequences of construction cannot be made without first determining whether those activities will disturb the remaining contamination or compromise the controls established to protect public health and the environment.

Request for Expedited Written Determination

In view of the pending PSC review and the Applicant's anticipated construction schedule, the Village respectfully requests that NYSDEC:

1. **Confirm the controlling remediation requirements.** Identify whether the February 2022 SMP remains the currently approved plan and provide any subsequent amendments, relevant approvals, or modifications to engineering and institutional controls.

2. **Determine the relationship between the proposed construction and the remediation areas.** Require a scaled, georeferenced overlay identifying the SMP site boundaries, remaining contamination, existing soil covers, restricted areas, and drainage features in relation to Propel's proposed Phase 1 clearing, temporary access roads, equipment movements, staging areas, and subsequent excavation and construction activities.

3. **Identify prior consultation and approvals.** Confirm whether NYSDEC has received or reviewed Propel's proposed work plans, Notices of Intrusion, excavation notifications, requests to modify engineering controls, or other submissions concerning Site V00351, and identify any approvals or written determinations issued.

4. **Determine the applicability of the Excavation Work Plan.** Advise whether any proposed Phase 1 activities constitute intrusive work, could damage existing engineering controls, or otherwise require approval under §1.3.1 and Appendix C of the SMP. The Village requests that NYSDEC make this determination based on the actual proposed activities rather than relying solely on the Applicant's characterization of Phase 1 as tree clearing.

5. **Evaluate additional investigation and monitoring requirements.** Determine whether the proposed work requires further site characterization, a site-specific Health and Safety Plan, Community Air Monitoring Plan, contaminated-soil management procedures, or additional safeguards to protect nearby recreational users and Hempstead Harbor.

6. **Address subsequent construction phases.** Determine whether the planned substation redevelopment and associated excavation trigger further investigation or remedial planning under §3.8 of the SMP, and identify the approvals required before such activities may occur.

7. **Coordinate directly with DPS Staff.** Provide a written determination to the Department of Public Service identifying any applicable remediation requirements, outstanding submissions, necessary approvals, and restrictions that must govern the affected Shore Road construction activities.

   The Village is not asserting that every proposed Phase 1 activity necessarily will penetrate contaminated soil or damage existing engineering controls. That is precisely the question that must be answered through a documented review of the actual construction plans against the NYSDEC-approved remediation record.

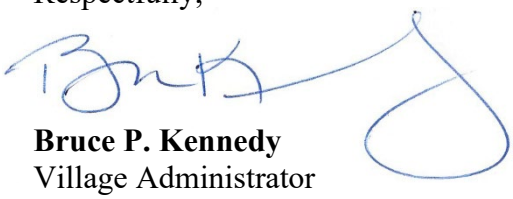
   However, the Applicant's construction schedule cannot substitute for compliance with existing environmental obligations. Neither should the PSC be asked to approve construction activities without a clear understanding of whether they may compromise protective measures previously required by NYSDEC.

   Accordingly, the Village requests that NYSDEC undertake this review on an expedited basis and advise the PSC and DPS Staff that authorization of the affected Shore Road work should not proceed until the applicable remediation requirements have been identified and compliance has been demonstrated.

   The Village would appreciate written acknowledgment of this request, identification of the assigned project manager, and an indication of when NYSDEC expects to provide its determination.

   Thank you for your attention to this important matter. The Village is prepared to provide its recently filed PSC comments and the relevant Propel construction documents to facilitate the review.

Respectfully,



Bruce P. Kennedy
Village Administrator
Incorporated Village of Sea Cliff
(516) 671-0080
bkennedy@seacliff-ny.gov

cc:
Hon. Michelle L. Phillips, Secretary, NYS Public Service Commission
NYS Department of Public Service Staff — Case 24-T-0446
NYS Department of Health
Town of Oyster Bay

References/Enclosures:
NYSDEC, *Site Management Plan, Glenwood Landing Former Gas Plant Site, V00351* (Feb. 2022), particularly §§1.3.1, 2.1, 2.4, 3.4–3.8, and Appendices B and C; Village of Sea Cliff, *Supplemental Comments and Continuing Objections Concerning Phase 1 EM&CP Filings* (Oct. 23, 2026); relevant Shore Road Phase 1 construction plans.

NATIONAL GRID GLENWOOD LANDING FORMER GAS PLANT SITE

NASSAU COUNTY

GLENWOOD LANDING, NEW YORK

SITE MANAGEMENT PLAN

NYSDEC Site Number: V00351

Prepared for:

National Grid

175 East Old Country Road

Hicksville, NY 11801

Prepared by:

GEI Consultants, Inc., P. C.

1000 New York Avenue

Huntington Station, NY 11746

631.760.9300

Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date
1	2/28/22	Revised to December 2020 template	

FEBRUARY 2022

CERTIFICATION STATEMENT

I, JEFFERY PARILLO, certify that I am currently a NYS registered professional engineer and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

P.E.

02/28/2022 DATE

It is a violation of Article 145 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.

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Abbreviations and Acronyms

ASP	Analytical Services Protocol
CAMP	Community Air Monitoring Plan
CFR	Code of Federal Regulation
COC	Certificate of Completion
CP	Commissioner Policy
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
EWP	Excavation Work Plan
FSP	Field Sampling Plan
HASP	Health and Safety Plan
IC	Institutional Control
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
P.E. or PE	Professional Engineer
PFAS	Per- and Polyfluoroalkyl Substances
PRR	Periodic Review Report
QAPP	Quality Assurance Project Plan
QEP	Qualified Environmental Professional
RCRA	Resource Conservation and Recovery Act
RP	Remedial Party and Respondent
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVI	Soil Vapor Intrusion
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
USEPA	United States Environmental Protection Agency
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program

Executive Summary

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance, and reporting activities required by this Site Management Plan (SMP):

Site Identification:	VCA No: V00351; Former Glenwood Landing Gas Plant	
Institutional Controls:	1. The property may be used for industrial use (Areas 2 and 3) and restricted residential use (Areas 1A and 1B)	
	2. Institutional controls implemented at the Site include a Declaration of Covenants and Restrictions (DCR), which enforces the execution of this SMP, limits Site use to industrial (Areas 2 and 3) and restricted residential (Areas 1A and 1B), restricts the use of on-Site groundwater, and restricts the disturbance or excavation of any contamination remaining on the Site.	
	3. All ECs must be inspected at a frequency and in a manner defined in the SMP.	
Engineering Controls:	1. Soil Cover system	
Inspections:		**Frequency**
1. Site Wide Inspections		Annual
Monitoring:		
1. Soil Vapor Intrusion Evaluation for New Buildings		As needed
Maintenance:		
1. Soil Cover System Maintenance.		As needed
Reporting:		
1. Periodic Review Report		Every 5 Years
2. Site-wide Inspection Report		Annually
3. Severe Conditions Inspection Report		As Needed

Further descriptions of the above requirements are provided in detail in the Sections 3, 4, and 6 of this SMP.

The property owner (National Grid) is required to comply with this SMP including all notifications to the New York State Department of Environmental Conservation (NYSDEC), and the provisions in the Excavation Work Plan (Appendix C). If property ownership changes after the submission of the SMP, Institutional Controls (ICs) (DCR) must be addressed by the property owner's successors. This provision is transferred during the property ownership change by the DCR attached to the deed.

National Grid is responsible for Manufactured Gas Plant (MGP)-related impacts and costs associated therewith, only. If a remedy is determined to be necessary to address sources of non- MGP-related impacts present at the Site, this will be evaluated separately by NYSDEC, for further action. **While National Grid has voluntarily assumed responsibility for preparation of this SMP, National Grid reserves all of its rights under federal and state environmental laws to pursue other parties who may have responsibilities at this Site and for violations of the SMP.**

Further descriptions of the above requirements are provided in detail in the latter sections of this SMP.

1. Introduction

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the Glenwood Landing Former Gas Plant Site located in Glenwood Landing, New York (hereinafter referred to as the "Site"). See Fig. 1. The Site is currently in a New York State (NYS) Voluntary Cleanup Agreement (VCA) Site No. R1-0001-01-01 which is administered by New York State Department of Environmental Conservation (NYSDEC or Department).

National Grid's corporate predecessor, KeySpan Corporation, (hereinafter "National Grid" or "RP") entered into a Voluntary Cleanup Agreement (VCA) in March 2001 with the NYSDEC to remediate MGP-related impacts at the Site (the Order). This VCA required the investigation and remediation of contaminated media at the Site. The Site remediation included the excavation and off-site disposal of approximately 10,880 tons of non-hazardous contaminated soil, and demolition and removal of several on-site buildings and structures. In accordance with the VCA, a limited amount of soil contamination was left in place after completion of the remedy which are addressed with Land Use Controls and covered under this SMP. This SMP is required under the NYSDEC Voluntary Cleanup Program (VCP). A figure showing the Site location and boundaries of this Site is provided in Fig. 1. The boundaries of the Site are provided along with metes and bounds descriptions of the excavation areas in the Declaration of Covenants and Restrictions (DCR) included in Appendix A.

After completion of the remedial work, some target compounds and were left in the subsurface at this Site. Remaining impacts above the Restricted Residential Soil Cleanup Objectives (SCOs) are present in Area 1B of the Site; however, this area is currently being used for Industrial purposes. Remaining impacts are also present above the Industrial Use SCOs in Area 2 at the Site. Impacted areas were excavated to the groundwater table; however, as noted below the cleanup standards have been updated since the time of excavation. The remaining impacts in these areas do not have the potential for day-to-day exposure to the public. Institutional and Engineering Controls (ICs and ECs) have been incorporated into the SMP to control exposure to target compounds detected at concentrations exceeding applicable Standards Criteria and Guidance (SCGs) in environmental samples collected at the Site (i.e. remaining impacts) to ensure protection of public health and the environment.

Institutional controls implemented at the site include a DCR, which enforces the execution of this Site Management Plan, limits site use to industrial (Areas 2 and 3) and restricted residential (Areas 1A and 1B), restricts the use of on-site groundwater, restricts the excavation of any contamination remaining on the site and prevents the construction of any new structures in Area 1A and 1B without the assessment for potential vapor intrusion. It should be noted that although Areas 2 and 3 are classified for industrial use, approximately 94% of the VCA related property located to the east of Shore Road meets restricted-

residential use standards. A DCR recorded with the Nassau County Clerk, requires compliance with this SMP and all ECs and ICs placed on the Site. The DCR is located in Appendix A.

ECs and ICs will be incorporated into this SMP to control exposure to remaining impacts to ensure protection of public health and the environment. The ECs established on the Site as part of the remedy include a soil cover system in Areas 1B and 3. The soil cover system placed in Area 1B is 18 inches thick and is comprised of a 10 oz./square yard geotextile, 1 foot of clean clay/soil cover, and 6 inches of topsoil and vegetation. The soil cover system placed in Area 3 is comprised of clean fill from the bottom of the excavation area to approximately 6 inches below grade, 6 inches of topsoil and vegetation. The excavation areas were dug to a depth of eight feet, excluding Area 3-8, which was dug to approximately two feet. The thickness of the soil cover corresponds to the depth of excavation in each excavation area within Area 3. An as-built drawing detailing the location of the engineering controls is provided in Appendix B.

Annual inspections will be completed to assess compliance with the provisions of the DCR, and this SMP.

This SMP was prepared to manage remaining impacts at the Site or until extinguishment of the DCR in accordance with Environmental Conservation Law (ECL) Article 71, Title 36. This plan has been approved by the NYSDEC and may only be revised with the approval of the NYSDEC.

It is important to note that:

- This SMP details the Site-specific implementation procedures that are required by the DCR. Failure to properly implement the SMP is a violation of the DCR, which is grounds for revocation of the Certificate of Completion (COC).

- Failure to comply with this SMP is a violation of ECL Article 71, Title 36 Environmental Easements and, 6 New York Codes, Rules, and Regulations (NYCRR) Part 375 and the VCA (Index #R1-0001-01-01 Site #V00351) for the Site, and thereby subject to applicable penalties. If the failure to comply with this SMP occurs, the NYSDEC may take action against the violating party. The property owner is required to comply with this SMP including all notifications to NYSDEC, and the provisions in the Excavation Work Plan (Appendix C).

- NYSDEC can take action against an onsite and/or offsite owner if they interfere with the remedial program under the ECL. Triggers include improper disposal, release of COC's to environment, lack of odor control, etc.

Annual inspections of the Site will be conducted to assess compliance with the provisions of the DCR and this SMP.

All reports associated with the Site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by GEI Consultants, Inc., P.C., on behalf of National Grid, in accordance with the requirements of the NYSDEC's Division of Environmental Remediation (DER)-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 2010, and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs and/or ECs that are required by the DCR for the Site. **While National Grid has voluntarily assumed the costs of preparing this SMP, National Grid reserves all of its rights under federal and state environmental laws to pursue other parties who may have responsibilities at this Site and for violations of the SMP.**

To address these needs, this SMP includes the following two plans:

1. An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the Site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

    - Institutional Controls:

        - Compliance with the DCR by the Grantor and the Grantor's successors and assigns with all elements of this SMP.

        - All Engineering Controls must be operated and maintained as specified in this SMP.

        - All Engineering Controls on the Controlled Property must be inspected and certified at a frequency and in a manner defined in the SMP.

        - Soil vapor and other environmental or public health monitoring must be performed as defined in this SMP; and

        - Data and information pertinent to Site Management for the Controlled Property must be reported at the frequency and in a manner defined in this SMP.

        - Use of groundwater underlying the Site property is prohibited without testing and/or treatment to ensure it is safe for the intended use.

- All future activities on the property that will disturb contaminated material are prohibited unless they are conducted in accordance with this SMP.

- The portion of the property located to the east of Shore Road may be used for industrial use, provided that the long-term Engineering and Institutional Controls remain in use as described in this SMP.

- The portion of the property located to the west of Shore Road may be used for restricted residential use, provided that the long-term Engineering and Institutional Controls, in particular the Area 1B soil cover system, remain in use as described in this SMP.

- The two portions of the property may not be used for a higher level of use, without NYSDEC approval, and amendment and approval of the DCR.

- The site owner or remedial party will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

- Engineering Controls:

  - Exposure to remaining soil/fill contamination in portions of the Site is prevented by soil cover systems. An 18-inch soil cover system was placed in Area 1B, which is comprised of a 10 oz./square yard geotextile, 1 foot of clean clay/soil cover and 6 inches of topsoil and seed and Area 3, which is comprised of clean fill from the bottom of the excavation area to approximately 6 inches below grade and 6 inches of topsoil and seed. The soil cover system in Area 3 is approximately eight feet thick, excluding one area where the cover is approximately two feet thick.

- The Institutional and Engineering Control Plan, which is presented in Section 3 of this SMP, includes the following plans and provisions:

  - An Excavation Work Plan which details the provisions for management of small-scale excavations in areas of remaining impacts.

- A Health and Safety Plan.
- Community Air Monitoring Plans.
- A Quality Assurance Project Plan.
- A Field Sampling Plan.
- Further investigation and possible remediation should large-scale redevelopment occur (see Section 3.8).
- Management and inspection of the identified engineering controls (see Section 3.4); and
- Maintenance of Site access controls and Department notification.

2. A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes:

   - A schedule of monitoring and frequency of submittals to the Department. The Monitoring Plan is presented in Section 4 of this SMP.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager as an addendum. The NYSDEC can also make changes to the SMP or request revisions from the remedial party. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shutdown of a remedial system, post-remedial removal of impacted sediment or soil, or other significant change to the Site conditions. The NYSDEC project manager will provide a notice of any approved changes to the SMP and append these notices to the SMP that is retained in its files.

1.3 Notifications

1.3.1 Site Notification Requirements

All intrusive activities must be approved by NYSDEC. Sufficient notification must be made to NYSDEC so they can make the decision on the type of reporting. Typically, the type of notification and reporting requirements depend on the scope of work. Large-scale intrusive work will require additional investigation and, depending on findings of the investigation, may require a detailed work plan, such as a Remedial Action Work Plan while smaller scale (*i.e.*, "limited") intrusive activities will comply with the Excavation Work Plan (Appendix C) and may require a Notice of Intrusion letter or a simple letter work plan.

Notifications shall be submitted, in writing, to National Grid and to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

1. 60-day advance notice of any proposed changes in Site use that are required under the terms of the VCA, 6 NYCRR Part 375 and/or ECL.
2. 7-day advance notice of any field activity not pursuant to the EWP.
3. 15-day advance notice of any proposed ground-intrusive activity pursuant to the EWP. If the ground-intrusive activity qualifies as a change of use as defined in 6 NYCRR Part 375, the above mentioned 60-day advance notice is also required.
4. Notice within 48 hours of any non-routine maintenance activities.
5. Notice within 48-hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
6. 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 ECs in place at the Site 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.
7. Follow-up status reports on actions taken to respond to any damage or defect to the EC requiring ongoing responsive action will be prepared and submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the Site use of the Site, or the responsibility for implementing this SMP will include the following notifications:

8. At least 60 days prior to the change, National Grid and the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the VCA, and all approved work plans and reports, including this SMP.

9. Within 15 days after the transfer of all or part of the Site, the new owner's name, contact representative, and contact information will be confirmed in writing to National Grid and the NYSDEC.

In addition to the above notifications pursuant to DER-10, notification shall be made to National Grid for the following reasons:

10. 30-day advance notice of the start of any field activity not pursuant to the EWP (e.g., non-intrusive field activity or work in non-impacted media).

11. As-soon-as-possible advance notice of any proposed ground-intrusive activity pursuant to the EWP.

12. 12-month advance notice or as soon as possible of any property redevelopment and/or building demolition.

Table 1 includes contact information for the above notifications. The information on this table will be updated as necessary to provide accurate contact information.

Table 1. Notifications*

Name	Contact Information	Required Notification**
Jenelle Gaylord NYSDEC Project Manager	(518) 402-9791 Jenelle.Gaylord@dec.ny.gov	All Notifications
Kelly Lewandowski Chief, NYSDEC Site Control	(518) 402-9553 Kelly.lewandowski@dec.ny.gov	Notifications 1 and 8
Jacquelyn Nealon NYSDOH Project Manager	(518) 402-7860 Jacquelyn.nealon@health.ny.gov	All Notifications
Michael Quinlan National Grid Project Manager	(516) 220-4363 Michael.Quinlan@nationalgrid.com	All Notifications

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

** Note: Numbers in this column reference the numbered bullets in the notification list in this section.

2. Summary of Previous Investigations and Remedial Actions

2.1 Site Location and Description

The Site is located in Glenwood Landing, Nassau County, New York and is identified as Section 21, Block F, P/O Lots 4, 9 and 1947, and Section 21, Block M, P/O Lots 35, 36, 596 and 597 on the Nassau County Tax Map (see Fig. 1). The Site is located on approximately 800 feet of waterfront on the east shore of Hempstead Harbor, and extends east across Shore Road. The property is bounded on the south by Gladsky Marina, to the west by Hempstead Harbor, to the north by Tappen Beach and east by the North Shore Country Club (see Fig. 2 – Site Layout Map). The boundaries of the excavation areas on the Site are shown on Fig. 2 and more fully described in Appendix A –DCR. The owner(s) of the Site parcel(s) at the time of issuance of this SMP is National Grid.

2.2 Physical Setting

2.2.1 Land Use

The Site consists of the following: an electric power generating station to the east of Shore Road and a compressed natural gas (CNG) injection station to the west of Shore Road. The Site is zoned for and is currently an industrial site.

The properties adjoining the Site and, in the neighborhood, surrounding the Site primarily include commercial/municipal/residential properties. The properties immediately south of the Site include a marina to the west of Shore Road and an oil terminal to the east of Shore Road; the properties immediately north of the Site include a public beach and marina to the west of Shore Road and a golf course to the east of Shore Road which is also present east of the Site; and immediately west of the Site is Hempstead Harbor.

2.2.2 Geology

The westernmost portion of the Site is located adjacent to Hempstead Harbor and is approximately eight feet above mean sea level (msl). Moving inland from Hempstead Harbor and across Shore Road, surface topography increases steeply with the eastern boundary of the Site property at approximately 80 feet above msl.

The Site is immediately underlain by the Upper Glacial aquifer, a Pleistocene-aged unit consisting of glacial till and outwash deposits. It consists mainly of a poorly to moderately sorted fine-coarse sand and gravel with variable amounts of clay and silt and is considered to have excellent groundwater transmitting properties. The Upper Glacial aquifer is

approximately 225 feet thick in the Site area and generally overlies the Magothy aquifer. However, in the immediate vicinity of the Site property, the Magothy aquifer has been completely eroded away and, as a result, the Upper Glacial aquifer directly overlies the Raritan Clay confining unit. A review of soil borings indicates that the glacial sediments underlying the Site property consist of primarily fine to medium sand with varying amounts of silt and gravel, with fairly good water transmitting properties. However, the available information also indicates that there exists a number of low permeable clay-rich zones interbedded with the more permeable sand-rich zones.

The Magothy aquifer is a Cretaceous-aged unit consisting of alternating layers of fine sand, silts and clays considered to have moderate groundwater transmitting properties. However, due to the numerous clay-rich zones, it is highly anisotropic with vertical hydraulic conductivities being approximately 0.01 of horizontal values.

Underlying the Magothy aquifer are additional Cretaceous-aged units, including, in descending order, the Raritan Clay confining unit and the Lloyd aquifer. Consolidated bedrock is located approximately 475 feet below grade at the Site. The Raritan Clay beneath the Site consists of solid, compact clay at least 100 feet thick.

Geologic cross section and supporting information are shown in Figs. 4 and 5.

2.2.3 Hydrogeology

The water table is located within the Upper Glacial aquifer and is found at depths ranging from less than 6 feet at the Area 1A Parcel, adjacent to Hempstead Harbor, to approximately 115 feet below grade, approximately 1 mile to the east of the Site. Regional horizontal groundwater flow is westward toward Hempstead Harbor. Therefore, areas to the east of the Site property are considered upgradient to the site with respect to groundwater flow. At the Area 1A Parcel, hydraulic head measurements from deep and shallow groundwater monitoring wells identify a strong upward vertical gradient, indicating this is an area of groundwater discharge.

2.3 Site and Investigation and Remedial History

2.3.1 Site History

Prior to 1951, a hotel was operated at the site. The site was then developed as a natural gas reforming plant to reduce the British Thermal Unit (BTU) value of pipeline natural gas using a gas catalytic cracking process. The plant started operating in 1951. Subsequent development included a natural gas regulating station (compressor station), laboratory, and propane storage field. The gas facilities and propane storage tank field have since been decommissioned and demolished. The compressor station and associated site features have also been decommissioned and demolished and laboratory services have been terminated. Currently, the western portion of the Site consists of vacant land and a CNG injection station, and the eastern portion of the site is used for electric power generation.

The locations of former and current structures are shown on Fig. 2.

2.3.2 Investigation Summary

The Phase I ESA completed by Fluor Daniel GTI in January 1999 suggested the presence of several potential Recognized Environmental Conditions (RECs) in each of the three site areas. These RECs included leach fields, former above ground storage tanks (ASTs), fill deposits/areas, debris piles, structures, and gas handling/processing facilities.

The Phase II ESA completed by Fluor Daniel GTI in May 1999 investigated the proposed RECs reported in the Phase I ESA. Analytical results from samples collected during the Phase II ESA were compared to referenced background concentrations published by state and federal sources. Analytical results from the Phase II ESA suggested the following:

- Volatile organic compounds (VOCs) were present in groundwater in Area-1A at concentrations above published background levels.
- Inorganics were present in soil in Area-1B at concentrations above published background levels.
- Inorganics and polychlorinated biphenyls (PCBs) were present in soil in Area-2 at concentrations above published background levels.
- VOCs, semi-volatile organic compounds (SVOCs), and inorganics were present in soil in Area-3 at concentrations above published background levels.

The Supplemental ESA completed by IT Corporation in June 1999 was conducted to "delineate the chemicals detected during the Phase II ESA and determine remediation cost estimates based on the delineation of chemical impacts." Analytical results from the Supplemental ESA suggested the following:

- VOCs were present in shallow groundwater on the west side of Area-1A at concentrations exceeding NYSDEC groundwater standards.
- Ash, asbestos and inorganics (particularly arsenic and vanadium) were present in surface and subsurface soils in the central portion of Area-1B. Arsenic and vanadium were present in concentrations above eastern United States background levels.
- In Area-2, mercury and polycyclic aromatic hydrocarbons (PAHs) were detected in debris piles along the western portion of the property above NYSDEC guidance values. Mercury was detected in soil borings from the former septic system in excess of NYSDEC guidance values. PCBs and PAHs were detected in soil borings in the boiler waste pit area.

- In Area-3, PAHs and PCBs were detected in the wastewater/condensate accumulation area above NYSDEC guidance values. One boring contained VOCs marginally above NYSDEC guidance values. PCBs were also detected above NYSDEC guidance values in the yard storage area.

A Supplemental ESA and risk analysis were performed by VHB in December 1999 to evaluate VOCs in groundwater and inorganics in soil in Area-1. Analytical results from this investigation suggested the following:

- The arsenic and vanadium present in the surface and shallow subsurface soils in Area-1B was evaluated relative to certain site development scenarios. However, there was no immediate threat, and there was no evidence of migration from the Site or into groundwater at that time, and access to the Site was currently controlled. Additional characterization of the area was not necessary since the analytes of concern were associated with the presence of ash, which could be easily distinguished through visual inspection.

- VOCs were present in shallow groundwater in Area-1A above NYSDEC guidance values.

An up-gradient Shallow Groundwater Investigation was performed by VHB in March 2000 to determine whether a source of VOCs was present in shallow groundwater areas adjacent to Shore Road, and adjacent to former and existing septic tanks and leach fields.

- Nineteen groundwater samples were collected from temporary wells approximately 8 to 12 feet in depth installed using direct-push technology. In addition, four existing monitoring wells were sampled. These samples were analyzed for VOCs.

- Analytical results indicated the presence of chlorinated VOCs (tetrachloroethene (PCE), trichloroethene (TCE)) in shallow groundwater upgradient of Area-1, however the concentrations detected are well below the levels found in Area-1 and are also below applicable regulatory criteria.

- There appears to be no existing sources of VOCs in subsurface soils and shallow groundwater adjacent to Shore Road, the compressor building, storage sheds, laboratory, and associated septic structures.

A VCA investigation in November 2000 and April 2001 and a geophysical investigation and supplemental environmental sampling in March 2003 were conducted by VHB. The objectives of the investigations included: determining if the storm sewers were a conduit or source of VOCs to shallow groundwater in Area-1A; verify presence of VOCs in shallow groundwater in Area- 1A; determine if a sinking dense non-aqueous phase liquids (DNAPL)

plume exists in Area-1A; determine potential impact to shallow groundwater in Area- 1B associated with overlying fill materials; collection of co-located surface water/sediment samples from the tidal pond in Area 1B to determine potential for surface water discharges; sampling under the gas holder to determine if VOCs and/or SVOCs were present, and determine if inorganics were migrating or exist under the holder pad. The results from this investigation suggested the following:

- Geotechnical and analytical results from shallow groundwater samples in Area-1A were consistent with previous investigations. The compounds and concentrations detected were consistent with previous data. No substantial confining layer was found in Area-1A. Analytical results indicated VOCs at depth in the Area-1A upgradient well. Based on the comprehensive investigation conducted in this area, there was no evidence of DNAPL or a sunken plume. Sufficient characterization was performed for the purpose of performing a preliminary remedial design. The shallow subsurface area between the drywells and Hempstead Harbor appeared to be a source of VOCs to shallow groundwater. Analytical results from Area-1A surface soil samples indicated five locations with SVOCs above site-specific action levels.

- Analytical results indicated an isolated area of VOCs in shallow groundwater in the northeast comer of Area-1B. The compounds detected were typically associated with the degradation of PCE and TCE. The primary 36-inch reinforced-concrete pipe (RCP) main that runs between Area-lA/lB serves as a shallow groundwater divide. No VOCs were found in the sewer or adjacent tidal pond. Analytical results for surface water samples collected from the pond in Area-1B indicated SVOCs were present in both samples at concentrations below action levels. Sediment samples collected from the pond indicated SVOCs were present in one of the two samples, but at concentrations below action levels.

- Discrete surface soil samples from Areas 2 and 3 contained SVOCs, but at concentrations below action levels.

- Analytical results from subsurface soil samples collected from Area-2 confirmed the presence of SVOCs and PCBs at concentrations above site-specific action levels in isolated hotspots as previously defined.

- Analytical results from the subsurface soils collected from beneath the gas holder foundation in Area-3 indicated there were no compounds present at levels which require action. Analytical results of the grab groundwater sample contained no compounds that require action or indicate a migration of material from the drip storage area.

- The storm sewers were constructed and consistent with as-built documentation. A 36-inch diameter RCP running east to west down the main site access road, between Areas- 1A and lB, carries most of the storm runoff from the site to Hempstead Harbor. Analytical results from the storm sewer system indicated that there were no sources of VOCs in, or migrating from Area-2, Area-3, and off-site sources via the sewer.

- The survey conducted on the compressor building sub-floor found no evidence of a release or potential release to the subsurface from the building. All compressor equipment was removed from the building. A thorough examination of the sub-floor was conducted. The building sumps and roofs drains were connected to the main 36-inch site storm sewer.

A groundwater investigation was completed in three separate phases between March 2006 and December 2007 by National Grid to determine the likelihood that the chlorinated VOCs previously detected in groundwater at the Area 1A Parcel are actually associated with upgradient sources and do not originate from the Glenwood Landing Site. The findings of the first two phases were presented to the NYSDEC in a report dated August 2006. The combined findings of all three phases were then presented to the NYSDEC in a June 2008 Groundwater Investigation Findings report. A total of 15 groundwater probes, five membrane interface probes (MIPs) and one temporary monitoring well were completed as part of this investigation. A total of 110 groundwater samples were collected from the completed groundwater probes and temporary well for VOC analysis.

Based on the westerly direction of groundwater flow toward Hempstead Harbor, a minimum of five potential sources of chlorinated VOCs have been identified approximately one mile directly upgradient of the National Grid property including four dry cleaning businesses and an electronics manufacturer. The chlorinated VOC groundwater contamination located in the vicinity of the upgradient sites is referred to as the Glen Head groundwater plume by the NYSDEC. Based on currently available information, the total length, width and vertical thickness of the Glen Head groundwater plume has not been defined by the NYSDEC. However, based on regional ground flow, the National Grid property is clearly within the projected path of the plume.

The completed groundwater investigation identified contamination in groundwater consistent with the suspected upgradient sources extending well to the north and south of the National Grid Site. The identified contamination consists predominantly of PCE (a dry-cleaning solvent) and, to a lesser degree, related contaminants such as TCE and 1,2-dichloroethene (1,2-DCE). Total chlorinated VOC concentrations were detected up to 1,347 ug/l along Shore Road, a minimum of 600 feet north and side gradient of the National Grid property. The investigation data clearly indicates that the Glen Head groundwater plume, or other groundwater contaminant sources located upgradient of the National Grid Site, is impacting

groundwater quality over a relatively large area, including the National Grid Site. Based on regional groundwater flow, the groundwater contaminant plume associated with these upgradient sources migrates under the National Grid Site and is likely discharging to Hempstead Harbor. Based on D&B's assessment of the data generated by the NYSDEC in 2006 (and the results presented in the June 2008 report from D&B), the plume appears to be at least 2,800 feet in width along Shore Road, and well north and south (sidegradient) of the National Grid property.

2.3.3 Remedial Summary

The Site was remediated in accordance with the Conceptual Remedial Action Plan provided in the NYSDEC-approved Supplemental Environmental Assessment Report dated September 2001. The remedial work was documented in the Remedial Action Summary Report – Surface and Shallow Subsurface Soil, dated August 2003.

The following is a summary of the Remedial Actions performed at the Site:

- Area-1A: Hot spot removal (excavation and off-site disposal) of surface soils (designated discrete areas 1A-5a through 1A-5e) with concentrations of carcinogenic polycyclic aromatic hydrocarbons (CPAHs) above the site cleanup objectives.

- Area-1B: The fill area of 1B was consolidated and covered with a clean fill cover to isolate detected levels of inorganics with concentrations above the site cleanup objectives.

- Area-2: Hot spot removal (excavation and off-site disposal) of surface and subsurface soils with concentrations of PCBs, CPAHs, and inorganics above the site cleanup objectives was completed down to the water table.

- Area-3: Hot spot removal (excavation and off-site disposal) of surface and subsurface soils with concentrations of PCBs, CPAHs, and inorganics above the site cleanup objectives was completed down to the water table.

- Demolition and removal of four Drip Pits located on the north, south, east, and west sides of the former gas holder foundation. Contaminated soil above the site cleanup objectives was also excavated from the Drip Pit footprints.

- Demolition and removal of the holder pad, compressor building, and ancillary facilities, utilizing proper environmental controls and techniques.

- Execution and recording of a DCR to restrict land use and prevent future exposure to any contamination remaining at the Site.

- Development and implementation of a Site Management Plan for long-term management of remaining contamination as required by the DCR, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring and (3) reporting.

Remedial activities at the Site began in October 2001 and were completed in September 2002.

As part of the remedial activities at the Site, approximately 10,880 tons of non-hazardous contaminated soil was excavated and transported off-site for disposal at Clean Earth of New Castle, Inc., a permitted waste disposal facility located in New Castle, Delaware. A summary of the total amount of soil removed by remedial area is shown on the Table 2 on the following page.

Areas of soil contamination were excavated based on the concentrations of contaminants detected above applicable site-specific cleanup goals. The site-specific cleanup goals were based on a residential site reuse scenario using the following guidance documents: United States Environmental Protection Agency (USEPA) Region III Risk Based Concentrations; NYSDEC Technical and Administrative Guidance Memorandum (TAGM) No. 4046 Soil Cleanup Objectives (SCOs); and Association for Environmental Health and Sciences (AEHS) background levels for PAHs and selected metals in New England urban soils.

Upon completion of the initial excavations, excavation endpoint samples were collected from each excavation area. One sample was collected from the bottom of the excavation, one outside each horizontal limit on the surface, and one sidewall sample per 5 feet of depth (i.e., an 8-foot-deep excavation had two samples collected from each sidewall). Duplicate samples were collected from this matrix at a rate of 1 per 10. Samples collected were analyzed for SVOCs, PCBs, and Inorganics by Method 8270C, 8020, and NYS ASP 95 TAL Metals, respectively, at a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) facility.

Based on the results of the excavation endpoint samples, several areas were re-excavated in order to address the full extent of the contamination. Excavation endpoint samples were collected again in the same fashion as described above. A map showing areas where excavation was performed is shown on the as-built drawing for the Site (see Appendix B).

Table 2. Excavation Quantities

Excavation Area	Estimated Soil Removal Quantity (tons)
AREA 1-A	220
AREA 2-2	5,413

Excavation Area	Estimated Soil Removal Quantity (tons)
AREA 2-3	283
AREA 2-4	354
AREA 2-6	91
AREA 2-7	900
AREA 3-1	3,600
AREA 3 (DRIP PITS)	22

Groundwater remediation was not conducted on-Site as the identified impacts are from an upgradient source or sources.

2.4 Remaining Impacts

2.4.1 Soil

The property east of Shore Road was remediated to site-specific residential use SCOs (see below) established under the Department-approved conceptual RAP, dated September 2001. Excavations were limited to surface and shallow subsurface and did not extend below the water table in accordance with the conceptual RAP. At three locations, the site-specific residential use SCOs were not achieved because the excavations reached the water table. A summary of the excavation endpoint sample results from each area of the Site, as presented in the August 2003 "Remedial Action Summary Report – Surface and Shallow Subsurface Soil" (VHB, 2003), is included in Appendix B.

Table 3. Site Specific Soil Cleanup Objectives

Contaminant	Soil Cleanup Objective (mg/kg)
Arsenic	20
Lead	400
Vanadium	500
Benzo(a)anthracene	1.0
Benzo(b)fluoranthene	1.0
Benzo(a)pyrene	0.1
Indeno(1,2,3-cd)pyrene	1.0

Contaminant	Soil Cleanup Objective (mg/kg)
Benzo(g,h,i)perylene	310
Dibenzo(a,h)anthracene	0.1
PCBs	2.0

It should be noted that since the time the remedial excavation activities were completed, the NYSDEC has adopted new soil cleanup standards, which are presented in 6 NYCRR Part 375-6. As per this standard, different SCOs have been defined based on the intended future use of the property. Therefore, based on this new standard, the soil sample results collected from the area located to the west of Shore Road, which was intended to be used as open space and which portions of are currently being used as an injection station, were compared to the restricted-residential use criteria and the soil sample results collected from the area located to the east of Shore Road, which was intended to be used as an electric generating station were compared to the industrial use criteria. Although the endpoint soil samples collected in the areas located to the east of Shore Road are compared to the industrial use criteria, it should be noted that 94% of the VCA related property located to the east of Shore Road meets the restricted-residential criteria.

As presented on the tables in Appendix B, several excavation endpoint samples from the area east of Shore Road were detected above the applicable 6 NYCRR Part 375 SCOs:

- Sample GLA1-2, collected from excavation Area 3-1 from an approximate depth of six feet, exhibited concentrations of benzo(a)pyrene and total PCBs above their applicable industrial use SCO;

- Samples GLDPW-02 and GLDPW-04S were collected from the drips pits west area (Area 3). The samples were collected from the sidewalls (following concrete removal) from near the groundwater interface (approximately six feet), exhibited concentrations of arsenic above its applicable industrial use SCO; and

- Lastly, four soil samples collected from Area 2-2 from an approximate depth of six feet had concentrations of PCBs above the site-specific cleanup goal of 2 mg/kg. However, the PCB concentrations were below the industrial use SCO for total PCBs of 25 mg/kg.

Excavation endpoint samples were not collected from Area 1B as part of the remedial activities; however, samples collected during previous investigations throughout Area 1B exhibited concentrations of arsenic, chromium, copper, mercury, and nickel, above their applicable restricted residential use SCOs. Vanadium was also detected at elevated

concentrations above the Site-Specific Soil Cleanup Objectives, however 6 NYCRR Part 375 does not contain an applicable soil cleanup objective for vanadium.

The location of the areas with residual contamination above the application SCOs, as discussed above, is provided on the as-built drawing provided in Appendix B.

The as-built drawing in Appendix B provides the location of the areas with residual contamination above the application SCOs at the Site after the completion of the remedial action.

2.4.2 Groundwater

As previously stated, based on the westerly direction of groundwater flow toward Hempstead Harbor, a minimum of five potential sources of chlorinated VOCs have been identified approximately one mile directly upgradient of the Site including four dry cleaning businesses and an electronics manufacturer. The chlorinated VOC groundwater contamination located in the vicinity of the upgradient sites is referred to as the Glen Head groundwater plume by the NYSDEC (Site No. 130098). Based on currently available information at the time of the investigation, the total length, width and vertical thickness of the Glen Head groundwater plume had not been defined by the NYSDEC. However, based on regional ground flow, the Site is clearly within the projected path of the plume.

The completed groundwater investigation identified contamination in groundwater consistent with the suspected upgradient sources extending well to the north and south of the Site. The identified contamination consists predominantly of PCE (a dry-cleaning solvent) and, to a lesser degree, related contaminants such as TCE and 1,2-dichloroethene (1,2-DCE). Total chlorinated VOC concentrations were detected up to 1,347 ug/l along Shore Road, a minimum of 600 feet north and sidegradient of the Site. The investigation data clearly indicates that the Glen Head groundwater plume, or other groundwater contaminant sources located upgradient of the Site, is impacting groundwater quality over a relatively large area, including the Site.

Based on regional groundwater flow, the groundwater contaminant plume associated with these upgradient sources migrates under the Site and is likely discharging to Hempstead Harbor. Based on D&B's assessment of the data generated by the NYSDEC in 2006 (and the results presented in the June 2008 report from D&B), the plume appears to be at least 2,800 feet in width along Shore Road, and well north and south (sidegradient) of the Site.

3. Institutional and Engineering Control Plan

3.1 General

Since impacts remain in soil and groundwater at the Site, Institutional Controls (ICs) and Engineering Controls (ECs) are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs at the Site. The IC/EC Plan is one component of the SMP and is subject to revision by the NYSDEC project manager.

This Institutional and Engineering Control Plan provides:

- A description of all IC/ECs on the Site.
- The basic implementation and intended role of each IC/EC.
- A description of the key components of the ICs set forth in the DCR.
- A description of the controls to be evaluated during each required inspection and periodic review.
- A description of plans and procedures to be followed for implementation of IC/ECs, such as the EWP (as provided in Appendix C) for the proper handling of impacted material that may be disturbed during intrusive work and/or activities on the Site, HASP (Appendix D), and Community Air Monitoring Plan (CAMP) (Appendix E).
- A description of the roles and responsibilities of each party with respect to this SMP; and Other provisions necessary to identify or establish methods for implementing the IC/ECs required by the Site remedy, as determined by the NYSDEC project manager:
    - An EWP (provided in Appendix C) that details the provisions for management of excavations, in areas of impacts detected in soil and/or groundwater samples, including the proper handling of impacted material that may be disturbed during intrusive work and/or activities at the Site.
    - Further investigation and remediation should large-scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible.
    - The management and inspection of the identified ECs.

- Maintenance of site access controls and Department notification.

The IC/ECs described below for the Site are designed to:

- Prevent ingestion/direct contact with contaminated soil.
- Prevent ingestion of groundwater with contaminant levels that exceed drinking water standards.
- Prevent contact with or inhalation of volatiles from contaminated groundwater.
- Prevent the discharge of site-related contaminants to surface water.
- Prevent migration of site-related contaminants that would result in off-site groundwater or surface water contamination.

3.2 Roles and Responsibilities

A description of the responsibilities of each party (i.e., the Department and National Grid) for on-site intrusive work to be performed as required by this SMP is outlined in a decision tree, included as Fig. 6.

3.3 Institutional Controls

3.3.1 Site Institutional Controls

One ICs, a DCR, is required to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining impacts; and (3) limit the use and development of the Site to Industrial uses in Areas 2 and 3 and Restricted Residential uses in Areas 1A and B as shown on Fig. 3. The DCR requires compliance with this SMP. Restrictions identified in the DCR may not be discontinued without approval from the NYSDEC. The IC boundaries are shown in the DCR package included in Appendix A. The ICs include the following:

- Compliance with the DCR by the Grantor and the Grantor's successors and assigns with all elements of this SMP.
- All Engineering Controls must be operated and maintained as specified in this SMP.
- All Engineering Controls on the Controlled Property must be inspected and certified at a frequency and in a manner defined in the SMP.

- Soil vapor and other environmental or public health monitoring must be performed as defined in this SMP.

- Data and information pertinent to Site Management for the Controlled Property must be reported at the frequency and in a manner defined in this SMP.

- Institutional Controls may not be discontinued without an amendment to or extinguishment of the DCR.

The Site has a series of Institutional Controls in the form of site restrictions. Adherence to these Institutional Controls is required by the DCR. Site restrictions that apply to the Site are:

- The Controlled Properties to the east of Shore Road may be used for: Industrial [as described in 6 NYCRR Part 475-1.8(g)(2)(iv)] use.

- The Controlled Property to the west of Shore Road may be used for: Restricted Residential as described in 6 NYCRR Part 475-1.8(g)(2)(ii), use.

- All ECs must be maintained by National Grid as specified in this SMP (see Section 3.4]).

- All ECs must be inspected at a frequency and in a manner defined in the SMP (see Section 4.0).

- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Nassau County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.

- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP (see Section 7).

- All future intrusive activities that will disturb remaining impacts must be conducted in accordance with this SMP (see Section 3).

- Monitoring to assess the remedy must be performed as defined in this SMP (see Section 4.0).

- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP (see Section 5.0).

- Access to the Site 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 this SMP and the DCR.

- The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries noted on Fig. 3, and any potential impacts that are identified must be monitored or mitigated.

- An evaluation shall be performed to determine the need for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible.

Components of the ICs and/or DCR may be modified, added or deleted from this list as warranted by Site-specific conditions with approval from the NYSDEC project manager.

3.4 Engineering Controls

Engineering controls installed at the Site include a soil cover system in Areas 1B and 3 as described below.

3.4.1 Soil Cover System

Exposure to remaining impacts at the Site is prevented by a soil cover system placed over the portions of Site. This soil cover system is comprised of a 10 oz./square yard geotextile, one foot of clean clay/soil cover and six inches of topsoil and seed in Area 1B and clean fill from the bottom of the excavation area to approximately six inches below grade and 6 inches of topsoil and seed in Area 3 as shown in the table below.

Table 4. Soil Cover System Thicknesses

Area	Soil Cover System Thickness (feet from ground surface)
1B	1'6"
3-1	8'
3 (Drip Pits West)	6-11'

The as-built plan in Appendix B presents the location of the soil cover systems and applicable demarcation layers. The Excavation Work Plan (EWP) provided in Appendix C outlines the procedures required to be implemented in the event the soil cover system is breached, penetrated, or temporarily removed. The Soil Cover Systems are also shown on Fig. 2. Procedures for the inspection of this cover are provided in the Monitoring and

Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a ~~(~~HASP~~)~~ and associated CAMP prepared for the Site and provided in Appendices [**E** and **F**]. Any disturbance of the site's soil cover system must be overseen by a qualified environmental professional as defined in 6 NYCRR Part 375, a Professional Engineer (PE) who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State.

The soil cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in accordance with this SMP in perpetuity. The soil cover systems purpose is to maintain a barrier between the public and remaining impacts and the inspection will focus on the structural/remedial integrity of the soil cover system. Monitoring for aesthetics or functionality apart from the remedial purpose is not required by the SMP.

3.5 Plans and Procedures to be Followed for Implementation of IC/ECs

A description of each of the plans to be followed for implementation of IC/ECs is provided below.

3.5.1 Steps to Be Taken in Advance of On-Site Intrusive Work

A decision tree describing notifications and actions to be taken in advance of on-site work by the property owner is included as Fig. 6.

3.5.2 Excavation Work Plan

This SMP includes an EWP that is to be used for excavations (Appendix C). The NYSDEC project manager will make the determination if the EWP is appropriate for large-scale projects with respect to excavations on a case-by-case basis. Modifications for specific projects will be made as needed. This EWP will be implemented to address any intrusive activities prior to the final remedy or any portion of the final remedy at the Site. The property owners, their tenants, consultants, and contractors are required to implement this EWP. National Grid is only responsible for costs associated with MGP-related impacts.

3.5.3 HASP

This SMP includes a Health and Safety Plan that is to be used for small-scale (i.e., limited) excavations and large-scale redevelopment. Modifications for specific projects will be made as needed. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in the HASP provided in Appendix D. This HASP establishes policies and procedures to protect personnel from the potential hazards posed by the activities at the Site. Site workers are required to review and sign the HASP, acknowledging that they understand and will adhere to the HASP. Subcontractors will also prepare their

own Site-specific HASP for the protection of their employees from the hazards associated with their work tasks and may use this document as a guide.

3.5.4 CAMP

A CAMP was developed for future activities at the Site and must be used for intrusive work that will disturb remaining impacts. This CAMP can be used for small-scale and/or large-scale activities. This plan describes the proposed air monitoring means and methods that will be implemented during intrusive activities. The NYSDEC generic CAMP is included in Appendix E.

Special requirements for work within 20 feet of potentially exposed individuals or structures are listed in Appendix E. The CAMP requirements for each individual ground-intrusive activity will be evaluated on a case-by-case basis taking into consideration the proximity to occupied spaces, the use of the occupied space, known subsurface conditions at a specific on-site location, as well as potential receptors in the immediate area. The CAMP requirements will be proposed in the Notice of Intrusive Activity (NOIA) letter that is required to be submitted to the NYSDEC and NYSDOH. At that time, the NYSDEC and NYSDOH can provide comments on the proposed CAMP to be implemented during the intrusive activity described in the NOIA letter.

3.6 Maintenance of Site Access Controls

Access to the Site is controlled by gates and fences. Control of access to the Site is to be maintained. The property owner (National Grid) is responsible for maintenance of site access controls (e.g., buildings, walls, doors, fences, gates, etc.).

3.7 Notification of the Department

As stated in Section 1.3, NYSDEC must be notified in advance of all intrusive work performed at the Site. Responsibility for notifications to the Department, including those described in Section 1.3 of this SMP, is the responsibility of the property owner (National Grid).

3.8 Further Investigation and Possible Remedial Work Plan

Further investigation of the Site will be required should large-scale redevelopment occur in an area of the Site not previously investigated, if any of the existing structures are demolished, if the subsurface is otherwise made accessible, or if impacts are discovered in a new area on the Site. The nature and extent, if any, of impacts in areas where access was previously limited or unavailable, will be investigated pursuant to an investigation work plan approved by the Department. A Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP) will be included in the work plan as needed. Based on the investigation results and the Department's determination of the need for a remedy, a remedial work plan will be developed for the final remedy for MGP-related impacts at the Site including removal and/or

treatment of any source areas to the extent feasible. If a remedy is determined to be necessary to address sources of non-MGP-related impacts present at the Site, this will be evaluated separately for further action. A Citizen Participation Plan (CPP) will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment.

4. Monitoring and Sampling Plan

4.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy. This Monitoring Plan may only be revised with the approval of the NYSDEC project manager.

This Monitoring Plan describes the methods to be used for:

- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment.

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

- Periodic inspection and certification.

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 Site – wide Inspection

Site-wide inspections will be performed on an annual basis by a qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State. These periodic inspections must be conducted when the ground surface is visible (i.e. no snow cover). Modification to the frequency or duration of the inspections will require approval from the NYSDEC project manager. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed as provided in Appendix F – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including Site usage.
- An evaluation of the condition and continued effectiveness of ECs;
- General Site conditions at the time of the inspection.
- Whether stormwater management systems, such as basins and outfalls, are working as designed.

- The Site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and

- Confirm that Site records are up to date.

A comprehensive Site-wide inspection will be conducted and documented according to the SMP schedule. The inspections will determine and document the following:

- Whether ECs continue to perform as designed.

- If these controls continue to be protective of human health and the environment.

- Compliance with requirements of this SMP and the DCR.

- Achievement of remedial performance criteria.

Inspections will be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, the property owner (National Grid) will notify the NYSDEC project manager as soon as possible but at least before noon the following day. In addition, an inspection of the Site will be conducted within 5 days of the event (to the extent possible) to verify the effectiveness of the IC/ECs implemented at the Site by a qualified environmental professional, as defined in 6 NYCCR Part 375. Written confirmation must be provided to the NYSDEC project manager 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.

4.3 Post-Remediation Media Monitoring and Sampling

4.3.1 Soil Vapor Intrusion Sampling

Prior to the construction of any new enclosed structures on the Area 1 part of the Site property, a soil vapor intrusion (SVI) evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. The design of the building foundation will also be considered in this type of evaluation. Alternatively, an SVI mitigation system can be installed as an element of the building foundation without first conducting an investigation. The mitigation system would potentially include a vapor barrier and passive sub-slab venting system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan would be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan would be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York." Measures to be employed to mitigate potential

vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action.

SVI sampling results, evaluations, and follow-up actions will also be summarized in the subsequent Periodic Review Report (see Section 7.0).

4.3.2 Monitoring and Sampling Protocol

All sampling activities performed by National Grid's QEP will be recorded in a field book. Other observations (e.g. weather conditions) will also be noted in the field book or in a separate sampling log.

5. Operation and Maintenance Plan

5.1 General

The Site remedy 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 SMP.

6. Periodic Assessment/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 a given Site and associated remedial systems. Vulnerability assessments provide information so that the Site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

Portions of Areas 1A and 1B are located within Flood Zone AE, which is a high-risk or 100-year flood zone. Other portions of these parcels in addition to a portion of Area 2 of the Site are located within Flood Zone X, with a 0.2% annual chance flood hazard, and 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile. The remainder of the site is also within Zone X but is defined as an area of minimal flood hazard (FEMA Flood Map Service Center).

This section provides a summary of vulnerability assessments that will be conducted for the Site during periodic assessments, and briefly summarizes the vulnerability of the Site and/or engineering controls to severe storms/weather events and associated flooding.

As previously stated, a soil cover system is in place over portions of the Site. The soil cover system in Area 1B is located within an identified high-risk flood zone. The soil cover system in Area 1B is comprised of a 10 oz./square yard geotextile, one foot of clean clay/soil cover and six inches of topsoil and seed. In addition, a perimeter drainage swale, consisting of vegetated waterways and riprap, was installed along the north, east, and portions of the south side of the Area 1B soil cover system area to accommodate runoff. An as-built drawing depicting the soil cover system is provided in Appendix B. Although it is unlikely that a flood or rain event would expose contaminated soil in Area 1B due to the depth of the soil cover system, vulnerability assessments of this area will include inspections for signs of erosion to the cover or drainage system, or other damage resulting from rain or high winds such as downed trees. A soil cover system is also present in Area 3; however, this area of the Site is classified as a minimal flood hazard.

If after a vulnerability assessment a deficiency is noted, in the Site soil cover system, it shall be repaired by the Site owner in a timely manner, integrating appropriate engineering evaluation as necessary.

Repair of the soil cover system in Area 1B will be in accordance with the EWP in Appendix C.

All repairs completed will be verified by the qualified environmental professional as part of their inspection of the engineering controls (see Section 4.0).

7. 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 F. These forms are subject to revision by NYSDEC for use on the Site. All site management inspection, maintenance, and monitoring events will be conducted by a qualified environmental professional as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State.

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the Site during the reporting period will be provided in electronic format to the NYSDEC by the QEP in accordance with the requirements of Table 7a and summarized in the Periodic Review Report.

Table 5. Schedule of Inspection Reports

Task/Report	Reporting Frequency*
Inspection Report	Annual
Periodic Review Report	Every 5 years, or as otherwise determined by the NYSDEC

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

All 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).

- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation).
- 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.
- A determination as to whether impact conditions have changed since the last reporting event.

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).
- 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 Periodic Review Report

A Periodic Review Report (PRR) was initially submitted by National Grid's QEP to the NYSDEC project manager on an annual basis in 2013 until 2017 when the frequency was modified. Currently, the PRR is submitted every five years to the NYSDEC project manager. The frequency may be modified by the NYSDEC project manager. The report 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 Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the Site.
- Results of the required annual Site inspections, fire inspections and severe condition inspections, if applicable.
- All applicable site management forms and other records generated for the Site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.
- Identification of any wastes generated during the reporting period, along with waste characterization data, manifests, and disposal documentation.
- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.
- Data summary tables by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted, if applicable.
- 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 Site evaluation, which includes the following:
    - The compliance of the remedy with the requirements of the site-specific DCR.
    - Any new conclusions or observations regarding site impacts based on inspections.
    - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan.
    - The overall performance and effectiveness of the remedy.

7.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, National Grid's qualified environmental professional as defined in 6 NYCRR Part 375 will prepare, and include in the Periodic Review Report, the following certification as per the requirements of NYSDEC DER-10:

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

- *The inspection of the Site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*
- *The institutional control and/or engineering control employed at this Site is unchanged from the date the control was put in place, or last approved by the Department.*
- *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 Site will continue to be provided to the Department and National Grid to evaluate the remedy, including access to evaluate the continued maintenance of this control.*
- *If a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for the intended purpose under the document.*
- *Use of the Site is compliant with the DCR.*
- *The 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 Site remedial program; 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 National Grid's Designated Site Representative.

"I certify that the New York State Education Department has granted a Certificate of Authorization to provide Professional Engineering services to the firm that prepared this Periodic Review Report."

7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control or failure to conduct site management activities, a Corrective Measures Work Plan will be submitted to the NYSDEC project manager by National Grid's QEP for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by the NYSDEC project manager.

8. References

6 NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.

NYSDEC DER-10 – "Technical Guidance for Site Investigation and Remediation".

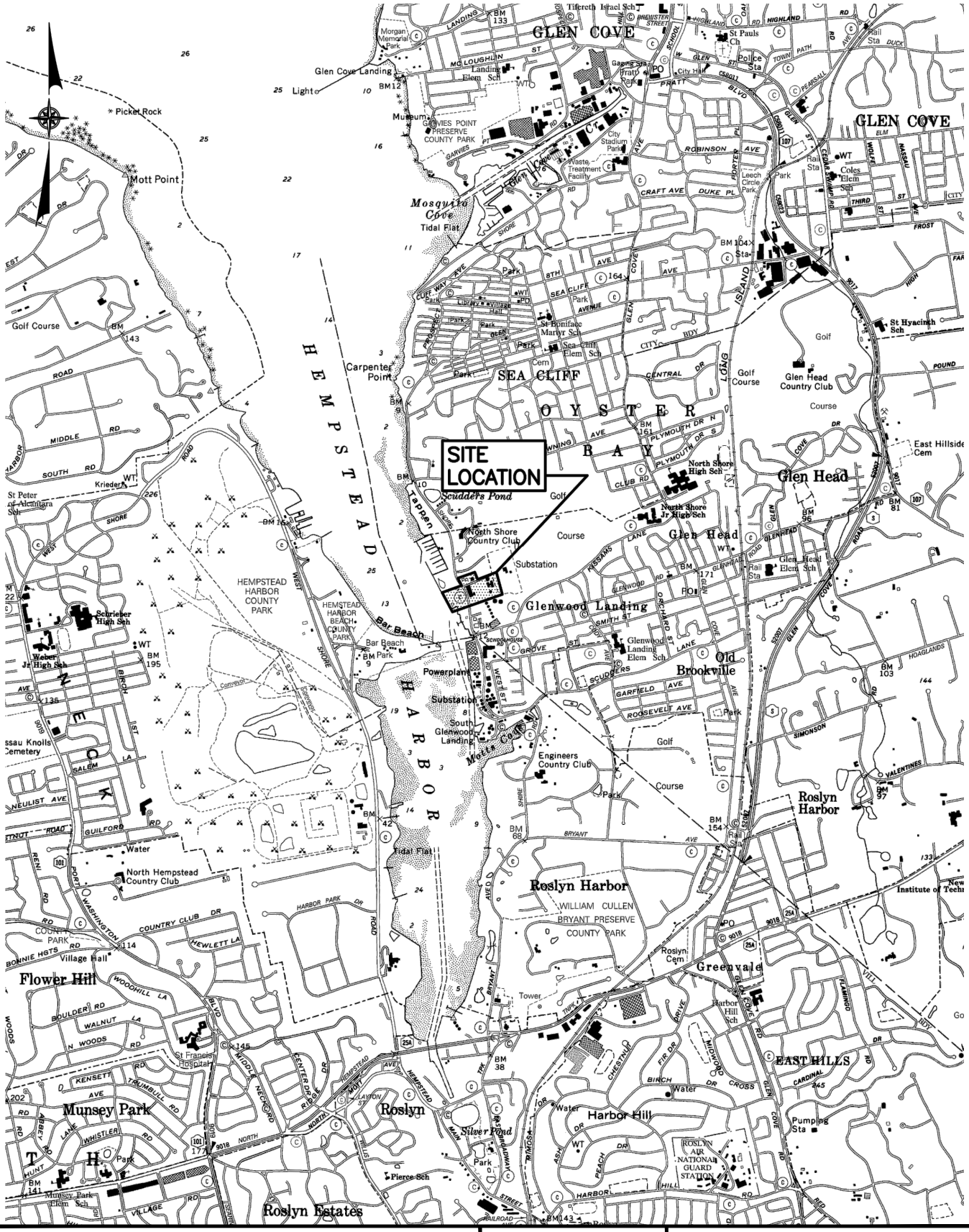
NYSDEC DER-31 – "Green Remediation".

NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

FEMA - Flood Map Service Center (https://msc.fema.gov/portal/home)

Site Management Plan, Glenwood Landing Former Gas Plant Site, Dvirka and Bartilucci Consulting Engineers, May 2012.

Figures



Site Mangement Plan
Glenwood Landing Former Gas Plant Site
Glenwood Landing, New York

nationalgrid

GEI Consultants

SITE LOCATION MAP

Project 1702897 | October 2021 | Fig. 1

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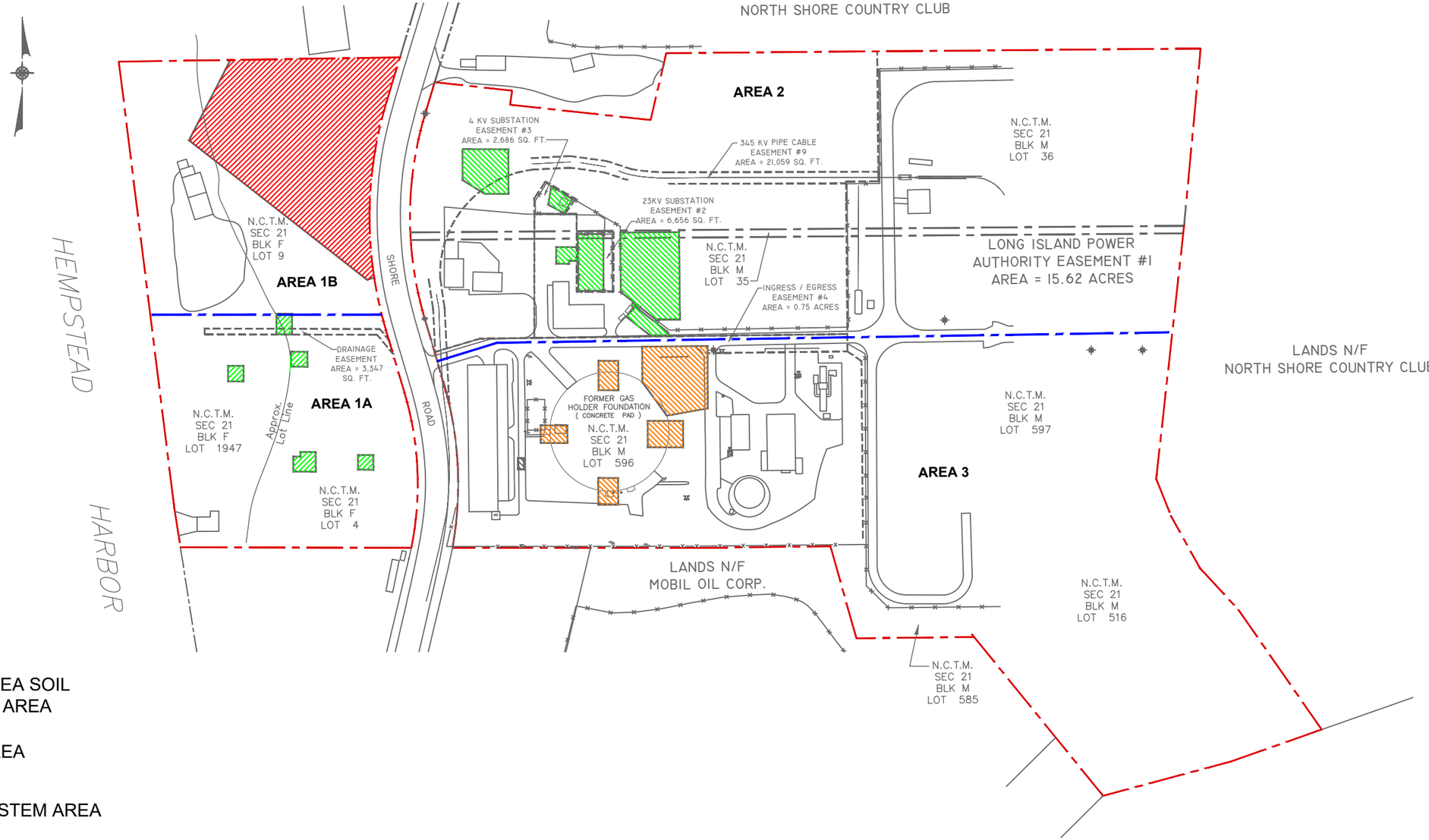

LEGEND

- EXCAVATION AREA SOIL COVER SYSTEM AREA
- EXCAVATION AREA
- SOIL COVER SYSTEM AREA
- SITE BOUNDARY
- AREA BOUNDARY

Site Mangement Plan
Glenwood Landing Former Gas Plant Site
Glenwood Landing, New York

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SITE LAYOUT MAP

Project 1702897 | October 2021 | Fig. 2

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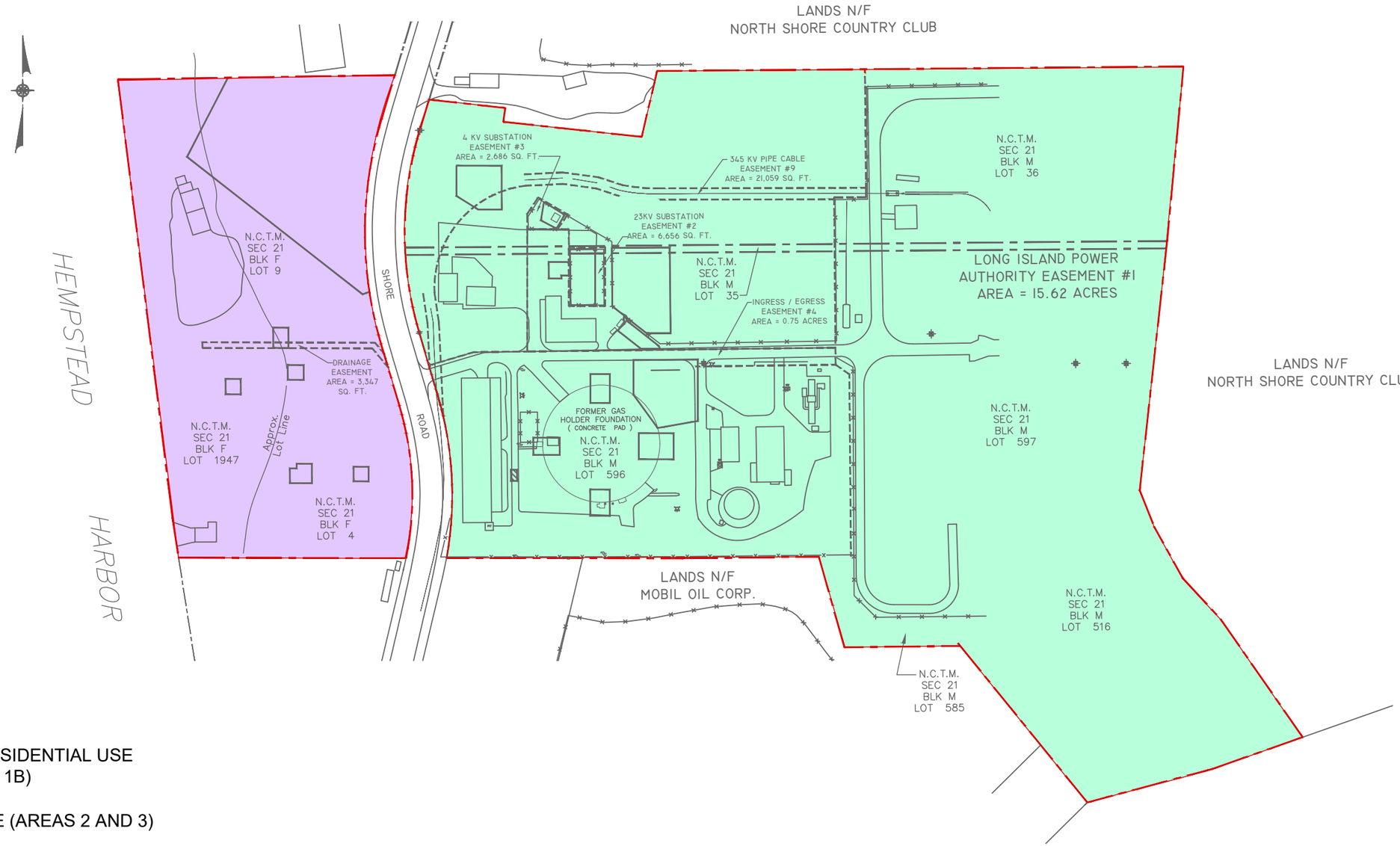

LEGEND

- RESTRICTED RESIDENTIAL USE (AREAS 1A AND 1B)
- INDUSTRIAL USE (AREAS 2 AND 3)
- SITE BOUNDARY

Site Mangement Plan
Glenwood Landing Former Gas Plant Site
Glenwood Landing, New York

nationalgrid

GEI Consultants

SITE LAYOUT MAP

Project 1702897 | October 2021 | Fig. 3

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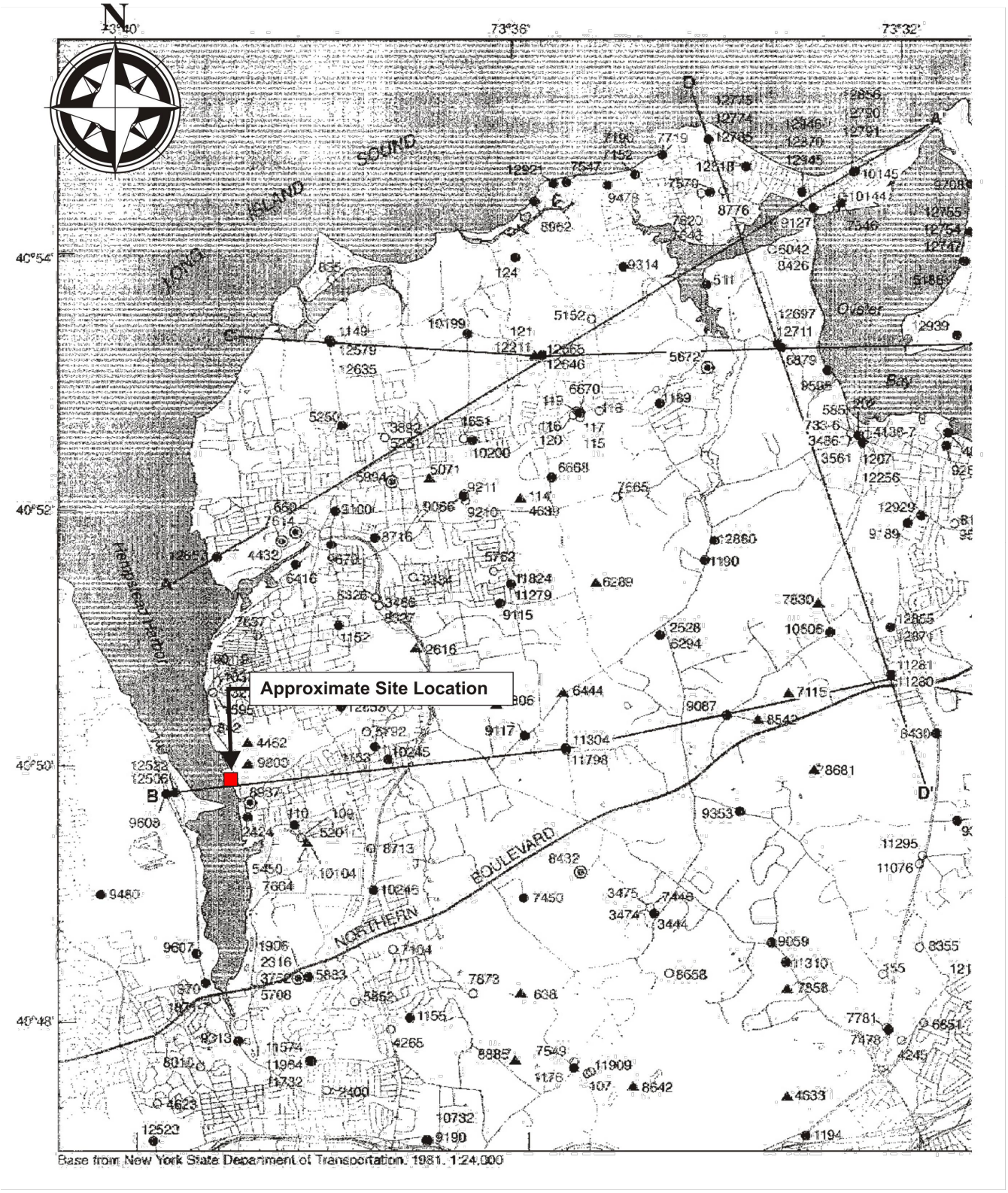

SOURCE: USGS WATER RESOURCES INVESTIGATIONS REPORT 03-4288

APPROXIMATE SCALE: 1"=1.25MI

Site Mangement Plan Glenwood Landing Former Gas Plant Site Glenwood Landing, New York	GEI Consultants	CROSS SECTION KEY MAP
nationalgrid	Project 1702897	October 2021 Fig. 4

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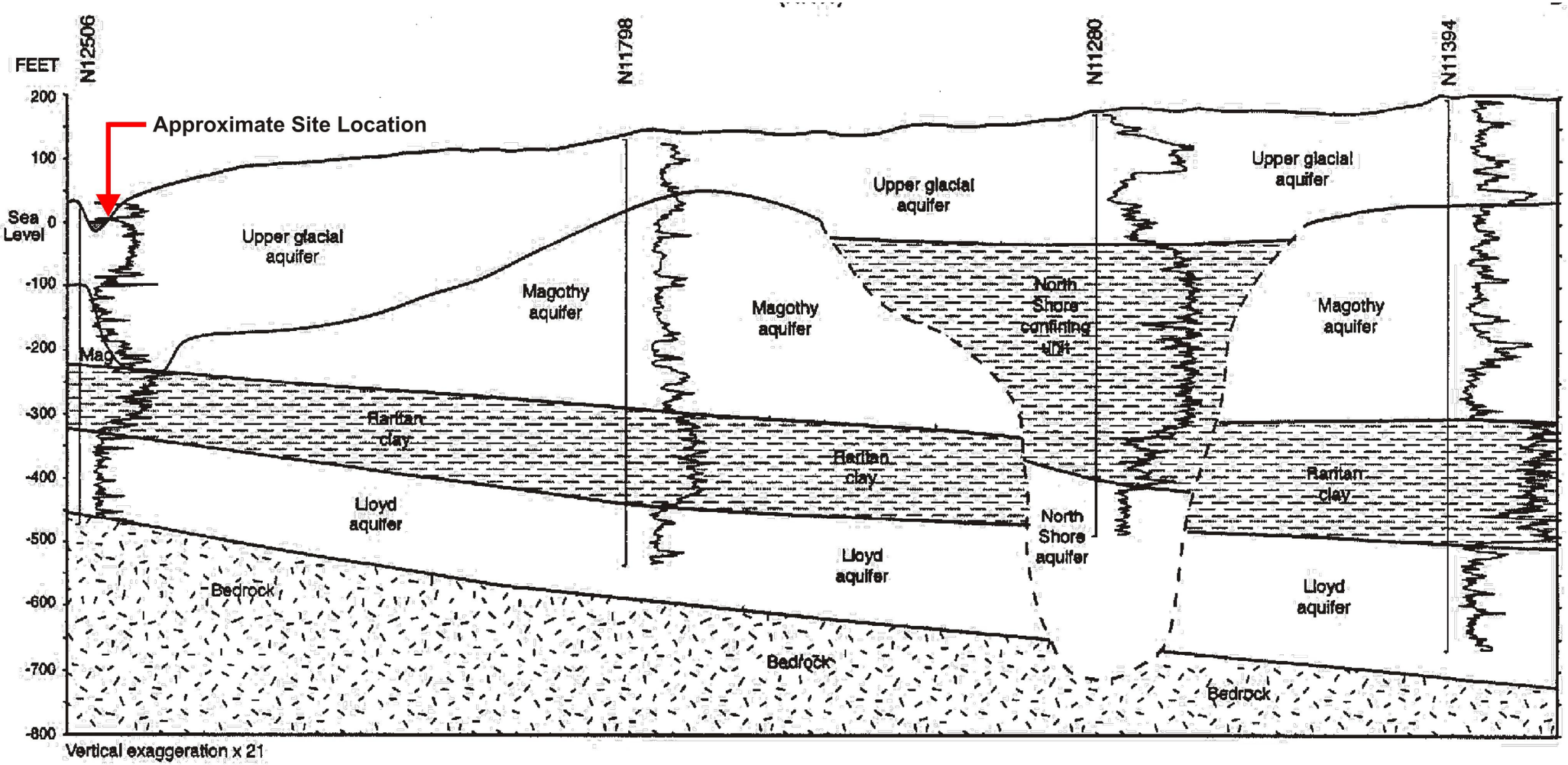

SOURCE: USGS WATER RESOURCES INVESTIGATIONS REPORT 03-4288

Site Mangement Plan Glenwood Landing Former Gas Plant Site Glenwood Landing, New York nationalgrid	GEI Consultants	GEOLOGIC CROSS-SECTION OF SITE AND UPGRADIENT AREAS
	Project 1702897	October 2021 Fig. 5

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Identify Change Or Action

Change of Ownership

Notify NYSDEC in writing 60 days prior

Within 15 days after the transfer of ownership, provide NYSDEC with the new owner name, contact representative, and contact information

Change of Use

Notify NYSDEC in writing 60 days prior

Redevelopment or Demolition of Structures

Notify NYSDEC in writing as early as possible, minimum 18 months

Excavation

Notify NYSDEC in writing as early as possible

Emergency Situation Only

Provide verbal notice to NYSDEC by noon of the following day.

Written confirmation to follow within 7 days

NYSDEC determines if activity is:
1. Small-scale (i.e., limited), or
2. Large-scale (e.g., redevelopment)

Large-Scale

Further investigation will be performed. Based on results of the investigation, National Grid may prepare a Remedial Action Work Plan (RAWP)

Submit results to NYSDEC. If remediation is required, prepare and submit:
- RAWP with robust CAMP

Small-Scale

Notify NYSDEC in writing 60 days prior to intrusive activity and 30 days prior to starting field activities

Prepare and submit:
- Notice of Intrusion Letter
- Excavation Work Plan
- CAMP requirements

*: ALL ACTIVITIES CONDUCTED BY NATIONAL GRID UNLESS OTHERWISE INDICATED

Site Mangement Plan
Glenwood Landing Former Gas Plant Site
Glenwood Landing, New York

nationalgrid

GEI Consultants

DECISION TREE FOR INTRUSIVE ACTIVITIES ON-SITE

Project 1702897

October 2021

Fig. 6

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Appendix A

Declarations of Covenants and Restrictions

RECEIVED
APR 17 2012
REMEDIAL BUREAU E

NASSAU COUNTY CLERK'S OFFICE
ENDORSEMENT COVER PAGE

Recorded Date: 02-24-2012
Recorded Time: 11:43:30 a

Liber Book: D 12804
Pages From: 723
To: 737 A

Record and Return To:
AECOM
ATTN TAMERA REBY
100 CORPORATE PKWY
SUITE 341
AMHERST, NY 14226

Control Number: 747
Ref #:
Doc Type: D03 DECLARATION RESTRICTIONS

Location:	Section	Block	Lot	Unit
OYSTER BAY (2824)	0021	0000F-00	00004	
OYSTER BAY (2824)	0021	0000F-00	00009	
OYSTER BAY (2824)	0021	0000F-00	01947	

Taxes Total	.00
Recording Totals	190.00
Total Payment	190.00

GJS001

THIS PAGE IS NOW PART OF THE INSTRUMENT AND SHOULD NOT BE REMOVED
MAUREEN O'CONNELL
COUNTY CLERK

201202240074?

R/R AECOM
100 Corporate Pkwy
Suite 341
Amherst, N.Y. 14226
Attn: Tamara Raby

DECLARATION of COVENANTS and RESTRICTIONS

THIS COVENANT is made the 21st day of October 2011, by KeySpan Gas East Corporation d/b/a National Grid, a corporation of the State of New York, having its principal office at 175 East Old Country Road, Hicksville, New York 11801; and

WHEREAS, Glenwood Landing Propane Plant and Compressor Station is the subject of Voluntary Cleanup Agreement executed by KeySpan Energy Delivery Long Island, the former fictitious name (*i.e.,* d/b/a) of KeySpan Gas East Corporation as part of the New York State Department of Environmental Conservation's (the Department's) Voluntary Cleanup Program, namely that parcel of real property located On Nassau SBL County Tax Map Section 21, Block F, Lots 4, 9 and 1947, located on Shore Road in the Town of Oyster Bay, County of Nassau, State of New York, which is part of lands conveyed by Long Island Lighting Company to MarketSpan Gas Corporation by deed dated May 27, 1998 and recorded in the Nassau County Clerk's Office in Liber 10921 from Page 0406 through Page 0415 and being more particularly described in Appendix "A," attached to this declaration and made a part hereof and hereinafter referred to as "the Property"; and

WHEREAS, the Department approved a remedy to eliminate or mitigate all significant threats to the environment presented by the contamination disposed at the Property and such remedy requires that the Property be subject to restrictive covenants.

NOW, THEREFORE, KeySpan Gas East Corporation, for itself and its successors and/or assigns, covenants that:

First, the Property subject to this Declaration is as shown on a map attached to this Declaration as Appendix "B" and made a part hereof.

Second, unless prior written approval by the Department or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens (hereinafter referred to as the "Relevant Agency"), is first obtained, where contamination remains at the Property subject to the provisions of the approved Site Management Plan (the "SMP"), dated October 2011, there shall be no construction, use or occupancy of the Property that results in the disturbance or excavation of the Property, which threatens the integrity of the soil cap, or which results in unacceptable human exposure to contaminated soils. The cover page and table of contents of the SMP is attached to this Declaration as Appendix "C" and made a part hereof.

Third, the Owner of the Property shall maintain the cap covering the Property by maintaining its grass cover or, after obtaining the written approval of the Department or Relevant Agency, by capping the Property with another material. The Owner of the Property shall not disturb, remove, or otherwise interfere with the installation, use,

operation, and maintenance of engineering controls required for the remedy, which are described in the SMP, unless in each instance the Owner obtains a written waiver of such prohibition from the Department or Relevant Agency.

Fourth, the Owner of the Property shall prohibit the Property from ever being used for purposes other than for Restricted Residential, Commercial or Industrial Use without the express written waiver of such prohibition by the Department or Relevant Agency.

Fifth, the Owner of the Property shall prohibit the use of the groundwater underlying the Property without treatment rendering it safe for drinking water or industrial purposes, as appropriate, unless the user first obtains permission to do so from the Department or Relevant Agency.

Sixth, the Owner of the Property shall continue in full force and effect any institutional and engineering controls required under the SMP and maintain such controls, unless the Owner first obtains permission to discontinue such controls from the Department or Relevant Agency.

Seventh, this Declaration is and shall be deemed a covenant that shall run with the land and shall be binding upon all future owners of the Property, and shall provide that the Owner and its successors and assigns consent to enforcement by the Department or Relevant Agency of the prohibitions and restrictions that the SMP requires to be recorded, and hereby covenant not to contest the authority of the Department or Relevant Agency to seek enforcement.

Eighth, any deed of conveyance of the Property, or any portion thereof, shall recite, unless the Department or Relevant Agency has consented to the termination of such covenants and restrictions, that said conveyance is subject to this Declaration.

[Signature Page Follows]

IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

Name: Robert P Peets

Title: vice president

::ODMA\PCDOCS\DOCS\287179\1

STATE OF NEW YORK)
)ss:
COUNTY OF Nassau)

On the 21st day of October in the year 2011, before me, the undersigned, personally appeared Robert D. Teetz, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signatures(s) on the instrument, the individual(s), or the person on behalf of which the individual(s) acted, executed the instrument.

Notary Signature

Notary Stamp & Expiration Date:

BETH P. SANTANELLO
NOTARY PUBLIC, State of New York
No. 01SA6197484
Qualified in Nassau County
Commission Expires December 1, 2012

Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #1
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "F"; P/O Lot 4
Sheet #1 of 3
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southeasterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following THREE (3) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;

Thence running across Shore Road North 76° 37' 26" West 70.00 feet to a point on the westerly right-of-way line of Shore Road; Thence northerly along the westerly right-of-way line of Shore Road along the arc of a curve to the left having a radius of 555.02 feet an a arc length of 153.69 feet to a point; Thence running through P/O Lot 4 along a Tie-Line Due West 76.44 feet to the true point or place of beginning;

Thence continuing running though P/O Lot 4 the following FOUR (4) bearings and distances:

1. Due West 26.34 feet to a point;
2. Due North 25.48 feet to a point;
3. Due East 26.34 feet to a point;
4. Due South 25.48 feet to the true point of place of beginning;

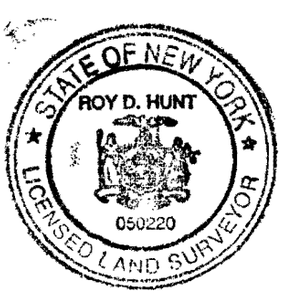
Containing within said bounds 671 Sq. Ft. more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
May 8, 1947	Liber 3330, Page 240	May 14, 1947
May 27, 1998	Liber 10921, Page 406	June 18, 1998

Legal Description was
Established From a Map By:
Nationgrid Survey Division
Dated: May 22, 2001
Revised: Feb. 8, 2011
Revived: Sept. 17, 2011

Bearings, Distances and Area
Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220



Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #2
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "F"; P/O Lot 4
Sheet #1 of 3
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southeasterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following THREE (3) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc Length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;

Thence running across Shore Road North 76° 37' 26" West 70.00 feet to a point on the westerly right-of-way line of Shore Road; Thence northerly along the westerly right-of-way line of Shore Road along the arc of a curve to the left having a radius of 555.02 feet an a arc length of 150.21 feet to a point; Thence running through P/O Lot 4 along a Tie-Line Due West 176.23 feet to the true point or place of beginning;

Thence continuing running though P/O Lot 4 the following SIX (6) bearings and distances:

1. Due West 38.69 feet to a point;
2. Due North 25.99 feet to a point;
3. Due East 11.96 feet to a point;
4. Due North 7.93 feet to a point;
5. Due East 26.74 feet to a point;
6. Due South 33.93 feet to the true point of place of beginning;

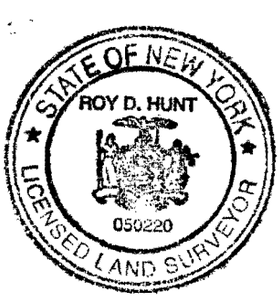
Containing within said bounds 1,218 Sq. Ft. more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
May 8, 1947	Liber 3330, Page 240	May 14, 1947
May 27, 1998	Liber 10921, Page 406	June 18, 1998

Legal Description was
Established From a Map By:
Nationgrid Survey Division
Dated: May 22, 2001
Revised: Feb. 8, 2011
Revised: Sept. 17, 2011

Bearings, Distances and Area
Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220



Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #3
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "F"; P/O Lot 1947
Sheet #1 of 3
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southeasterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following THREE (3) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc Length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;

Thence running across Shore Road North 76° 37' 26" West 70.00 feet to a point on the westerly right-of-way line of Shore Road; Thence running northerly along the westerly right-of-way line of Shore Road the following TWO (2) bearings and distances:

1. Along the arc of a curve to the left having a radius of 555.02 feet an a arc length of 288.53 feet to a point;
2. North 16° 30' 46" West 20.76 feet to a point;

Thence running through P/O Lots 4 and 1947 along a Tie-Line Due West 272.78 feet to the true point or place of beginning;

Thence continuing running though P/O Lot 1947 the following FOUR (4) bearings and distances:

1. Due West 26.75 feet to a point;
2. Due North 27.03 feet to a point;
3. Due East 26.75 feet to a point;
4. Due South 27.03 feet to the true point of place of beginning;

Containing within said bounds 723 Sq. Ft. more or less.

Being and intending to be a part the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
May 8, 1947	Liber 3330, Page 240	May 14, 1947
May 27, 1998	Liber 10921, Page 406	June 18, 1998

Legal Description was
Established From a Map By:
Nationgrid Survey Division
Dated: May 22, 2001
Revised: Feb. 8, 2011
Revised: Sept. 17, 2011

Bearings, Distances and Area
Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220

Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #4
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "F"; P/O Lot 4
Sheet #1 of 3
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southeasterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following THREE (3) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc Length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;

Thence running across Shore Road North 76° 37' 26" West 70.00 feet to a point on the westerly right-of-way line of Shore Road; Thence running northerly along the westerly right-of-way line of Shore Road the following TWO (2) bearings and distances:

1. Along the arc of a curve to the left having a radius of 555.02 feet an a arc length of 288.53 feet to a point;
2. North 16° 30' 46" West 47.11 feet to a point;

Thence running through P/O Lot 4 along a Tie-Line Due West 154.91 feet to the true point or place of beginning;

Thence continuing running though P/O Lot 4 the following FOUR (4) bearings and distances:

1. Due West 28.07 feet to a point;
2. Due North 26.00 feet to a point;
3. Due East 28.07 feet to a point;
4. Due South 26.00 feet to the true point of place of beginning;

Containing within said bounds 730 Sq. Ft. more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
May 8, 1947	Liber 3330, Page 240	May 14, 1947
May 27, 1998	Liber 10921, Page 406	June 18, 1998

Legal Description was
Established From a Map By:
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Dated: May 22, 2001
Revised: Feb. 8, 2011
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By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220

Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #5
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "F"; P/O Lots 4 & 1947
Sheet #1 of 3
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southeasterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following THREE (3) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc Length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;

Thence running across Shore Road North 76° 37' 26" West 70.00 feet to a point on the westerly right-of-way line of Shore Road; Thence running northerly along the westerly right-of-way line of Shore Road the following TWO (2) bearings and distances:

1. Along the arc of a curve to the left having a radius of 555.02 feet an a arc length of 288.53 feet to a point;
2. North 16° 30' 46" West 105.64 feet to a point;

Thence running through P/O Lot 4 along a Tie-Line Due West 164.97 feet to the true point or place of beginning;

Thence continuing running though P/O Lots 4 and Lot 1947 the following FOUR (4) bearings and distances:

1. Due West 26.75 feet to a point;
2. Due North 35.58 feet to a point;
3. Due East 26.75 feet to a point;
4. Due South 35.58 feet to the true point of place of beginning;

Containing within said bounds 952 Sq. Ft. more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
May 8, 1947	Liber 3330, Page 240	May 14, 1947
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Legal Description was
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Nationgrid Survey Division
Dated: May 22, 2001
Revised: Feb. 8, 2011
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Bearings, Distances and Area
Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220

Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #6
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "F"; P/O Lots 9 & 1947
Sheet #1 of 3
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southeasterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following THREE (3) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc Length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;

Thence running across Shore Road North 76° 37' 26" West 70.00 feet to a point on the westerly right-of-way line of Shore Road; Thence running northerly along the westerly right-of-way line of Shore Road the following THREE (3) bearings and distances:

1. Along the arc of a curve to the left having a radius of 555.02 feet an a arc length of 288.53 feet to a point;
2. North 16° 30' 46" West 113.00 feet to a point;
3. Along the arc of a curve to the right having a radius of 689.82 feet an a arc length of 93.93 feet to the true point or place of beginning;

Thence running along the division line of Lots 4 and 9 South 69° 25' 48" West 12.76 feet to a point;

Thence running though P/O Lots 9 and Lot 1947 the following TWO (2) bearings and distances:

1. North 51° 55' 18" West 392.18 feet to a point;
2. North 27° 25' 15" East 156.50 feet to a point on the division line of Lots 9 and Lot 10-B (Town of Oyster Bay) ;

Thence running along said division line North 89° 06' 34" East 293.38 feet to a point on the westerly right-of-way line of Shore Road;

Thence running along said right-of-way the following TWO (2) bearings and distances:

1. South 16° 48' 44" West 80.30 feet to a point;
3. Along the arc of a curve to the left having a radius of 689.82 feet an a arc length of 307.29 feet to the true point of place of beginning;

Containing within said bounds 82,549 Sq. Ft. or 1.90 Acres more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
May 8, 1947	Liber 3330, Page 240	May 14, 1947
May 27, 1998	Liber 10921, Page 406	June 18, 1998

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Bearings, Distances and Area
Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220

Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #6
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "F"; P/O Lots 9 & 1947
Sheet #1 of 3
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

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1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc Length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;

Thence running across Shore Road North 76° 37' 26" West 70.00 feet to a point on the westerly right-of-way line of Shore Road; Thence running northerly along the westerly right-of-way line of Shore Road the following THREE (3) bearings and distances:

1. Along the arc of a curve to the left having a radius of 555.02 feet an a arc length of 288.53 feet to a point;
2. North 16° 30' 46" West 113.00 feet to a point;
3. Along the arc of a curve to the right having a radius of 689.82 feet an a arc length of 93.93 feet to the true point or place of beginning;

Thence running along the division line of Lots 4 and 9 South 69° 25' 48" West 12.76 feet to a point;

Thence running though P/O Lots 9 and Lot 1947 the following TWO (2) bearings and distances:

1. North 51° 55' 18" West 392.18 feet to a point;
2. North 27° 25' 15" East 156.50 feet to a point on the division line of Lots 9 and Lot 10-B (Town of Oyster Bay) ;

Thence running along said division line North 89° 06' 34" East 293.38 feet to a point on the westerly right-of-way line of Shore Road;

Thence running along said right-of-way the following TWO (2) bearings and distances:

1. South 16° 48' 44" West 80.30 feet to a point;
3. Along the arc of a curve to the left having a radius of 689.82 feet an a arc length of 307.29 feet to the true point of place of beginning;

Containing within said bounds 82,549 Sq. Ft. or 1.90 Acres more or less.

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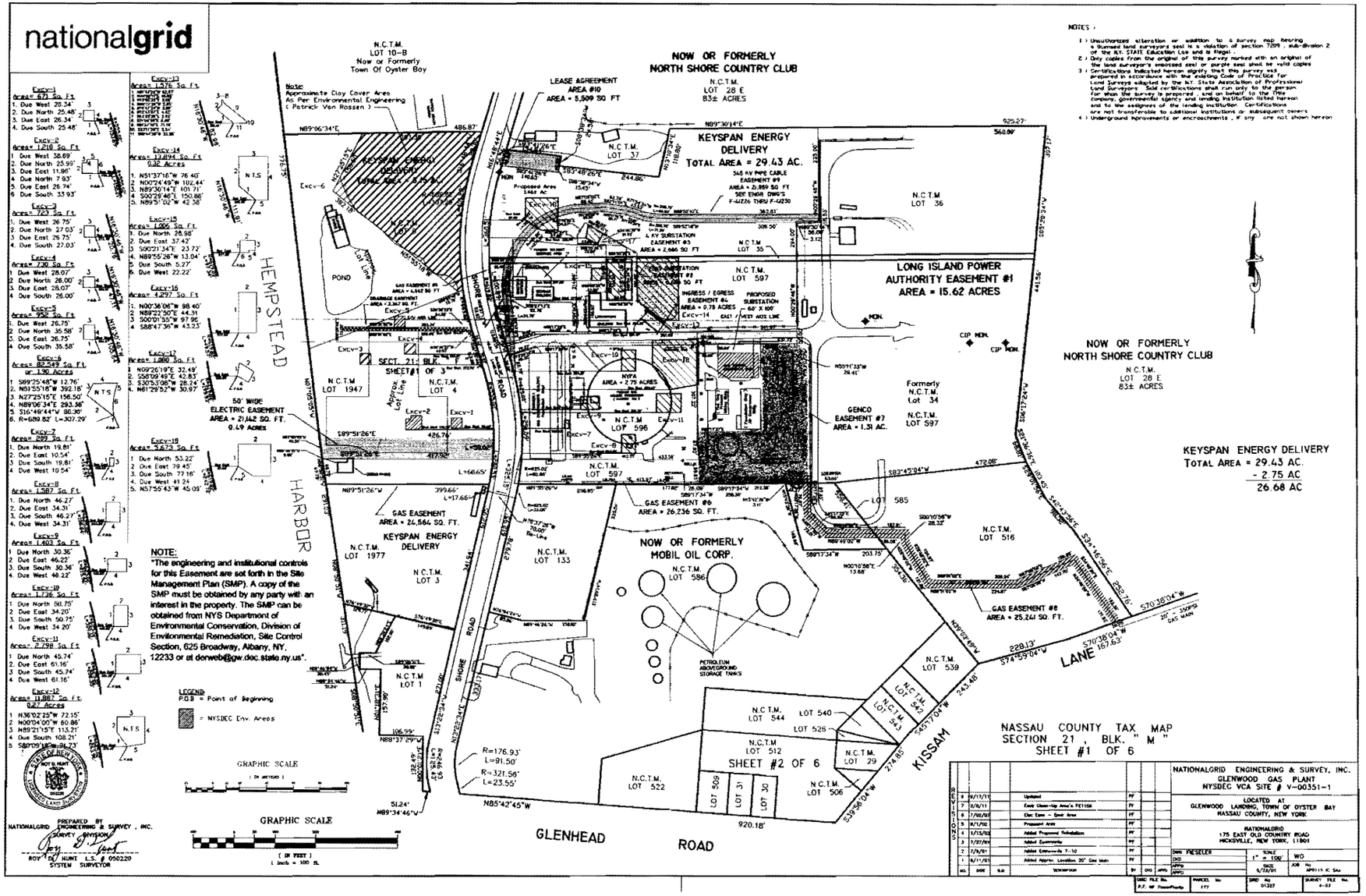
nationalgrid
NOTES :
1) Unauthorized alteration or addition to a survey map bearing a licensed land surveyors seal is a violation of section 7209 , sub-division 2 of the N.Y. STATE Education Law and is illegal .
2) Only copies from the original of the survey marked with an original of the land surveyor's embossed seal or purple seal shall be valid copies
3) Certifications indicated hereon signify that this survey was prepared in accordance with the existing Code of Practice for Land Surveys adopted by the N.Y. State Association of Professional Land Surveyors . Said certifications shall run only to the person for whom the survey is prepared , and on behalf of the Title Company, governmental agency and lending institution listed hereon and to the assignees of the lending institution . Certifications are not transferable to additional institutions or subsequent owners
4) Underground improvements or encroachments , if any , are not shown hereon
N.C.T.M. LOT 10-B Now or Formerly Town Of Oyster Bay
NOW OR FORMERLY NORTH SHORE COUNTRY CLUB
N.C.T.M. LOT 28 E 83± ACRES
LEASE AGREEMENT AREA #10 = 5,909 SQ FT
KEYSPAN ENERGY DELIVERY TOTAL AREA = 29.43 AC.
345 KV PIPE CABLE EASEMENT #9 AREA = 21,889 SQ FT SEE ENGR DWG'S F-41226 THRU F-41230
LONG ISLAND POWER AUTHORITY EASEMENT #1 AREA = 15.62 ACRES
NOW OR FORMERLY NORTH SHORE COUNTRY CLUB
N.C.T.M. LOT 28 E 83± ACRES
KEYSPAN ENERGY DELIVERY TOTAL AREA = 29.43 AC. - 2.75 AC 26.68 AC
GENCO EASEMENT #7 AREA = 1.31 AC.
GAS EASEMENT #8 AREA = 25,241 SQ. FT.
GAS EASEMENT AREA = 24,564 SQ. FT.
GAS EASEMENT #6 AREA = 26,236 SQ. FT.
50' WIDE ELECTRIC EASEMENT AREA = 21,142 SQ. FT. 0.49 ACRES
NYTA AREA = 2.75 ACRES
NOW OR FORMERLY MOBIL OIL CORP.
N.C.T.M. LOT 586
PETROLEUM ABOVEGROUND STORAGE TANKS
SECT. 21 BLK. M SHEET #1 OF 3
SHEET #2 OF 6
HEMPSTEAD HARBOR
SHORE ROAD
KISSAM LANE
GLENHEAD ROAD
POND
NOTE: "The engineering and institutional controls for this Easement are set forth in the Site Management Plan (SMP). A copy of the SMP must be obtained by any party with an interest in the property. The SMP can be obtained from NYS Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY, 12233 or at derweb@gw.dec.state.ny.us".
LEGEND
POB = Point of Beginning
= NYSDEC Env. Areas
GRAPHIC SCALE
(IN METERS)
GRAPHIC SCALE
(IN FEET)
1 Inch = 100 ft.
PREPARED BY NATIONALGRID ENGINEERING & SURVEY , INC. SURVEY DIVISION
ROY D. HUNT L.S. # 050220 SYSTEM SURVEYOR
NASSAU COUNTY TAX MAP SECTION 21 , BLK. " M " SHEET #1 OF 6
NATIONALGRID ENGINEERING & SURVEY, INC.
GLENWOOD GAS PLANT
NYSDEC VCA SITE # V-00351-1
LOCATED AT GLENWOOD LANDING, TOWN OF OYSTER BAY NASSAU COUNTY, NEW YORK
NATIONALGRID 175 EAST OLD COUNTRY ROAD HICKSVILLE, NEW YORK, 11801
DWG P:\ESELER
SCALE 1" = 100'
WO
DATE 6/20/01
JOB No. AP0111 VC SNA
DRG FILE No. P:\ MP PowerPoints\
PARCEL No. 177
DRG No. 01327
SURVEY FILE No. V-00

SITE MANAGEMENT PLAN

NATIONAL GRID GLENWOOD LANDING FORMER GAS PLANT SITE
GLENWOOD LANDING, NEW YORK

VOLUNTARY CLEANUP AGREEMENT NO. R1-0001-01-01

Prepared for:

NATIONAL GRID
HICKSVILLE, NEW YORK

Prepared by:

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
WOODBURY, NEW YORK

OCTOBER 2011

SITE MANAGEMENT PLAN
NATIONAL GRID GLENWOOD LANDING FORMER GAS PLANT SITE

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1 Site Plan ..... Map Pocket at end of Section 1.0

RECEIVED
APR 17 2012
REMEDIAL BUREAU E

NASSAU COUNTY CLERK'S OFFICE
ENDORSEMENT COVER PAGE

Recorded Date: 02-24-2012
Recorded Time: 11:43:30 a

Liber Book: D 12804
Pages From: 738
To: 758

Record and Return To:
AECOM
ATTN TAMERA REBY
100 CORPORATE PKWY
SUITE 341
AMHERST, NY 14226

Control
Number: 748
Ref #:
Doc Type: D03 DECLARATION RESTRICTIONS

Location:	Section	Block	Lot	Unit
OYSTER BAY (2824)	0021	0000M-00	00035	
OYSTER BAY (2824)	0021	0000M-00	00036	
OYSTER BAY (2824)	0021	0000M-00	00516	
OYSTER BAY (2824)	0021	0000M-00	00585	
OYSTER BAY (2824)	0021	0000M-00	00596-597	

Taxes Total	.00
Recording Totals	220.00
Total Payment	220.00

GJS001

THIS PAGE IS NOW PART OF THE INSTRUMENT AND SHOULD NOT BE REMOVED
MAUREEN O'CONNELL
COUNTY CLERK

2012022400748

R/R AECOM
100 Corporate Pkwy
Suite 371
Amherst, N.Y. 14226
Attn Tamara Raby

DECLARATION of COVENANTS and RESTRICTIONS

THIS COVENANT is made the 21st day of October 2011, by KeySpan Gas East Corporation d/b/a National Grid, a corporation of the State of New York, having its principal office at 175 East Old Country Road, Hicksville, New York 11801; and

WHEREAS, Glenwood Landing Propane Plant and Compressor Station is the subject of Voluntary Cleanup Agreement executed by KeySpan Energy Delivery Long Island, the former fictitious name (*i.e.*, d/b/a) of KeySpan Gas East Corporation as part of the New York State Department of Environmental Conservation's (the Department's) Voluntary Cleanup Program, namely that parcel of real property found on Nassau County Tax Map Section 21, Block M, Lots 35, 36, 516, 585, 596 and 597, located on Shore Road in the Town of Oyster Bay, County of Nassau, State of New York, which is part of lands conveyed by Long Island Lighting Company to MarketSpan Gas Corporation by deed dated May 27, 1998 and recorded in the Nassau County Clerk's Office in Liber 10921 from Page 0406 through Page 0415 and being more particularly described in Appendix "A," attached to this declaration and made a part hereof and hereinafter referred to as "the Property"; and

WHEREAS, the Department approved a remedy to eliminate or mitigate all significant threats to the environment presented by the contamination disposed at the Property and such remedy requires that the Property be subject to restrictive covenants.

NOW, THEREFORE, KeySpan Gas East Corporation, for itself and its successors and/or assigns, covenants that:

First, the Property subject to this Declaration is as shown on a map attached to this Declaration as Appendix "B" and made a part hereof.

Second, unless prior written approval by the Department or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens (hereinafter referred to as the "Relevant Agency"), is first obtained, where contamination remains at the Property subject to the provisions of the approved Site Management Plan (the "SMP"), dated October 2011, there shall be no construction, use or occupancy of the Property that results in the disturbance or excavation of the Property, which threatens the integrity of the soil cap, or which results in unacceptable human exposure to contaminated soils. The cover page and table of contents of the SMP is attached to this Declaration as Appendix "C" and made a part hereof.

Third, the Owner of the Property shall maintain the cap covering the Property by maintaining its grass cover or, after obtaining the written approval of the Department or Relevant Agency, by capping the Property with another material. The Owner of the Property shall not disturb, remove, or otherwise interfere with the installation, use,

operation, and maintenance of engineering controls required for the remedy, which are described in the SMP, unless in each instance the Owner obtains a written waiver of such prohibition from the Department or Relevant Agency.

Fourth, the Owner of the Property shall prohibit the Property from ever being used for purposes other than for Industrial Use without the express written waiver of such prohibition by the Department or Relevant Agency.

Fifth, the Owner of the Property shall prohibit the use of the groundwater underlying the Property without treatment rendering it safe for drinking water or industrial purposes, as appropriate, unless the user first obtains permission to do so from the Department or Relevant Agency.

Sixth, the Owner of the Property shall continue in full force and effect any institutional and engineering controls required under the SMP and maintain such controls, unless the Owner first obtains permission to discontinue such controls from the Department or Relevant Agency.

Seventh, this Declaration is and shall be deemed a covenant that shall run with the land and shall be binding upon all future owners of the Property, and shall provide that the Owner and its successors and assigns consent to enforcement by the Department or Relevant Agency of the prohibitions and restrictions that the SMP requires to be recorded, and hereby covenant not to contest the authority of the Department or Relevant Agency to seek enforcement.

Eighth, any deed of conveyance of the Property, or any portion thereof, shall recite, unless the Department or Relevant Agency has consented to the termination of such covenants and restrictions, that said conveyance is subject to this Declaration.

[Signature Page Follows]

IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

Robert D. Teetz

Name: Robert D Teetz

Title: Vice President

::ODMA\PCDOCS\DOCS\287179\1

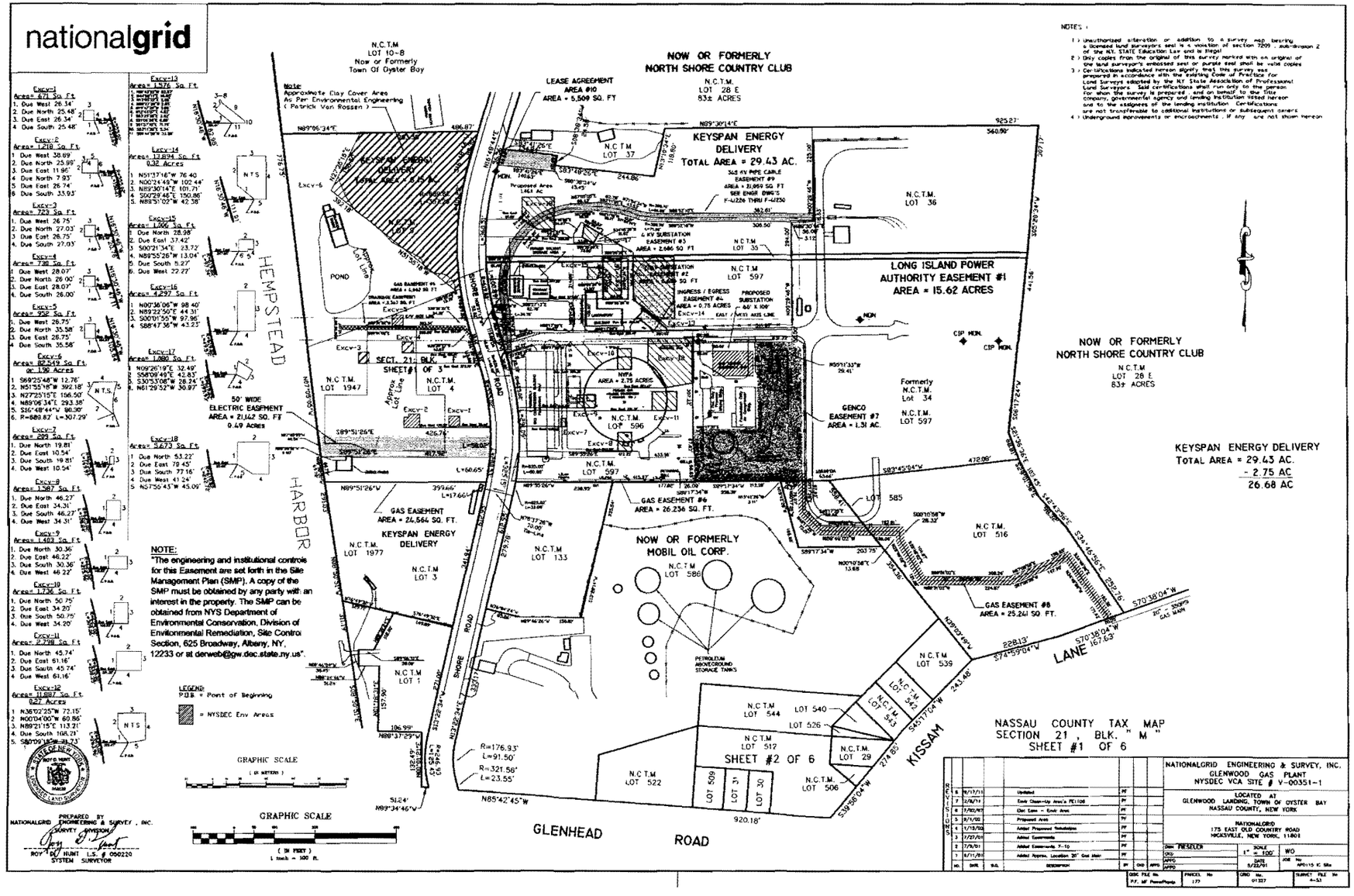
STATE OF NEW YORK)
)ss:
COUNTY OF Nassau)

On the 21st day of October in the year 2011, before me, the undersigned, personally appeared Robert D. Teetz, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signatures(s) on the instrument, the individual(s), or the person on behalf of which the individual(s) acted, executed the instrument.

Beth P Santanello
Notary Signature

Notary Stamp & Expiration Date:

BETH P. SANTANELLO
NOTARY PUBLIC, State of New York
No. 01SA6197484
Qualified in Nassau County
Commission Expires December 1, 2012


nationalgrid
NOTES :
1) Unauthorized alteration or addition to a survey map bearing a licensed land surveyors seal is a violation of section 7209 , sub-division 2 of the N.Y. STATE Education Law and is illegal
2) Only copies from the original of this survey marked with an original of the land surveyor's embossed seal or purple seal shall be valid copies
3) Certifications indicated hereon signify that this survey was prepared in accordance with the existing Code of Practice for Land Surveys adopted by the N.Y. State Association of Professional Land Surveyors. Said certifications shall run only to the person for whom the survey is prepared , and on behalf to the title company, governmental agency and lending institution listed hereon and to the assignees of the lending institution. Certifications are not transferable to additional institutions or subsequent owners
4) Underground improvements or encroachments , if any , are not shown hereon
NOW OR FORMERLY
NORTH SHORE COUNTRY CLUB
N.C.T.M.
LOT 28 E
83± ACRES
LEASE AGREEMENT
AREA #10
AREA = 5,509 SQ. FT
KEYSPAN ENERGY
DELIVERY
TOTAL AREA = 29.43 AC.
LONG ISLAND POWER
AUTHORITY EASEMENT #1
AREA = 15.62 ACRES
NOW OR FORMERLY
NORTH SHORE COUNTRY CLUB
N.C.T.M.
LOT 28 E
83± ACRES
KEYSPAN ENERGY DELIVERY
TOTAL AREA = 29.43 AC.
- 2.75 AC
26.68 AC
N.C.T.M
LOT 10-8
Now or Formerly
Town Of Oyster Bay
Note:
Approximate Clay Cover Area
As Per Environmental Engineering
(Patrick Van Rossen)
HEMPSTEAD
HARBOR
50' WIDE
ELECTRIC EASEMENT
AREA = 21,142 SQ. FT
0.49 Acres
GAS EASEMENT
AREA = 24,564 SQ. FT.
KEYSPAN ENERGY
DELIVERY
GAS EASEMENT #6
AREA = 26,236 SQ. FT.
GENCO
EASEMENT #7
AREA = 1.31 AC.
GAS EASEMENT #8
AREA = 25,241 SQ. FT.
NOW OR FORMERLY
MOBIL OIL CORP.
PETROLEUM
ABOVEGROUND
STORAGE TANKS
SHORE ROAD
GLENHEAD ROAD
KISSAM LANE
SHEET #2 OF 6
NASSAU COUNTY TAX MAP
SECTION 21 , BLK. " M "
SHEET #1 OF 6
NOTE:
"The engineering and institutional controls for this Easement are set forth in the Site Management Plan (SMP). A copy of the SMP must be obtained by any party with an interest in the property. The SMP can be obtained from NYS Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY, 12233 or at derweb@gw.dec.state.ny.us".
LEGEND:
POB = Point of Beginning
= NYSDEC Env Areas
GRAPHIC SCALE
(IN METERS)
GRAPHIC SCALE
(IN FEET)
1 inch = 100 ft.
PREPARED BY
NATIONALGRID ENGINEERING & SURVEY , INC.
SURVEY DIVISION
ROY D. HUNT L.S. # 050220
SYSTEM SURVEYOR
NATIONALGRID ENGINEERING & SURVEY, INC.
GLENWOOD GAS PLANT
NYSDEC VCA SITE # V-00351-1
LOCATED AT
GLENWOOD LANDING, TOWN OF OYSTER BAY
NASSAU COUNTY, NEW YORK
NATIONALGRID
175 EAST OLD COUNTRY ROAD
HICKSVILLE, NEW YORK, 11801
SCALE 1" = 100'
WO
DATE 5/22/01
JOB No APO115 IC Site
SURVEY FILE No 4-53
GRID No. 01327
PARCEL No 177
DISC FILE No. P.F. MF PlanetPlanta

SITE MANAGEMENT PLAN

NATIONAL GRID GLENWOOD LANDING FORMER GAS PLANT SITE
GLENWOOD LANDING, NEW YORK

VOLUNTARY CLEANUP AGREEMENT NO. R1-0001-01-01

Prepared for:

NATIONAL GRID
HICKSVILLE, NEW YORK

Prepared by:

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
WOODBURY, NEW YORK

OCTOBER 2011

SITE MANAGEMENT PLAN
NATIONAL GRID GLENWOOD LANDING FORMER GAS PLANT SITE

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Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #7
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "M"; P/O Lot 596
Sheet #1 of 6
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southwesterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following FOUR (4) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;
4. Along the arc of a curve to the left having a radius of 625.02 feet an a arc length of 169.97 feet to a point;

Thence running through P/O Lot 596 Due East 103.93 feet to the true point or place of beginning;

Thence continuing running though P/O Lots 596 the following FOUR (4) bearings and distances:

1. Due North 19.81 feet to a point;
2. Due East 10.54 feet to a point;
3. Due South 19.81 feet to a point;
4. Due West 10.54 feet to the true point of place of beginning;

Containing within said bounds 209 Sq. Ft. more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
May 8, 1947	Liber 3330, Page 240	May 14, 1947
May 27, 1998	Liber 10921, Page 406	June 18, 1998

Legal Description was
Established From a Map By:
Nationgrid Survey Division
Dated: May 22, 2001
Revised: Feb. 8, 2011
Revised: Sept. 17, 2011

Bearings, Distances and Area
Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220

Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #8
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "M"; P/O Lot 596
Sheet #1 of 6
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southwesterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following FOUR (4) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;
4. Along the arc of a curve to the left having a radius of 625.02 feet an a arc length of 108.84 feet to a point;

Thence running through P/O Lot 596 Due East 243.69 feet to the true point or place of beginning;

Thence continuing running though P/O Lots 596 the following FOUR (4) bearings and distances:

1. Due North 46.27 feet to a point;
2. Due East 34.31 feet to a point;
3. Due South 46.27 feet to a point;
4. Due West 34.31 feet to the true point of place of beginning;

Containing within said bounds 1,587 Sq. Ft. more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
May 8, 1947	Liber 3330, Page 240	May 14, 1947
May 27, 1998	Liber 10921, Page 406	June 18, 1998

Legal Description was
Established From a Map By:
Nationgrid Survey Division
Dated: May 22, 2001
Revised: Feb. 8, 2011
Revised: Sept. 17, 2011

Bearings, Distances and Area
Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220

Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #9
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "M"; P/O Lot 596
Sheet #1 of 6
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southwesterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following FOUR (4) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;
4. Along the arc of a curve to the left having a radius of 625.02 feet an a arc length of 215.96 feet to a point;

Thence running through P/O Lot 596 Due East 146.83 feet to the true point or place of beginning;

Thence continuing running though P/O Lots 596 the following FOUR (4) bearings and distances:

1. Due North 30.36 feet to a point;
2. Due East 46.22 feet to a point;
3. Due South 30.36 feet to a point;
4. Due West 46.22 feet to the true point of place of beginning;

Containing within said bounds 1,403 Sq. Ft more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
May 8, 1947	Liber 3330, Page 240	May 14, 1947
May 27, 1998	Liber 10921, Page 406	June 18, 1998

Legal Description was
Established From a Map By:
Nationgrid Survey Division
Dated: May 22, 2001
Revised: Feb. 8, 2011
Revised: Sept. 17, 2011

Bearings, Distances and Area
Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220

Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area#10
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "M"; P/O Lot 596
Sheet #1 of 6
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southwesterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following FOUR (4) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;
4. Along the arc of a curve to the left having a radius of 625.02 feet an a arc length of 309.06 feet to a point;

Thence running through P/O Lot 596 Due East 264.36 feet to the true point or place of beginning;

Thence continuing running though P/O Lots 596 the following FOUR (4) bearings and distances:

1. Due North 50.75 feet to a point;
2. Due East 34.20 feet to a point;
3. Due South 50.75 feet to a point;
4. Due West 34.20 feet to the true point of place of beginning;

Containing within said bounds 1,736 Sq. Ft more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
May 8, 1947	Liber 3330, Page 240	May 14, 1947
May 27, 1998	Liber 10921, Page 406	June 18, 1998

Legal Description was
Established From a Map By:
Nationgrid Survey Division
Dated: May 22, 2001
Revised: Feb. 8, 2011
Revised: Sept. 17, 2011

Bearings, Distances and Area
Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220

Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Remediation Area #11
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "M"; P/O Lot 596
Sheet #1 of 6
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southwesterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following FOUR (4) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;
4. Along the arc of a curve to the left having a radius of 625.02 feet an a arc length of 208.35 feet to a point;

Thence running through P/O Lot 596 Due East 331.32 feet to the true point or place of beginning;

Thence continuing running though P/O Lots 596 the following FOUR (4) bearings and distances:

1. Due North 45.74 feet to a point;
2. Due East 61.16 feet to a point;
3. Due South 45.74 feet to a point;
4. Due West 61.16 feet to the true point of place of beginning;

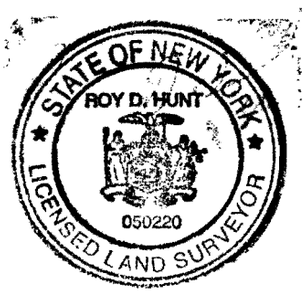
Containing within said bounds 2,798 Sq. Ft more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
May 8, 1947	Liber 3330, Page 240	May 14, 1947
May 27, 1998	Liber 10921, Page 406	June 18, 1998

Legal Description was
Established From a Map By:
Nationgrid Survey Division
Dated: May 22, 2001
Revised: Feb. 8, 2011
Revised: Sept. 17, 2011

Bearings, Distances and Area
Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220



Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #12
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "M"; P/O Lots 596 and 597
Sheet #1 of 6
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southwesterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following FOUR (4) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;
4. Along the arc of a curve to the left having a radius of 625.02 feet an a arc length of 263.96 feet to a point;

Thence running through P/O Lot 596 Due East 372.47 feet to the true point or place of beginning;

Thence continuing running though P/O Lots 596 and Lot 597 the following FIVE (5) bearings and distances:

1. North 36° 02' 25" West 72.15 to a point;
2. North 00° 04' 00" West 60.86 feet to a point;
3. North 89° 21' 15" East 113.21 feet to a point;
4. Due South 108.21 feet to a point;
5. South 80° 09' 18" West 71.73 feet to the true point of place of beginning;

Containing within said bounds 11,887 Sq. Ft or 0.27 Acres more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
May 8, 1947	Liber 3330, Page 240	May 14, 1947
May 27, 1998	Liber 10921, Page 406	June 18, 1998

Legal Description was
Established From a Map By:
Nationgrid Survey Division
Dated: May 22, 2001
Revised: Feb. 8, 2011
Revised: Sept. 17, 2011

Bearings, Distances and Area
Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220

Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #13
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "M"; P/O Lot 597
Sheet #1 of 6
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southwesterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following FIVE (5) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;
4. Along the arc of a curve to the left having a radius of 625.02 feet an a arc length of 325.05 feet to a point;
5. North 16° 30' 46" West 82.98 feet to a point;
   Thence running through P/O Lot 597 Due East 381.41feet to the true point or place of beginning;

Thence continuing running though P/O Lots 597 the following ELEVEN (11) bearings and distances:

1. North 51° 43' 22" West 52.57 feet to a point;
2. North 44° 59' 11" East 16.65 feet to a point;
3. North 12° 05' 22" East 2.08 feet to a point;
4. North 09° 27' 29" West 2.65 feet to a point;
5. North 19° 47' 24" West 3.86 feet to a point;
6. North 12° 43' 07" East 4.62 feet to a point;
7. South 63° 25' 28" East 2.92 feet to a point;
8. South 21° 06' 56" East 6.86 feet to a point;
9. South 51° 37' 10" East 71.19 feet to a point;
10. South 23° 11' 20" East 5.54 feet to a point;
11. South 89° 44' 59" West 33.28 feet to the true point of place of beginning;

Containing within said bounds 1,576 Sq. Ft more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
May 8, 1947	Liber 3330, Page 240	May 14, 1947
May 27, 1998	Liber 10921, Page 406	June 18, 1998

Legal Description was
Established From a Map By:
Nationgrid Survey Division
Dated: May 22, 2001
Revised: Feb. 8, 2011
Revised: Sept. 17, 2011

Bearings, Distances and Area
Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220

Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #14
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "M"; P/O Lots 35 and Lot 597
Sheet #1 of 6
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southwesterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following FIVE (5) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;
4. Along the arc of a curve to the left having a radius of 625.02 feet an a arc length of 325.05 feet to a point;
5. North 16° 30' 46" West 111.91 feet to a point;
   Thence running through P/O Lot 597 Due East 398.98 feet to the true point or place of beginning;

Thence continuing running though P/O Lots 35 and Lot 597 the following FIVE (5) bearings and distances:

1. North 51° 37' 16" West 76.40 feet to a point;
2. North 00° 24' 49" West 102.44 feet to a point;
3. North 89° 30' 14" East 101.71 feet to a point;
4. South 00° 29' 46" East 150.86 feet to a point;
5. North 89° 51' 02" West 42.38 feet to the true point of place of beginning;

Containing within said bounds 13,894 Sq. Ft or 0.32 Acres more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
May 8, 1947	Liber 3330, Page 240	May 14, 1947
May 27, 1998	Liber 10921, Page 406	June 18, 1998

Legal Description was
Established From a Map By:
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Bearings, Distances and Area
Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220

Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #15
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "M"; P/O Lot 597
Sheet #1 of 6
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southwesterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following SIX (6) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;
4. Along the arc of a curve to the left having a radius of 625.02 feet an a arc length of 325.05 feet to a point;
5. North 16° 30' 46" West 113.00 feet to a point;
6. Along the arc of a curve to the right having a radius of 619.82 feet an a arc length of 97.34 feet to a point;

Thence running through P/O Lot 597 Due East 247.85 feet to the true point or place of beginning;

Thence continuing running though P/O Lots 597 the following SIX (6) bearings and distances:

1. Due North 28.98 feet to a point;
2. Due East 37.42 feet to a point;
3. South 00° 21' 34" East 23.72 feet to a point;
4. North 89° 55' 26" West 13.04 feet to a point;
5. Due South 5.27 feet to a point;
6. Due West 22.22 feet to the true point of place of beginning;

Containing within said bounds 1,006 Sq. Ft more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
May 8, 1947	Liber 3330, Page 240	May 14, 1947
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Legal Description was
Established From a Map By:
Nationgrid Survey Division
Dated: May 22, 2001
Revised: Feb. 8, 2011
Revised: Sept. 17, 2011

Bearings, Distances and Area
Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220

Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #16
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "M"; P/O Lots 35 and Lot 597
Sheet #1 of 6
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southwesterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following SIX (6) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;
4. Along the arc of a curve to the left having a radius of 625.02 feet an a arc length of 325.05 feet to a point;
5. North 16° 30' 46" West 113.00 feet to a point;
6. Along the arc of a curve to the right having a radius of 619.82 feet an a arc length of 49.57 feet to a point;

Thence running through P/O Lot 597 Due East 277.69 feet to the true point or place of beginning;

Thence continuing running though P/O Lots 35 and Lot 597 the following FOUR (4) bearings and distances:

1. North 00° 36' 06" West 98.40 feet to a point;
2. North 89° 22' 50" East 44.31 feet to a point;
3. South 00° 01' 55" West 97.96 feet to a point;
4. South 88° 47' 36" West 43.23 feet to the true point of place of beginning;

Containing within said bounds 4,297 Sq. Ft more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

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May 8, 1947	Liber 3330, Page 240	May 14, 1947
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Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220

Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #17
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "M"; P/O Lot 36
Sheet #1 of 6
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southwesterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following SIX (6) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc length of 91.50 feet to a point;
3. North 13º 22' 34" East 612.95 feet to a point;
4. Along the arc of a curve to the left having a radius of 625.02 feet an a arc length of 325.05 feet to a point;
5. North 16° 30' 46" West 113.00 feet to a point;
6. Along the arc of a curve to the right having a radius of 619.82 feet an a arc length of 199.93 feet to a point;

Thence running through P/O Lot 36 Due East 239.05 feet to the true point or place of beginning;

Thence continuing running though P/O Lot 36 the following FOUR (4) bearings and distances:

1. North 09° 26' 19" East 32.49 feet to a point;
2. South 58° 09' 49" East 42.83 feet to a point;
3. South 30° 53' 08" West 28.24 feet to a point;
4. North 61° 29' 52" West 30.97 feet to the true point of place of beginning;

Containing within said bounds 1,080 Sq. Ft more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

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Legal Description was
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Roy D. Hunt L.S. #050220

Schedule A

Quad 01327
Job - FE1106
Dated: 02/08/11

Description of NYSDEC Env. Remediation Area #18
Nassau County Tax Map (2010)
Glenwood Gas Plant - Parcel 177
Section 021; Block "M"; P/O Lot 36
Sheet #1 of 6
Situated in
Glenwood Landing, Town of Oyster Bay
Nassau County, State of New York

Beginning at the southwesterly corner of the herein described easement the said true point or place of beginning being more fully described and located as follows:

Beginning at the intersection of the northerly right-of-way line of Glenhead Road and the easterly right-of-way line of Shore Road; running thence northerly along the easterly right-of-way line of Shore Road the following SIX (6) bearings and distances:

1. Along the arc of a curve to the right having a radius of 321.56 feet an a arc length of 23.55 feet to a point;
2. Along the arc of a curve to the right having a radius of 176.93 feet an a arc length of 91.50 feet to a point;
3. North 13° 22' 34" East 612.95 feet to a point;
4. Along the arc of a curve to the left having a radius of 625.02 feet an a arc length of 325.05 feet to a point;
5. North 16° 30' 46" West 113.00 feet to a point;
6. Along the arc of a curve to the right having a radius of 619.82 feet an a arc length of 242.72 feet to a point;

Thence running through P/O Lot 36 Due East 87.65 feet to the true point or place of beginning;

Thence continuing running though P/O Lot 36 the following FIVE (5) bearings and distances:

1. Due North 53.22 feet to a point;
2. Due East 79.45 feet to a point;
3. Due South 77.16 feet to a point;
4. Due West 41.24 feet to a point;
5. North 57° 55' 43" West 45.09 feet to the true point of place of beginning;

Containing within said bounds 5,673 Sq. Ft more or less.

Being and intending to be a part of the same premises conveyed to the party of the first part by deeds recorded in the Nassau County Clerks Office as follows;

Deed Dated	Recorded	Recorded Date
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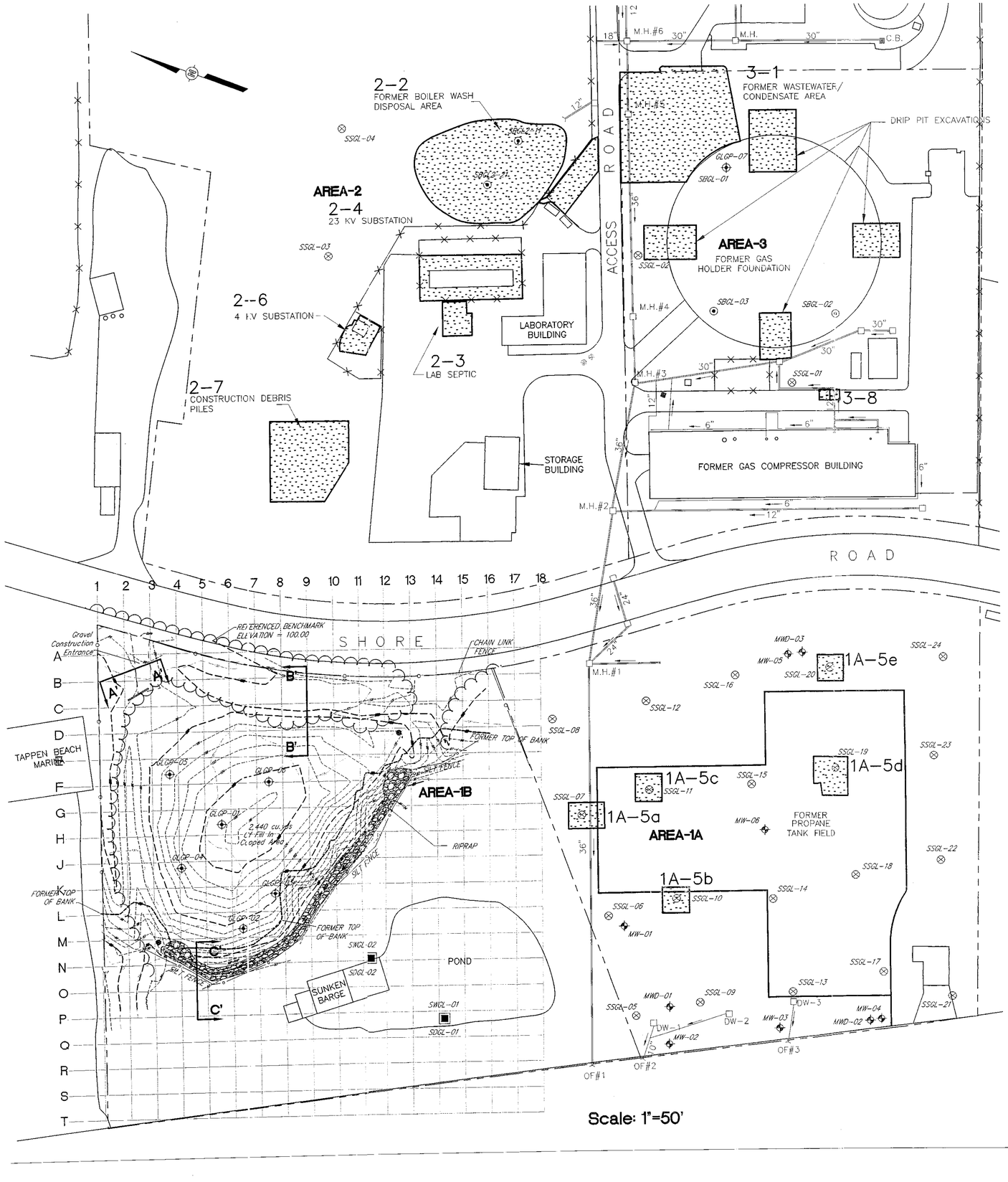
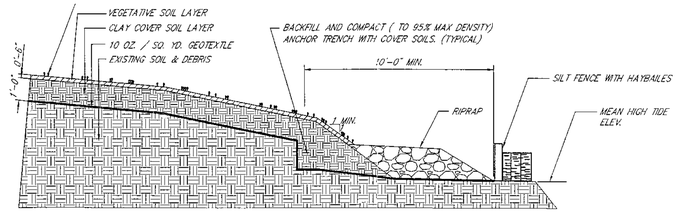
Bearings, Distances and Area
Of Easement were computed
By Nationalgrid System Surveyor
Roy D. Hunt L.S. #050220

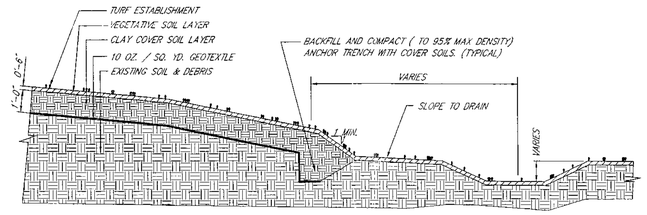
Appendix B

As-Built Plan and Excavation Endpoint Results

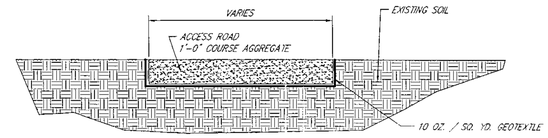




TYPICAL COVER AND TRENCH DETAIL SECTION 'C-C' (Not To Scale)



TYPICAL COVER AND TRENCH DETAIL SECTION 'B-B' (Not To Scale)



TYPICAL GRAVEL ACCESS ROAD DETAIL SECTION 'A-A' (Not To Scale)

PROPOSED EXCAVATION VOLUMES				ACTUAL EXCAVATION VOLUMES		
AREA	AREA(FT.)	DEPTH (FT)	VOL.(C.Y.)	AREA(FT.)	DEPTH (FT)	VOL.(C.Y.)
AREA 1A-5 HOT SPOTS	25'x25' (5)	1'	120	25'x25' (3) 35'x35' (2)	1' 1'	161
AREA 2-2 FORMER BOILER WASH DISPOSAL AREA	90'x 100'	8'	2670	90'x 145'	8'	3867
AREA 2-3 LAB SEPTIC	30'x 20'	8'	180	34'x 20'	8'	180
AREA 2-4 23 KV SUBSTATION	25'x 70'	2'	105	200'x 12' 15'x 18'	2' 2'	198
AREA 2-6 4 KV SUBSTATION	35'x 25'	2'	65	35'x 25'	2'	65
AREA 2-7 CONSTRUCTION DEBRIS PILES	100'x 40'	5'	740	100'x 40'	5'	740
AREA 3-1 FORMER WASTEWATER/ CONDENSATE AREA	100'x90'	8'	2670	100'x90'	8'	2670
AREA 3-8 COMP. BLDG./GAS HOLDER	10'x 10'	2'	8	20'x 10'	2'	15

EXCAVATION AREAS

Proposed Remedial Action Objectives For Soils in Areas 1, 2, and 3 (mg/kg)	
Analyte	Objective
Benzo(a)anthracene	1
Benzo(b)fluoranthene	1
Benzo(a)pyrene	0.1
Indeno (1,2,3-cd)pyrene	1
Benzo(g,h,i)perylene	310
Dibenzo(a,h)anthracene	0.1
Arsenic	20
Lead	400
Vanadium	500
PCBs	2

Response actions should meet the designated values to the Groundwater Interface.

VHB
Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
54 Tuttle Place
Middletown, Connecticut 06457
860 632 1500 • FAX 860 632 7879

LEGEND

- MONITORING WELL
- SOIL BORING
- SURFACE SOIL SAMPLE
- GEOPROBE SAMPLE
- SURFACE WATER/SEDIMENT SAMPLE
- M.H. MANHOLE
- DW DRYWELL
- OF OUTFALL
- C.B. CATCH BASIN
- AS-BUILT MINOR CONTOUR
- AS-BUILT MAJOR CONTOUR
- FORMER MINOR CONTOUR
- FORMER MAJOR CONTOUR
- FORMER TOP OF BANK
- TREE/BRUSH LINE
- RIPRAP

No.	Revision	Date	Appvd.
1	Add Notes	8/19/03	MJW

Designed by DKH | Drawn by RCA | Checked by DKH
CAD checked by RCA | Approved by MJW
Scale As Noted | Date March, 2003
Project Title

Glenwood Landing
Gas Plant Site
Glenwood Landing, New York
Issued for

KEYSPAN ENERGY

Drawing Title

SITE PLAN

Drawing Number 1-2
Sheet 1 of 1
Project Number 06392-26

J:\06392\cad\ver\Glenwood\GW_remedial_action_plan.dwg 08/20/2003 11:52:16 AM EDT

Table 1
Summary of Analytical Results From Area 3-1
KeySpan Energy - Glenwood Landing
Queens, NY

Analyte	Sample Collection Designation & Collection Date																
	GLA1-1A 11/02/01	GLA1-1B 11/02/01	GLA1-2 11/02/01	GLA1-3 11/02/01	GLA1-3S 11/02/01	GLA1-3SSA 1/23/02	GLA1-4 11/02/01	GLA1-4B 11/20/01	GLA1-4C 11/20/01	GLA1-4S 11/02/01	GLA1-5 11/02/01	GLA1-5S 11/02/01	GLA1-6 11/02/01	GLA1-6S 11/02/01	GLA1-6SA 12/12/01	GLA1-6SB 12/12/01	GLA1-6SB 12/12/01
SVOC 8270 (ug/kg)																	
2-Methylnaphthalene	390 U	390 U	22000 J	340 U	36 J	330 U	28 J	360 U	380 U	14 J	88 J	360 U	340 U	330 U	32 Ua	390 Ua	380 U
4-Chloroaniline	390 U	390 U	37000 U	340 U	340 U	330 U	360 U	360 U	4 J	350 U	360 U	360 U	340 U	330 U	28 U	390 U	380 U
4-Methylphenol	390 U	390 U	37000 U	340 U	340 U	330 U	360 U	360 U	380 U	10 J	360 U	360 U	340 U	330 U	20 U	390 Ua	380 U
Acenaphthene	390 U	390 U	2000 J	340 U	18 J	330 U	360 U	360 U	380 U	9 J	8 J	360 U	340 U	330 U	17 U	390 Ua	18 J
Acenaphthylene	390 U	390 U	10000 J	340 U	1400	330 U	60 J	360 U	380 U	58 J	44 J	360 U	340 U	330 U	12 U	61 Ja	55 J
Anthracene	390 U	390 U	3700 J	340 U	400	330 U	360 U	360 U	380 U	51 J	23 J	4 J	340 U	330 U	19 Ja	49 Ja	84 J
Benzo(a)anthracene	390 U	390 U	1500 J	340 U	220 J	330 U	360 U	360 U	380 U	150 J	30 J	11 J	340 U	330 U	51 Ja	160 Ja	310 J
Benzo(a)pyrene	390 U	390 U	1200 J	340 U	300 J	330 U	360 U	360 U	380 U	150 J	31 J	10 J	340 U	330 U	51 Ja	180 Ja	290 J
Benzo(b)fluoranthene	390 U	390 U	680 J	340 U	300 J	330 U	360 U	360 U	380 U	120 J	18 J	10 J	340 U	330 U	43 Ua	150 Ja	240 J
Benzo(g,h,i)perylene	390 U	390 U	37000 U	340 U	140 J	330 U	89 J	360 U	380 U	78 J	29 J	360 U	340 U	330 U	42 Ja	190 Ja	230 J
Benzo(k)fluoranthene	390 U	390 U	890 J	340 U	320 J	330 U	360 U	360 U	380 U	140 J	19 J	10 J	340 U	330 U	49 Ja	170 Ja	290 J
Benzoic acid	1900 U	1900 U	180000 U	1600 U	190 J	1600 U	1800 U	1700 U	1800 U	130 J	1800 U	1700 U	1600 U	1600 U	750 U	1900 U	1800 U
bis(2-Ethylhexyl)phthalate	390 U	390 U	37000 U	340 U	38 J	330 U	360 U	320 J	240 J	49 J	360 U	360 U	340 U	330 U	41 UB	390 U	380 U
Butylbenzylphthalate	390 U	390 U	37000 U	340 U	14 J	330 U	360 U	470	400	16 J	360 U	360 U	340 U	330 U	15 U	390 U	380 U
Carbazole	390 U	390 U	37000 U	340 U	16 J	330 U	360 U	360 U	380 U	17 J	2 J	360 U	340 U	330 U	25 U	390 Ua	380 U
Chrysene	390 U	390 U	1600 J	340 U	260 J	330 U	360 U	360 U	380 U	180 J	31 J	11 J	340 U	330 U	72 Ja	210 Ja	380 J
Dibenzo(a,h)anthracene	390 U	390 U	37000 U	340 U	20 J	330 U	360 U	360 U	380 U	29 J	360 U	360 U	340 U	330 U	20 Ua	53 Ja	85 J
Dibenzofuran	390 U	390 U	37000 U	340 U	12 J	330 U	360 U	360 U	380 U	6 J	360 U	360 U	340 U	330 U	17 U	390 Ua	380 U
Di-n-butylphthalate	390 U	390 U	37000 U	340 U	12 J	330 U	360 U	360 U	380 U	45 J	360 U	360 U	340 U	330 U	16 U	390 U	380 U
Di-n-octylphthalate	390 U	390 U	37000 U	340 U	340 U	330 U	360 U	360 U	11 J	350 U	360 U	360 U	340 U	330 U	14 U	390 U	380 U
Fluoranthene	390 U	390 U	3600 J	340 U	280 J	330 U	360 U	360 U	380 U	250 J	35 J	21 J	340 U	330 U	95 Ja	250 Ja	520
Fluorene	390 U	390 U	5700 J	340 U	340 U	330 U	360 U	360 U	380 U	15 J	20 J	360 U	340 U	330 U	23 U	390 U	380 U
Indeno(1,2,3-cd)pyrene	390 U	390 U	37000 U	340 U	100 J	330 U	360 U	360 U	380 U	89 J	15 J	5 J	340 U	330 U	37 Ja	150 Ja	210 J
Naphthalene	390 U	390 U	43000	340 U	34 J	330 U	360 U	360 U	18 J	16 J	360 U	360 U	340 U	330 U	36 U	390 Ua	380 U
Phenanthrene	390 U	390 U	15000 J	340 U	230 J	330 U	360 U	360 U	25 J	220 J	89 J	17 J	340 U	330 U	81 Ja	110 Ja	290 J
Phenol	390 U	390 U	37000 U	340 U	340 U	330 U	360 U	11 J	5 J	350 U	360 U	360 U	340 U	330 U	27 U	390 Ua	380 U
Pyrene	390 U	390 U	5800 J	340 U	330 J	330 U	360 U	360 U	380 U	320 J	60 J	21 J	340 U	330 U	120 Ja	320 Ja	680
CLP Metals (mg/kg)																	
Aluminum	1450 *	578. *	3000 *	1620 *	9340 *	1520	970. *	1060	1120	5360 *	2040 *	1270 *	930. *	1240 *	11000	7490	
Antimony	1.1 UN	1.1 UN	0.91 UN	0.86 UN	0.97 UN	1.1 U	0.96 UN	0.96 UN	0.83 UN	0.95 UN	1.0 UN	0.95 UN	0.98 UN	0.84 UN	0.24 B	0.37 B	
Arsenic	1.1 U	1.0 U	2.2	1.2 B	11.6	1.5	1.0 B	1.1 B	1.2 B	4.9	6.6	1.1 B	0.92 U	1.0 B	9.0	9.6	
Barium	4.1 B	1.5 B	18.4 B	6.6 B	34.7 B	8.3	3.0 B	3.4 B	3.8 B	36.8 B	8.0 B	4.0 B	3.9 B	5.5 B	34.3	34.1	
Beryllium	0.17 B	0.11 U	0.26 B	0.17 B	0.41 B	0.45 U	0.10 U	0.10 U	0.090 U	0.42 B	0.13 B	0.10 B	0.16 B	0.18 B	0.34 B	0.29 B	
Cadmium	0.19 U	0.18 U	0.15 U	0.15 U	0.19 B	0.91 U	0.16 U	0.17 U	0.14 U	0.17 B	0.18 U	0.16 U	0.17 U	0.14 U	0.0013 U	0.14 B	
Calcium	141. B	64.3 B	1620	168. B	1210	131	573. B	109. B	121. B	2880	5450	134. B	67.1 B	96.3 B	701	1800	
Chromium	2.6	1.4 B	12.6	4.4	24.8	3.7	3.0	1.9 B	1.9	59.0	25.8	2.4	2.9	4.1	29.1	14.7	
Cobalt	0.43 B	0.29 U	2.2 B	0.78 B	3.0 B	1.1	0.26 U	0.27 U	0.27 B	3.0 B	0.85 B	0.26 U	0.68 B	0.97 B	3.6	3.7	
Copper	2.3 B	1.2 B	6.8	3.8 B	17.4	2.9	1.6 B	2.3 B	2.2 B	18.1	4.7 B	2.1 B	1.7 B	2.0 B	15.6	15.8	
Iron	1090	704.	5200	2940	12900	4280	809.	912.	750.	11800	3270	1300	2310	3060	14500	11800	
Lead	3.7 N	1.2 N	13.6 N	6.0 N	103. N	2.6	2.6 N	2.2	2.0	206. N	14.6 N	2.4 N	0.95 N	1.8 N	68.8	52.2	
Magnesium	40.4 B	13.8 B	463. B	185. B	1390	284	303. B	27.2 B	24.8 B	1610	462. B	35.3 B	124. B	188. B	1280	1430	
Manganese	8.3	3.3 B	113.	51.8	177.	95.6	4.9	2.4 B	1.7 B	186.	31.0	6.6	28.8	54.4	175	209	
Mercury	0.0032 U	0.0029 U	0.016	0.0037 B	0.36	0.13 U	0.0032 U	0.077	0.26	0.13	0.0054	0.0027 U	0.0028 U	0.0037 U	0.25 B	0.39 B	
Nickel	0.52 B	0.32 U	4.0 B	1.8 B	10.6	2.1	0.65 B	0.36 B	0.39 B	11.5	1.8 B	0.51 B	1.2 B	1.9 B	11.6	12.0	
Potassium	156. B	65.8 B	330. B	144. B	479. B	178	88.9 B	82.0 B	78.2 B	416. B	193. B	191. B	90.5 B	138. B	541 ^	650 ^	
Selenium	1.2 U	1.1 U	0.92 U	0.88 U	0.99 U	1.5 U	0.98 U	1.0 U	0.88 U	0.97 U	1.1 U	0.97 U	1.0 U	0.86 U	0.24 B	0.37 B	
Silver	0.24 U	0.23 U	0.19 U	0.18 U	0.21 U	0.27 U	0.20 U	0.21 U	0.18 U	0.20 U	0.22 U	0.20 U	0.21 U	0.18 U	0.061 B	0.19 B	
Sodium	11.8 B	9.5 B	29.6 B	9.8 B	29.0 B	34.5	5.9 B	13.7 B	13.4 B	28.3 B	23.8 B	13.4 B	7.0 B	8.0 B	31.3 B	34.0 B	
Thallium	2.4 U	2.3 U	1.9 U	1.8 U	2.1 U	2.7 U	2.0 U	3.9 U	3.3 U	2.0 U	2.2 U	2.0 U	2.1 U	1.8 U	0.0091 U	0.0095 U	
Vanadium	8.5 B	3.9 B	10.7	6.7 B	38.0	5.0	6.4 B	5.0 B	4.2 B	29.8	7.8 B	5.3 B	3.1 B	3.6 B	40.5	34.2	
Zinc	6.6 BE	2.9 BE	40.4 E	8.5 E	143. E	5.7	5.6 BE	3.1 B	3.1 B	140. E	17.6 E	3.7 BE	3.8 BE	6.2 E	51.5	95.3	
PCB 8082 (ug/kg)																	
Aroclor-1242	40. U	40. U	35000	34. U	35. U	17. U	740 U	36. U	38. U	35. U	480	36. U	34. U	33. U	19 U	20 U	
Aroclor-1248	22. J	2.9 J	7300 U	24. J	59.	17. U	3700	36. U	38. U	86.	190 U	21. J	3.9 J	18. J	19 U	20 U	
Aroclor-1254	40. U	40. U	7300 U	34. U	90.	17. U	740 U	7.0 J	38. U	150	190 U	36. U	34. U	33. U	19 U	20 U	
Aroclor-1260	40. U	40. U	2100 J	34. U	180	17. U	480 J	6.4 J	2.6 J	120	59. J	36. U	34. U	33. U	46	36	

SVOC and PCB analytical results reported in micrograms per kilogram (ug/kg), or parts per billion (ppb).

Metals analytical results reported in milligrams per kilogram (mg/kg), or parts per million (ppm).

U - Indicates analyte was not detected at or above the reporting limit

J - Indicates that the compound was analyzed for and determined to be present in the sample. However, the concentration indicated is an estimated value which is less than the specified minimum detection limit but greater than zero.

B - Indicates result between instrument detection limit (IDL) and contract required detection limit (CRDL)

E - Indicates that the concentration is estimated due to matrix interferences.

N - Spiked sample recovery not within control limits

a - Concentration exceeds the instrument calibration range or is below the reporting limit

^ - Instrument quality control not within control limits.

* - Batch quality control not within control limits.

NS- Not Sampled

Table 2
Summary of Analytical Results From Area 2-2
KeySpan Energy - Glenwood Landing
Queens, NY

Analyte	Sample Collection Designation & Collection Date																									
	GLA2-1 11/27/01	GLA2-1A 12/12/01	GLA2-2 11/27/01	GLA2-2A 12/12/01	GLA2-3 11/15/01	GLA2-3S 11/15/01	GLA2-4 11/27/01	GLA2-4S 11/27/01	GLA2-5 11/15/01	GLA2-5S 11/15/01	GLA2-6 11/15/01	GLA2-6A 12/12/01	GLA2-6B 12/12/01	GLA2-6S 11/15/01	GLA2-7 11/15/01	GLA2-8 11/27/01	GLA2-9 11/27/01	GLA2-10 11/27/01	GLA2-10A 12/12/01	GLA2-10AD 12/12/01	GLA2-10B 12/12/01	GLA2-11 11/27/01	GLA2-11A 12/12/01	GLA2-11S 11/27/01	GLA2-11SA 12/12/01	GLA2-TPDK 12/13/01	GLA2-TPLT 12/13/01
SVOC 8270 (ug/kg)																										
2-Methylnaphthalene	1300 U	40 U	160 J	42 U	330 U	42 J	320 U	350 U	330 U	16 J	330 U	34 U	33 U	21 J	320 U	330 U	330 U	13 J	33 U	33 U	33 U	330 U	33 U	370 U	37 U	33 U	33 U
4-Chloroaniline	1300 U	210 Ja	380 U	36 U	330 U	9 J	320 U	350 U	330 U	10 J	330 U	29 U	29 U	23 J	320 U	330 U	330 U	840	29 U	29 U	28 U	330 U	29 Ua	7 J	37 Ja	29 U	28 U
4-Methylphenol	1300 U	23 U	380 U	23 U	330 U	320 U	320 U	350 U	330 U	340 U	330 U	19 U	19 U	340 U	320 U	330 U	330 U	330 U	19 U	19 U	18 U	330 U	19 U	17 J	21 U	19 U	18 U
Acenaphthene	300 J	60 Ja	74 J	20 U	330 U	320 U	320 U	350 U	330 U	6 J	330 U	16 U	16 U	340 U	320 U	330 U	330 U	14 J	16 U	16 U	15 U	330 U	16 U	370 U	18 U	11 U	15 U
Acenaphthylene	280 J	640	560	14 U	11 J	75 J	320 U	350 U	330 U	110 J	330 U	12 U	11 U	83 J	320 U	330 U	24 J	1300	11 U	11 U	11 U	330 U	11 U	19 J	13 U	12 U	11 U
Anthracene	670 J	740	290 J	16 U	330 U	30 J	320 U	350 U	330 U	46 J	330 U	13 U	12 U	27 J	320 U	330 U	330 U	320 J	12 U	12 U	12 U	330 U	13 U	24 J	14 Ja	15 U	12 U
Benzo(a)anthracene	390 J	830 Q	410	20 U	330 U	42 J	320 U	350 U	330 U	72 J	330 U	16 U	16 U	42 J	320 U	330 U	330 U	170 J	16 U	16 U	15 U	330 U	19 Ja	110 J	51 Ja	16 U	15 U
Benzo(a)pyrene	310 J	560 H	280 J	21 U	330 U	43 J	320 U	350 U	330 U	67 J	330 U	17 U	17 U	42 J	320 U	330 U	330 U	290 J	17 U	17 U	16 U	330 U	18 Ja	100 J	67 Ja	39 U	16 U
Benzo(b)fluoranthene	250 J	700	200 J	49 U	330 U	37 J	320 U	350 U	330 U	65 J	330 U	40 U	39 U	40 J	320 U	330 U	330 U	100 J	39 U	39 U	39 U	330 U	40 Ua	87 J	55 Ja	17 U	38 U
Benzo(g,h,i)perylene	1300 U	130 Ja	170 J	22 U	330 U	68 J	320 U	350 U	330 U	130 J	330 U	18 U	18 U	37 J	320 U	330 U	64 J	560	44 Ja	62 Ja	17 U	330 U	18 Ua	16 J	62 Ja	40 U	17 U
Benzo(k)fluoranthene	360 J	430 Q	290 J	51 U	330 U	41 J	320 U	350 U	330 U	77 J	330 U	41 U	40 U	36 J	320 U	330 U	330 U	270 J	40 U	40 U	40 U	330 U	41 Ua	110 J	69 Ja	40 U	39 U
Benzoic acid	6100 U	830 U	120 J	860 U	1600 U	32 J	1600 U	66 J	1600 U	1700 U	1600 U	700 U	680 U	110 J	1500 U	1600 U	1600 U	200 J	690 U	690 U	670 U	1600 U	690 U	280 J	770 U	680 U	670 U
bis(2-Ethylhexyl)phthalate	1300 U	200 JaB	20 J	250 JaB	330 U	320 U	320 U	350 U	330 U	26 J	330 U	200 JaB	37 UB	340 U	320 U	330 U	330 U	330 U	230 JaB	260 JaB	390 B	330 U	220 JaB	66 J	240 JaB	37 U	36 U
Butylbenzylphthalate	1300 U	16 U	380 U	17 U	330 U	320 U	320 U	350 U	330 U	340 U	330 U	14 U	13 U	8 J	320 U	330 U	330 U	330 U	13 U	13 U	13 U	330 U	14 U	370 U	15 U	13 U	13 U
Carbazole	1300 U	28 U	380 U	29 U	330 U	320 U	320 U	350 U	330 U	4 J	330 U	23 U	23 U	6 J	320 U	330 U	330 U	330 U	23 U	23 U	22 U	330 U	23 U	19 J	26 U	23 U	22 U
Chrysene	430 J	1000	470	22 U	330 U	58 J	320 U	14 J	330 U	100 J	330 U	18 U	18 U	56 J	320 U	330 U	330 U	120 J	18 U	18 U	17 U	330 U	24 Ja	130 J	81 Ja	17 U	17 U
Dibenzo(a,h)anthracene	1300 U	23 U	36 J	23 U	330 U	18 J	320 U	350 U	330 U	28 J	330 U	19 U	19 U	340 U	320 U	330 U	330 U	160 J	19 U	19 U	18 U	330 U	19 U	370 U	21 Ua	19 U	18 U
Dibenzofuran	1300 U	19 U	380 U	20 U	330 U	320 U	320 U	350 U	330 U	340 U	330 U	16 U	16 U	6 J	320 U	330 U	330 U	330 U	16 U	16 U	15 U	330 U	16 U	370 U	18 U	19 U	18 U
Di-n-butylphthalate	1300 U	18 U	380 U	18 U	330 U	320 U	320 U	350 U	330 U	340 U	330 U	15 U	14 U	340 U	320 U	330 U	330 U	330 U	15 U	15 U	14 U	330 U	15 U	13 J	16 U	14 U	14 U
Fluoranthene	820 J	1600 H	780	29 U	330 U	55 J	320 U	350 U	330 U	120 J	330 U	23 U	23 U	68 J	320 U	330 U	330 U	130 J	23 U	23 U	22 U	330 U	28 Ja	140 J	79 Ja	23 U	22 U
Fluorene	1800	340 Ja	120 J	26 U	330 U	320 U	320 U	350 U	330 U	17 J	330 U	21 U	21 U	340 U	320 U	330 U	330 U	330 U	21 U	21 U	20 U	330 U	21 U	370 U	23 U	21 U	20 U
Indeno(1,2,3-cd)pyrene	1300 U	89 Ja	160 J	23 U	330 U	56 J	320 U	350 U	330 U	92 J	330 U	19 U	19 U	40 J	320 U	330 U	330 U	530	25 Ja	43 Ja	18 U	330 U	19 Ua	24 J	50 Ja	19 U	18 U
Naphthalene	1300 U	210 Ja	380 U	42 U	330 U	320 U	320 U	350 U	330 U	14 J	330 U	34 U	33 U	14 J	320 U	330 U	330 U	11 J	33 U	33 U	33 U	330 U	33 U	370 U	37 U	33 U	32 U
Phenanthrene	4000	3200	370 J	31 U	330 U	54 J	320 U	350 U	330 U	180 J	330 U	25 U	25 U	61 J	320 U	330 U	14 J	29 J	25 U	25 U	24 U	330 U	25 U	63 J	50 Ja	25 U	24 U
Pyrene	1600	3200	1800	25 U	9 J	130 J	320 U	18 J	330 U	270 J	330 U	20 U	20 U	110 J	320 U	330 U	330 U	410	20 U	20 U	19 U	330 U	37 Ja	210 J	120 Ja	20 U	19 U
CLP Metals (mg/kg)																										
Aluminum	495	557	690	3050	3650	2650	1210	1540	2440	1190	1170	2310	1610	4190	1260	923	1090	824	781	602	904	2320	3630	6540	7420	1920 H^	1460 H^
Antimony	0.98 U	0.68 B	0.77 U	0.44 B	0.89 UN	0.81 UN	0.71 U	0.87 U	0.80 UN	0.82 UN	0.73 UN	0.17 B	0.12 B	1.2 BN	0.84 UN	0.87 U	0.88 U	0.86 U	0.36 B	0.14 B	0.29 B	0.86 U	0.4 B	0.88 U	0.39 B	0.90 UH^	1.1 UH^
Arsenic	0.94 U	1.1 B	0.73 U	1.6 B	1.8 B	2.9	0.94 B	0.83 U	0.81 B	2.6	0.70 U	1.1 B	0.83 B	3.2	0.80 U	0.84 U	1.3 B	1.2 B	0.71 B	0.43 B	0.85 B	0.82 U	4.4 B	5.2	10.4	0.81 BH^	1.2 BH^
Barium	4.7 B	4.0	9.9 B	10.2	14.4 B	20.7 B	9.2 B	7.9 B	16.6 B	17.1 B	9.9 B	12.4	10.4	16.8 B	8.8 B	7.6 B	3.6 B	5.7 B	6.1	5.4	6.6	13.6 B	19.0	36.8 B	32.6	11.6 H^	11.3 H^
Beryllium	0.11 U	0.007 U	0.18 B	0.086 B	0.47 B	0.75 B	0.098 B	0.17 B	0.24 B	0.46 B	0.16 B	0.17 B	0.094 B	0.58 B	0.17 B	0.096 B	0.36 B	0.28 B	0.042 B	0.036 B	0.042 B	0.18 B	0.28 B	0.41 B	0.28 B	0.18 U^	0.21 U^
Cadmium	0.17 U	0.29 U	0.13 U	0.25 U	0.15 U	0.14 U	0.12 U	0.15 U	0.14 U	0.14 U	0.13 U	0.22 U	0.25 U	0.14 U	0.15 U	0.15 U	0.15 U	0.15 U	0.26 U	0.27 U	0.2 U	0.15 U	0.24 U	0.15 U	0.24 U	0.21 U	0.25 U
Calcium	138. B	55.7 B	210. B	122	558. B	604. B	185. B	184. B	367. B	302. B	197. B	243	321	197. B	160. B	96.9 B	254. B	191. B	80.0	70.7 B	254	282. B	422	1360	2260	202 H^	160 H^
Chromium	4.0	3.2	3.7	8.2	8.0	23.7	2.5	4.5	5.8	12.4	2.6	7.2	3.7	20.4	3.2	2.3	7.2	4.0	15.0	5.5	6.7	5.7	10.6	13.2	41.2	6.0 H^	4.2 H^
Cobalt	0.30 B	0.41 B	0.75 B	0.89 B	2.6 B	9.0	1.2 B	1.1 B	1.9 B	3.9 B	1.7 B	2.2	1.6 B	3.8 B	1.0 B	0.66 B	0.69 B	0.83 B	0.67 B	0.43 B	1.0 B	2.2 B	2.3	2.8 B	3.8	1.7 H^	1.6 BH^
Copper	34.6	42.3	17.6	19.5	10.	29.6	2.2 B	4.1 B	4.1 B	96.4	4.7	3.9 B	2.6 B	27.2	3.9 B	1.9 B	8.9	15.8	21.5	21.7	1.5 B	4.7	19.3	13.7	21.3	5.4 H^	3.2 BH^
Iron	2850	1500	3400	4260	10100	7820	4180	4060	5950	6210	4380	8160	5200	8060	4430	2660	6860	5900	4050	6040	3230	6170	10200	9670	12800	6810 H^	4640 H^
Lead	4.1	2.2 B	9.0	6.1 B	7.0	30.4	1.7	11.5	22.3	17.0	2.3	7.2 ^	11.9 ^	124.	2.0	1.1	3.1	2.6	2.6 B	2.5 B	1.3 B	22.0	24.2	74.8	90.3	10 H^	5.7 BH^
Magnesium	156. B	152	156. B	341	944. B	966.	401. B	386. B	628. B	366. B	324. B	608	484	949.	348. B	242. B	261. B	188. B	189	137	258	513. B	717	1010	1190	688 H	370 H
Manganese	19.1 *	5.6	28.0 *	14.8	162.	119.	111. *	60.9 *	128.	66.9	155.	124	112	99.6	110.	54.3 *	71.2 *	42.9 *	39.5	25.0	72.1	125. *	191	244. *	172	98.3 H^	100 H^
Mercury	0.053	0.014 B	0.039	0.0055 U	0.0045 U	0.24	0.0036 U	0.0055 B	0.013	0.0092 U	0.0034 U	0.0045 U	0.0043 U	0.095	0.0032 U	0.0033 U	0.0025 U	0.0028 U	0.0047 B	0.0047 U	0.0052 U	0.0045 B	0.045 B	0.12	0.0056 U	0.011 B	0.0053 B
Nickel	6.2 B	6.7	20.3	10.7	9.7	255.	2.2 B	7.1 B	5.4 B	142.	2.5 B	7.4	4.6	64.1	4.9 B	2.9 B	11.7	6.3 B	7.8	6.0	1.6 B	5.6 B	7.2	13.0	10.9	11.6	5.2
Potassium	79.1 B	104 B^	89.2 B	239 ^	373. B	390. B	270. B	199. B	457. B	210. B	179. B	328 ^	275 ^	456. B	229. B	164. B	155. B	118. B	169 B^	97.5 B^	171 ^	328. B	324 ^	417. B	463 ^	245 H^	246 H^
Selenium	1.0 UN	0.68 B	0.82 UN	0.44 B	0.95 U	0.90	0.76 UN	0.93 UN	0.85 U	1.2	0.78 U	0.17 B	0.12 B	1.0	0.90 U	0.93 UN	0.94 UN	0.92 UN	0.36 B	0.14 B	0.29 B	0.91 UN	0.4 B	0.94 UN	0.39 B	1.2 UH^	1.4 UH^
Silver	0.21 U	0.14 B	0.17 U	0.037 B	0.19 U	0.26 B	0.15 U	0.19 U	0.17 U	0.18 U	0.16 U	0.014 B	0.026 B	0.17 U	0.18 U	0.19 U	0.19 U	0.19 U	0.072 B	0.038 B	0.035 B	0.19 U	0.00097 U	0.19 U	0.079 B	0.20 UH^	0.23 UH^
Sodium	11.0 B	10.4 B	26.6 B	12.5 B	24.7 B	75.9 B	16.2 B	18.5 B	17.9 B	59.7 B	12.2 B	25.4 B	15.7 B	43.8 B	13.1 B	8.8 B	11.4 B	12.0 B	10.5 B	22.8 B	12.2 B	22.7 B	24.4 B	32.2 B	38.2 B	15.1 BH^	22.1 BH^
Thallium	4.0 U	2.3 U	3.1 U	2.0 U	3.6 U	3.3 U	2.9 U	3.5 U	3.2 U	3.3 U	3.0 U	1.7 U	1.9 U	3.2 U	2.4 U	3.5 U	3.6 U	3.5 U	2.0 U	2.1 U	1.6 U	3.5 U	1.9 U	3.6 U	1.9 U	1.7 U	2 U
Vanadium	92.5	48.2	178	120	208	681	11.9	61.2		463.	55.6	13.1	68.0	348.	73.6	12.1	428	175	274	298	41.2	7.3 B	10.8	31.0	33.1	15.8 H	17.5 H
Zinc	4.9 B	4.9 B	6.5	9.4 B	13.8	35.6	6.6	9.8	14.5	12.8	7.3	10.6 B	9.3 B	34.6	6.2	5.2 B	8.5	7.4	7.4 B	4.3 B	4.7 B	23.7	23.3	71.0	85.1	12.2 BH^	13.2 BH^
PCB 8082 (ug/kg)																											
Aroclor-1242	3900 U	12000	3800 U	22 U	34. U	34. U	33. U	35. U	34. U	68. U	34. U	18 U	18 U	33. U	34. U	34. U	670 U	3400 U	17 U	18 U	18 U	34. U	17 U	8.8 J	20 U	NS	NS
Aroclor-1248	7100	1000 U	10000	22 U	230	180	3.1 J	7.1 J	34. U	380	34. U	18 U	18 U	67.	24. J	23. J	1100	18000	340	470	18 U	34. U	17 U	37. U	20 U	NS	NS
Aroclor-1254	3900 U	1000 U	3800 U	320	99.	230	33. U	7.0 J	34. U	610	34. U	18 U	18 U	96	21. J	34. U	670 U	3400 U	17 U	18 U	18 U	34. U	17 U	21. J	20 U	NS	NS
Aroclor-1260	850 J	1000 U	1000 J	22 U	68.	170	1.2 J	6.9 J	3.3 J	280	34. U	18 U	18 U	96.	12. J	2.2 J	100 J	1800 J	17 U	18 U	18 U	34. U	17 U	32. J	82	NS	NS

SVOC and PCB analytical results reported in micrograms per kilogram (ug/kg), or parts per billion (ppb).
Metals analytical results reported in milligrams per kilogram (mg/kg), or parts per million (ppm).
U - Indicates analyte was not detected at or above the reporting limit
J - Indicates that the compound was analyzed for and determined to be present in the sample. However, the concentration indicated is an estimated value which is less than the specified minimum detection limit but greater than zero.
B - Indicates result between instrument detection limit (IDL) and contract required detection limit (CRDL)
E - Indicates that the concentration is estimated due to matrix interferences.
N - Spiked sample recovery not within control limits
e - Concentration exceeds the instrument calibration range or is below the reporting limit.
^ - Instrument quality control not within control limits.
* - Batch quality control not within control limits.
NS- Not Sampled

Table 3
Summary of Analytical Results From Area 2-3
KeySpan Energy - Glenwood Landing
Queens, NY

Analyte	Sample Collection Designation & Collection Date												
	GLA3-1 12/17/01	GLA3-1A 12/21/01	GLA3-1AD 12/21/01	GLA3-2 12/14/01	GLA3-3 12/14/01	GLA3-4 12/14/01	GLA3-4A 12/21/01	GLA3-5 12/14/01	GLA3-6 12/14/01	GLA3-7 12/14/01	GLA3-8 12/14/01	GLA3-8A 12/21/01	GLA3-9 12/14/01
SVOC 8270 (ng/kg)													
2,4-Dinitrophenol	260 U	59 U	59 U	52 U	52 U	54 U*	52 U	53 U*	52 U*	52 U*	53 U*	61 U	53 U*
4,6-Dinitro-2-methylphenol	250 U	33 U	33 U	29 U	28 U	29 U*	29 U	29 U*	29 U*	29 U*	29 U*	33 U	29 U*
2-Methylnaphthalenene	170 U	33 U	33 U	29 U	28 U	29 U	29 U	29 U	29 U	29 U	29 Ua	33 U	29 Ua
Acenaphthene	110 U	17 U	17 U	15 U	15 U	16 U	15 U	16 U	15 U	15 U	15 U	18 U	15 U
Acenaphthylene	100 U	18 Ja	13 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	13 U	11 U
Anthracene	120 U	14 Ja	14 U	12 U	12 U	13 U	12 U	12 U	12 U	12 U	12 U	14 U	12 U
Benzo(a)anthracene	110 U	33 Ja	17 U	15 U	15 U	16 U	15 U	16 U	15 U	15 U	15 U	18 U	15 U
Benzo(a)pyrene	110 U	19 U	19 U	16 U	16 U	17 U	16 U	17 U	16 U	16 U	17 U	19 U	17 U
Benzo(b)fluoranthene	150 U	44 U	44 U	39 U	38 U	40 U	39 U	39 U	39 U	39 U	39 U	45 U	39 U
Benzo(ghi)perylene	160 U	20 U	20 U	17 U	17 U	18 U	17 U	18 U	17 U	17 U	18 U	20 U	18 U
Benzo(k)fluoranthene	130 U	44 U	45 U	40 U	39 U	41 U	40 U	40 U	40 U	40 U	40 U	47 U	40 U
Benzoic acid	130 U	770 U	770 U	680 U	670 U	700 Ua	680 U	690 U	680 U	680 U	680 U	790 U	680 U
bis-2-ethylhexyl-phthalate	170 UB	42 U	42 U	37 U	36 U	38 U	37 U	37 U	37 U	37 U	37 U	43 U	37 U
Chrysene	130 U	41 Ja	20 U	17 U	17 U	18 U	17 U	18 U	17 U	17 U	18 U	20 U	18 U
Dibenz(a,h)anthracene	150 U	21 U	21 U	18 U	18 U	19 U	18 U	19 U	19 U	18 U	19 U	21 U	19 U
Dibenzofuran	130 U	17 U	17 U	15 U	15 U	16 U	15 U	16 U	15 U	15 U	15 U	18 U	15 U
Fluoranthene	140 U	72 Ja	26 Ua	22 U	22 U	23 Ua	23 U	23 U	23 U	22 U	23 U	26 U	23 U
Fluorene	89 U	23 U	23 U	20 U	20 U	21 U	20 U	21 U	21 U	20 U	21 U	24 U	21 U
Indeno(1,2,3-cd)pyrene	160 U	21 U	21 U	18 U	18 U	19 Ua	18 U	19 U	19 U	18 U	19 U	21 U	19 U
Phenanthrene	120 U	32 Ja	28 U	25 U	24 U	25 U	25 U	25 U	25 U	25 U	25 U	29 U	25 U
Pyrene	310 U	98 Ja	36 Ja	19 U	19 U	20 U	19 U	20 U	20 U	19 U	20 U	23 U	20 U
CLP Metals (mg/kg)													
Aluminum	839 H	705	1260	722 H^	721 H^	1430 H^	821	1050 H^	896 H^	787 H^	566 H^	1230	867 H^
Antimony	0.93 UH	0.0041 U	0.039	0.83 UH^	1.2 UH^	0.98 UH^	0.21	0.82 UH^	1.0 UH^	1.1 UH^	1.1 UH^	0.032	0.86 UH^
Arsenic	0.64 UH	0.35	0.38	0.57 UH^	0.81 UH^	1.3 H^	0.71	0.57 UH^	0.70 UH^	1.7 H^	0.77 UH^	0.32	0.76 H^
Barium	6.9 H	11.5	53.0	5.6 H^	6.1 H^	10.6 H^	7.5	7.9 H^	4.8 H^	8.5 H^	3.6 H^	34.1	4.7 H^
Beryllium	0.18 UH	0.033	0.10	0.16 U^	0.23 U^	0.19 U^	0.12	0.16 U^	0.20 U^	0.21 U^	0.22 U^	0.15	0.17 U^
Cadmium	0.22 UH	0.069	0.35	0.20 UH	0.28 UH	0.23 UH	0.0089	0.20 UH	0.24 UH	0.26 UH	0.27 UH	0.10	0.21 UH
Calcium	220 H	78.6	174	105 H^	193 H^	170 H^	79.8	259 H^	79.5 H^	57.1 H^	43.1 H^	151	96.4 H^
Chromium	2.7	4.1	6.4	1.4 BH^	3.1 H^	3.4 H^	2.8	3.0 H^	2.7 H^	6.6 H^	2.1 H^	4.8	2.8 H^
Cobalt	0.56 H	0.65	2.4	0.84 BH^	0.85 BH^	1.4 H^	1.3	1.4 H^	0.94 H^	0.94 H^	0.26 H^	0.59	0.96 H^
Copper	10.8	45.5	132	1.6 BH^	1.5 BH^	2.8 H^	2.3	1.8 H^	4.9 H^	3.9 H^	26.1 H^	10.3	3.6 H^
Iron	3520 H	1300	1930	2600 H^	2790 H^	4630 H^	4950	3570 H^	3030 H^	4390 H^	1740 H^	1360	4100 H^
Lead	4.8 H	3.1	3.5	0.88 BH^	0.96 BH^	4.1 H^	3.8	1.2 H^	1.1 H^	1.0 H^	3.4 H^	2.1	0.86 H^
Magnesium	219 H	170	335	188 H	246 H	354 H	168	361 H	248 H	142 H	121 H	232	230 H
Manganese	51.0 H	16.8	13.3	92.5 H^	100 H^	135 H^	127	109 H^	95.2 H^	98.2 H^	12.7 H^	7.5	84.1 H^
Mercury	2.8 B^	0.90 B	1.2 B	0.012 B	0.0045 U	0.077 B	0.0068 B	0.0050 U	0.38 B	0.0040 U	3.0 B	0.77 B	0.35 B
Nickel	3.7 H	9.9	49.5	1.3 B	1.3 B	2.7	1.8	2.0	1.7	1.7	0.53	9.3	1.8
Potassium	111 H^	107	239	128 BH^	134 BH^	192 H^	119	243 H^	138 H^	104 H^	87.3 H^	147	188 H^
Selenium	1.3 UH	0.0045 U	0.20	1.1 UH^	1.6 UH^	1.3 UH^	0.079	1.1 UH^	1.4 UH^	1.5 UH^	1.5 UH^	0.078	1.2 UH^
Silver	0.20 UH^	0.074	0.047	0.18 UH^	0.26 UH^	0.21 UH^	0.030	0.18 UH^	0.22 UH^	0.24 UH^	0.24 UH^	0.0010 U	0.19 UH^
Sodium	12.3 H	92.4	113	16.6 BH^	13.7 BH^	27.0 H^	131	29.8 H^	40.9 H^	16.8 H^	14.4 H^	125	710 H^
Thallium	1.7 UH	0.25	0.18	1.6 UH^	2.2 UH^	1.8 UH^	0.31	1.5 UH^	1.9 UH^	2.0 UH^	2.1 UH^	0.0082 U	1.6 UH^
Vanadium	33.3 H	39.5	149	2.4 BH	2.7 BH	6.3 H	3.5	4.3 H	3.2 H	3.0 H	3.4 H	101	5.1 H
Zinc	9 H	10.9	38.0	4.1 BH^	4.2 BH^	8.4 H^	5.9	7.4 H^	6.8 H^	6.0 H^	9.4 H^	25.8	13.0 H^
PCB 8082 (ug/kg)													
Aroclor-1242	19 U	38 P	19 U	17 U	17 U	18 U	17 U	17 U	17 U	17 U	17 U	20 U	17 U
Aroclor-1248	19 U	19 U	19 U	17 U	17 U	18 U	17 U	17 U	17 U	17 U	17 U	20 U	17 U
Aroclor-1254	42 P	19 U	19 U	17 U	17 U	18 U	17 U	17 U	17 U	17 U	17 U	20 U	17 U
Aroclor-1260	19 U	19 U	19 U	17 U	17 U	18 U	17 U	17 U	17 U	17 U	17 U	20 U	17 U

SVOC and PCB analytical results reported in micrograms per kilogram (µg/kg), or parts per billion (ppb).

Metals analytical results reported in milligrams per kilogram (mg/kg), or parts per million (ppm).

U - Indicates analyte was not detected at or above the reporting limit

J - Indicates that the compound was analyzed for and determined to be present in the sample. However, the concentration indicated is an estimated value which is less than the specified minimum detection limit but greater than zero.

B - Indicates result between instrument detection limit (IDL) and contract required detection limit (CRDL)

E - Indicates that the concentration is estimated due to matrix interferences.

N - Spiked sample recovery not within control limits

a - Concentration exceeds the instrument calibration range or is below the reporting limit.

^ - Instrument quality control not within control limits.

* - Batch quality control not within control limits.

NS- Not Sampled

Table 4
Summary of Analytical Results From Area 2-4
KeySpan Energy - Glenwood Landing
Queens, NY

Analyte	Sample Collection Designation & Collection Date																					
	GLA4-1 12/05/01	GLA4-2 12/18/01	GLA4-2A 1/8/02	GLA4-2S 12/18/01	GLA4-2SA 1/8/02	GLA4-2SB 1/7/02	GLA4-3 12/05/01	GLA4-4 12/05/01	GLA4-4S 12/05/01	GLA4-4SA 12/18/01	GLA4-4SB 12/18/01	GLA4-4SC 1/7/02	GLA4-4SD 1/7/02	GLA4-4SE 1/7/02	GLA4-5 12/05/01	23 KV Bottom 9/3/02	23 KV East Wall 9/3/02	23 KV North Wall 9/3/02	23 KV South Wall 9/3/02	Glenwood Bottom C 9/19/02	Glenwood Bottom N 9/19/02	Glenwood Bottom S 9/19/02	Glenwood Sidewall E 9/19/02
SVOC 8270 (ug/kg)																						
2-Methylnaphthalene	330 U	150 U	28 U	150 U	28 U	32 Ua	330 U	8 J	2900 J	360 U	160 U	29 U	30 U	130 Ja	330 U	340 U	520 J	1800 U	340 U	410 U	350 U	340 U	340 U
2,4,5-Trichlorophenol	1600 U	93 U	10 U	93 U	10 U	20 Ja	1600 U	1700 U	65000 U	900 U	95 U	10 U	11 U	42 U	1600 U	840 U	4200 U	4300 U	830 U	990 U	840 U	830 U	820 U
Acenaphthene	330 U	96 U	15 U	96 U	15 U	17 Ua	330 U	350 U	9500 J	360 U	98 U	16 U	16 U	450 Ja	330 U	22 J	1600 J	110 J	13 J	410 U	350 U	340 U	340 U
Acenaphthylene	330 U	90 U	11 U	89 U	11 U	22 Ja	330 U	350 U	13000 U	360 U	92 U	11 U	12 U	85 Ja	330 U	340 U	1700 U	1800 U	340 U	410 U	350 U	340 U	340 U
Anthracene	330 U	110 U	15 Ja	110 U	12 U	48 Ja	330 U	350 U	14000	360 U	110 U	12 Ua	38 Ja	1100 Ja	330 U	52 J	2400	900 J	40 J	410 U	350 U	11 J	340 U
Benzo(a)anthracene	330 U	100 U	15 U	350 J	15 U	210 Ja	10 J	10 J	28000	160 J	660	42 Ja	84 Ja	2800	30 J	190 J	4800	3700	150 J	410 U	350 U	94 J	340 U
Benzo(a)pyrene	330 U	100 U	16 U	400	16 U	190 Ja	12 J	350 U	22000	130 J	590	41 Ja	93 Ja	2500	26 J	170 J	3900	2400	140 J	410 U	350 U	96 J	340 U
Benzo(b)fluoranthene	330 U	130 U	39 U	600	39 U	160 Ja	11 J	9 J	18000	140 J	690	39 Ua	76 Ja	1900	26 J	130 J	3700	3900	240 J	410 U	350 U	110 J	340 U
Benzo(g,h,i)perylene	330 U	140 U	17 U	160 J	17 U	200 Ja	330 U	350 U	9900 J	66 J	220 J	18 Ja	46 Ja	2400	330 U	100 J	1300 J	760 J	110 J	410 U	350 U	70 J	340 U
Benzo(k)fluoranthene	330 U	110 U	40 U	250 J	40 U	200 Ja	14 J	10 J	21000	63 J	270 J	47 Ja	85 Ja	2400	29 J	160 J	2600	1800 U	340 U	410 U	350 U	65 J	340 U
bis(2-Ethylhexyl)phthalate	330 U	150 U	36 U	150 U	37 U	250 JaB	330 U	120 JB	13000 U	360 U	150 U	37 UaB	47 JaB	360 JaB	57 J	17 J	1700 U	1800 U	99 J	410 U	29 J	100 J	340 U
Butyl benzyl phthalate	330 U	180 U	13 U	180 U	13 U	38 Ja	330 U	350 U	13000 U	360 U	190 U	13 U	14 U	55 U	330 U	340 U	1700 U	1800 U	340 U	410 U	350 U	340 U	340 U
Carbazole	330 U	na	22 U	na	22 U	37 Ja	330 U	350 U	4900 J	360 U	na	23 U	23 Ua	760 Ja	330 U	na	na	na	na	na	na	na	na
Chrysene	330 U	110 U	17 U	470	17 U	320 Ja	13 J	10 J	29000	140 J	610	54 Ja	120 Ja	3300	30 J	160 J	4200	2700	140 J	410 U	350 U	100 J	340 U
Dibenzo(a,h)anthracene	330 U	130 U	18 U	130 U	18 U	70 Ja	330 U	350 U	4300 J	360 U	130 U	19 U	21 Ja	720 Ja	330 U	50 J	830 J	480 J	48 J	410 U	350 U	23 J	340 U
Dibenzofuran	330 U	110 U	15 U	110 U	15 U	17 Ua	330 U	350 U	3900 J	360 U	120 U	16 U	16 U	370 Ja	330 U	340 U	860 J	1800 U	340 U	410 U	350 U	340 U	340 U
Di-n-butyl phthalate	330 U	120 U	14 U	120 U	14 U	16 Ua	330 U	350 U	13000 U	360 U	120 U	14 U	15 U	59 Ua	330 U	91 BJ	1700 U	1800 U	13 BJ	31 J	20 J	47 J	37 J
Fluoranthene	330 U	130 U	22 U	1200	22 Ua	410	330 U	15 J	56000	260 J	1000	71 Ja	120 Ja	5700	25 J	330 J	9800	6800	270 J	410 U	350 U	200 J	340 U
Fluorene	330 U	79 U	20 U	79 U	20 U	23 Ua	330 U	350 U	6200 J	360 U	80 U	21 U	21 U	580 Ja	330 U	17 J	1400 J	66 J	10 J	410 U	350 U	340 U	340 U
Indeno(1,2,3-cd)pyrene	330 U	140 U	18 U	150 J	18 U	190 Ja	330 U	350 U	10000 J	57 J	220 J	19 Ua	45 Ja	2100	10 J	96 J	1500 J	860 J	92 J	410 U	350 U	59 J	340 U
Naphthalene	330 U	80 U	32 U	80 U	33 U	36 Ua	330 U	350 U	5000 J	360 U	82 U	33 U	34 U	310 Ja	330 U	340 U	2200	1800 U	340 U	410 U	350 U	340 U	340 U
Phenanthrene	330 U	100 U	24 U	660	49 Ja	280 Ja	330 U	8 J	51000	95 J	310 J	34 Ja	45 Ja	6200	330 U	240 J	11000	1600 J	140 J	410 U	350 U	49 J	340 U
Pyrene	330 U	280 U	19 U	1300	36 Ja	640	330 U	16 J	42000	230 J	890	64 Ja	120 Ja	7900	32 J	280 J	7400	7000	260 J	410 U	350 U	160 J	340 U
CLP Metals (mg/kg)																						
Aluminum	1550	6090	1090	1530	1600	1910	1570	1620	1430	2200 H	1610	2350	2120	1940	2390	1850 E	2460 E	6140 E	2150 E	2040 E	2400 E	2200 E	1430 E
Antimony	0.90 U	1.1 U	0.30	8.7	0.29	4.7	0.78 U	0.83 U	0.71 U	0.77 UH	1.1 U	0.42	0.26	3.4	0.84 U	1.2 B	0.65 B	0.93 B	1.1 B	0.82 BN	0.59 NU	0.57 NU	0.56 NU
Arsenic	0.94 B	1.5	0.70	0.99	1.2	3.4	1.2 B	1.0 B	1.1 B	1.4 H	0.80 U	1.6	1.3	3.0	0.81 U	1.1	1.1	2.4	1.4	1.5	0.99 B	1.3	0.59 B
Barium	10.4 B	24.4	6.6	26.4	11.5	26.5	10.4 B	10.8 B	9.8 B	15.0 H	13.2	15.6	14.0	27.7	13.8 B	11.8 B	18.3 B	58.8	10.6 B	15.5 BE	14.4 BE	14.6 BE	9.5 BE
Beryllium	0.23 B	0.29	0.06	0.21 U	0.20	0.14	0.24 B	0.20 B	0.20 B	0.19 H	0.23 U	0.13	0.13	0.17	0.25 B	0.09 B	0.12 B	0.19 B	0.15 B	0.18 B	0.15 B	0.17 B	0.09 B
Cadmium	0.16 U	0.25 U	0.11	0.51	0.20	0.70	0.79 B	0.14 U	0.12 U	0.18 UH	0.28 U	0.14	0.17	1.6	0.15 U	0.04 B	0.08 B	0.03 B	0.47 B	0.17 B	0.03 U	0.11 B	0.03 U
Calcium	232. B	528	95.1	1340	156	1030	193. B	176. B	135. B	257 H	162	271	268	1290	351. B	194 B	221 B	7040	171 B	213 B	319 B	233 B	124 B
Chromium	3.6	9.6	3.1	8.4	38.9	12.4	3.8	3.3	4.6	6.1	3.5	5.3	4.6	33.6	4.7	3.7	5.3	10.6	3.7	6 E	4.4 E	4.5 E	4.5 E
Cobalt	1.4 B	3.2	1.1	2.2	2.4	2.8	1.5 B	1.4 B	1.8 B	1.7 H	1.4	1.9	1.7	4.1	2.1 B	1.6 B	2.7 B	4.8 B	2.4 B	2 B	5 B	1.9 B	1.4 B
Copper	15.4	5.7	1.9	59.3	6.3	44.7	6.1	3.5 B	11.8	10.3	4.3	5.1	6.7	63.0	4.3 B	5.1	6.9	31.4	3.7	7.8	5.8	7.5	2.6
Iron	4710	10100	3150	6530	9770	9790	9860	5100	4830	6210 H	4370	4630	4840	9260	6300	4960	5470	12400	6110	7020 E	6240 E	5540 E	3820 E
Lead	22.2	11.6 ^	1.0	335 ^	1.0	408	5.3	12.7	53.3	19.9 H	9.8 ^	8.1	37.0	450	5.9	17.2	16.6	61.7	5.2	31.7 *	12 *	29 *	7.4 *
Magnesium	377. B	1180	304	881	409	751	390. B	381. B	369. B	454 H	474	470	479	1060	573 B	376 B	591	3690	413 B	558 BE	610 E	506 BE	449 BE
Manganese	114.	145	91.1	752	202	111	191.	129.	106.	143 H	115	133	123	97.1	123	121 N	140 N	192 N	152 N	126 N	150 N	125 N	94.7 NU
Mercury	0.0036 B	0.015 B	0.0052 U	0.095 B	0.0057 U	0.18 B	0.18	0.0081	0.19	0.095 B	0.014 B	0.012 B	0.039 B	1.8 B	0.022	0.013 U	0.015 U	0.057	0.014 U	0.016 U	0.013 U	0.021 B	0.014 U
Nickel	3.8 B	7.3	1.8	19.2	14.8	28.6	4.0 B	3.0 B	6.3	4.0 H	4.0	5.2	3.5	90.8	5.0 B	2.9 B	4.1 B	13.5	8.3	9.2	5.3	3.8 B	5.3
Potassium	207. B	454 ^	141	189 ^	223	227	232. B	202. B	206. B	265 H^	187 ^	291	232	213	335. B	215 B	274 B	780	248 B	334 B	322 B	269 B	216 B
Selenium	0.96 U	1.4 U^	0.19	1.5 U^	0.23	0.71	0.83 U	0.88 U	0.76 U	1.1 UH	1.6 U^	0.27	0.29	0.61	0.90 U	0.54 U	0.53 U	0.56 U	0.54 U	0.67	0.44 U	0.42 U	0.42 U
Silver	0.20 U	0.23 U^	0.00091 U	0.43 ^	0.00084 U	0.35	0.17 U	0.18 U	0.15 U	0.17 UH	0.25 U^	0.0010 U	0.020	0.56	0.18 U	0.1 U	0.1 U	0.1 U	0.1 U	0.06 U	0.05 U	0.05 U	0.05 U
Sodium	17.0 B	33.1	36.1	54.4	49.5	84.3	13.0 B	18.4 B	17.1 B	18.3 H	21.6	65.9	51.7	73.4	26.4 B	26.9 B	25.3 U	136 B	53 B	32 U	28.1 U	41.6 B	26.9 U
Thallium	3.6 U	2.0 U^	0.33	2.0 U^	0.0068 U	0.40	3.2 U	3.4 U	2.9 U	1.5 UH	2.2 U^	0.0081 U	0.0065 U	0.048	3.4 U	0.4 U	0.39 U	0.41 U	0.41 B	0.48 U	0.42 U	0.72 B	0.41 U
Vanadium	8.0 B	13.7	3.0	56.8	6.1	98.0	11.4	4.9 B	23.1	7.8 H	6.2	9.2	8.5	307	7.0 B	12.2	9.1	20.6	48.4	114	9.6	7.2	56.1
Zinc	48.3	17.0	11.7	274	12.2	341	221.	14.4	44.4	32.1 H	48.7	33.1	42.9	328	19.8	69.2	75.5	58	717	186 *	32.3 *	125 *	14.1 *
PCB 8082 (ug/kg)																						
Aroclor-1248	17 U	18 U	18 U	18 U	18 U	18 U	18 U	18 U	17 U	18 U	18 U	18 U	18 U	72	18 U	85 U	85 U	85 U	85 U	98 U	84 U	83 U	82 U
Aroclor-1254	17 U	18 U	18 U	33	18 U	42	18 U	18 U	17 U	18 U	18 U	18 U	18 U	150	18 U	85 U	85 U	85 U	85 U	98 U	84 U	83 U	82 U
Aroclor-1260	17 U	18 U	18 U	21	18 U	31	18 U	18 U	52	68	18 U	18 U	18 U	100	18 U	85 U	85 U	85 U	85 U	98 U	84 U	83 U	82 U

SVOC and PCB analytical results reported in micrograms per kilogram (ug/kg), or parts per billion (ppb).
Metals analytical results reported in milligrams per kilogram (mg/kg), or parts per million (ppm).
U - Indicates analyte was not detected at or above the reporting limit
J - Indicates that the compound was analyzed for and determined to be present in the sample. However, the concentration indicated is an estimated value which is less than the specified minimum detection limit but greater than zero.
B - Indicates result between instrument detection limit (IDL) and contract required detection limit (CRDL)
E - Indicates that the concentration is estimated due to matrix interferences.
N - Spiked sample recovery not within control limits
a - Concentration exceeds the instrument calibration range or is below the reporting limit.
^ - Instrument quality control not within control limits.
* - Batch quality control not within control limits
NS- Not Sampled
na- not analyzed

Table 5
Summary of Analytical Results From Area 1A-5
KeySpan Energy - Glenwood Landing
Queens, NY

Analyte	Sample Collection Designation & Collection Date																			
	GLA5A-1 11/28/01	GLA5A-2 11/28/01	GLA5A-3 11/28/01	GLA5A-4 11/28/01	GLA5A-4A 12/17/01	GLA5A-4B 12/17/01	GLA5A-4C 12/17/01	GLA5A-4D 12/17/01	GLA5A-5 11/28/01	GLA5B-1 11/28/01	GLA5B-1D 11/28/01	GLA5B-2 11/28/01	GLA5B-3 11/28/01	GLA5B-4 11/28/01	GLA5B-5 11/28/01	GLA5C-1 11/28/01	GLA5C-1D 11/28/01	GLA5C-2 11/28/01	GLA5C-3 11/28/01	GLA5C-4 11/28/01
SVOC 8270 (ug/kg)																				
2-Methylnaphthalene	4 J	5 J	4 J	10 J	350 U	350 U	350 U	350 U	4	2 J	350 U	340 U	4 J	3 J	4 J	330 U	330 U	330 U	340 U	330 U
Acenaphthene	340 U	340 U	330 U	340 U	350 U	350 U	350 U	350 U	330	340 U	350 U	340 U	340 U	330 U	340 U	330 U	330 U	330 U	340 U	330 U
Acenaphthylene	340 U	340 U	330 U	340 U	350 U	350 U	350 U	350 U	330	340 U	350 U	340 U	340 U	330 U	340 U	330 U	330 U	330 U	340 U	330 U
Anthracene	6 J	7 J	15 J	32 J	350 U	350 U	350 U	350 U	9	5 J	350 U	340 U	4 J	7 J	5 J	7 J	7 J	15 J	9 J	12 J
Benzo(a)anthracene	24 J	24 J	65 J	270 J	48 J	350 U	350 U	350 U	40	16 J	14 J	340 U	20 J	16 J	21 J	32 J	30 J	79 J	32 J	52 J
Benzo(a)pyrene	23 J	25 J	58 J	210 J	53 J	350 U	350 U	350 U	59	18 J	14 J	5 J	18 J	15 J	21 J	29 J	28 J	70 J	32 J	54 J
Benzo(b)fluoranthene	30 J	29 J	59 J	220 J	80 J	350 U	37 J	350 U	57	18 J	15 J	5 J	19 J	24 J	26 J	36 J	32 J	74 J	33 J	55 J
Benzo(g,h,i)perylene	11 J	14 J	29 J	110 J	350 U	350 U	350 U	350 U	29	9 J	9 J	3 J	8 J	8 J	10 J	18 J	17 J	32 J	21 J	38 J
Benzo(k)fluoranthene	25 J	30 J	74 J	260 J	350 U	350 U	350 U	350 U	60	18 J	17 J	8 J	23 J	20 J	23 J	36 J	40 J	78 J	48 J	59 J
bis(2-Ethylhexyl)phthalate	120 J	18 J	51 J	13 J	130 J	250 JB	49 JB	110 JB	330	92 J	210 J	13 J	14 J	36 J	26 J	330 U	100 JB	330 U	340 U	2100 B
Butylbenzylphthalate	340 U	340 U	330 U	340 U	350 U	350 U	350 U	350 U	330	340 U	350 U	340 U	340 U	330 U	340 U	330 U	18 J	330 U	340 U	330 U
Carbazole					na	na	na	na	330 U			340 U	340 U	330 U	340 U	330 U	330 U	330 U	340 U	330 U
Chrysene	31 J	29 J	83 J	280 J	57 J	350 U	350 U	350 U	48	19 J	17 J	340 U	23 J	25 J	25 J	43 J	37 J	92 J	42 J	60 J
Dibenzo(a,h)anthracene	5 J	6 J	9 J	40 J	350 U	350 U	350 U	350 U	12	3 J	3 J	340 U	4 J	3 J	4 J	330 U	330 U	330 U	340 U	330 U
Dibenzofuran	340 U	340 U	330 U	340 U	350 U	350 U	350 U	350 U	330	340 U	350 U	340 U	340 U	330 U	340 U	330 U	330 U	330 U	340 U	330 U
Diethylphthalate	340 U	25 JB	31 JB	340 U	350 U	350 U	350 U	350 U	330	340 U	30 JB	340 U	340 U	330 U	37 JB	330 U	23 JB	330 U	340 U	330 U
Fluoranthene	39 J	41 J	130 J	460	73 J	36 J	41 J	350 U	64	32 J	23 J	9 J	37 J	48 J	32 J	47 J	50 J	140 J	55 J	81 J
Fluorene	340 U	340 U	330 U	340 U	350 U	350 U	350 U	350 U	330	340 U	350 U	340 U	340 U	330 U	340 U	330 U	330 U	330 U	340 U	330 U
Indeno(1,2,3-cd)pyrene	10 J	12 J	25 J	96 J	350 U	350 U	350 U	350 U	26	7 J	6 J	2 J	7 J	7 J	10 J	15 J	17 J	32 J	19 J	34 J
Phenanthrene	11 J	18 J	34 J	88 J	350 U	350 U	350 U	350 U	25	18 J	350 U	4 J	12 J	22 J	16 J	23 J	20 J	33 J	27 J	38 J
Pyrene	35 J	35 J	110 J	400	76 J	350 U	350 U	350 U	47	26 J	21 J	8 J	30 J	36 J	29 J	45 J	50 J	120 J	55 J	83 J
CLP Metals (mg/kg)																				
Aluminum	1850	2670	2350	2300	2940 H	2100 H	2270 H	2360 H	2230	2390	2700	2660	2510	2570	2280	2220	2460	2410	3160	2920
Antimony	0.67 U	0.79 U	0.75 U	0.66 U	1.1 UH	1.2 UH	1.2 UH	1.2 UH	0.77 U	0.83 U	0.88 U	0.83 U	0.83 U	0.76 U	0.76 U	0.72 UN	0.68 UN	0.79 UN	0.79 UN	0.73 UN
Arsenic	1.1 B	1.6 B	1.4 B	1.5	2.0 H	1.5 H	1.8 H	1.0 H	1.1 B	0.85 U	1.3 B	1.2 B	1.7 B	1.3 B	0.91 B	0.69 U	0.65 U	0.76 U	0.97 B	3.2
Barium	14.4 B	16.8 B	17.9 B	18.4 B	21.4 H	17.7 H	19.4 H	19.9 H	14.9 B	25.3 B	31.1 B	35.8 B	33.6 B	21.7 B	17.5 B	17.0 B	19.9 B	29.5 B	22.8 B	20.5 B
Beryllium	0.11 B	0.12 B	0.14 B	0.12 B	0.22 UH	0.23 UH	0.23 UH	0.24 H	0.11 B	0.13 B	0.18 B	0.23 B	0.18 B	0.15 B	0.12 B	0.18 B	0.20 B	0.21 B	0.25 B	0.26 B
Cadmium	0.12 U	0.14 U	0.16 B	0.12 U	0.27 UH	0.28 UH	0.28 UH	0.28 UH	0.17 B	0.15 B	0.17 B	0.15 U	0.25 B	0.17 B	0.14 U	0.12 U	0.12 U	0.14 U	0.14 U	0.13 U
Calcium	295. B	342. B	711. B	378. B	1180 H	459 H	609 H	646 H	356. B	1040	1110	2510	942.	769. B	451. B	436. B	596. B	563. B	698. B	570. B
Chromium	4.5	6.6	5.9	5.3	7.0	5.3	6.3	7.1	5.2	6.2	7.6	6.9	6.8	6.6	5.7	5.5	6.3	6.4	7.4	6.2
Cobalt	1.6 B	2.2 B	2.3 B	1.9 B	2.2 H	1.9 H	2.2 H	1.8 H	1.8 B	2.4 B	3.5 B	2.2 B	3.5 B	2.5 B	2.1 B	2.0 B	2.1 B	2.3 B	2.5 B	2.0 B
Copper	3.6 B	5.3	6.0	5.2	6.2	5.1	5.5	5.2	4.8	5.8	10.9	6.5	9.6	6.8	5.5	5.5	6.2	6.5	6.9	6.5
Iron	5370	7180	6430	6020	7380 H	5920 H	6360 H	6270 H	5320	6020	8710	7720	11700	7130	5980	5340	6270	6980	7660	7350
Lead	7.6	13.8	16.2	14.3	17.9 H	15.6 H	16.5 H	17.1 H	12.5	23.1	25.3	40.4	21.6	18.2	15.6	14.6	17.6	21.0	15.7	16.7
Magnesium	457. B	814. B	680. B	629. B	920 H	680 H	760 H	828 H	668. B	1050	1030	1420	981.	869.	686. B	652. B	757.	750. B	958.	693. B
Manganese	99.8 *	124. *	102. *	80.9 *	115 H	92.9 H	102 H	86.1 H	77.4 *	94.8 *	122. *	112. *	196. *	105. *	83.6 *	85.4	92.3	184.	112.	90.2
Mercury	0.0066 B	0.012	0.0099	0.0086 B	0.046 B	0.011 B	0.011 B	0.011 B^	0.0082 B	0.42	0.0090	0.0035 U	0.0048 B	0.0057 B	0.0076 B	0.0093	0.0086	0.0087	0.0088	0.010
Nickel	4.3 B	5.9 B	5.6 B	5.8	6.3 H	5.5 H	5.5 H	5.9 H	4.9 B	6.4 B	7.8	6.7 B	9.5	6.6 B	5.8 B	5.9 B	6.1	6.0 B	7.2	6.7
Potassium	294. B	442. B	407. B	440. B	551 H^	436 H^	482 H^	472 H^	402. B	534. B	579. B	588. B	554. B	530. B	439. B	407. B	441. B	428. B	556. B	418. B
Selenium	0.73 U	0.86 U	0.81 U	0.71 U	1.6 UH	1.6 UH	1.6 UH	1.6 UH	0.83 U	0.91 U	0.95 U	0.91 U	0.91 U	0.83 U	0.83 U	0.77 U	0.73 U	0.84 U	0.86	0.78 U
Silver	0.15 U	0.18 U	0.17 U	0.14 U	0.25 UH^	0.26 UH^	0.26 UH^	0.25 UH^	0.17 U	0.18 U	0.19 U	0.18 U	0.18 U	0.17 U	0.17 U	0.16 U	0.15 U	0.17 U	0.17 U	0.16 U
Sodium	23.4 B	29.8 B	33.9 B	33.7 B	40.0 H	31.8 H	33.9 H	30.2 H	33.4 B	44.9 B	60.1 B	79.3 B	52.4 B	45.8 B	36.0 B	25.9 B	28.3 B	29.6 B	41.3 B	32.6 B
Thallium	1.5 U	1.8 U	1.7 U	1.4 U	2.1 UH	2.2 UH	2.2 UH	2.2 UH	1.7 U	1.8 U	1.9 U	1.8 U	1.8 U	1.7 U	1.7 U	2.9 U	2.8 U	3.2 U	3.2 U	3.0 U
Vanadium	5.9 B	8.6 B	8.0 B	7.2 B	9.5 H	7.6 H	8.2 H	7.4 H	7.1 B	7.3 B	9.2 B	8.2 B	10.	8.3 B	7.5 B	7.3 B	8.6	9.0	9.9	8.2
Zinc	11.1	18.8	17.5	15.7	21.7 H	16.2 H	16.4 H	18.2 H	14.5	27.4	34.0	16.5	21.0	17.0	16.6	16.9	18.6	18.2	20.8	20.3
PCB 8082 (ug/kg)																				
Aroclor-1254	34 U	34 U	33 U	34 U	17 U	17 U	17 U	17 U	33 U	34 U	35 U	33 U	35 U	33 U	34 U	33 U	33 U	34 U	33 U	34 U
Aroclor-1260	34 U	34 U	33 U	34 U	17 U	17 U	17 U	17 U	33 U	34 U	35 U	33 U	35 U	33 U	34 U	33 U	33 U	34 U	33 U	34 U

SVOC and PCB analytical results reported in micrograms per kilogram (ug/kg), or parts per billion (ppb).
Metals analytical results reported in milligrams per kilogram (mg/kg), or parts per million (ppm).
U - Indicates analyte was not detected at or above the reporting limit
J - Indicates that the compound was analyzed for and determined to be present in the sample. However, the concentration indicated is an estimated value which is less than the specified minimum detection limit but greater than zero
B - Indicates result between instrument detection limit (IDL) and contract required detection limit (CRDL)
E - Indicates that the concentration is estimated due to matrix interferences.
N - Spiked sample recovery not within control limits
s - Concentration exceeds the instrument calibration range or is below the reporting limit.
^ - Instrument quality control not within control limits.
* - Batch quality control not within control limits.
NS- Not Sampled
na- not analyzed

Table 5 cont'd
Summary of Analytical Results From Area 1A-5
KeySpan Energy - Glenwood Landing
Queens, NY

Analyte	Sample Collection Designation and Collection Date																		
	GLA5C-5 11/28/01	GLA5D-1 11/28/01	GLA5D-2 11/28/01	GLA5D-2A 12/14/01	GLA5D-2B 12/14/01	GLA5D-2C 12/14/01	GLA5D-2D 12/14/01	GLA5D-3 11/28/01	GLA5D-4 11/28/01	GLA5D-5 11/28/01	GLA5D-5A 12/14/01	GLA5D-5B 12/14/01	GLA5D-5C 12/14/01	GLA5D-5D 12/14/01	GLA5E-1 12/04/01	GLA5E-2 11/28/01	GLA5E-3 11/28/01	GLA5E-4 11/28/01	GLA5E-5 11/28/01
SVOC 8270 (ug/kg)																			
2-Methylnaphthalene	330 U	4 J	3300 U	350 U	360 Ua	350 U	350 U	5 J	3 J	12 J	360 U	350 U	350 U	360 Ua	340 U	340 U	3 J	2 J	3 J
Acenaphthene	330 U	340 U	3300 U	350 U	27 Ja	350 U	350 U	9 J	340 U	160 J	360 U	350 U	350 U	360 U	340 U	340 U	340 U	330 U	340 U
Acenaphthylene	330 U	340 U	3300 U	350 U	22 Ja	350 U	350 U	340 U	340 U	J	360 U	350 U	350 U	360 U	340 U	340 U	340 U	12 J	340 U
Anthracene	8 J	6 J	3300 U	350 U	120 Ja	350 U	350 U	20 J	10 J	450 J	360 U	350 U	350 U	360 U	340 U	7 J	8 J	5 J	5 J
Benzo(a)anthracene	34 J	24 J	110 J	350 Ua	300 Ja	27 Ja	40 Ja	58 J	47 J	1300 J	45 Ja	48 Ja	45 Ja	68 Ja	17 J	37 J	42 J	25 J	19 J
Benzo(a)pyrene	34 J	27 J	150 J	350 U	190 Ja	30 Ja	40 Ja	52 J	46 J	970 J	44 Ja	48 Ja	48 Ja	68 Ja	16 J	34 J	38 J	27 J	22 J
Benzo(b)fluoranthene	37 J	36 J	90 J	350 Ua	170 Ja	350 Ua	44 Ja	64 J	50 J	1000 J	43 Ja	50 Ja	55 Ja	78 Ja	19 J	44 J	52 J	28 J	28 J
Benzo(g,h,i)perylene	20 J	15 J	250 J	350 U	170 Ja	28 Ja	33 Ja	29 J	32 J	330 J	23 Ja	28 Ja	29 Ja	54 Ja	340 U	16 J	19 J	13 J	12 J
Benzo(k)fluoranthene	38 J	35 J	77 J	350 Ua	200 Ja	350 Ua	41 Ja	63 J	59 J	1000 J	54 Ja	58 Ja	54 Ja	100 Ja	19 J	52 J	48 J	26 J	32 J
bis(2-Ethylhexyl)phthalate	330 U	340 U	3300 U	350 U	360 U	350 U	350 U	88 J	150 J	1900 U	360 U	350 U	350 U	360 U	340 U	130 J	22 J	87 J	140 J
Butylbenzylphthalate	330 U	340 U	3300 U	350 U	360 U	350 U	350 U	340 U	340 U	1900 U	360 U	350 U	350 U	360 U	340 U	340 U	340 U	330 U	340 U
Carbazole	330 U	340 U	3300 U	350 U	360 U	350 U	350 U	340 U	340 U	1900 U	360 U	350 U	350 U	120 J	340 U				
Chrysene	42 J	31 J	210 J	22 Ja	490	39 Ja	59 Ja	68 J	62 J	1400 J	55 Ja	67 Ja	63 Ja	130 Ja	21 J	62 J	50 J	29 J	32 J
Dibenzo(a,h)anthracene	330 U	340 U	3300 U	350 U	51 Ja	350 U	350 U	10 J	340 U	120 J	360 U	350 U	350 U	360 U	340 U	7 J	7 J	3 J	4 J
Dibenzofuran	330 U	340 U	3300 U	350 U	16 Ja	350 U	350 U	340 U	340 U	58 J	360 U	350 U	350 U	20 Ja	340 U	340 U	340 U	330 U	340 U
Diethylphthalate	330 U	340 U	3300 U	350 U	360 U	350 U	350 U	340 U	340 U	1900 U	360 U	350 U	350 U	360 U	340 U	67 JB	22 JB	330 U	21 JB
Fluoranthene	56 J	34 J	75 J	350 Ua	480	40 Ja	54 Ja	110 J	89 J	3000	72 Ja	75 Ja	68 Ja	350 Ja	23 J	70 J	80 J	41 J	42 J
Fluorene	330 U	340 U	3300 U	350 U	360 U	350 U	350 U	340 U	340 U	140 J	360 U	350 U	350 U	360 U	340 U	340 U	340 U	330 U	340 U
Indeno(1,2,3-cd)pyrene	19 J	13 J	78 J	350 U	150 Ja	21 Ja	27 Ja	23 J	26 J	340 J	20 Ja	23 Ja	22 Ja	39 Ja	340 U	14 J	16 J	9 J	10 J
Phenanthrene	24 J	13 J	3300 U	350 U	120 Ja	350 Ua	350 Ua	69 J	36 J	1900	360 Ua	350 Ua	350 Ua	340 Ja	340 U	12 J	28 J	19 J	14 J
Pyrene	54 J	29 J	190 J	26 Ja	770	59 Ja	86 Ja	98 J	85 J	2200	76 Ja	86 Ja	82 Ja	320 Ja	340 U	52 J	72 J	60 J	35 J
CLP Metals (mg/kg)																			
Aluminum	2510	3030	3320	2280 H^	5440 H^	3230 H^	3190 H^	3130	3390	2230	2850 H^	3030 H^	3340 H^	2930 H^	2540	2650	2920	2760	2860
Antimony	0.80 UN	0.68 U	0.83 U	1.2 UH^	1.1 UH^	1.0 UH^	0.99 UH^	0.83 U	0.79 U	0.78 U	0.90 UH^	0.92 UH^	1.1 UH^	0.86 UH^	0.80 U	0.89 U	0.89 U	0.68 U	0.85 U
Arsenic	0.77 U	1.6	2.5	1.2 H^	2.4 H^	2.0 H^	1.5 H^	3.3	3.0	1.6 B	2.2 H^	2.1 H^	1.6 H^	2.1 H^	0.89 B	1.2 B	1.7 B	1.3 B	1.7 B
Barium	20.5 B	23.5 B	25.5 B	20.8 H^	39.1 H^	24.7 H^	24.5 H^	22.0 B	22.9 B	16.2 B	25.1 H^	22.0 H^	27.8 H^	22.4 H^	20.2 B	32.3 B	20.0 B	27.2 B	21.8 B
Beryllium	0.21 B	0.14 B	0.18 B	0.23 U^	0.33 ^	0.20 U^	0.21 ^	0.18 B	0.17 B	0.11 B	0.18 ^	0.20 ^	0.23 ^	0.21 ^	0.26 B	0.15 B	0.16 B	0.14 B	0.15 B
Cadmium	0.14 U	0.19 B	0.24 B	0.28 UH	0.27 UH	0.24 UH	0.27 H	0.25 B	0.16 B	0.22 B	0.22 UH	0.22 UH	0.26 UH	0.21 UH	0.14 U	0.16 B	0.30 B	0.18 B	0.20 B
Calcium	805. B	1060	666. B	638 H^	2760 H^	889 H^	767 H^	610. B	916.	440. B	605 H^	490 H^	775 H^	694 H^	656. B	804. B	691. B	645. B	708. B
Chromium	6.1	6.4	8.3	5.7 H^	12.6 H^	8.2 H^	7.4 H^	8.5	7.9	5.2	10.4 H^	10.4 H^	7.3 H^	6.7 H^	5.7	6.2	6.4	6.6	8.7
Cobalt	2.1 B	2.4 B	2.8 B	2.1 H^	4.3 H^	2.8 H^	2.4 H^	2.9 B	6.5 B	1.8 B	2.5 H^	2.3 H^	3.0 H^	2.3 H^	2.2 B	2.8 B	2.8 B	2.8 B	2.9 B
Copper	6.8	6.2	8.3	5.9 H^	12.5 H^	7.0 H^	7.8 H^	8.1	8.0	6.4	7.2 H^	8.0 H^	8.2 H^	7.3 H^	6.0	6.2	6.7	6.5	7.2
Iron	6410	6510	9260	6870 H^	12400 H^	8090 H^	7740 H^	9220	6510	5270	7890 H^	7370 H^	9880 H^	7240 H^	7540	7040	6680	7550	7880
Lead	16.3	19.7	37.1	28.0 H^	24.8 H^	23.3 H^	23.7 H^	25.9	37.4	23.2	76.7 H^	38.7 H^	25.7 H^	24.2 H^	18.2	23.6	19.1	31.5	23.8
Magnesium	821 B	856.	881. B	801 H	2290 H	1190 H	995 H	811.	936.	614. B	923 H	718 H	929 H	892 H	752. B	877. B	837. B	850.	818. B
Manganese	103.	112. *	147. *	105 H^	215 H^	122 H^	119 H^	144. *	130 *	92.5 *	113 H^	130 H^	153 H^	122 H^	129.	240. *	134. *	154. *	134. *
Mercury	0.0084 B	0.011	0.049	0.016 B	0.40 B	0.025 B	0.038 B	0.042	0.043	0.036	0.016 B	0.043 B	0.035 B	0.035 B	0.010	0.0050 U	0.013	0.0070 B	0.015
Nickel	6.4 B	10.5	7.3 B	5.9	12.5	8.2	6.7	8.6	6.6 B	5.2 B	7.9	6.5	7.0	6.4	6.2 B	7.0 B	6.4 B	8.2	9.8
Potassium	439. B	545. B	558. B	520 H^	1380 H^	814 H^	744 H^	536. B	486. B	389. B	585 H^	450 H^	506 H^	574 H^	459. B	539. B	432. B	590. B	539. B
Selenium	0.86 U	0.74 U	0.90 U	1.6 UH^	1.6 UH^	1.4 UH^	1.3 UH^	0.68 U	0.86 U	0.84 U	1.2 UH^	1.3 UH^	1.5 UH^	1.2 UH^	0.85 U	0.97 U	0.97 U	0.74 U	0.93 U
Silver	0.17 U	0.15 U	0.18 U	0.25 UH^	0.25 UH^	0.22 UH^	0.22 UH^	0.14 U	0.18 U	0.17 U	0.20 UH^	0.20 UH^	0.24 UH^	0.19 UH^	0.17 U	0.20 U	0.20 U	0.15 U	0.19 U
Sodium	41.9 B	47.7 B	43.4 B	37.2 H^	130 H^	47.0 H^	75.6 H^	38.2 B	47.2 B	46.5 B	60.0 H^	41.8 H^	55.2 H^	44.1 H^	36.8 B	39.5 B	31.5 B	41.3 B	38.1 B
Thallium	3.2 U	1.5 U	1.8 U	2.2 UH^	2.2 UH^	1.9 UH^	1.9 UH^	1.4 U	1.8 U	1.7 U	1.7 UH^	1.7 UH^	2.0 UH^	1.6 UH^	3.2 U	2.0 U	2.0 U	1.5 U	1.9 U
Vanadium	8.5 B	9.0	11.0	8.0 H	17.3 H	10.8 H	10 H	12.2	9.6	7.4 B	10.1 H	10.3 H	10.3 H	9.6 H	8.3 B	8.8 B	9.0 B	8.8	9.8
Zinc	19.0	18.2	28.9	16.7 H^	34.4 H^	23.0 H^	26.0 H^	27.0	29.4	21.5	27.6 H^	26.4 H^	31.2 H^	26.9 H^	17.3	18.6	26.6	18.5	19.6
PCB 8082 (ug/kg)																			
Aroclor-1254	33 U	34 U	34 U	18 U	18 U	180	18 U	34 U	34 U	39 U	18 U	18 U	17 U	18 U	17 U	34 U	34 U	34 U	34 U
Aroclor-1260	33 U	34 U	9.9 J	18 U	36	18 U	18 U	6.8 J	5.9 J	7.0 J	18 U	18 U	17 U	18 U	17 U	34 U	34 U	15 J	34 U

SVOC and PCB analytical results reported in micrograms per kilogram (ug/kg), or parts per billion (ppb).
Metals analytical results reported in milligrams per kilogram (mg/kg), or parts per million (ppm).
U - Indicates analyte was not detected at or above the reporting limit
J - Indicates that the compound was analyzed for and determined to be present in the sample. However, the concentration indicated is an estimated value which is less than the specified minimum detection limit but greater than zero.
B - Indicates result between instrument detection limit (IDL) and contract required detection limit (CRDL)
E - Indicates that the concentration is estimated due to matrix interferences.
N - Spiked sample recovery not within control limits
a - Concentration exceeds the instrument calibration range or is below the reporting limit.
^ - Instrument quality control not within control limits.
* - Batch quality control not within control limits.
NS- Not Sampled
na- not analyzed

Table 6
Summary of Analytical Results From Area 2-6
KeySpan Energy - Glenwood Landing
Queens, NY

Analyte	Sample Collection Designation & Collection Date									
	GLA6-1 11/15/01	GLA6-1B 11/20/01	GLA6-2 11/15/01	GLA6-2S 11/20/01	GLA6-3 11/20/01	GLA6-3S 11/20/01	GLA6-4 11/20/01	GLA6-4S 11/20/01	GLA6-5 11/20/01	GLA6-5S 11/20/01
SVOC 8270 (ug/kg)										
2-Methylnaphthalene	330 U	350 U	340 U	3 J	340 U	380 U	380 U	340 U	330 U	350 U
Benzo(a)anthracene	330 U	350 U	5 J	340 U	340 U	380 U	380 U	340 U	330 U	350 U
Benzo(a)pyrene	5 J	350 U	340 U	340 U	340 U	380 U	380 U	340 U	330 U	350 U
Benzo(b)fluoranthene	8 J	350 U	5 J	340 U	340 U	380 U	380 U	340 U	330 U	350 U
Benzo(k)fluoranthene	8 J	350 U	6 J	340 U	340 U	380 U	380 U	340 U	330 U	350 U
Chrysene	12 J	350 U	7 J	340 U	340 U	380 U	380 U	340 U	330 U	350 U
Fluoranthene	22 J	350 U	10 J	13 J	340 U	380 U	380 U	11 J	330 U	8 J
Indeno(1,2,3-cd)pyrene	330 U	350 U	340 U	340 U	340 U	380 U	380 U	5 J	330 U	350 U
Phenanthrene	10 J	350 U	340 U	340 U	340 U	380 U	380 U	340 U	330 U	350 U
Pyrene	16 J	350 U	8 J	15 J	340 U	380 U	380 U	17 J	330 U	12 J
CLP Metals (mg/kg)										
Aluminum	2640	1850	3490	2090	1870	3400	1370	2570	1610	2330
Antimony	0.80 UN	0.92 UN	0.98 BN	1.8 BN	0.88 UN	0.98 UN	0.92 UN	0.76 UN	0.79 UN	0.98 BN
Arsenic	1.5 B	1.6 B	2.2	1.5 B	1.2 B	1.7 B	1.0 B	1.7	1.3 B	1.8 B
Barium	14.6 B	10.4 B	16.5 B	10.7 B	13.4 B	26.5 B	11.9 B	16.5 B	11.2 B	18.2 B
Beryllium	0.22 B	0.20 B	0.25 B	0.15 B	0.16 B	0.25 B	0.10 U	0.20 B	0.13 B	0.15 B
Cadmium	0.14 U	0.16 U	0.14 U	0.17 B	0.15 U	0.17 U	0.16 U	0.13 U	0.14 U	0.16 U
Calcium	498. B	217. B	423. B	250. B	217. B	414. B	310. B	427. B	225. B	290. B
Chromium	5.2	7.5	6.4	5.9	4.3	7.2	5.2	5.1	5.5	5.2
Cobalt	1.9 B	2.0 B	2.2 B	1.9 B	1.6 B	2.4 B	2.8 B	2.2 B	2.0 B	2.4 B
Copper	4.5	9.5	6.1	5.6	3.2 B	6.3	3.4 B	9.7	4.4	5.3
Iron	7490	9200	7660	6290	5070	8540	7070	6530	6280	7320
Lead	11.4	1.9	11.6	17.3	1.5	10.6	2.0	50.4	1.9	22.9
Magnesium	714. B	454. B	779. B	557. B	554. B	777. B	371. B	729. B	450. B	496. B
Manganese	133.	112.	130.	92.2	138.	150.	150.	126.	111.	141.
Mercury	0.0068 B	0.0037 U	0.019	0.011	0.0037 U	0.012	0.0031 U	0.036	0.0031 U	0.016
Nickel	5.4 B	6.4 B	6.2 B	5.1 B	3.5 B	6.4 B	6.1 B	5.3 B	5.7 B	5.4 B
Potassium	318. B	260. B	352. B	316. B	349. B	333. B	315. B	308. B	279. B	310. B
Selenium	0.85 U	0.98 U	0.85 U	0.88 U	0.94 U	1 U	0.98 U	0.8 U	0.85 U	0.98 U
Silver	0.17 U	0.2 Y	0.7 U	0.18 U	0.19 U	0.21 U	0.2 U	0.16 U	0.17 U	0.2 U
Sodium	15.4 B	16.0 B	18.1 B	19.9 B	21.0 B	31.7 B	35.4 B	22.6 B	20.2 B	22.1 B
Thallium	3.2 U	3.7 U	3.2 U	3.3 U	3.6 U	4 U	3.7 U	3 U	3.2 U	3.7 U
Vanadium	8.4 B	6.3 B	11.3	11.7	5.7 B	9.7 B	6.4 B	10.1	6.2 B	9.7 B
Zinc	27.1	8.6	89.4	404.	7.9	17.2	12.8	22.7	6.6	18.2
PCB 8082 (ug/kg)										
Aroclor-1260	1.9 J	35 U	1.8 J	2.2 J	34 U	2.4 J	38 U	1.6 J	33 U	3 J

SVOC and PCB analytical results reported in micrograms per kilogram (µg/kg), or parts per billion (ppb).

Metals analytical results reported in milligrams per kilogram (mg/kg), or parts per million (ppm).

U - Indicates analyte was not detected at or above the reporting limit

J - Indicates that the compound was analyzed for and determined to be present in the sample. However, the concentration indicated is an estimated value which is less than the specified minimum detection limit but greater than zero.

B - Indicates result between instrument detection limit (IDL) and contract required detection limit (CRDL)

E - Indicates that the concentration is estimated due to matrix interferences.

N - Spiked sample recovery not within control limits

a - Concentration exceeds the instrument calibration range or is below the reporting limit.

^ - Instrument quality control not within control limits.

* - Batch quality control not within control limits.

NS- Not Sampled

na- not analyzed

Table 7
Summary of Analytical Results From Area 2-7
KeySpan Energy - Glenwood Landing
Queens, NY

Analyte	Sample Collection Designation & Collection Date																					
	GLA7-1A 11/09/01	GLA7-1B 11/09/01	GLA7-1C 11/20/01	GLA7-1D 11/27/01	GLA7-1E 11/21/01	GLA7-1F 11/21/01	GLA7-2 11/09/01	GLA7-3 11/09/01	GLA7-3B 11/27/01	GLA7-3C 11/21/01	GLA7-3D 11/27/01	GLA7-3E 11/21/01	GLA7-4 11/09/01	GLA7-4A 12/12/01	GLA7-5 11/09/01	GLA7-5A 12/12/01	GLA7-5SA 12/12/01	GLA7-6 11/09/01	GLA7-6A 12/12/01	GLA7-7S 11/09/01	GLA7-7SA 12/12/01	GLA7-8S 11/09/01
SVOC 8270 (ug/kg)																						
2,4-Dimethylphenol	1700 U	8500 U	350 U	320 U	340 U	330 U	210 J	350 U	350 U	340 U	46 J	330 U	350 U	35 U	340 U	33 U	34 U	350 U	31 U	350 U	35 U	340 U
2-Methylnaphthalene	460 J	300 J	350 U	30 J	36 J	330 U	98 J	320 J	4 J	340 U	77 J	330 U	65 J	30 U	49 J	28 U	30 Ua	4 J	29 U	20 J	30 Ua	13 J
4-Methylphenol	1700 U	8500 U	350 U	320 U	340 U	330 U	39 J	8 J	350 U	340 U	340 U	330 U	350 U	20 U	340 U	18 U	19 U	350 U	18 U	350 U	20 U	340 U
Acenaphthene	620 J	950 J	350 U	320 U	340 U	330 U	15 J	51 J	350 U	340 U	14 J	330 U	7 J	16 U	36 J	15 U	16 U	350 U	15 U	14 J	16 U	340 U
Acenaphthylene	890 J	1300 J	350 U	50 J	25 J	330 U	51 J	66 J	10 J	340 U	50 J	330 U	60 J	12 U	100 J	11 U	12 U	350 U	11 U	21 J	12 U	23 J
Anthracene	2200	4700 J	350 U	20 J	18 J	330 U	57 J	290 J	350 U	340 U	62 J	330 U	46 J	13 U	180 J	12 U	13 U	19 J	12 U	53 J	13 U	17 J
Benzo(a)anthracene	9700	22000	350 U	37 J	73 J	330 U	190 J	1300	350 U	11 J	340	19 J	170 J	16 U	560	15 U	16 U	120 J	15 U	190 J	16 U	58 J
Benzo(a)pyrene	11000	24000	350 U	46 J	89 J	330 U	220 J	1200	350 U	340 U	330 J	35 J	190 J	17 U	640	16 U	17 U	140 J	16 U	180 J	17 U	70 J
Benzo(b)fluoranthene	9600	18000	350 U	41 J	81 J	330 U	210 J	1300	350 U	12 J	230 J	26 J	140 J	41 U	890	39 U	41 U	120 J	39 U	140 J	41 U	72 J
Benzo(g,h,i)perylene	870 J	12000	350 U	33 J	55 J	330 U	26 J	100 J	350 U	340 U	150 J	39 J	91 J	18 U	59 J	17 U	18 Ua	39 J	17 U	38 J	18 Ua	15 J
Benzo(k)fluoranthene	7200	18000	350 U	39 J	78 J	330 U	200 J	1200	350 U	13 J	300 J	30 J	180 J	42 U	1000	40 U	42 U	130 J	40 U	190 J	42 U	62 J
Benzoic acid	8200 U	41000 U	1700 U	1500 U	22 J	1600 U	120 J	36 J	24 J	1600 U	64 J	1600 U	1700 U	720 U	39 J	670 U	710 U	1700 U	680 U	1700 U	750 U	70 J
bis(2-Ethylhexyl)phthalate	1700 U	8500 U	350 U	320 U	340 U	330 U	310 J	350 U	29 J	340 U	47 J	330 U	72 J	240 JaB	55 J	160 JaB	210 JaB	350 U	290 JaB	350 U	210 JaB	340 U
Carbazole	320 J	8500 U	350 U	320 U	340 U	330 U	360 U	44 J	350 U	340 U	20 J	330 U	350 U	24 U	26 J	22 U	24 U	350 U	23 U	18 J	24 U	340 U
Chrysene	9600	22000	350 U	56 J	100 J	330 U	260 J	1400	350 U	14 J	360	26 J	230 J	18 U	640	17 U	18 U	140 J	17 U	230 J	19 U	84 J
Dibenzo(a,h)anthracene	580 J	5100 J	350 U	13 J	21 J	330 U	360 U	51 J	350 U	340 U	67 J	330 U	40 J	20 U	340 U	18 U	19 U	16 J	17 U	20 J	18 U	340 U
Dibenzofuran	310 J	490 J	350 U	5 J	340 U	330 U	18 J	68 J	350 U	340 U	18 J	330 U	13 J	18 U	14 J	15 U	16 U	350 U	18 U	7 J	19 U	340 U
Di-n-butylphthalate	1700 U	8500 U	350 U	320 U	340 U	330 U	360 U	350 U	350 U	340 U	7 J	330 U	350 U	15 U	340 U	14 U	15 U	350 U	14 U	350 U	15 U	340 U
Fluoranthene	9900	30000	350 U	43 J	86 J	15 J	260 J	1700	8 J	16 J	370	37 J	220 J	24 U	990	22 U	24 Ua	150 J	23 Ua	290 J	24 Ua	76 J
Fluorene	710 J	1100 J	350 U	5 J	340 U	330 U	15 J	54 J	350 U	340 U	15 J	330 U	350 U	22 U	41 J	20 U	22 U	350 U	20 U	350 U	22 U	340 U
Indeno(1,2,3-cd)pyrene	1300 J	14000	350 U	26 J	54 J	330 U	34 J	140 J	350 U	5 J	180 J	25 J	98 J	20 U	58 J	18 U	19 Ua	44 J	18 U	46 J	19 Ua	18 J
Naphthalene	490 J	450 J	350 U	28 J	32 J	330 U	62 J	230 J	350 U	340 U	56 J	330 U	48 J	35 U	34 J	33 U	34 U	350 U	33 U	350 U	34 U	340 U
N-Nitrosodiphenylamine (1)	1700 U	8500 U	350 U	320 U	340 U	330 U	35 J	350 U	350 U	340 U	340 U	330 U	350 U	17 U	340 U	16 U	17 U	350 U	16 U	350 U	18 U	340 U
Phenanthrene	5700	12000	350 U	33 J	53 J	330 U	230 J	900	10 J	340 U	200 J	16 J	130 J	26 U	430	24 U	26 U	45 J	25 U	190 J	26 U	38 J
Phenol	1700 U	8500 U	350 U	320 U	340 U	330 U	40 J	4 J	350 U	340 U	340 U	330 U	350 U	26 U	3 J	24 U	26 U	350 U	25 U	350 U	26 U	340 U
Pyrene	14000	37000	350 U	78 J	120 J	14 J	400	1800	10 J	18 J	570	48 J	330 J	21 U	730	19 U	25 Ja	170 J	19 Ua	340 J	25 Ja	100 J
CLP Metals (mg/kg)																						
Aluminum	6460	7160	3020	2050	5710	1440	6090	3520	5330	1580	3580	2340	4440	4330	3170	4280	3100	7200	1730	5600	7240	5540
Antimony	0.81 UN	0.81 UN	0.86 UN	0.87 U	0.78 U	0.83 U	0.88 UN	0.87 UN	0.86 U	0.82 U	0.89 U	0.82 U	0.90 UN	0.096 B	0.75 UN	0.071 B	0.53 B	0.95 UN	0.42 B	0.79 UN	0.17 B	0.75 UN
Arsenic	3.2	2.9	1.6 B	1.1 B	3.2	1.2 B	5.5	3.4	2.2	1.2 B	2.2	1.3 B	3.7	2.3 B	3.3	2.1 B	2.8 B	3.1	1.1 B	3.9	1.9 B	4.8
Barium	44.3	46.0	25.9 B	12.7 B	29.3 B	7.9 B	42.1	28.6 B	24.4 B	9.6 B	24.2 B	15.6 B	24.6 B	17.3	23.7 B	19.8	20.4	29.6 B	12.5	34.2 B	21.4	41.3
Beryllium	0.51 B	0.52 B	0.18 B	0.18 B	0.39 B	0.094 B	0.62 B	0.43 B	0.34 B	0.17 B	0.32 B	0.19 B	0.59 B	0.23 B	0.35 B	0.22 B	0.22 B	0.62 B	0.14 B	0.47 B	0.22 B	0.57 B
Cadmium	0.14 U	0.14 U	0.15 U	0.15 U	0.14 U	0.14 U	0.15 U	0.15 U	0.15 U	0.14 U	0.15 U	0.14 U	0.16 U	0.001 U	0.13 U	0.0011 U	0.011 B	0.16 U	0.001 U	0.14 U	0.001 U	0.13 U
Calcium	3490	13400	404. B	254. B	1310	563. B	5900	3530	662. B	446. B	1210	388. B	1290	625	7000	503	2640	2250	466	8040	4790	1010
Chromium	10.4	10.4	6.0	4.6	13.8	8.1	15.0	9.5	14.0	4.6	8.4	4.5	10.8	7.7	130.	9.6	10.3	10.5	4.8	8.9	6.7	12.8
Cobalt	3.2 B	3.5 B	3.0 B	1.5 B	4.0 B	1.1 B	5.4 B	4.6 B	3.5 B	1.4 B	2.9 B	1.8 B	4.1 B	2.9	2.3 B	3.9	3.6	4.7 B	2.7	3.4 B	6.2	4.1 B
Copper	10.0	11.0	4.8	4.4 B	13.5	3.1 B	76.4	46.7	7.3	7.0	18.6	3.8 B	15.6	8.5	12.8	6.7	6.9	30.2	3.2 B	27.2	75.9	36.4
Iron	9390 *	10100 *	7540	6890	11400		12200 *	7790 *	10800	5650	8910	5780	10000 *	8430	11900 *	11700	9830	13300 *	5750	11200 *	17800	10200 *
Lead	20.5 *	24.4 *	5.2	6.5	24.5	4.0	43.8 *	24.6 *	8.0	4.3	27.3	4.5	49.4 *	7.4 B	95.2 *	4.8 B	14.4	35.4 *	5.1 B	28.4 *	13.6	51.8 *
Magnesium	2100	3060	647. B	477. B	1680	592. B	1680	1440	1170	475. B	1030	602. B	1370	868	3940	1100	1730	1850	484	2680	2350	1110
Manganese	204.	222.	199.	105. *	189. *	65.9 *	202.	128.	206. *	96.5 *	180. *	127. *	148.	153	155.	191	166	173.	155	153.	207	157.
Mercury	0.051	0.046	0.0074 B	0.043	0.17	0.0048 B	0.17	0.12	0.011	0.0041 U	0.046	0.0056 B	0.39	0.0054 U	0.13	0.0052 U	0.0050 U	0.047	0.0049 U	0.64	0.0055 U	0.10
Nickel	7.2	8.3	5.2 B	6.0 B	23.6	3.8 B	71.4	86.9	8.0	4.5 B	16.9	4.6 B	45.2	7.3	9.0	7.8	26.9	11.3	4.3	10.7	8.5	40.6
Potassium	494. B	554. B	343. B	302. B	569. B	177. B	743. B	498. B	571. B	187. B	403. B	345. B	517. B	416 ^	395. B	517 ^	521 ^	820. B	291 ^	735. B	833 ^	609. B
Selenium	0.87 U	0.86 U	0.91 U	0.93 UN	0.98 N	0.88 UN	0.94 U	1.2	0.91 UN	0.87 UN	0.95 UN	0.87 UN	0.96 U	0.096 B	0.80 U	0.071 B	0.53 B	1.0 U	0.42 B	0.84 U	0.17 B	0.96
Silver	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.18 U	0.19 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.20 U	0.00091 U	0.16 U	0.001 U	0.072 B	0.21 U	0.023 B	0.17 U	0.00091 U	0.16 U
Sodium	74.1 B	94.2 B	30.7 B	20.0 B	44.4 B	15.7 B	70.9 B	61.9 B	36.7 B	19.0 B	33.8 B	19.3 B	41.7 B	29.3 B	36.1 B	30.2 B	37.5 B	63.8 B	22.0 B	196. B	527	47.6 B
Thallium	3.3 U	3.3 U	3.4 U	3.5 U	3.2 U	3.3 U	3.5 U	3.5 U	3.5 U	3.3 U	3.6 U	3.3 U	3.6 U	0.0073 U	3.0 U	0.0081 U	0.0092 U	3.8 U	0.0073 U	3.2 U	0.0073 U	3.0 U
Vanadium	14.6	15.6	8.6 B	11.2	70.0	5.8 B	373.	202.	13.9	37.0	60.4	7.4 B	235.	166	18.0	11.8	32.8	35.5	5.8	35.9	36.7	139.
Zinc	33.1	39.4	11.0	13.7	44.9	8.0	55.7	31.1	18.9	17.1	37.2	14.0	56.3	66.7	69.3	14.2 B	21.3	44.6	11.8 B	48.1	36.1	54.2
PCB 8082 (ug/kg)																						
Aroclor-1242	34. U	34. U	35. U	34. U	34. U	33. U	36. U	34. U	35. U	34. U	35. U	33. U	35. U	18 U	43.	18 U	18 U	35. U	18 U	35. U	19 U	34. U
Aroclor-1248	34. U	34. U	35. U	34. U	34. U	33. U	35. J	42.	35. U	34. U	15. J	33. U	35. U	18 U	34. U	18 U	18 U	35. U	18 U	35. U	19 U	34. U
Aroclor-1254	34. U	34. U	35. U	34. U	34. U	33. U	69.	50.	35. U	34. U	35.	33. U	19. J	18 U	46.	18 U	18 U	35. U	18 U	35. U	19 U	34. U
Aroclor-1260	34. U	34. U	35. U	34. U	13. J	33. U	41.	29. J	4.7 J	34. U	53.	33. U	17. J	18 U	30. J	18 U	18 U	12. J	18 U	11. J	19 U	30. J

SVOC and PCB analytical results reported in micrograms per kilogram (ug/kg), or parts per billion (ppb).
Metals analytical results reported in milligrams per kilogram (mg/kg), or parts per million (ppm).
U - Indicates analyte was not detected at or above the reporting limit
J - Indicates that the compound was analyzed for and determined to be present in the sample. However, the concentration indicated is an estimated value which is less than the specified minimum detection limit but greater than zero.
B - Indicates result between instrument detection limit (IDL) and contract required detection limit (CRDL)
E - Indicates that the concentration is estimated due to matrix interferences.
N - Spiked sample recovery not within control limits
a - Concentration exceeds the instrument calibration range or is below the reporting limit.
^ - Instrument quality control not within control limits.
* - Batch quality control not within control limits.
NS- Not Sampled
na- not analyzed

Table 8
Summary of Analytical Results From Area 3-8
KeySpan Energy - Glenwood Landing
Queens, NY

Analyte	Sample Collection Designation & Collection Date									
	GLA8-01 10/26/01	GLA8-02 10/26/01	GLA8-2B 12/04/01	GLA8-2C 12/04/01	GLA8-2D 12/04/01	GLA8-2E 12/04/01	GLA8-03 10/26/01	GLA8-04A 10/26/01	GLA8-04B 10/26/01	GLA8-05 10/26/01
SVOC 8270 (ug/kg)										
2-Methylnaphthalene	350 U	11 J	11 J	330 U	24 J	9 J	13 J	340 U	340 U	340 U
Acenaphthene	350 U	44 J	11 J	330 U	350 U	9 J	330 U	340 U	340 U	340 U
Acenaphthylene	350 U	13 J	340 U	330 U	12 J	350 U	330 U	340 U	340 U	340 U
Anthracene	6 J	160 J	18 J	330 U	23 J	26 J	12 J	340 U	340 U	340 U
Benzo(a)anthracene	350 U	310 J	80 J	13 J	82 J	110 J	83 J	340 U	340 U	340 U
Benzo(a)pyrene	350 U	260 J	84 J	15 J	77 J	120 J	95 J	340 U	340 U	340 U
Benzo(b)fluoranthene	350 U	200 J	79 J	17 J	59 J	98 J	96 J	340 U	340 U	340 U
Benzo(g,h,i)perylene	350 U	220 J	64 J	17 J	69 J	110 J	75 J	340 U	340 U	340 U
Benzo(k)fluoranthene	350 U	240 J	94 J	15 J	75 J	130 J	97 J	340 U	340 U	340 U
Carbazole	350 U	78 J	340 U	330 U	350 U	11 J	330 U	340 U	340 U	340 U
Chrysene	350 U	310 J	110 J	23 J	96 J	140 J	120 J	340 U	340 U	340 U
Dibenzo(a,h)anthracene	350 U	340 U	23 J	330 U	23 J	44 J	330 U	340 U	340 U	340 U
Dibenzofuran	350 U	37 J	9 J	330 U	350 U	8 J	330 U	340 U	340 U	340 U
Fluoranthene	52 J	450	160 J	18 J	130 J	180 J	120 J	340 U	340 U	21 J
Fluorene	350 U	72 J	340 U	330 U	350 U	350 U	330 U	340 U	340 U	340 U
Indeno(1,2,3-cd)pyrene	350 U	190 J	58 J	14 J	58 J	100 J	66 J	340 U	340 U	340 U
Naphthalene	350 U	340 U	340 U	330 U	25 J	350 U	330 U	340 U	340 U	340 U
Phenanthrene	28 J	590	100 J	12 J	97 J	96 J	58 J	340 U	340 U	340 U
Pyrene	78 J	930	150 J	24 J	170 J	210 J	210 J	340 U	340 U	340 U
CLP Metals (mg/kg)										
Aluminum	3130	3140	4430	4680	3800	4100	2720	1400	1530	2270
Antimony	0.94 UN	0.82 UN	0.84 U	0.82 U	0.77 U	0.88 U	0.93 UN	0.86 UN	0.86 UN	0.82 UN
Arsenic	1.2 B	1.3 B	2.3	3.5	3.1	2.3	1.9 B	0.92 U	0.92 U	2.6
Barium	12.3 B	13.0 B	18.8 B	26.4 B	17.8 B	17.4 B	14.5 B	7.7 B	10.5 B	6.1 B
Beryllium	0.27 B	0.25 B	0.30 B	0.42 B	0.32 B	0.30 B	0.18 B	0.10 B	0.095 B	0.15 B
Cadmium	0.16 U	0.14 U	0.14 U	0.14 U	0.13 U	0.15 U	0.24 B	0.15 U	0.15 U	0.14 U
Calcium	494. B	370. B	1330	1040	438. B	1410	820. B	301. B	370. B	185. B
Chromium	10.8	8.2	9.6	7.5	7.8	11.6	6.5	5.2	4.7	13.0
Cobalt	1.8 B	2.0 B	2.2 B	2.4 B	2.1 B	2.4 B	1.9 B	1.5 B	1.6 B	1.2 B
Copper	5.3	7.3	8.1	10.7	6.0	7.5	7.6	3.7 B	3.7 B	3.9 B
Iron	7210 *	7270 *	6460	6770	6260	7210	5360 *	5150 *	5500 *	4720 *
Lead	10.8	15.5	48.0	32.8	17.8	63.4	28.1	2.0	2.5	7.3
Magnesium	457. B	710. B	896. B	922.	537. B	963.	749. B	501. B	637. B	293. B
Manganese	80.5	81.0	94.8	50.9	93.8	106.	99.3	72.9	79.7	46.4
Mercury	0.019	0.024	0.059	0.034	0.046	0.077	0.088	0.0066 B	0.014	0.026
Nickel	4.8 B	4.1 B	5.2 B	6.2 B	4.8 B	5.8 B	4.1 B	4.7 B	4.5 B	2.4 B
Potassium	209. B	173. B	335. B	283. B	281. B	326. B	262. B	260. B	372. B	130. B
Selenium	0.94 U	0.82 U	0.89 U	0.87 U	0.82 U	0.94 U	0.93 U	0.86 U	0.86 U	0.82 U
Silver	0.20 U	0.18 U	0.18 U	0.18 U	0.17 U	0.19 U	0.20 U	0.19 U	0.19 U	0.18 U
Sodium	35.6 B	20.2 B	37.5 B	48.6 B	26.3 B	49.6 B	20.3 B	15.5 B	17.1 B	19.1 B
Thallium	2.8 U	2.4 U	3.4 U	3.3 U	3.1 U	3.6 U	2.8 U	2.6 U	2.6 U	2.4 U
Vanadium	7.4 B	8.2 B	10.6	10.2	10.1	10.3	8.3 B	5.1 B	5.8 B	6.5 B
Zinc	16.0	18.9	79.9	29.6	33.0	81.2	97.7	14.9	15.2	11.2
PCB 8082 (ug/kg)										
Aroclor-1248	35 U	3.9 J	19 U	18 U	18 U	18 U	9.3 J	34 U	35 U	34 U
Aroclor-1260	35 U	5.3 J	19 U	18 U	18 U	18 U	4.2 J	34 U	35 U	34 U

SVOC and PCB analytical results reported in micrograms per kilogram (µg/kg), or parts per billion (ppb).

Metals analytical results reported in milligrams per kilogram (mg/kg), or parts per million (ppm).

U - Indicates analyte was not detected at or above the reporting limit

J - Indicates that the compound was analyzed for and determined to be present in the sample. However, the concentration indicated is an estimated value which is less than the specified minimum detection limit but greater than zero.

B - Indicates result between Instrument detection limit (IDL) and contract required detection limit (CRDL)

E - Indicates that the concentration is estimated due to matrix interferences.

N - Spiked sample recovery not within control limits

a - Concentration exceeds the instrument calibration range or is below the reporting limit.

^ - Instrument quality control not within control limits.

* - Batch quality control not within control limits.

NS- Not Sampled

ne- not analyzed

Table 9
Summary of Analytical Results From Drip Pits
KeySpan Energy - Glenwood Landing
Queens, NY

Analyte	Sample Collection Designation & Collection Date															
	GLDPE-01 10/26/01	GLDPE-02 10/26/01	GLDPE-03 10/26/01	GLDPE-04 10/26/01	GLDPN-01 10/26/01	GLDPN-02 10/26/01	GLDPN-03 10/26/01	GLDPN-04 10/26/01	GLDPS-01 10/26/01	GLDPS-02 10/26/01	GLDPS-03 10/26/01	GLDPS-04 10/26/01	GLDPW-01 10/26/01	GLDPW-02 10/26/01	GLDPW-03 10/26/01	GLDPW-04 10/26/01
SVOC 8270 (ug/kg)																
2-Methylnaphthalene	380 U	340 U	350 U	390 U	41 J	340 U	360 U	330 U	340 U	6 J	350 U	11 J	350 U	360 U	350 U	340 U
Acenaphthene	380 U	340 U	350 U	390 U	8 J	340 U	360 U	330 U	340 U	350 U	350 U	380 U	350 U	360 U	350 U	340 U
Acenaphthylene	380 U	340 U	350 U	390 U	150 J	340 U	360 U	330 U	340 U	350 U	350 U	87 J	350 U	360 U	350 U	340 U
Anthracene	380 U	340 U	23 J	390 U	58 J	340 U	360 U	330 U	11 J	5 J	350 U	39 J	350 U	7 J	350 U	340 U
Benzo(a)anthracene	380 U	340 U	45 J	390 U	140 J	340 U	360 U	330 U	36 J	350 U	350 U	120 J	350 U	360 U	350 U	340 U
Benzo(a)pyrene	380 U	340 U	350 U	390 U	160 J	340 U	360 U	330 U	340 U	350 U	350 U	150 J	350 U	360 U	350 U	340 U
Benzo(b)fluoranthene	380 U	340 U	350 U	390 U	87 J	340 U	360 U	330 U	340 U	350 U	350 U	98 J	350 U	360 U	350 U	340 U
Benzo(g,h,i)perylene	380 U	340 U	350 U	390 U	320 J	340 U	360 U	330 U	340 U	350 U	350 U	170 J	350 U	360 U	350 U	340 U
Benzo(k)fluoranthene	380 U	340 U	350 U	390 U	130 J	340 U	360 U	330 U	340 U	350 U	350 U	130 J	350 U	360 U	350 U	340 U
Benzoic acid	1800 U	1700 U	1700 U	1900 U	1700 U	1600 U	1800 U	1600 U	21 J	25 J	1700 U	28 J	1700 U	29 J	1700 U	1700 U
Chrysene	380 U	340 U	56 J	390 U	170 J	340 U	360 U	330 U	52 J	350 U	350 U	140 J	350 U	360 U	350 U	340 U
Fluoranthene	380 U	340 U	68 J	390 U	100 J	26 J	360 U	330 U	47 J	19 J	350 U	120 J	350 U	25 J	350 U	12 J
Fluorene	380 U	340 U	350 U	390 U	350 U	340 U	360 U	330 U	340 U	350 U	350 U	10 J	350 U	360 U	350 U	340 U
Indeno(1,2,3-cd)pyrene	380 U	340 U	24 J	390 U	150 J	340 U	360 U	330 U	340 U	350 U	350 U	120 J	350 U	360 U	350 U	340 U
Isophorone	380 U	340 U	350 U	390 U	350 U	260 J	360 U	330 U	340 U	350 U	350 U	380 U	350 U	360 U	350 U	340 U
Naphthalene	380 U	340 U	350 U	390 U	31 J	340 U	360 U	330 U	340 U	29 J	350 U	11 J	350 U	360 U	350 U	340 U
Phenanthrene	380 U	340 U	50 J	390 U	250 J	340 U	360 U	330 U	32 J	16 J	350 U	62 J	350 U	16 J	350 U	340 U
Pyrene	380 U	340 U	160 J	390 U	370	42 J	360 U	330 U	100 J	45 J	350 U	380	350 U	61 J	350 U	24 J
CLP Metals (mg/kg)																
Aluminum	1020	1810	1700	748.	2190	1400	2150	1370	2460	2810	2620	1960	2330	3520	2470	1610
Antimony	0.97 UN	0.88 UN	0.98 UN	1.0 UN	0.94 UN	0.93 UN	0.98 UN	0.86 UN	0.86 UN	0.99 UN	0.88 UN	0.92 UN	0.84 UN	0.92 UN	0.92 UN	0.94 UN
Arsenic	1.0 U	0.94 U	1.1 B	1.1 U	2.6	0.99 U	1.4 B	0.91 U	1.8 B	1.3 B	1.4 B	1.6 B	0.92 B	20.2	1.2 B	1.0 U
Barium	3.9 B	9.2 B	8.4 B	2.3 B	12.4 B	7.2 B	12.5 B	14.7 B	11.6 B	14.9 B	11.8 B	8.3 B	10.6 B	16.9 B	13.8 B	8.9 B
Beryllium	0.10 U	0.11 B	0.11 U	0.11 U	0.13 B	0.13 B	0.14 B	0.11 B	0.16 B	0.18 B	0.18 B	0.16 B	0.16 B	0.24 B	0.16 B	0.11 B
Cadmium	0.17 U	0.15 U	0.17 U	0.18 U	0.31 B	0.16 U	0.17 U	0.15 U	0.22 B	0.17 U	0.15 U	0.18 B	0.15 U	0.31 B	0.16 U	0.16 U
Calcium	927. B	345. B	1470	135. B	5850	511. B	3820	171. B	2510	1100	284. B	582. B	239. B	828. B	244. B	167. B
Chromium	3.1	4.1	18.6	2.0 B	105.	7.1	10.2	3.7	32.4	17.9	5.7	110.	4.4	45.4	7.5	4.5
Cobalt	0.46 B	2.0 B	1.6 B	0.27 U	1.6 B	1.4 B	1.4 B	0.82 B	1.6 B	3.0 B	2.3 B	1.3 B	1.4 B	2.4 B	3.2 B	1.7 B
Copper	2.0 B	4.4 B	5.2 B	2.0 B	8.7	3.2 B	4.3 B	2.2 B	6.9	5.9	4.5 B	6.7	17.4	9.0	4.0 B	2.9 B
Iron	1060 *	5040 *	3460 *	1100 *	10700 *	3970 *	4170 *	2820 *	5600 *	6440 *	7300 *	7930 *	4980 *	10600 *	6490	4140
Lead	2.8	5.1	12.4	2.0	54.0	6.6	14.1	2.2	15.9	18.9	4.7	28.9	6.7	35.9	8.7	3.9
Magnesium	36.4 B	440. B	393. B	20.2 B	3000	298. B	1050 B	210. B	505. B	483. B	381. B	392. B	284. B	685. B	578. B	281. B
Manganese	10.4	52.9	54.9	7.2	128.	71.6	71.4	110.	84.6	133.	81.6	66.9	78.9	124.	125.	111.
Mercury	0.0059 B	0.0061 B	0.011	0.0040 B	0.025	0.0087	0.016	0.0038 B	0.018	0.010	0.0036 U	0.017	0.0072	0.027	0.023	0.0066
Nickel	0.90 B	4.0 B	2.4 B	0.39 B	4.8 B	2.0 B	2.3 B	2.2 B	3.6 B	4.2 B	4.0 B	3.4 B	3.3 B	5.1 B	6.5 B	2.3 B
Potassium	137. B	246. B	205. B	105. B	230. B	143. B	204. B	116. B	224. B	325. B	409. B	186. B	221. B	270. B	232. B	179. B
Selenium	0.97 U	0.88 U	0.98 U	1.0 U	0.94 U	0.93 U	0.98 U	0.86 U	0.86 U	0.99 U	0.88 U	0.92 U	0.84 U	0.92 U	0.92 U	0.94 U
Silver	0.21 U	0.19 U	0.21 U	0.23 U	0.20 U	0.20 U	0.21 U	0.19 U	0.19 U	0.22 U	0.19 U	0.20 U	0.18 U	0.20 U	0.20 U	0.20 U
Sodium	13.8 B	12.7 B	17.4 B	11.1 B	30.2 B	12.2 B	24.7 B	11.8 B	21.2 B	20.5 B	12.3 B	11.0 B	15.0 B	21.1 B	19.3 B	13.6 B
Thallium	2.9 U	2.6 U	2.9 U	3.1 U	2.8 U	2.8 U	2.9 U	2.6 U	2.6 U	2.9 U	2.6 U	2.7 U	2.5 U	2.7 U	2.7 U	2.8 U
Vanadium	5.8 B	6.1 B	7.6 B	6.0 B	7.6 B	4.6 B	7.2 B	3.1 B	7.4 B	8.3 B	8.4 B	8.7 B	6.8 B	18.0	7.5 B	5.9 B
Zinc	6.5	8.1	15.8	4.2 B	40.8	12.4	13.3	5.4 B	24.6	26.2	12.0	31.3	10.4	51.4	11.7	11.3
PCB 8082 (ug/kg)																
Aroclor-1248	3.7 J	35. U	1100	39. U	390	74.	17. J	34. U	6.4 J	35. U	35. U	8.2 J	34. U	1.6 J	34. U	35. U
Aroclor-1254	38. U	35. U	350 U	39. U	70. U	56.	37. U	34. U	35. U	35. U	35. U	38. U	34. U	38. U	34. U	3.2 J
Aroclor-1260	38. U	35. U	120 J	39. U	110	34.	4.7 J	34. U	35. U	3.3 J	35. U	6.6 J	34. U	38. U	34. U	2.0 J

SVOC and PCB analytical results reported in micrograms per kilogram (µg/kg), or parts per billion (ppb).
Metals analytical results reported in milligrams per kilogram (mg/kg), or parts per million (ppm).
U - indicates analyte was not detected at or above the reporting limit
J - indicates that the compound was analyzed for and determined to be present in the sample. However, the concentration indicated is an estimated value which is less than the specified minimum detection limit but greater than zero.
B - Indicates result between instrument detection limit (IDL) and contract required detection limit (CRDL)
E - Indicates that the concentration is estimated due to matrix interferences.
N - Spiked sample recovery not within control limits
a - Concentration exceeds the instrument calibration range or is below the reporting limit.
^ - Instrument quality control not within control limits.
* - Batch quality control not within control limits.
NS- Not Sampled
na- not analyzed

Appendix C

Excavation Work Plan (EWP)

Excavation Work Plan

This EWP will be implemented to address any intrusive activities prior to the final remedy, including any portion of the final remedy at the Site, or in areas where impacts are encountered. The property owner and tenants (if applicable), consultants, and contractors are required to comply with this EWP. National Grid is only responsible for costs associated with MGP-related impacts. Remedial excavation areas are identified in the as-built figure in Appendix B (note that these areas may not encompass the entire property or all tax parcels) and areas of remaining impacts are discussed in Section 2.4 of this SMP.

C-1 NOTIFICATION

At least 15 days prior to the start of any small-scale (limited[1]) excavation activity that is anticipated to encounter, impacts on the Site or breach or alter the site's cover system, based on the data available, the property owner or their representative will notify the NYSDEC contacts in the table listed below in writing. Notification requirements for large-scale projects are included in Section 1.3.1. Table C-1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information.

Table C-1: Notifications*

Name	Contact Information
Jenelle Gaylord NYSDEC Project Manager	(518) 402-9791 Jenelle.Gaylord@dec.ny.gov
Kelly Lewandowski Chief, NYSDEC Site Control	(518) 402-9553 Kelly.Lewandowski@dec.ny.gov
Jacquelyn Nealon NYSDOH Project Manager	(518) 402-7860 Jacquelyn.Nealon@health.ny.gov
Michael Quinlan National Grid Project Manager	(516) 220-4363 Michael.Quinlan@nationalgrid.com

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

[1] Note that NYSDEC makes the determination of which excavations are small-scale (e.g. limited) and which are large-scale. To know with certainty that the proposed excavation is considered to be small-scale (e.g. limited) will require a prior notification to NYSDEC describing the work to be performed.

All intrusive activities must be approved by NYSDEC. Notification must be made to NYSDEC in accordance with Section 1.3 of the SMP.

The property owner will generate the notification to NYSDEC via a Notice of Intrusion (NOIA) 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 re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of impacted soil to be excavated, any modifications of truck routes, and any work that may impact the engineering control;
- Whether proposed activities will require dewatering, proposed containment and/or treatment 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 impacted 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 EWP;
- A statement from the party performing the work that the work will be performed in compliance with this EWP and 29 Code of Federal Regulations (CFR) 1910.120;
- A copy of the contractor's ~~(~~HASP~~)~~, in electronic format, if it differs from the HASP provided in Appendix D of this SMP;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with the required request to import form and all supporting documentation including, but not limited to, chemical testing results.

Copies of a contractor's HASP or information regarding backfill sources will be provided as soon as possible if not available at the time of NOIA submittal but must be submitted before intrusive work begins.

C-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed during all limited excavations into known or potentially-impacted material or a breach of the cover system. A QEP as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State will perform the screening. 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~~.~~

Based on previous environmental data and screening results, soils will be segregated into material that requires off-site disposal and material that requires testing to determine if the material can be reused as soil beneath a cover. Further discussion of off-site disposal of materials and on-site reuse is provided in Section 4 of this Appendix.

C-3 SOIL STAGING METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points. Stockpiles will be located and sized to minimize potential for material or run-off to enter discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected, and damaged tarp covers will be promptly replaced. Stockpiles will be segregated on-site based on the soil/material type. These soil/material types will include impacted soils, reuse soil, and imported fill.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by the NYSDEC.

C-4 MATERIALS EXCAVATION AND LOAD-OUT

A QEP as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State will oversee all invasive work at the Site and the excavation and load-out of all excavated material.

To the extent that they perform work under this EWP, the property owner and their contractors are responsible for safe execution of all invasive and other work; including the structural integrity of excavations and structures; such as subsurface utilities and buildings that may be affected by excavations.

The presence of utilities and easements on the Site will be investigated. Based on this investigation, it will be determined whether a risk or impediment to the work planned under this EWP is posed by utilities or easements on the Site. A site utility stakeout will be completed for all utilities prior to any ground intrusive activities at the site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and New York State Department of Transportation (NYSDOT) requirements (and all other applicable transportation requirements).

A truck wash will be operated on-Site, as appropriate. The QEP will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the Site until the

activities performed under this section are complete. Similarly, any equipment used on Site (e.g. backhoe, excavator, drill rig) will be decontaminated prior to leaving Site. If equipment decontamination is necessary, a plastic lined and bermed decontamination area will be established. Truck wash and equipment decontamination waters will be collected and disposed of off-site in an appropriate manner.

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-site soil tracking.

The QEP will be responsible for ensuring that all egress points for truck and equipment transport from the Site are clean of dirt and other materials derived from the Site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials. Material accumulated from the street cleaning and egress cleaning activities will be disposed off-site at a permitted landfill facility in accordance with all applicable local, State, and Federal regulations.

C-5 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.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

The NYSDOT-approved truck transport routes will be developed and submitted to the Department prior to the start of a project. All trucks loaded with Site materials will exit the vicinity of the Site 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; (f) overall safety in transport; and (g) community input [where necessary].

Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

C-6 MATERIALS DISPOSAL OFF-SITE

All material excavated and removed from the Site will be treated as impacted and regulated material and will be transported and disposed off-site in a permitted facility in accordance with all local, State and Federal regulations. If disposal of material from this Site 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 project manager. Unregulated off-site management of materials from this Site will not occur without formal NYSDEC project manager approval.

Regulated soils will be stockpiled and transported to a NYSDEC and National Grid approved facility. Off-site disposal locations for excavated soils will be identified in the pre-excavation notification submittal to NYSDEC. This will include estimated quantities and a breakdown by class of disposal facility if appropriate. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report (PRR). This documentation will include, but will not be limited to: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and impacted soils taken off-site will be handled consistent with 6 NYCRR Parts 360, 361, 362, 363, 364 and 365. Material that does not meet Unrestricted Use SCOs is prohibited from being taken to a New York State C&D debris recovery facility (6 NYCRR Subpart 360-15 registered or permitted facility).

C-7 MATERIALS REUSE ON-SITE

A Request to Import/Reuse Fill or Soil form, which can be found in Appendix G and at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review.

Material that meets the Restricted Residential (Areas 1A and 1B) and Industrial (Areas 2 and 3) Use SCOs listed in Table 375-6.8(b) of 6 NYCRR Part 375 meet the chemical criteria for on-Site reuse. Prior to reuse, samples will be collected and analyzed by an Environmental Laboratory Approval Program (ELAP)-certified laboratory for:

- Total VOCs via U.S. Environmental Protection Agency (EPA) Method 8260
- Total SVOCs via EPA Method 8270C
- Polychlorinated biphenyls (PCBs) via EPA Method 8082/8082A/8080
- Total cyanide via EPA Method 9010/9014
- Total Metals (RCRA+Cu, Ni, Zn, Va, Cn HexChrome) via EPA Method 6010B and 6010
- Total Mercury via EPA Method 7471.

- per- and polyfluoroalkyl substances (PFAS) by USEPA method 537.1; and
- 1,4-dioxane by USEPA method 8270

The QEP as defined in 6 NYCRR part 375 will ensure that procedures defined for materials reuse in this EWP are followed and that unacceptable material (i.e. impacted) does not remain on-Site. Impacted soil that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Proposed materials for reuse on-site must be sampled for full suite analytical parameters including per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. The sampling frequency will be in accordance with DER-10 Table 5.4(e)10 unless prior approval is obtained from the NYSDEC project manager for modification of the sampling frequency. The analytical results of soil/fill material testing must meet the site use criteria presented in NYSDEC DER-10 Appendix 5 – Allowable Constituent Levels for Imported Fill or Soil for all constituents listed, and the NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances [January 2021 or date of current version, whichever is later] guidance values. Approvals for modifications to the analytical parameters must be obtained from the NYSDEC project manager prior to the sampling event.

Soil/fill material for reuse on-site will be segregated and staged as described in Sections C-2 and C-3 of this EWP. The anticipated size and location of stockpiles will be provided in the 15-day notification to the NYSDEC project manager. Stockpile locations will be based on the location of site excavation activities and proximity to nearby site features. Material reuse on-site will comply with requirements of NYSDEC DER-10 Section 5.4(e)4. Any modifications to the requirements of DER-10 Section 5.4(e)4 must be approved by the NYSDEC project manager.

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 Site will not be reused on- site.

C-8 FLUIDS MANAGEMENT

All impacted liquids to be removed from the Site including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters, will be handled, transported and disposed off-site at a permitted facility in accordance with applicable local, State, and Federal regulations. Impacted liquids removed from the Site will be disposed of at a National Grid approved disposal facility. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the Site and will be managed off-site, unless prior approval is obtained from NYSDEC.

Discharge of water generated during construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a State Pollutant Discharge Elimination System (SPDES) permit.

C-9 SOIL COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the soil cover system will be restored in a manner that complies with the SMP and DCR by National Grid. The existing soil cover system is comprised of a minimum of 18 inches of clean soil in Area 1B and a minimum of two feet of clean soil in Area 3. A demarcation layer, consisting of geotextile is installed in Area 1B and will be replaced to provide a visual reference to the top of the remaining impact zone, the zone that requires adherence to special conditions for disturbance of impacted soils defined in this EWP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining impacted soils. A figure showing the modified surface will be included in the subsequent PRR and in an updated SMP.

C-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the Site will be approved by Grid's QEP, as defined in 6 NYCRR Part 375, and will be in compliance with provisions in this EWP prior to receipt at the Site. A Request to Import/Reuse Fill or Soil form, which can be found in Appendix G and at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager by National Grid allowing a minimum of 5 business days for review. This form will include analytical sampling of the borrow source or existing documentation of agency approvals of the source (i.e. NYSDOT virgin source certification and latest analytical sampling results). NYSDEC approval must be received before material is imported to the Site.

Material from industrial sites, spill sites, other environmental remediation sites, or potentially impacted sites will not be imported to the Site.

All imported soils will meet the backfill and cover soil quality standards established in 6 NYCRR 375-6.7(d) and DER-10 Appendix 5 for restricted-residential use in Areas 1A and 1B and Commercial/Industrial use in Areas 2 and 3. Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are in accordance with those listed above for imported soil for the respective areas of the Site. Soils that meet 'general' fill requirements under 6 NYCRR Part 360.13, but do not meet backfill or cover soil objectives for this Site will not be imported onto the Site without prior approval by NYSDEC project manager. Solid waste will not be imported onto the Site.

Samples will be collected from imported fill in accordance with the analytical sampling requirements of DER-10 and the frequency requirements in NYSDEC's Soil Cleanup Guidance, CP-51. At a minimum, samples will be analyzed for Inorganics, Pesticides, PCBs, VOCs,

SVOCs, per- and polyfluoroalkyl substances (PFAS), and 1,4-dioxane and compared to the Restricted Residential, or Industrial Use SCOs listed in Table 375-6.8(b)] of 6 NYCRR Part 375. The frequency and type of the sampling (i.e. discrete or composite) will be based on the quantity of material imported in accordance with Table 4 of CP-51.

Trucks entering the 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 (Section X-3).

C-11 STORMWATER POLLUTION PREVENTION

For excavations less than one acre that are not part of a larger disturbance, the following stormwater management practices will be completed in accordance with the requirements in the New York State Stormwater Management Design Manual, latest revision.

Silt fencing and/or 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 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 silt fencing and/or 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 EWP 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.

In the event that the work on the property is part of a larger plan that disturbs more than 1 acre, the respective property owner must obtain coverage under the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity.

C-12 EXCAVATION CONTINGENCY PLAN

Identification of unknown or unexpected potentially impacted media identified by screening during invasive site work will be promptly communicated by phone to National Grid and National Grid will notify NYSDEC's project manager. Reportable quantities of petroleum

product will also be reported to the NYSDEC spills hotline. These findings will be also included in the PRR.

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations-excavation activities will be suspended until sufficient equipment is mobilized to address the condition. The NYSDEC project manager will be promptly notified of the discovery.

In the event that potential impacts are encountered at unexpected depth or locations, Site activities will be suspended and National Grid will be notified and will evaluate the observed conditions National Grid and/or NYSDEC may determine that laboratory testing is required to evaluate the observed conditions for concentrations and characteristics. If the encountered materials are determined to be MGP-impacted, then the encountered materials will be segregated and stockpiled for disposal at a National Grid approved facility.

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 [TAL metals, Target Compound List (TCL) volatiles and semi-volatiles (including 1,4-dioxane), pesticides and PCBs, PFAS, and free cyanide). In the event that future sampling results provide sufficient justification to limit the list of analytes, a reduced list of analytes will be proposed to the NYSDEC project manager for approval prior to sampling. Any tanks will be closed as per NYSDEC regulations and guidance.

C-13 COMMUNITY AIR MONITORING PLAN

The CAMP will consist of a real-time monitoring and action level reporting system. The CAMP will be conducted during all intrusive activity on the Site that are located within areas of MGP-impacted material. Location(s) of remedial excavation areas shown in Appendix B and remaining impacts are discussed in Section 2.4 of this SMP. National Grid will consult with NYSDOH and NYSDEC to determine the applicability of CAMP requirements outside of the MGP- impacted boundaries. Air sampling stations locations will be chosen based on generally prevailing wind conditions and adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations.

Special requirements for work within 20 feet of potentially exposed individuals or structures are listed in Appendix E. The CAMP requirements for each individual ground-intrusive activity will be evaluated on a case-by-case basis taking into consideration the proximity to occupied spaces, the use of the occupied space, known subsurface conditions at a specific on-site location, as well as potential receptors in the immediate area. The CAMP requirements will be proposed in the Notice of Intrusive Activity (NOIA) letter that is required to be submitted to the NYSDEC and NYSDOH. At that time, the NYSDEC and NYSDOH can provide comments on the proposed CAMP to be implemented during the intrusive activity described in the NOIA letter.

Exceedances of action levels listed in the CAMP (Appendix E) will be reported to NYSDEC and NYSDOH Project Managers.

C-14 ODOR CONTROL PLAN

Odors which derive from site impacts may cause a nuisance to some site workers and the surrounding community, even though the impacts are at levels well below the safety limits defined in the CAMP. This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used on a routine basis will include all reasonable and necessary means as described in the following paragraph. If nuisance odors are identified at the 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 by National Grid, 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 contractor, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and (f) use of staff to monitor odors in surrounding neighborhoods.

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.

C-15 DUST CONTROL PLAN

Particulate monitoring must be conducted according to the CAMP provided in Appendix E. If particulate levels at the site exceed the thresholds listed in the CAMP or if airborne dust is observed on the site or leaving the site, the dust suppression techniques listed below will be employed. The remedial party will also take measures listed below to prevent dust production on the site.

Dust which derives from site impacts may cause a nuisance to some site workers and the surrounding community, even though the impacts are at levels well below the safety limits defined in the CAMP. 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 using 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.

In the event that complaints are received for dust, the contractor will take the appropriate response actions for dust suppression listed above. If these actions are not successful, work will be stopped, and additional dust suppression alternatives will be evaluated and implemented. If upon resumption of work the nuisance is not mitigated, work will be stopped again until the nuisance condition is resolved.

C-16 OTHER NUISANCES

The following items may be necessary depending on the type of wastes present, the location of the site and other site-specific concerns. These plans are generally not required for submission to the NYSDEC but are generally required as part of construction.

A plan for rodent control will be developed and utilized by the contractor prior to and during Site clearing and Site 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.

Appendix D

Health and Safety Plan

Appendix E

Community Air Monitoring Plan

New York State Department of Health
Community Air Monitoring Plan

Overview

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

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

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

Community Air Monitoring Plan

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

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

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

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

VOC Monitoring, Response Levels, and Actions

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

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

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

Special Requirements for Work within 20 Feet of Potentially Exposed Individuals or Structures:

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1ppm, monitoring should occur within the occupied structure(s). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

  If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m3 or less at the monitoring point.

- Depending upon the nature of contamination and remedial activities, other parameters (e.g. explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

GEI Consultants

Consulting
Engineers and
Scientists

Health and Safety Plan

Downstate OMM
Multiple Sites
Long Island and New York City Area

Prepared For:
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June 2020
Project Nos. 1702897 and 1905774

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Project Manager

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Revisions to Final Approved Health and Safety Plan

Revision #	Submitted Date	Summary of Revision
1	August 2018	Added working on water and boat safety language. Added Matrix New World Engineering, Land Surveying and Landscape Architecture, PC to list of subcontractors performing on project.
2	April 2020	Added Coronavirus COVID-19 preparedness to HASP. Added Industrial Sales and Services Corporation and ADT A Cascade Company to list of subcontractors. Made edits to PPE to be worn for groundwater sampling and oxygen system inspections. Added Site Specific Information for Hempstead Intersection, Dangman Park, Inwood, and Patchogue (Appendices R through U).
3	June 2020	Added COVID-19 Preparedness and National Grid COVID-19 Procedures to Appendices

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U. Patchogue – Site Specific Information

Attachments

1. National Grid Reporting Requirements
2. Effective Management Practices Memo for Recovering NAPL
3. National Grid COVID-19 Procedures

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1. Emergency Contact Information

Table 1. Emergency Information

Important Phone Numbers		Directions to Hospital
Local Police:	911	To Hospital and Occupational Health Clinic: See Attached Maps and Directions for each site in Appendices (A-M)
Fire Department:	911	
Ambulance:	911	
State Police or County Sheriff:	911	
For Site-Specific Hospital and Occupational Clinic information – see Appendices A through M		
Project Manager: Chris Morris	(631) 759-2967 office (631) 484-9152 cell	
Field Operations Manager: Mike Quinlan	(631) 708-8063 cell	
Corporate Health and Safety Officer Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell	
Regional Health and Safety Officer Jeena Sheppard	(856) 608-5663 office (856) 298-7138 cell	
Client Contact: Sarah Aldridge	(516) 545-2568 office (860) 334-0554 cell	
Nearest Telephone Location: On-site cellular		

2. Background Information

2.1 General

Engineer	GEI Consultants, Inc., P.C. (GEI) 1000 New York Avenue Huntington Station, NY 11746
Project Name	Downstate OMM Multiple Address New York City & Long Island, New York

This Health and Safety Plan (HASP) establishes policies and procedures to protect GEI personnel from the potential hazards posed by the activities at the Downstate OMM sites located at Multiple Addresses within New York City and Long Island in New York. Site-specific information is provided in Appendices A through M. GEI personnel and Subcontractors are required to review and sign this HASP, acknowledging that they understand and will adhere to this HASP. Subcontractors will also prepare their own Site-specific HASP for the protection of their employees from the hazards associated with their work tasks and may use this document as a guide. GEI will verify that its subcontractor's HASP includes National Grid site-specific requirements, as outlined in this HASP.

Additionally, federal, state and local representatives, as well as National Grid employees may be required to sign and adhere to this HASP, depending on the nature of their presence onsite during activities conducted by GEI. The plan identifies measures to minimize accidents and injuries, which may result from project activities or during adverse weather conditions. A copy of this HASP will be maintained on site for the duration of the work.

Included in Appendices A through M and Appendices R through U are routes to the nearest medical facility from the Site with directions and contact information. Safety data sheets (formerly known as Material Safety Data Sheets [MSDS]) specific to chemicals that may be encountered while working at the Site, are in Appendix N. Appendix O details the signs, symptoms, care and procedures to both heat and cold stress. Appendix P includes the Tailgate Safety Briefing form, the Project Safety Briefing form, the Accident/Incident Report Form and the Near Miss Reporting Form. Appendix Q contains the GEI Health and Safety (H&S) Standard Operating Procedures (SOPs) that apply to this project.

GEI and Subcontractor employees have the authority to stop work activities if an unanticipated hazard is encountered or a potential unsafe condition is observed. The

GEI employees should contact the Corporate Health and Safety Officer and the Project Manager to discuss the stop work conditions and potential control methods that can be implemented.

2.2 Project Description

The activities conducted at the seventeen formerly regulated environmental waste sites across National Grid's Downstate New York service territory: these sites include former manufactured gas plant sites, holder stations, and former or current electric substations. Many of these sites are not owned by National Grid.

Services required in the Program include the operation and maintenance of groundwater treatment systems, oxygen injection systems, site inspections, groundwater monitoring site activities, NAPL monitoring, annual site-wide inspections for each site, general maintenance and any reporting requirements. Specific activities for each of the sites are included in the site-specific Appendices A through M and Appendices R through U.

2.3 Site Descriptions

See site-specific Appendices A through M and Appendices R through U.

3. Statement of Safety and Health Policy

GEI is committed to providing a safe and healthy work environment for its employees. To maintain a safe work environment, GEI has established an organizational structure and a Corporate Health and Safety Program to promote the following objectives:

- Reduce the risk of injury, illness, and loss of life to GEI employees.
- Maintain compliance with federal, state, and other applicable safety regulations; and minimize GEI employees' work exposure to potential physical, chemical, biological, and radiological hazards.

Safety policy and procedure on any one project cannot be administered, implemented, monitored, and enforced by any one individual. The total objective of a safe, accident free work environment can only be accomplished by a dedicated, concerted effort by every individual involved with the project from management down to all employees.

Each GEI employee must understand their value to the company; the costs of accidents, both monetary, physical, and emotional; the objective of the safety policy and procedures; the safety rules that apply to the safety policy and procedures; and what their individual role is in administering, implementing, monitoring, and compliance of their safety policy and procedures. This allows for a more personal approach to compliance through planning, training, understanding, and cooperative effort, rather than by strict enforcement. If for any reason an unsafe act persists, strict enforcement will be implemented.

4. Hazard/Risk Analysis

Physical hazards associated with heavy equipment operations may be present should the need arise to excavate, trench, or install or abandon groundwater monitoring wells, oxygen injection wells, or soil vapor points. These activities would require the use of heavy equipment such as a backhoe or drill rig. Some of the hazards associated with this equipment include bodily injuries, slipping, tripping, or falling, heavy lifting and electrical hazards associated with the substations.

Should intrusive activities be necessary, the selected Contractor should verify that electric, gas, water, steam, sewer, and other service lines are shut off, capped, or otherwise controlled, at or outside the building before demolition work is started. In each case, any utility company that is involved should be notified in advance by the selected Contractor, and its approval or services, if necessary, will be obtained.

Smoking is prohibited at or in the vicinity of hazardous operations or materials. Where smoking is permitted, safe receptacles will be provided for smoking materials. The hazards for this operation are listed in the following Activity Hazard Analysis and Site Hazards sections.

4.1 Personal Safety

Field activities have the potential to take employees into areas which may pose a risk to personal safety. The following website (source) has been researched to identify potential crime activity in the area of the project:

- www.city-data.com/crime.com: Provides average crime rates for cities.

  The crime rates (average number of crimes per 100,000 people) for each of the sites is listed below by category.

  Very Low (<50) – Halesite, Glenwood Landing, and Oyster Bay

  Low (50 – 199) – East Garden City, Patchogue and Sag Harbor

  Average (200 – 449) – Arverne, Rockaway Park, Bay Ridge, Clifton, Coney Island, Far Rockaway, Hempstead, Dangman Park, Inwood, and Flatbush

To protect yourself, take the following precautions:

- If deemed necessary by the Project Manager (PM), use the buddy system (teams of a minimum of two persons present);

- Let the Site Safety Officer (SSO) know when you begin work in these areas and when you leave;
- Call in regularly;
- Pay attention to what is going on around you; and
- If you arrive in an area and it does not look safe to get out of your vehicle, lock the doors and drive off quickly but safely.

Employees must not knowingly enter into a situation where there is the potential for physical and violent behaviors to occur. If employees encounter hostile individuals or a confrontation develops in the work area, suspend work activities, immediately leave the area of concern, and contact local 911 for assistance. Notify the SSO and Corporate Health and Safety Officer (CHSO) of any incidents once you are out of potential danger.

In the event of an emergency, prompt communications with local emergency responders is essential. At least one charged and otherwise functioning cell phone to facilitate emergency communications will be on-site. Confirmation of cellular phone operation will be confirmed at the start of each working day.

4.2 Activity Hazard Analysis

The potential hazards for this project associated with site conditions and activity hazards associated with GEI on-site activities have been identified in Table 2. General hazards and control measures that are applicable to all site activities are identified in the General Hazards section. The site-specific tasks, potential hazards, and control measures established to reduce the risk of injury or illness are identified in the Activity Hazard section of the site-specific Appendices A through M and Appendices R through U. Health and Safety SOPs for routine hazards and common site conditions are referenced in the table below and included in Appendix Q.

Table 2. Activity Hazard Analysis

General Hazards These Hazards Apply to All Site Activities	Control Measure
Inclement Weather	• Listen to local forecasts for warnings about specific weather hazards such as tornados, thunderstorms, and flash floods. • If the storms produce thunder and/or lightning, leave the work area immediately and move to a safe area. • Discuss an action plan prior to the severe weather. • Wear appropriate PPE for the type of weather that could be encountered. • Stop work until conditions are suitable. Take cover in vehicles or shelter as appropriate. • See SOP HS-010
Cold Stress – Hypothermia, Frostbite	• Take breaks in heated shelters when working in extremely cold temperatures. • Drink warm liquids to reduce the susceptibility to cold stress. • Wear protective clothing (recommended three layers: an outside layer to break the wind, a middle layer to provide insulation, and an inner layer of cotton of synthetic weave to allow ventilation). • Wear a hat and insulated boots. • Keep a change of dry clothing available in case clothes become wet. • Do heavy work during the warmer parts of the day and take breaks from the cold. • If possible, shield work areas from drafts of wind and use insulating material on equipment handles when temperatures are below 30°F. • Watch for symptoms of cold stress. (See Appendix O in HASP)
Heat stress – Fainting, Fatigue, Heat Stroke	• Increase water intake while working. • Increase number of rest breaks and/or rotate workers in shorter work shifts. Rest in cool, dry areas. • Watch for signs and symptoms of heat exhaustion and fatigue. • Plan work for early morning or evening during hot months. • Use ice vests when necessary. • In the event of heat stroke, bring the victim to a cool environment and initiate first aid procedures. • See Appendix O of the HASP

General Hazards These Hazards Apply to All Site Activities	Control Measure
Vehicular Traffic – Struck by injury, crushing	• Increase visibility of the work area to others by using cones, flags, barricades, proper lighting and caution tape to define work area. • Use a "spotter" to locate oncoming vehicles. • Use vehicle to block work area. • Engage police detail for all work conducted in appropriate areas. • Wear high-visibility, reflective vest at all times. • Maintain minimum DOT defined distances to other traffic lanes. • See SOP HS-016
Utilities – Shock, Electrocution, Fire, Explosion	• A thorough underground utility survey must be conducted prior to intrusive activities. Coordination with utility locating services, property owner(s) or utility companies must be conducted. • Utilities are to be considered live or active until documented otherwise. • For overhead utilities within 50 feet, determine with the utility company the appropriate distance. Minimum distance for clearance is based on voltage of the line. • If exposing a utility, proper support and protection must be provided so that the utility will not be damaged. • If a gas line is contacted, the contractor must notify police, fire, and emergency personnel, and evacuate employees according to the site evacuation procedures. No attempt should be made to tamper with or correct the damaged utility. • See SOP HS-014

General Hazards These Hazards Apply to All Site Activities	Control Measure
Driving	• Employees must wear their safety belt while in a moving vehicle. • Vehicle accidents will be reported in accordance with GEI's accident reporting procedures. • Vehicles will be properly maintained and safely operated (refer to GEI's Fleet Maintenance Program). • Employees will follow safe driving behaviors, which include limiting distractions such as manipulating radios or other equipment that may cause a distraction. Employees should not exceed the posted speed limit and should maintain a safe distance between other vehicles. • Use defensive driving techniques. • Driving distance and time after a 12-hour shift should not exceed 30 miles or 30 minutes (whichever is greater). • See SOP HS-004
Insects – Bites, Stings, Allergic Reactions	• Apply insect repellent prior to performing field work and as often as needed throughout the work shift. • Wear proper protective clothing (work boots, socks and light-colored clothing). • Wear shoes, long pants with bottoms tucked into boots or socks, and a long-sleeved shirt when outdoors for long periods of time, or when many insects are most active (between dawn and dusk). • When walking in wooded areas, avoid contact with bushes, tall grass, or brush as much as possible. • Field personnel who may have insect allergies should have bee sting allergy medication on site and should provide this information to the SSO and the CHSO prior to commencing work. • Field personnel should perform a self-check at the end of the day for ticks. • See SOP HS-001

General Hazards These Hazards Apply to All Site Activities	Control Measure
Physical Injury – Slips, Trips and Falls	• Wear PPE that properly fits, is in good condition and appropriate for the activities and hazards. • Maintain good visibility of the work area. • Avoid walking on uneven, steeply sloped or debris ridden ground surfaces. • Plan tasks prior to preforming them including an activity hazard analysis. • Keep trafficked areas free from slip/trip/fall hazards. • Maintain weed growth in sampling areas, especially on slopes. • Wear shoes with traction. • Avoid traversing steep areas in slippery conditions. • Do not carry heavy objects to sampling areas, on steeply sloped areas, or where steep areas must be traversed to arrive at sample points.
Poisonous Plants – Poison Ivy, Poison Oak, and Poison Sumac	• Avoid areas infested with poisonous plants. • Use a barrier cream to provide some protection. • Wash exposed clothing separately in hot water with detergent. • After use, clean tools, and soles of boots with rubbing alcohol or soap and lots of water. • Immediately wash with soap and water any areas that come into contact with poisonous plants. • If exposed to a poisonous plant, wash with soap and water or a product such as Tecnu™. First aid kits are available in company vehicles. • See SOP HS-001
Repetitive Motion Injury – Standing, Squatting, and Bending Over	• Take regular breaks and do not work in unusual positions for long periods of time. • Walk and stretch between tasks. • See SOP HS-025

Personal Protective Equipment (PPE) is the initial level of protection based on the activity hazards and Site conditions which have been identified. Upgrades to respiratory protection may be required based on the designated Action Levels found in Section 9. General on-site provisions will include: extra nitrile, leather, and/or Kevlar® gloves, extra protective coveralls (e.g. Tyvek®) with boot covers, drinking water and electrolyte fluids, reflective vest, first aid kit, fire extinguisher, hearing protection, and washing facilities.

If Site conditions suggest the existence of a situation more hazardous than anticipated, the Site personnel will evacuate the immediate area. The hazard, the level of precautions, and the PPE will then be reevaluated with the assistance and approval of the CHSO and the Project Manager (PM) Chris Morris.

4.2.1 Handling Drums and Containers

Regulations for handling drums and containers are specified by Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1910.120(j). Potential hazards associated with handling drums include vapor generation, fire, explosions, and possible physical injury. Handling of drums/containers during the OM&M activities may be necessary. If drum/container handling is necessary, it will be performed in accordance with applicable regulations.

4.2.2 Electrical Hazards

4.2.2.1 Electric Substations

Electrical hazards are typically the most serious physical hazards associated with working on or **near an electric substation**. The following sites contain substations: Arverne, East Garden City, Halesite, Oyster Bay, and Rockaway. All staff working within substations must have completed PSEG Long Island Substation Awareness training. Measures to mitigate exposure to overhead and subsurface electrical transmission and distribution lines should still be considered:

- Contact Dig-Safely New York for mark out of underground public utilities.
- Obtain the most recent as-built drawings of the transmission/distribution line layout from utility owner.
- Mark out of underground transmission/distribution lines by utility owner's survey/mark out personnel.
- Conduct work under the supervision of a National Grid Health and Safety representative.
- Use hand digging tools specifically designed for use on substation property (i.e., insulated digging bar, long-handled spoon shovel, etc.). In addition, rubber gloves and Fire-Resistant clothing are required if hand digging in a substation in/or around energized conductors, which is not anticipated to be the case.
- Use insulated lineman's gloves.
- Electrical Hazard (EH)-rated footwear is required when working on or around electrical equipment over 50 volts, or in an area of expected downed wires.

- Avoid carrying tools/equipment above waist height if overhead electric hazards exist.
- Ground vehicles or equipment using 4-aught gauge grounding cable.
- Maintain a minimum clearance of 16 feet from bus bars, transformer/capacitor electrodes, and overhead transmission/distribution lines.
- Maintain a minimum offset of 3 feet from marked underground transmission/ distribution lines.
- Avoid working on substation in conditions of high humidity or rain or thunderstorms.
- Stop work immediately and vacate the work area in the event lightning is observed.

4.2.2.2 Utilities

The Sites may have shallow, buried utilities and overhead utilities in certain areas. It will be necessary for parties disturbing the existing ground surface and conducting operations with heavy equipment having high clearances to exercise caution in performing project-related work with respect to the presence of utilities. Utility companies with active, buried lines in the Site area will be asked by the Contractor performing intrusive activities to mark their facilities. Employees will use these data to choose work locations.

4.2.2.3 Underground Utilities

No excavating, drilling, boring, or other intrusive activities will be performed until an underground utility survey, conducted by knowledgeable persons or agencies, has been made. This survey will identify underground and in-workplace utilities such as the following:

- Electrical lines and appliances;
- Telephone lines;
- Cable television lines;
- Gas lines;
- Pipelines;
- Steam lines;
- Water lines;
- Sewer lines; and/or
- Pressurized air lines.

The location of utilities will be discussed with GEI employees and subcontractors during a Site Safety Briefing. Identified utilities should be marked or access otherwise restricted to avoid chance of accidental contact.

Even when a utility search has been completed, drilling, boring, and excavation should commence with caution until advanced beyond the depth at which such utilities are usually located. Utilities will be considered "live" or active until reliable sources demonstrate otherwise.

4.2.2.4 Overhead Utilities

Overhead transmission and distribution lines will be carried on towers and poles which provide adequate safety clearance over roadways and structures. Clearances will be adequate for the safe movement of vehicles and for the operation of construction equipment.

Overhead or above-ground electric lines should be considered active until a reliable source has documented them to be otherwise. Elevated work platforms, ladders, scaffolding, man-lifts, and drill or vehicle superstructures will be erected a minimum of 20 feet (the actual distance is dependent upon the voltage of the line) from overhead electrical lines until the line is de-energized, grounded, or shielded so arcing cannot occur between the work location or superstructure.

4.2.3 Precautions for Working in Confined Spaces

Work in confined spaces will be performed in accordance with 29 CFR 1910.146 (effective April 15, 1993), and GEI Permit Required Confined Space Entry program. The PM will work with the CHSO to address confined space issues as applicable prior to the start of the project. A confined space entry number will be obtained from the CHSO before entering space. The PM will contact local emergency responders to make arrangements for potential rescue. This correspondence will be documented and submitted to the CHSO. Copies of the standards will be kept on file in GEI's main office. Confined space work will not be performed without first notifying and receiving approval from the CHSO.

4.2.4 Excavations and Trenches

The safety requirements for excavations and trenches must be determined by a competent person who is capable of identifying existing and predictable hazards and work conditions that are unsanitary, hazardous, or dangerous to GEI employees. The competent person must also have the authorization to take prompt corrective measures to eliminate unsatisfactory conditions. GEI employees will not enter trenches.

The following are general requirements for work activities in and around excavations:

- Prior to initiation of excavation activity (or ground intrusive activity, such as drilling), the location of underground installations will be determined. The Dig-Safely New York center will be contacted by the Contractor/Subcontractor a minimum of 72 hours prior to excavation activities. It may also be necessary to temporarily support underground utilities during excavation. When excavations approach the estimated location of underground installations, the exact location of the underground installations will be determined by means that are safe for GEI employees, i.e., hand dig, test pits, etc.
- Excavations should be inspected daily by the excavating company's competent person prior to commencement of work activities. Evidence of cave-ins, slides, sloughing, or surface cracks or excavations will be cause for work to cease until necessary precautions are taken to safeguard employees.
- Excavated and other materials or equipment that could fall or roll into the excavation, and vehicular traffic and heavy equipment will be placed at least 5 feet from the edge of the excavation.
- Excavation operations will cease immediately during hazardous weather conditions such as high winds, heavy rain, lightning, and heavy snow.

Employees will refer to GEI's Excavation Safety SOP for further information.

4.2.5 Fire and Explosion

When conducting excavating activities, the opportunity for encountering fire and explosion hazards exists from contamination in soil and the possibility of free product in underground structures and pipelines. Additionally, the use of diesel-powered excavating equipment could present the possibility of encountering fire and explosion hazards.

4.2.6 Heat Stress

Employees may be exposed to the hazards associated with heat stress when ambient temperatures exceed 70ºF. Employees should increase water intake while working in conditions of high heat. Enough water should be available so that each employee can consume 1 quart of water per hour. In addition, they should increase number of rest breaks and/or rotate employees in shorter work shifts. Employees should rest in cool, dry, shaded areas for at least 5 minutes. Employees should not wait until they feel sick to cool down. Watch for signs and symptoms of heat exhaustion and fatigue. In the event of heat stroke, bring the victim to a cool environment, call for help, and initiate first aid procedures

The procedures to be followed regarding avoiding heat stress are provided in Appendix O – Heat Stress Guidelines and in GEI's Heat Stress program.

4.2.7 Cold Stress

Employees may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trench foot or immersion foot, hypothermia, as well as slippery surfaces, brittle equipment, and poor judgment. The procedures to be followed regarding avoiding cold stress are provided in Appendix O – Cold Stress Guidelines and in GEI's Cold Stress program.

4.2.8 Noise

Noise is a potential hazard associated with the operation of heavy equipment, power tools, pumps, and generators. Employees who will perform suspected or established high noise tasks and operations for short durations (less than 1-hour) will wear hearing protection. If deemed necessary by the SSO, the CHSO will be consulted on the need for additional hearing protection and the need to monitor sound levels for Site activities. Other employees who do not need to be in proximity of the noise should distance themselves from the equipment generating the noise.

4.2.9 Hand and Power Tools

In order to complete the various tasks for the project, personnel may use hand and power tools. The use of hand and power tools can present a variety of hazards, including physical harm from being struck by flying objects, being cut or struck by the tool, fire, and electrocution. Work gloves, safety glasses, and hard hats will be worn by the operating personnel when using hand and power tools and Ground Fault Indicator (GFI)-equipped circuits will be used for power tools.

4.2.10 Slips, Trips, and Falls

Working in and around the Site may pose slip, trip, and fall hazards due to slippery and uneven surfaces. Excavation at the Site may cause uneven footing in trenches and around the soil piles. Steep slope and uneven terrain conditions at the Site are also a primary concern. GEI employees will wear proper foot gear and will employ good work practice and housekeeping procedures to minimize the potential for slips, trips, and falls.

4.2.11 Manual Lifting

Manual lifting of objects and equipment may be required. Failure to follow proper lifting technique can result in back injuries and strains. Employees should use a buddy system and/or power equipment to lift heavy loads whenever possible and should evaluate loads before trying to lift them (i.e., they should be able to easily tip the load and then return it to its original position). Carrying heavy loads with a buddy and proper lifting techniques

include: 1) make sure footing is solid; 2) make back straight with no curving or slouching; 3) center body over feet; 4) grasp the object firmly and as close to your body as possible; 5) lift with legs; and 6) turn with your feet, don't twist.

4.2.12 Projectile Objects and Overhead Dangers

Overhead dangers, including but not limited to falling debris and equipment, can occur while operating drill rigs. GEI employees will maintain a minimum distance from large overhead operations and to maintain proper communication with heavy equipment operators and their handlers, should work necessitate their presence beyond the minimum safety distance. Proper PPE will be worn during these types of activities including steel-toed/shank boots, safety vests, and hard hats.

4.2.13 Cuts and Lacerations

The core sampling program may require employees to use powered cutting tools (circular saw or shears) or a hooked knife to cut open the sample liner. Safety box cutters will be utilized for routine operations such as opening boxes of supplies or cutting rope or string. When using cutting tools, follow the safety precautions listed below:

- Keep free hand out of the way.
- Secure work if cutting through thick material.
- Use only sharp blades; dull blades require more force that results in less knife control.
- Pull the knife toward you; pulling motions are easier to manage.
- Do not put the knife in your pocket.
- Wear leather or Kevlar® gloves when using knives or blades, or when removing sharp objects caught or dangling in sampling gear.

4.2.14 Fall Protection

A Fall Protection Plan must be developed when GEI employees are working at heights above 5 feet. The Fall Protection Plan template can be found on the Health and Safety page of the GEI intranet. This plan must be submitted to the CHSO for approval and will be attached to this HASP as an appendix.

4.2.15 Working Near Water

The following sites are located near water bodies: Halesite, Rockaway Park, Far Rockaway, Coney Island, Glenwood Landing, and Sag Harbor. The buddy system will be used when working near water, in which two persons operate as a single unit in order to monitor and

assist each other in performing tasks. Personnel must be attired in a United States Coast Guard (USCG)-approved Type III or Type V work vest. The vest must be properly sized for the individual and must be secured. A throwable rescue device (Type IV personal flotation device [PFD] flotation aid) along with whatever equipment (i.e., ladders, lifting gear, or rescue boat) necessary will be immediately available to recover an individual from the water.

Waders may not be worn when working along, over, or in moving waters; or in waters influenced by tides or acted upon by waves when water depths exceed knee height unless specifically approved by the CHSO. Waders may be worn in still waters and in water depths up to the waist, if bottom conditions are firm and well understood. Waders should never be worn aboard a watercraft.

Take special care on slippery rocks along shorelines, lakeshores, riverbanks, and creeks. Always look ahead at the ground when walking around the water's edge and avoid stepping on stones that have algal growth, especially those in intertidal areas, as these are extremely slippery. Employees should limit access to areas where these slip/fall hazards exist, especially in locations containing tidal water flow.

4.2.16 Boating Safety

As part of the tri-annual sampling event conducted at the Coney Island MGP Site, surface water and sediment samples are to be collected from Coney Island Creek. The sediment samples will be collected from eight locations within the creek from a vessel operated by GEI. The vessel will be relatively small (approximately 12-feet in length) and will be manually operated using oars with oar locks.

In addition, a bathymetric survey of the Creek will also be conducted by vessel within the Creek. This portion of the work will be done by a subcontractor. GEI will oversee the work from shore.

4.2.16.1 Person Overboard

If someone falls overboard, the remaining personnel on the vessel will:

- Immediately throw anything that floats overboard to mark the position of the person.
- Throw a life ring (Type IV PFD) overboard as close to the person as possible.
- Maneuver the vessel to pick up the person in the water.
- Have the life ring with line attached ready to throw near the person so they may be pulled to the boat.

- If the person is not located immediately, radio the USCG and other vessels in the area.

4.2.16.2 Severe Weather

If severe weather is approaching, the decision to return to a pier or secure location at the shore of the creek will be made in a manner as to allow adequate time for the boat to return and personnel to evacuate. The location where the boat will dock is to be determined by its location in the body of water and the severity of the weather. The person in command of the vessel will make the final decision regarding movement of the boat. Equipment will be lashed securely to the deck of the boat and personnel will evacuate the boat to a place of safety. The vessel captain will make the final decision for actions taken due to changing weather conditions.

The field leader is responsible for:

- Keeping bilges dry to prevent loss of stability.
- Keeping passengers seated and evenly distributed.
- Clearing deck drains and securing lines from washing overboard.

4.2.16.3 Abandon Ship

The field leader and SSO:

- NEVER abandon ship unless actually forced to do so.
- In the event the vessel has to be abandoned the field leader and SSO will ensure that nearby boats and the USCG have been contacted with the locations.
- Life jackets are distributed throughout the vessel in plain view.
- If near or after dark, attach water lights to rafts and life rings.

4.3 Chemical Hazards

The characteristics of the compounds that may be encountered at most of the sites in the program varies and are discussed below for information purposes. However, it is unlikely that these compounds would be encountered at the sites in which the only activity included in the scope of work is a site inspection, namely, Arverne, Oyster Bay, Hempstead-Clinton, and Glenwood Landing. Volatile organic chemicals (VOCs) and Semi-volatile organic compounds (SVOCs) could be encountered at the each of the remaining sites. Adherence to the safety and health guidelines in this HASP should reduce the potential for exposure to the compounds discussed below.

4.3.1 Volatile Organic Compounds

Volatile organic chemicals (VOCs), such as benzene, toluene, ethyl benzene, and xylene (BTEX) are present as soil and groundwater contaminants, and in some cases chemical components in non-aqueous phase liquids (NAPL) such as such as oil or tar within soils and underground structures. These compounds are at environmental concentrations and are not expected to be at concentrations that exposure symptoms would occur. These compounds generally have a depressant effect on the Central Nervous System (CNS), may cause chronic liver and kidney damage, and some are suspected human carcinogens. Benzene is a known human carcinogen. Acute exposure may include headache, dizziness, nausea, and skin and eye irritation. The primary route of exposure to VOCs is through inhalation and therefore respiratory protection is the primary control against exposure to VOCs.

4.3.2 Semi-Volatile Organic Compounds

Semi-volatile organic compounds (SVOCs) usually consist of a mixture of acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluorethene, benz(a)pyrene, benzo(e)pyrene, benzo(g,h,i)peryline, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3cd)pyrene, 2-methyl naphthalene, naphththalene, phenanthrene, phenols, and pyrene.

These SVOCs may be present at each of the sites within impacted soil and groundwater. They may also be present as a dense non-aqueous phase liquid (DNAPL) by-product of gas production within soils, former manufactured gas plant (MGP) structures, and abandoned pipelines at several sites including Halesite, Rockaway Park, Clifton, Coney Island, Hempstead Intersection, and Sag Harbor.

These compounds are at environmental concentrations and are not expected to be at concentrations that exposure symptoms would occur. SVOCs such as those listed above may cause contact dermatitis. Direct contact can be irritating to the skin and produce itching, burning, swelling, and redness. Direct contact or exposure to the vapors may be irritating to the eyes. Conjunctivitis may result from prolonged exposure. Many SVOCs are considered to be very toxic, if ingested. High levels of exposure to SVOCs, though not anticipated during work activities conducted during this project, may increase the risk of cancer including lung, kidney, and skin cancer. Naphthalene is also an eye and skin irritant and can cause nausea, headache, fever, anemia, liver damage, vomiting, convulsions, and coma. Poisoning may occur by ingestion of large doses, inhalation, or skin absorption.

The major route of entry for the work activities to be conducted at this Site is through direct contact. Exposure is most likely when handling soil and water samples. Inhalation may occur when the soil is disturbed causing respirable and nuisance dust particles to become airborne.

4.3.3 Coal Tar and Coal Tar Products

Coal tar products, which are semi-volatile organic compounds (SVOCs) consist of a mixture of acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluorethene, benz(a)pyrene, benzo(e)pyrene, benzo(g,h,i)peryline, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3cd)pyrene, 2-methyl naphthalene, naphththalene, phenanthrene, phenols, pyrene.

Coal tar products and other SVOCs may be present at each of the sites within impacted soil and groundwater. They may also be present as a dense non-aqueous phase liquid (DNAPL) by-product of gas production within soils, former manufactured gas plant (MGP) structures, and abandoned pipelines at several sites including Halesite, Rockaway Park, Clifton, Coney Island, and Sag Harbor. Coal tar products such as those listed above may cause contact dermatitis. Direct contact can be irritating to the skin and produce itching, burning, swelling, and redness. Direct contact or exposure to the vapors may be irritating to the eyes. Conjunctivitis may result from prolonged exposure. Coal tar is considered to be very toxic, if ingested. High levels of exposure to coal tar, though not anticipated during work activities conducted during this project, may increase the risk of cancer including lung, kidney, and skin cancer. Naphthalene is also an eye and skin irritant and can cause nausea, headache, fever, anemia, liver damage, vomiting, convulsions, and coma. Poisoning may occur by ingestion of large doses, inhalation, or skin absorption.

The major route of entry for the work activities to be conducted at these Sites is through direct contact. Exposure is most likely when handling soil and water samples. Inhalation may occur when the soil is disturbed causing respirable and nuisance dust particles to become airborne.

4.3.4 Heavy Metals

Each of the sites may contain low levels of metals. The sites at which metals are currently monitored for include Bay Ridge, Clifton, Coney Island, Far Rockaway, and Flatbush.

Exposure to high concentrations of arsenic can cause dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, and hyper pigmentation of skin. Chronic exposure to arsenic has resulted in lung cancer in humans.

Exposure to high concentrations of barium may cause acute symptoms such as irritated eyes, nose, upper respiratory system, and benign pneumoconiosis (baritosis).

Exposure to high concentrations of cadmium can cause acute symptoms such as pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness and pain; headache; chills,

muscle aches; nausea, vomiting, diarrhea; loss of the sense of smell), mild anemia; and is considered a potential occupational carcinogen.

Exposure to chromium can cause acute symptoms such as irritation of the eyes, nose and throat as well as wheezing and coughing. Chronic effects include nosebleeds, nasal congestion, dermatitis, and loss of sight.

Exposure to lead may cause acute symptoms such as eye irritation, weakness, weight loss, abdominal pain, and anemia. Chronic exposure to lead may result in kidney disease, effects to the reproductive system, blood forming organs, and CNS.

Lead and arsenic are regulated by specific OSHA standards. They are 29 CFR 1910.1025/1926.52 and 29 CFR 1910.1018/1926.1118, respectively. These standards include specific requirements for air monitoring, signs and labels, training and medical surveillance.

Exposure to high concentrations of selenium can cause mucous membrane irritation, coughing, sneezing, shortness of breath, chills, headaches, hypotension, and CNS depression. Chronic exposure to selenium could cause bronchial irritation, gastrointestinal distress, excessive fatigue, and skin discoloration.

Exposure to mercury can cause dizziness, salivation nausea, vomiting, diarrhea, constipation, emotional disturbance, and kidney injury. Chronic exposure to mercury can cause CNS damage.

These metals are at environmental concentrations and are not expected to be at concentrations that exposure symptoms would occur. As with SVOCs, the primary route of exposure is through inhalation of dust particles when soil is disturbed and becomes airborne.

4.3.5 Asbestos-Containing Materials

These Sites are not known to contain asbestos containing materials (ACM).

4.3.6 Polychlorinated Biphenyls

Polychlorinated biphenyls (PCBs) have previously been encountered during MGP site investigations at other sites. PCBs have historically been used from a number of sources including, but not limited to; electrical systems, hydraulic oils, lubricants, cutting oils, printer's ink, and asphalt. Exposure to PCBs can occur through unbroken skin without immediate pain or irritation. PCBs detected at the site are at environmental concentrations and are not expected to be at concentrations that exposure symptoms would occur. Acute effects of exposure to high concentrations of PCB can include eye, skin, nose, and throat

irritation. Chronic effects of PCB exposure can include skin swelling and redness, gastro-intestinal disturbances, and neurological effects such as headache, dizziness, nervousness, and numbness of extremities. PCBs are suspected human carcinogens that can cause liver cancer. PCBs can accumulate in fatty tissues and result in health effects after the initial exposure has occurred. The primary route of exposure for PCBs is inhalation, dermal contact, and ingestion. PCBs are not currently monitored at any of the program sites.

4.3.7 Cyanide

Cyanide compounds are common by-products of manufactured gas production. Hydrogen cyanide is toxic because it is a chemical asphyxiate. It replaces the oxygen in the blood and thereby suffocates the cells. Ferro cyanides are not considered toxic because the hydrogen cyanide ion is bound too tightly to the iron and cannot therefore replace the oxygen. It takes a great amount of heat and/or acid to release cyanide gas from the ferro cyanide molecule; therefore, hydrogen cyanide is not a concern at this Site. However, it is National Grid policy to monitor for hydrogen cyanide during earth-disturbing activities at sites where MGP-related contaminants have been found. The sites being specifically monitored for cyanide include: East Garden City, Rockaway, and Clifton.

4.3.8 Hydrogen Sulfide

Hydrogen sulfide is another common by-product of manufactured gas production. Exposure to lower concentrations can result in eye irritation, a sore throat and cough, shortness of breath, and fluid in the lungs. These symptoms usually go away in a few weeks. Long-term, low-level exposure may result in fatigue, loss of appetite, headaches, irritability, poor memory, and dizziness. Breathing very high levels (> 800 parts per million [ppm]) of hydrogen sulfide can cause death within just a few breaths. The primary route of exposure is through inhalation and therefore respiratory protection is the primary control against exposure to hydrogen sulfide. Hydrogen sulfide is not currently monitored at any of the program sites.

4.3.9 Evaluation of Organic Vapor Exposure

Air monitoring reduces the risk of overexposure by indicating when action levels have been exceeded and when PPE must be upgraded or changed. Action Levels for VOCs and associated contingency plans for the work zone are discussed within Section 9 of this HASP.

Exposure to organic vapors will be evaluated and/or controlled by:

- Monitoring air concentrations for organic vapors in the breathing zone with a photoionization detector (PID) or a flame ionization detector (FID).

- When possible, engineering control measures will be utilized to suppress the volatile organic vapors. Engineering methods can include utilizing a fan to promote air circulation, utilizing volatile suppressant foam, providing artificial ground cover, or covering up the impacted material with a tarp to mitigate volatile odors.
- When volatile suppression engineering controls are not effective and organic vapor meters indicate concentrations above the action levels, then appropriate respiratory protection (i.e., air purifying respirator with organic vapor cartridge) will be employed.

4.3.10 Evaluation of Skin Contact and Absorption

Skin contact by contaminants may be controlled by use of proper hygiene practices, PPE, and good housekeeping procedures. The proper PPE (e.g., Tyvek®, gloves, safety glasses) as described in Section 5 will be worn for activities where contact with potential contaminated media or materials are expected.

SDSs for decontamination chemicals and laboratory reagents that may be used on Site are included in Appendix N. Specific chemical hazards information from the occupational health sources are summarized in Table 3.

Table 3. Chemical Data

Compound	CAS #	ACGIH TLV	OSHA PEL	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
Arsenic	7440-38-2	0.01 mg/m^3	0.01 mg/m^3 A.L. .005mg/m3	Inhalation Skin Absorption Ingestion Skin Contact	Ulceration of nasal septum, dermatitis, GI disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin, potential carcinogen	Liver, kidneys, skin, lungs, lymphatic system	Metal: Silver-gray or tin-white, brittle, odorless solid FP: NA IP: NA LEL: NA UEL: NA VP: 0 mm
Benzene	71-43-2	0.5 ppm (Skin)	1 ppm TWA 5 ppm STEL	Inhalation Skin Absorption Ingestion Skin Contact	Irritation of eyes, skin, nose, respiratory system, giddiness, headache, nausea; staggering gait, fatigue, anorexia, weakness, dermatitis, bone marrow depression, potential carcinogen	Eyes, skin, CNS, bone marrow, blood	FP: 12° F IP: 9.24 eve LEL: 1.2% UEL:7.8% VP: 75 mm
Chromium (Chromic Acid and Chromates)	1333-82-0	0.05 mg/m^3	0.1 mg/m^3	Inhalation Ingestion Skin Contact	Irritates respiratory system, nasal, septum perforation, liver and kidney damage, leucocytosis (increased blood leucocytes), leukopenis (reduced blood leucocytes), moncytosis (increased monocytes), Eosinophilia, eye injury, conjunctivitis, skin ulcer, sensitivity dermatitis, potential carcinongen	Blood, respiratory system, liver, kidney, eyes, skin, lung cancer	FP:NA IP:NA VP: Very Low LEL: NA UEL: NA
Copper (as a fume)	1317-38-0	NIOSH REL: TWA 0.1 mg/m3	TWA 0.1 mg/m3	Inhalation, skin and/or eye contact	Irritation eyes, upper respiratory system; metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough, lassitude (weakness, exhaustion); metallic or sweet taste; discoloration skin, hair	Eyes, skin, respiratory system (increased risk with Wilson's disease)	Finely divided black particulate dispersed in air FP: NA IP: NA LEL: NA UEL: NA VP: 0 mm
Ethylbenzene	100-41-4	100 ppm	100 ppm	Inhalation Ingestion Skin Contact	Eye, skin, mucous membrane irritation; headache; dermatitis, narcosis; coma	Eyes, skin, respiratory system, CNS	FP: 55° F IP: 8.76 eV LEL: 0.8% UEL:6.7% VP: 7 mm

Table 3. Chemical Data

Compound	CAS #	ACGIH TLV	OSHA PEL	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
Hydrogen cyanide	74-90-8	4.7 ppm (5 mg/m^3) STEL [skin]	10 ppm (11 mg/m^3) [skin]	Inhalation Ingestion Absorption Skin/Eye Contact	Asphyxia; weakness, headache, confusion; nausea, vomiting; increased rate and depth of respiration or respiration slow and gasping; thyroid, blood changes	CNS, CVS, thyroid, blood	Colorless or pale-blue liquid or gas (above 78°F) with a bitter, almond-like odor. VP: 630 mmHg IP: 13.60 eV
Hydrogen sulfide	7783-06-4	10 ppm TWA, 15 ppm STEL	20 ppm C, 50 ppm [10-min. Maximum peak]	Inhalation Skin/Eye Contact	Irritation eyes, respiratory system; apnea, coma, convulsions; conjunctivitis, eye pain, lacrimation (discharge of tears), photophobia (abnormal visual intolerance to light), corneal vesiculation; dizziness, headache, fatigue, irritability, insomnia; gastrointestinal disturbance; liquid: frostbite	Eyes, respiratory system, CNS	Colorless gas with a strong odor of rotten eggs. VP: 17.6 atm IP: 10.46 eV
Iron	1309-37-1	Iron oxide dust and fume (Fe2O3) as Fe: 5 mg/m3 (TWA);	Iron oxide dust and fume: 10 mg/m3	Inhalation, ingestion, eye contact	Respiratory tract irritation, coughing, shortness of breath, overdose of iron may cause vomiting, abdominal pain, bloody diarrhea, vomiting blood, lethargy, and shock; acidity in the blood, bluish skin discoloration, fever, liver damage, and possibly death; eye and cornea irritation and discoloration	Eyes, respiratory system, GI tract, liver	Reddish brown solid FP: NA LEL: NA UEL: NA VP: 0 mmHg

Table 3. Chemical Data

Compound	CAS #	ACGIH TLV	OSHA PEL	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
Lead	7439-92-1	0.050 mg/m^3	0.05 mg/m^3 A.L. 0.03 mg/m3	Inhalation Ingestion Skin Contact	Weakness, insomnia; facial pallor; pal eye, anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis of wrist and ankles; irritates eyes, hypo tension	Eyes, GI tract, CNS, kidneys, blood, gingival tissue	A heavy, ductile, soft, gray solid. FP: NA IP: NA LEL: NA UEL: NA VP: 0 mm
Manganese	7439-96-5	TWA 1 mg/m^3 ST 3 mg/m^3	C 5 mg/m^3	Inhalation, ingestion	Manganism; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like fever; low-back pain; vomiting; malaise (vague feeling of discomfort); lassitude (weakness, exhaustion); kidney damage	Respiratory system, central nervous system, blood, kidneys	A lustrous, brittle, silvery solid. FP: NA LEL: NA UEL: Na VP: 0 mmHg
Mercury	7439-97-6	0.025 mg/m^3	0.10 mg/m3	Inhalation Ingestion Skin Contact Skin Absorption	Irritates eyes and skin, chest pain, cough, difficulty breathing, bronchitis, pneumonitis, tremor, insomnia, irritability, indecision, headache, fatigue, weakness, stomatitis, salivation, Gastrointestinal disturbance, weight loss, proteinuria	Eyes, skin, respiratory tract, central nervous system	Silver-white, heavy odorless liquid FP: NA IP:? LEL: NA UEL:NA VP: 0.0012 mm

Table 3. Chemical Data

Compound	CAS #	ACGIH TLV	OSHA PEL	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
Naphthalene	91-20-3		10 ppm (50 mg/m^3) TWA	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage	Eyes, skin, blood, liver, kidneys, central nervous system	FP: 174 F IP: 8.12 eV, LEL: 0.8% UEL:6.7%, VP: 0.08 mm
Sodium	7440-23-5		None	Skin absorption, inhalation, ingestion	Skin contact (irritant), of eye contact (irritant). Hazardous in case of skin contact (permeator), of ingestion, of inhalation. Inflammation of the eye is characterized by redness, watering, and itching. Skin	Skins, eyes, lungs	Boiling Point: 881.4°C (1618.5°F) Melting Point: 97.8°C (208°F) Critical Temperature: Not available. Specific Gravity: 0.97
Selenium	7782-49-2	0.2 mg/m^3	0.2 mg/m^3	Inhalation Ingestion Skin Contact	Irritant to eyes, skin, nose and throat, visual disturbance, headache, chills, fever, breathing difficulty, bronchitis, metallic taste, garlic breath, GI disturbance, dermatitis, eye and skin burns,	Eyes, skin, respiratory system, liver, kidneys, blood spleen	Amphorous or crystalline, red to gray solid FP: NA IP: NA LEL: NA UEL: NA VP: 0 mm
Thallium		NIOSH REL: TWA 0.1 mg/m3 [skin]	OSHA PEL: TWA 0.1 mg/m3 [skin]	Inhalation, skin absorption, ingestion, skin and/or eye contact	Nausea, diarrhea, abdominal pain, vomiting; ptosis, strabismus; peri neuritis, tremor; retrosternal (occurring behind the sternum) tightness, chest pain, pulmonary edema; convulsions, chorea, psychosis; liver, kidney damage; alopecia; paresthesia legs	Eyes, respiratory system, central nervous system, liver, kidneys, gastrointestinal tract, body hair	Properties vary depending upon the specific soluble thallium compound.

Table 3. Chemical Data

Compound	CAS #	ACGIH TLV	OSHA PEL	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
Toluene	108-88-3	50 ppm	200 ppm	Inhalation Skin Absorption Ingestion Skin Contact	Eye, nose irritation; fatigue, weakness, confusion, euphoria, dizziness, headache; dilated pupils, tearing of eyes; nervousness, muscle fatigue, insomnia, tingling in limbs; dermatitis	Eyes, skin, respiratory system, CNS, liver, kidneys	FP: 40° F IP: 8.82 eV LEL: 1.1% UEL:7.1% VP: 21 mm
Xylene	1330-20-7	100 ppm	100 ppm	Inhalation Skin Absorption Ingestion, Skin Contact	Eye, skin, nose, throat irritation; dizziness, excitement, drowsiness; incoordination, staggering gait; corneal damage; appetite loss, nausea, vomiting, abdominal pain; dermatitis	Eyes, skin, respiratory system, Central Nervous System, GI tract, blood, liver, kidneys	FP: 90° F LEL: 0.9% UEL: 6.7% VP: 9 mm
Zinc	1314-13-2	5 mg/m3 (TWA), 10 mg/m3 (STEL) for zinc oxide fume	10 mg/m3 (TWA), for zinc oxide fume	Inhalation	Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function	Respiratory system	Colorless liquid FP: NA? IP: 11 eV LEL: 7.5% UEL: 12.5% VP: 100 mmHg

Table 3. Chemical Data

Compound	CAS #	ACGIH TLV	OSHA PEL	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
Nickel	7440-02-0 (Metal)	NIOSH REL*: Ca TWA 0.015 mg/m3 [*Note: The REL does not apply to Nickel carbonyl.]	TWA 1 mg/m3 [*Note: The PEL does not apply to Nickel carbonyl.]	Inhalation, ingestion, skin and/or eye contact	Sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]	Nasal cavities, lungs, skin **Cancer Site: [lung and nasal cancer]**	Metal: Lustrous, silvery, odorless solid FP: none LEL:N/A UEL: N/A VP: 0 mm

Abbreviations:

°F = degrees Fahrenheit
ACGIH = American Conference of Industrial Hygienists
A.L. = Action Level
atm = atmosphere
C = ceiling limit, not to be exceeded
CAS # = chemical abstract services number
CNS = Central Nervous System
CTPV = Coal Tar Pitch Volatiles
CVS = Cardiovascular System
eV = electron volt
f/cc = fibers per cubic centimeter
FP = Flash point
IP = Ionization Potential
LEL = Lower explosive limit
mg/m^3 = micrograms per cubic meter
min = minute
mm = millimeter
mmHg = millimeters of mercury
N/A = not applicable
OSHA = Occupational Safety and Health Administration
PAH = Polycyclic Aromatic Hydrocarbons
PCB = Polychlorinated Biphenyls
PEL = Permissible exposure limit
ppm = parts per million

Table 3. Chemical Data

Compound	CAS #	ACGIH TLV	OSHA PEL	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data

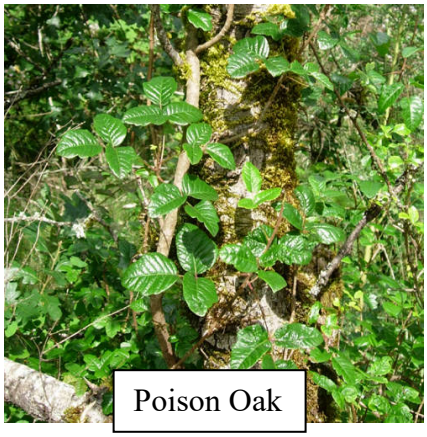
GI = Gastro-intestinal
H2S = Hydrogen Sulfide
HCN = Hydrogen Cyanide
hr = hour
Skin = significant route of exposure
STEL = Short-term exposure limit (15 minutes)
TWA = Time-weighted average (8 hours)
VP = vapor pressure approximately 68°F in mm Hg

4.4 Biological Hazards

Areas of the Sites may be wooded, surrounded with brush, or landscaped. Therefore, employees working on this project should be aware of the potential biological hazards at this Site. Each is discussed in detail below:

4.4.1 Poisonous Plants

Persons working on the Site should be aware of the possible presence of poisonous plants and insects. Poison ivy is a climbing plant with leaves that consist of three glossy, greenish leaflets. Poison ivy has conspicuous red foliage in the fall. Small yellowish-white flowers appear in May through July at the lower leaf axils of the plant. White berries appear from August through November. Poison ivy is typically found east of the Rockies. Poison oak is similar to poison ivy, but its leaves are oak-like in form. Poison oak occurs mainly in the south and southwest. Poison sumac typically occurs as a small tree or shrub and may be 6 to 20 feet in height. The bark is smooth, dark and speckled with darker spots. Poison sumac is typically found in swampy areas and east of the Mississippi. The leaves have 7 to 13 smooth-edged leaflets and drooping clusters of ivory-white berries that appear in August and last through spring.



Poison Oak

Poison Ivy

Poison Sumac

The leaves, roots, stems and fruit of these poisonous plants contain urushiol. Contact with the irritating oil causes an intensely itching skin rash and characteristic, blister-like lesions.

The oil can be transmitted on soot particles when burned and may be carried on the fur of animals, equipment, and apparel.

Proper identification of these plants is the key to preventing contact and subsequent dermatitis. Wear long sleeves and pants when working in wooded areas. In areas of known infestation, wear Tyvek® coveralls and gloves. Oils are easily transferred from one surface to another. If you come in contact with these poisonous plants, wash exposed areas immediately with cool water to remove the oils. Some commercial products such as Tecnu's Poison Oak-n-Ivy Cleanser claim to further help with the removal of oils.

4.4.2 Ticks

4.4.2.1 Lyme Disease

Ticks are bloodsuckers, attaching themselves to warm-blooded vertebrates to feed. Deer ticks are associated with the transmission the bacteria that causes Lyme disease. Female deer ticks are about ¼-inch in length and are black and brick red in color. Males are smaller and all black. If a tick is not 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, which the tick apparently injects while engorging. This neurotoxin acts upon the spinal cord causing incoordination, weakness, and paralysis.

The early stages of Lyme disease, which can develop within a week to a few weeks of the tick bite, are usually marked by one or more of these signs and symptoms:

- Tiredness
- Chills and fever
- Headache
- Muscle and/or join pain
- Swollen lymph glands
- Characteristic skin rash (i.e. bullseye rash)

4.4.2.2 Rocky Mountain Spotted Fever

Rocky Mountain spotted fever is spread by the American dog tick, the lone-star tick, and the wood tick, all of which like to live in wooded areas and tall, grassy fields. The disease is most common in the spring and summer when these ticks are active, but it can occur anytime during the year when the weather is warm.

Initial signs and symptoms of the disease include sudden onset of fever, headache, and muscle pain, followed by development of a rash. Initial symptoms may include fever, nausea, vomiting, severe headache, muscle pain, and/or lack of appetite.

The rash first appears 2 to 5 days after the onset of fever and is often not present or may be very subtle. Most often it begins as small, flat, pink, non-itchy spots on the wrists, forearms, and ankles. These spots turn pale when pressure is applied and eventually become raised on the skin. Later signs and symptoms include rash, abdominal pain, joint pain, and/or diarrhea.

The characteristic red, spotted rash of Rocky Mountain spotted fever is usually not seen until the 6th day or later after onset of symptoms, and this type of rash occurs in only 35% to 60% of patients with Rocky Mountain spotted fever. The rash involves the palms or soles in as many as 50% to 80% of patients; however, this distribution may not occur until later in the course of the disease.

4.4.2.3 Prevention

Tick season lasts from April through October; peak season is May through July. You can reduce your risk by taking these precautions:

- During outside activities, wear long sleeves and long pants tucked into socks. Wear a hat, and tie hair back.
- Use insecticides to repel or kill ticks. Repellents containing the compound n,n-diethyl-meta-toluamide (DEET) can be used on exposed skin except for the face, but they do not kill ticks and are not 100% effective in discouraging ticks from biting. Products containing permethrin kill ticks, but they cannot be used on the skin -- only on clothing. When using any of these chemicals, follow label directions carefully.
- After outdoor activities, perform a tick check. Check body areas where ticks are commonly found: behind the knees, between the fingers and toes, under the arms, in and behind the ears, and on the neck, hairline, and top of the head. Check places where clothing presses on the skin.
- Remove attached ticks promptly. Removing a tick before it has been attached for more than 24 hours greatly reduces the risk of infection. Use tweezers and grab as closely to the skin as possible. Do not try to remove ticks by squeezing them, coating them with petroleum jelly, or burning them with a match. Keep ticks in a zip-lock baggie in case testing needs to be performed.
- Report any of the above symptoms and all tick bites to the PM and CHSO for evaluation.

4.4.3 Mosquito- Borne Disease – West Nile Virus

West Nile encephalitis is an infection of the brain caused by the West Nile virus, which is transmitted by infected mosquitoes. Following transmission from an infected mosquito, West Nile virus multiplies in the person's blood system and crosses the blood-brain barrier to reach the brain. The virus interferes with normal CNS functioning and causes inflammation of the brain tissue. However, most infections are mild, and symptoms include fever, headache, and body aches. More severe infections may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and rarely, death. Persons over the age of 50 have the highest risk of severe disease.

Prevention centers on public health action to control mosquitoes and on individual action to avoid mosquito bites. To avoid being bitten by the mosquitoes that cause the disease, use the following control measures:

If possible, stay inside between dusk and dark. This is when mosquitoes are most active. When outside (between dusk and dark), wear long pants and long-sleeved shirts. Spray exposed skin with an insect repellent, preferably containing DEET.

4.4.4 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. Some people may develop an allergic reaction (i.e. anaphylactic shock) to a wasp or bee sting. If such a reaction develops, seek medical attention at once. If a GEI employee is allergic to bees or wasps notify the SSO and if, needed, the location of the epi pen.

4.4.5 Sun Exposure

Employees are encouraged to liberally apply sunscreen, with a minimum sun protection factor (SPF) of 15, when working outdoors to avoid sunburn and potential skin cancer, which is associated with excessive sun exposure to unprotected skin. Additionally, employees should wear safety glasses that offer protection from ultraviolet A and B (UVA/UVB) rays.

4.4.6 Coronavirus COVID-19 Preparedness

As we navigate through the COVID-19 outbreak and take precautions to remain healthy while carrying out field work and related activities, the guidelines below will provide important information to prevent potential exposures. National Grid's COVID-19 requirements must also be complied with and are included in Attachment 3.

4.4.6.1 Distancing

COVID-19 spreads from person-to-person primarily through droplets that are emitted from the initial person to a distance of 3 to 6 feet.

- Whenever possible, maintain a distance of 3 to 6 feet from others. This includes during site meetings, breaks, and performing work tasks.
- If tasks need to be performed close to others, limit the time spent in close proximity.
- Minimize time in office spaces to only perform essential duties such as picking up and dropping off equipment and samples.
- When travelling to project sites travel in separate vehicles. Do not travel in same vehicles.

4.4.6.2 Hygiene Practices

The hygiene practices we have been instructed to perform more routinely apply to performing field work as well, such as:

- Frequent hand washing with soap and warm water for 20 seconds. If soap and water are not readily available use hand sanitizer (containing 60 percent alcohol) until soap and water can be used. If sanitizer is not available, bringing gallon containers of water and soap may be more accessible.
- If filling water bottles (for drinking or hand washing) keep the bottle away from the spigot to avoid transfer of germs or contaminants.
- Wipe down surfaces with disinfectant on a routine basis (at least once per day). This includes field equipment and other items that may have previously been used by

others. When using company vehicles wipe surfaces including the steering wheel, gear shifter, controls, and door handles *before and after* use.

- Wear nitrile gloves as frequently as possible. Hand washing is necessary after removing gloves.
- When greeting others avoid handshaking, hugging, or other personal contact. A greeting from a distance such as a wave is suggested.

More detail on ways to protect yourself through distancing an hygiene can be found at MIT Medical's website: https://medical.mit.edu/three-ways-to-protect

4.4.6.3 Use of Public Places

- If your project requires you to stay in a hotel, practice the disinfecting precautions described above.
- If you will be eating at restaurants order take out or use delivery services.
- If you have concerns, discuss with the project manager, supervisor, or Steve Hawkins.

The health and safety of every member of our GEI family is most important. Continue to follow the guidance that is frequently communicated to all employees including:

- If you've experienced a fever, symptoms associated with COVID-19, or have potentially been exposed to COVID-19, please stay at home, contact your licensed healthcare provider and notify your Branch Manager and Julie Jennings before returning to the workplace.
- If you, a household member or someone you have come into first-hand contact with has a confirmed COVID-19 diagnosis, do not come into the workplace. Alert your Branch Manager and Julie Jennings without delay for specific instructions, including the requirements for returning to work once you are recovered.

Additional information can be found through the resources below:

- *Centers for Disease Control and Prevention (CDC) –* https://www.cdc.gov/coronavirus/2019-ncov/index.html
- *World Health Organization –* https://www.who.int/emergencies/diseases/novel-coronavirus-2019
- *State and Local agency resources*

Guidance surrounding the best way to implement containment and mitigation steps for the best prevention of COVID-19 exposure is changing day-to-day. The information included in this guide are general steps we can all take while performing our field assignments and

should be included in all safety briefings. If you have specific situations, questions, or concerns please discuss with the Project Manager, your Regional Safety Manager (RSM), or Steve Hawkins.

5. Personal Protective Equipment

The PPE specified in Table 4 represents PPE selection required by 29 CFR 1910.132, and is based on the Activity Hazard Analysis of Section 4 (Table 2). Specific information on the selection rationale activity can be found in the GEI Health and Safety Manual.

The PPE program addresses elements, such as PPE selection based on Site hazards, use and limitations, donning and doffing procedures, maintenance and storage, decontamination and disposal, training and proper fitting, inspection procedures prior to / during / and after use, evaluation of the effectiveness of the PPE program, and limitations during temperature extremes, heat stress, and other appropriate medical considerations. A summary of PPE for each level of protection is in Table 4.

Table 4. Site-Specific PPE

Task	PPE Level	Site-Specific Requirements	Respirator
Mobilization/Demobilization			
Reconnaissance	D	Safety glasses, steel toe/shank safety boot, reflective vest, leather work gloves, hearing protection as needed	D - None
Mobilization/Demobilization of Equipment and Supplies	D	Safety glasses, steel toe/shank safety boot, reflective vest, leather work gloves, hearing protection as needed	D – None
Establishment of Site Security, Work Zones, and Staging Area	D	Safety glasses, steel toe/shank safety boot, reflective vest, leather work gloves, hearing protection as needed	D - None
Construction			
Drilling, Groundwater Well Installation, Excavation, Digging Test Pits, Backfilling, Grading Observation, Sampling	D	Hard hat, safety glasses, steel toe/shank safety boot with over boot as needed, reflective vest, leather work gloves as needed, nitrile gloves, hearing protection as needed, Tyvek as needed	Level D initially, Level C-If action levels exceeded (see Section 9 of HASP)
Groundwater Treatment Systems			
Inspections, Maintenance and sampling if needed	D	Safety glasses, steel toe/shank safety boot with over boot as needed, reflective vest, leather work gloves as needed, nitrile gloves, hearing protection as needed, Tyvek as needed	D - None
NAPL			
Gauging, recovery, sampling	D	See Attachment 1. Safety glasses, steel toe/shank safety boot with over boots reflective vest, leather work gloves as needed, nitrile	D - None

		gloves, hearing protection as needed, Tyvek and face shield.	
Demolition/Remediation Observation			
Observe Contractor Activities	D	Hard hat, safety glasses, steel toe/shank safety boot with over boot as needed, reflective vest, leather work gloves as needed, nitrile gloves, hearing protection as needed, Tyvek as needed	D - None

Use of Level A or Level B PPE is not anticipated. If conditions indicating the need for Level A or Level B PPE are encountered, personnel will leave the Site and this HASP will be revised with oversight of the CHSO or GEI personnel will not re-enter the Site until conditions allow.

For most work conducted at these sites, Level D PPE will include long pants, high visible safety vests, safety glasses with side shields, and steel toe/shank or EH-rated safety boots. Hard hats will be kept within reach in vehicles and on Site in case conditions change in the field and hard hats are needed. When work is conducted in areas where non-aqueous phase liquid (NAPL) or tar-saturated soil is anticipated, employees will wear, at a minimum, Level D PPE, which can also include Tyvek® coveralls and safety boots with over boots. Attachment 1 provides more details on management practices for handling NAPL and required PPE.

5.1 OSHA Requirements for PPE

Personal protective equipment used during the course of this field investigation must meet the following OSHA standards:

Table 5. OSHA Standards for PPE

Type of Protection	Regulation	Source
Eye and Face	29 CFR 1910.133	ANSI Z87.1 1968
Respiratory	29 CFR 1910.134	ANSI Z88.1 1980
Head	29 CFR 1910.135	ANSI Z89.1 1969
Foot	29 CFR 1910.136	ANSI Z41.1 1999 or ASTM F-2412-2005, and ASTM F-2413-2005

CRF = Code of Federal Regulations
ANSI = American National Standards Institute
ASTM = American Society for Testing and Materials

On-site GEI personnel who have the potential to don a respirator must have a valid fit test certification and documentation of medical clearance. The CHSO will maintain such information on file for on-site personnel. The PM will obtain such information from the

subcontractor's site supervisor prior to the initiation of such work. Both the respirator and cartridges specified for use in Level C protection must be fit-tested prior to use in accordance with OSHA regulations (29 CFR 1910.134). Air purifying respirators cannot be worn under the following conditions:

- Oxygen deficiency (less than 20.7%).
- Imminent Danger to Life and Health (IDLH) concentrations.
- If contaminant levels exceed designated use concentrations.

GEI personnel accessing an energized electrical substation on National Grid sites will adhere to the following PPE requirements:

Personnel working within the National Grid substation property, or conducting intrusive work on site, will wear flame resistant clothing as outlined in OSHA standards: "Apparel which meets the flame-resistant clothing requirements of ASTM F1506-1994, is acceptable under flame and electric arc hazard conditions for compliance with the paragraph 1910.269(l)(6)(iii) standard." This includes long pants and long-sleeved shirts to provide protection from burns in the case of coming in contact with electrical arcing. Clothing worn should have a designation citing this ASTM Standard, or be labeled as meeting "NFPA 70E," which meets the ASTM standard. Additionally, EH-rated safety boots must be worn.

6. Key Project Personnel/Responsibilities and Lines of Authority

6.1 GEI Personnel

- Chris Morris — GEI Project Manager
- Jeff Parillo — GEI Project Engineer
- TBD — GEI Site Safety Officer
- Mike Quinlan — GEI Field Operations Manager
- Numerous — Field Personnel
- Steve Hawkins — GEI Corporate Health and Safety Officer
- Jeena Sheppard — Regional Health and Safety Officer

The implementation of health and safety at this project location will be the shared responsibility of the PM, the CHSO, the SSO, other GEI personnel implementing the proposed scope of work.

6.1.1 GEI Project Manager

The PM, Chris Morris, is responsible for confirming that the requirements of this HASP are implemented. Some of the PM's specific responsibilities include:

- Conducting and documenting the Project Safety Briefing for GEI project employees and forwarding the signed form (Appendix D) to the Health and Safety Committee;
- Verifying that the GEI staff selected to work on this program are sufficiently trained for Site activities;
- Assuring that personnel to whom this HASP applies, including subcontractor personnel, have received a copy of it;
- Providing the CHSO with updated information regarding conditions at the Site and the scope of Site work;
- Providing adequate authority and resources to the on-site SSO to allow for the successful implementation of necessary safety procedures;
- Supporting the decisions made by the SSO and CHSO;
- Maintaining regular communications with the SSO and, if necessary, the CHSO;

- Verifying that the subcontractors selected by GEI to work on this program have completed GEI environmental, health and safety requirements and has been deemed acceptable for the proposed scope of work; and
- Coordinating the activities of GEI subcontractors and confirming that they are aware of the pertinent health and safety requirements for this project.

6.1.2 GEI Corporate Health and Safety Officer

The CHSO is the individual responsible for the review, interpretation, and modification of this HASP. Modifications to this HASP which may result in less stringent precautions cannot be undertaken by the PM or the SSO without the approval of the CHSO. Specific duties of the CHSO include:

- Writing, approving, and amending the HASP for this project;
- Advising the PM and SSO on matters relating to health and safety on this Site;
- Recommending appropriate PPE and safety equipment to protect personnel from potential Site hazards;
- Conducting accident investigations; and
- Maintaining regular contact with the PM and SSO to evaluate Site conditions and new information which might require modifications to the HASP.

6.1.3 GEI Site Safety Officer

GEI field staff are responsible for implementing the safety requirements specified in this HASP. However, one person will serve as the SSO. For this program, due to the numerous sites, one of the staff members working on site will serve as the SSO. 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 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:

- Conducting/attending the Project Safety Briefing prior to beginning work, and subsequent safety meetings as necessary;
- Conduct daily Safety Tailgate meeting in accordance with National Grid requirements (can be combined with "pre-entry") briefing for Site-related work;

- Verifying that personnel to whom this HASP applies have attended and participated in the Project Safety Briefing and 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 activities;
- 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 GEI employees;
- Verifying that PPE and health and safety equipment used by GEI is in good working order;
- Verifying that the selected contractors are prepared with the correct PPE and safety equipment and supplies;
- Notifying the PM of noncompliance situations and stopping work in the event that an immediate danger situation is perceived;
- Monitoring and controlling the safety performance of personnel within the established restricted areas to confirm that required safety and health procedures are being followed;
- Stopping work in the event that an immediate danger situation is perceived; and
- Reporting accident/incident and preparing accident/incident reports, if necessary.

6.1.4 GEI Field Personnel

GEI 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:

- Reading and signing the HASP in its entirety prior to the start of on-site work;
- Attending and actively participating in the required Project Safety Briefing prior to beginning on-site work and any subsequent safety meetings that are conducted during the implementation of the program;
- Stopping work in the event that an immediate danger situation is perceived;
- 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 accidents, injuries, and illnesses, regardless of their severity, to the SSO, CHSO, and HR; and
- Complying with the requirements of this HASP and the requests of the SSO.

6.1.5 Lines of Authority will be as follows:

On Site – GEI will have responsibility for safety of its employees during the work performed at the Sites within the Downstate OMM program. GEI's field representative will have a cell phone available to contact the appropriate local authorities, in the event of an emergency. GEI's field representative will be available for communication with the GEI PM and with the National Grid representative.

GEI and Subcontractor employees have the authority to stop work activities if an unanticipated hazard is encountered or a potential unsafe condition is observed. The GEI employee should contact the Corporate Health and Safety Officer and the Project Manager to discuss the stop work conditions and potential control methods that can be implemented.

6.2 Subcontractors

GEI has subcontracted the following firms to assist in performing work on this project:

Barrier Environmental, LLC	PO Box 748 Patchogue, New York 11772 Contact: Patrick Condon (631) 803-8422
Island Pump & Tank	40 Doyle Court, East Northport, NY 11731 Contact: Matt Schieferstein (631) 462-2226 x22
Envirotrac	5 Old Dock Rd, Yaphank, NY 11980 Contact: Dale Konas (631) 924-3001
East End Building Services, Inc.	31 Old Dock Road, Yaphank, NY 11980 (631) 849-6464
Matrix New World Engineering, Land Surveying and Landscape Architecture, PC	26 Columbia Turnpike, Florham Park, NJ 07932 (973) 240-1800
ADT, A Cascade Company	75 East 2nd Street, Mineola, NY 11501 (516) 616-6026
Industrial Sales and Services Corporation	123 Marcus Blvd., Hauppauge, NY 11788 (631) 420-4800

GEI requires its subcontractors to work in a responsible and safe manner. Subcontractors for this project will be required to develop their own HASP for protection of their employees, but, at a minimum, must adhere to applicable requirements set forth in this HASP.

7. Training Program

7.1 HAZWOPER Training

In accordance with OSHA Standard 29 CFR 1910.120 "Hazardous Waste Operations and Emergency Response" (HAZWOPER) responders will, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations. At a minimum, the training will have consisted of instruction in the topics outlined in the standard. Personnel who have not met the requirements for initial training will not be allowed to work in any Site activities in which they may be exposed to hazards (chemical or physical). Proof of training will be submitted to the PM or his/her representative prior to the start of field activities.

7.2 Annual 8-Hour Refresher Training

Annual 8-hour refresher training will be required of hazardous waste site field personnel in order to maintain their qualifications for fieldwork. The training will cover a review of 29 CFR 1910.120 requirements and related company programs and procedures. Proof of current 8-hour refresher training will be submitted to the PM or his/her representative prior to the start of field activities.

7.3 Supervisor Training

Personnel acting in a supervisory capacity will have received 8 hours of instruction in addition to the initial 40-hour training. In addition, supervisors will have 1 year of field experience and training specific to work activities (i.e., sampling, construction observation, etc.)

7.4 Site-Specific Training

Prior to commencement of field activities, the PM or the SSO will verify GEI field personnel assigned to the project will have completed training that will specifically address the activities, procedures, monitoring, and equipment used in the Site operations. It will include Site and facility layout, hazards, and emergency services at the Site, and will highlight the provisions contained within this HASP and applicable GEI H&S SOPs (Appendix R). This training will be documented on the Project Safety Briefing Form Appendix Q). The signed form will be forwarded to the Health and Safety Team at: HealthandSafetyTeam@geiconsultants.com. In addition, GEI personnel will sign the plan to document that they understand the hazards and control measures presented and agree to

comply with the procedures established in the HASP. Personnel that have not received project-specific training will not be allowed on-site.

7.5 On-Site Safety Briefings

Other GEI personnel will be given health and safety briefings daily by the SSO or field representative to assist GEI personnel in safely conducting work activities. The briefing will include GEI subcontractors. The briefings can include information on new operations to be conducted, changes in work practices, or changes in the Site's environmental conditions, as well as periodic reinforcement of previously discussed topics. The briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety inspections. Documentation of these briefings will be recorded in the GEI field book, if the project duration is less than 5 days. If the project is longer than 5 days, the Tailgate Safety Briefing Form (Appendix P) will be used to document briefings. The meetings will also be an opportunity to periodically update the employees on monitoring results.

7.6 First Aid and CPR

The PM will verify that GEI field staff has current certifications in first aid and Cardiopulmonary Resuscitation (CPR), so that emergency medical treatment is available during field activities. The training will be consistent with the requirements of the American Red Cross Association. GEI employees also attend annual Bloodborne Pathogens training in compliance with OSHA regulations.

7.7 Client Specific Training

For the sites that contain substations, substation awareness training provided by PSEG Long Island will be required.

Hazardous Waste manifest training will also be required for sites that require drum pickups.

8. Medical Surveillance Program

GEI maintains a continuous, corporate, medical surveillance program that includes a plan designed specifically for field personnel engaged in work at sites where hazardous or toxic materials may be present. GEI's CHSO and is responsible for the administration and coordination of medical evaluations conducted for GEI's employees at branch office locations. Comprehensive examinations are given to GEI field personnel on an annual or biennial basis (as determined to be appropriate by the CHSO) participating in hazardous waste operations. The medical results of the examinations aid in determining the overall fitness of employees participating in field activities.

Under the CHSO's supervision, field personnel undergo a complete initial physical examination, including a detailed medical and occupational history, before they participate in hazardous waste site investigations. Extensive annual/biennial reexaminations are also performed. Upon completion of these tests, personnel are certified by an occupational health physician as to whether they are fit for field work in general and fit to use respiratory protection.

If a GEI employee or other project worker shows symptoms of exposure to a hazardous substance and wishes to be rechecked, he/she will be directed to the nearest area hospital or medical facility.

GEI subcontractor personnel that will enter any active waste handling or other active non-"clean" area must certify that they are participating in a medical surveillance program that complies with OSHA regulations for hazardous waste operations (i.e., 29 CFR 1910.120 and 29 CFR 1926.65). Proof of medical clearance will be submitted to the GEI PM or SSO prior to the start of field activities.

9. Monitoring

Air monitoring will be performed to identify and quantify airborne levels of hazardous substances and safety and health hazards in order to determine the appropriate level of worker protection needed on-site in the event that intrusive work is conducted. Work requiring air monitoring includes the installation and/or abandonment of monitoring wells, DNAPL recovery wells, oxygen injection wells, and soil vapor points. Additionally, PID screening of the well head space will be conducted during groundwater sampling activities.

GEI may conduct perimeter air monitoring, and work zone monitoring for on-site GEI employees during intrusive activities only. Activities requiring air monitoring will be conducted in accordance with a pre-approved work plan. GEI will monitor and document daily Site conditions and operations and inform field representatives of results. If Action Levels are exceeded, the SSO will immediately implement Site action(s) according to Table 6 below and notify the PM and CHSO.

GEI will provide the following equipment for health and safety monitoring of on-site GEI personnel:

- PID with 10.6 eV lamp or equivalent;
- Drager Chip Measurement System (CMS) with appropriate gas detection chips;
- Sensidyne Gas Detection Pump with appropriate gas detector tubes;
- Particulate Meter (PM-10 capable);
- Dust Meter; and
- Combustible Gas Indicator (CGI): LEL / Oxygen (O_2) / hydrogen sulfide (H_2S) / hydrogen cyanide (HCN) meter.

Air monitoring equipment will be calibrated and maintained in accordance with manufacturer's requirements. Calibrations will be recorded in the project notes daily or on a daily calibration form.

Organic vapor concentrations will be measured using a PID during intrusive activities. During intrusive operations, organic vapor concentrations will be measured continuously. Organic vapor concentrations will be measured upwind of the work site(s) to determine background concentrations at least twice a day, (once in the morning and once in the afternoon). The SSO will interpret monitoring results using professional judgment and according to the alert and Action Limits set forth in the associated Site Work Plan.

A dust meter will be used to measure airborne particulate matter during intrusive activities. Monitoring will be continuous, and readings will be averaged over a 15-minute period for comparison with the Action Levels. Monitoring personnel will make a best effort to collect dust monitoring data from downwind of the intrusive activity. If off-site sources are considered to be the source of the measured dust, upwind readings will also be collected.

A multi-gas meter will be used to monitor for combustible gases (Lower Explosive Limit – LEL) and O_2 content in the work zone during intrusive activities. The meter will also be equipped with an H_2Ssensor and an HCN sensor. H_2S monitoring will be completed every 15 minutes or, if a sulfur odor is present, monitoring will be continuous. HCN monitoring will be completed every 15 minutes or, if an almond odor is detected, monitoring will be continuous.

Table 6 provides a summary of real time air monitoring Action Levels and contingency plans for work zone activities. The below Action Levels are determined by halving the Permissible Exposure Limits (PELs) or Threshold Limit Values (TLVs) as set forth by OSHA and the American Conference of Government Industrial Hygienists (ACGIH). O_2 values are based on the maximum use limits of a full-face respirator if oxygen were being displaced by a chemical.

Table 6. Real-Time Work Zone Air Monitoring Action Levels

Air Monitoring Instrument	Monitoring Location	Action Level (above background)	Site Action
PID	Work Zone	1.0 ppm	Use detector tube for benzene or zNose® to verify if concentration is benzene. No respiratory protection is required if benzene is not present.
PID	Work Zone	10 ppm	Use Sensidyne detector tube for naphthalene or zNose® to verify if concentration is naphthalene. No respiratory protection is required if naphthalene is not present.
		10 – 50 ppm	No respiratory protection is required if benzene or naphthalene is not present.
		50 – 100 ppm	Stop work, withdrawal from work area, institute engineering controls, if levels persist, upgrade to Level C.
		> 100 ppm	Stop work, withdraw from work area, notify PM and CHSO.
O_2 Meter	Work Zone	< 20.7%	Stop work, withdraw from work area, ventilate area, notify PM and CHSO.
		> 21.1%	Stop work, withdraw from work area, notify PM and CHSO.
H_2S Meter	Work Zone	< 5.0 ppm	No respiratory protection is required.
		> 5.0 ppm	Stop work, cover excavation, withdraw from work area, institute engineering controls, notify PM and CHSO.
HCN Meter	Word Zone	< 1.0 ppm	Run CMS Drager tube. Continue monitoring with real-time meter and continue work if CMS Drager tube reading is less than 2.0 ppm.
		> 1.0 ppm HCN Concentrations < 2.0 ppm	Run CMS Drager tube and confirm concentration is less than 2.0 ppm, notify PM and CHSO. Run CMS tube for sulfur dioxide, hydrogen sulfide, and phosphine chip potential interferences. Continue to monitor with real-time meter.
		> 2.0 ppm	Stop work and move (with continuous HCN monitoring meter) at lease 25 ppm upwind of the excavation until continuous meter reads less than 1 ppm, notify PM and CHSO. Run CMS Drager hydrogen cyanide chip and re-evaluate activity, continue monitoring with a real-time meter, resume work if concentrations read less than 1.0 ppm.
Combustible Gas Indicator	Work Zone	< 10% LEL	Investigate possible causes, allow excavation to ventilate, use caution during procedures.
		> 10% LEL	Stop work, allow excavation/borehole to ventilate to < 10% LEL, if ventilation does not result in a decrease to < 10% LEL, withdraw from work area, notify PM and CHSO.
Particulate Meter	Work Zone	150 µg/m^3	Implement work practices to reduce/minimize airborne dust generation, e.g., spray/misting of soil with water.

10. Site Control Measures

10.1 Site Zones

Site zones are intended to control the potential spread of contamination and to assure that only authorized individuals are permitted into potentially hazardous areas. A three-zone approach will be utilized. It will include an Exclusion Zone (EZ), Contamination Reduction Zone (CRZ) and a Support Zone (SZ). Specific zones will be established on the work site by the Contractor when operations begin for each task requiring such delineation. Maps depicting the zones will be available at the Site.

This project is being conducted under the requirements of 29 CFR 1910.120, and any personnel working in an area where the potential for exposure to Site contaminants exists, will only be allowed access after proper training and medical documentation.

The following will be used for guidance in revising these preliminary zone designations, if necessary.

Support Zone – The SZ is an uncontaminated area that will be the field support area for most operations. The SZ provides for field team communications and staging for medical emergency. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone.

Contamination Reduction Zone – The CRZ is established between the EZ and the SZ. The CRZ contains the contamination reduction corridor and provides an area for decontamination of personnel and portable hand-held equipment, tools and heavy equipment. A personnel decontamination area will be prepared at each exclusion zone. The CRZ will be used for EZ entry and egress in addition to access for heavy equipment and emergency support services.

Exclusion Zone – Activities which may involve exposure to Site contaminants, hazardous materials, and/or conditions should be considered an EZ. This zone will be clearly delineated by cones, tapes, or other means. The Contractor may establish more than one EZ where different levels of protection may be employed, or different hazards exist. The size of the EZ will be determined by the Contractor allowing adequate space for the activity to be completed, field members, and emergency equipment.

The Contractor is responsible for constructing, maintaining, and enforcing the zones.

10.2 Buddy System

GEI personnel should be in line-of-site or communication contact with another on-site person. The other on-site person should be aware of his or her role as a "buddy" and be able to provide assistance in the event of an emergency. A copy of this plan will be given to any person acting as a GEI "buddy" for informational purposes.

10.3 Sanitation for Temporary Work Sites

Temporary sanitary facilities including toilets will be available on-site.

10.4 Illumination

Illumination requirements identified by OSHA are directed to work efforts inside buildings and/or during non-daylight hours. Activities planned for the Site are anticipated to occur outside during daylight hours. However, if yard areas are used after dark, they will be equipped with illumination that meets or exceeds requirements specified in OSHA Standard 29 CFR 1926.56 "Illumination." Employees will not work on sites that are not properly lighted.

11. Accident Reporting

GEI will report incidents involving GEI personnel or subcontractor personnel, including but not limited to, injuries, illnesses, near miss incidents, fires, fatalities, incidents involving the public, motor vehicle incidents and property damage. The report will be **immediately** made to the GEI PM **verbally** and all work will be suspended. The PM will **immediately** inform the GEI Safety Team and the Project-Specific National Grid Project manager**.**

A GEI Accident Report form will be submitted **immediately.** A DRAFT Incident Report Form will be completed and submitted to the Project-Specific National Grid Representative **within 4 hours**. A final incident report will be submitted to the Project-Specific National Grid PM, National Grid Regional Safety Lead, and/or the person to whom the verbal notification was initially provided **within 24 hours**.

An incident reporting flow chart, the Accident/Incident Report Forms and the Near Miss Reporting Form can be found in Appendix P. GEI report forms can also be found on the GEI Health and Safety smartphone app or on the Health and Safety page of the GEI Intranet.

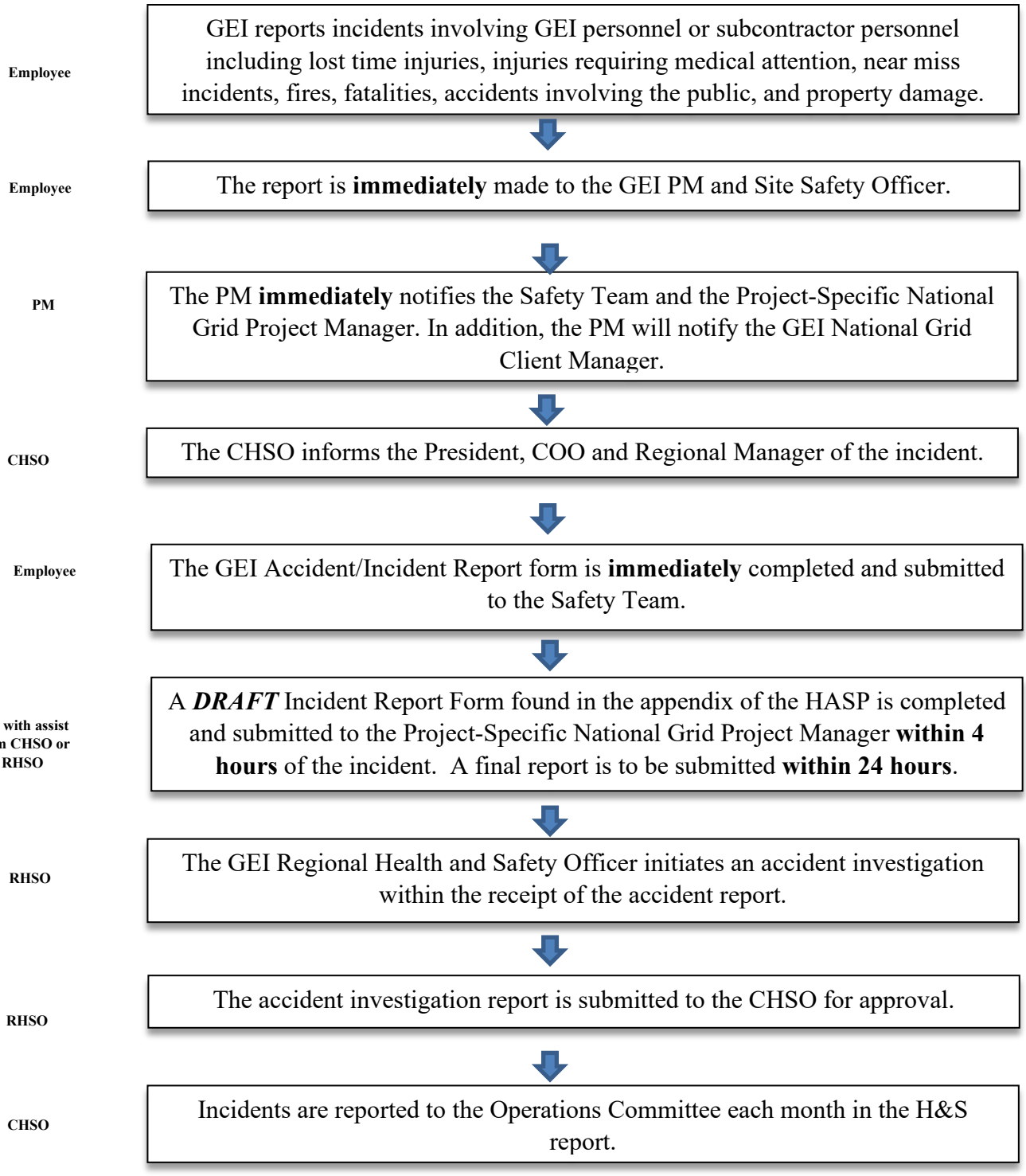
Staff must be aware that addressing accidents and injuries takes precedence over completing field work. If a staff member requires medical attention, or an incident/accident has occurred that call this into question, work must stop, and the situation must be addressed.

A copy of the National Grid Incident Reporting Requirements is included as Attachment 1.

11.1 Injury Triage Service

If a GEI employee experiences a work-related injury that is not life-threatening, the employee will initiate a call to Medcor Triage at 1-800-775-5866. The injured employee will detail any medical symptoms or complaints which will be evaluated by a Registered Nurse (RN) specially trained to perform telephonic triage. The RN will recommend first aid self-treatment or refer the injured employee for an off-site medical evaluation by a health professional at a clinic within GEI's workers' compensation provider network. GEI employees are still required to follow our Accident Reporting procedures as listed above.

11.2 Flow Chart for Accident Reporting



12. Decontamination Procedures

A decontamination pad has been established for personnel decontamination and equipment decontamination.

12.1 Personnel Decontamination Station

A personnel decontamination station where employees can drop equipment and remove PPE will be set up at the decontamination pad by the Contractor. It will be equipped with basins for water and detergent, and trash bag(s), or cans for containing disposable PPE and discarded materials. Once personnel have decontaminated at this station and taken off their PPE, they will proceed to a sink where they will wash themselves wherever they have potentially been exposed to any contaminants (e.g., hands, face, etc.)

The following specific decontamination procedure will be used as necessary by GEI personnel or subcontractor personnel wearing PPE from Level D through Level C.

- ***Step 1 –*** Equipment drop (respirator, tools, monitoring equipment, etc.) Decontaminate as appropriate (per GEI's field representative's instructions).
- ***Step 2 –*** Boot wash/rinse (wash with non-foaming detergent, rinse with freshwater spray). Remove boots. If inner and outer gloves are worn, wash outer gloves, remove and save for later use, or remove and discard outer gloves and place in trash bag/can provided in the decontamination area.
- ***Step 3 –*** Hard hat removal; wash if visibly contaminated (use same wash as in Step 2).
- ***Step 4 –*** If Tyvek® (or equivalent) suit was worn and is visibly contaminated, remove and place in trash bag/can provided in the decontamination area or decontaminate (wash) and store for reuse. Contaminated washable coveralls should be removed and bagged for washing.
- ***Step 5 –*** Respirator and/or eye protection removal (as applicable). Wash (per Step 2) to remove visible contamination.
- ***Step 6 –*** Remove outer gloves.
- ***Step 7 –*** Wash potentially exposed skin (use water and soap at indoor sink).
- ***Step 8 –*** Disinfect respirator per manufacturer's recommendations.

Contaminated PPE (gloves, suits, etc.) will be decontaminated and stored for reuse or placed in plastic bags (or other appropriate containers) and disposed of in an approved facility.

Decontamination wastewater and used cleaning fluids will be collected and disposed of in accordance with applicable state and federal regulations.

12.2 Heavy Equipment Decontamination

Modify for the specific project or delete if not applicable (then delete this note).

Heavy equipment decontamination will be performed by the Contractor within the limits of the on-site decontamination pad in accordance with the contract specifications. A steam generator and brushes will be used to clean demolition equipment and other tools. No heavy equipment will be permitted to leave the Site unless it has been thoroughly decontaminated.

Wastewater from the heavy equipment and personnel decontamination areas will be collected and disposed of in accordance with applicable state and federal regulations. The Contractor will be responsible for ultimate disposal of investigation-derived wastes.

12.3 Decontamination Equipment Requirements

The following equipment, if required, should be in sufficient supply to implement decontamination procedures for GEI's equipment.

- Buckets
- Alconox™ detergent concentrate
- Hand pump sprayers
- Long handled soft bristle brushes
- Large sponges
- Cleaning wipes for respirators
- Bench or stool(s)
- Methanol and/or Nitric Acid
- Liquid detergent and paper towels
- Plastic trash bags

The Contractor performing decontamination procedures is responsible for verifying that the above materials, as required for their operation, are in sufficient supply.

13. Supplemental Contingency Plan Procedures

13.1 Hazard Communication Plan

GEI personnel have received hazard communication training as part of their annual health and safety training and new employee health and safety orientation training. Hazardous materials used on the Site will be properly labeled, stored, and handled. SDS will be available to potentially exposed employees.

13.2 Fire

In the event of a fire personnel will evacuate the area. GEI's field representative will contact the local fire department with jurisdiction and report the fire. Notification of evacuation will be made to the PM, the CHSO, and the Project Specific National Grid Representative. The field representative will account for GEI personnel and subcontractor personnel and report their status to the PM.

13.3 Medical Support

In case of minor injuries, on-site care will be administered with the Site first aid kit. For serious injuries, call 911 and request emergency medical assistance. Seriously injured persons should not be moved, unless they are in immediate danger. Notify the PM, the CHSO, and the Project Specific National Grid Representative of the emergency.

Section 1 and Table 1 of this HASP contain detailed emergency information and a list of emergency services and their telephone numbers. Included in Appendices A through M are maps and directions to the hospital and/or occupational health clinic nearest the site. GEI field personnel will carry a cellular telephone.

13.4 Severe Weather

The contingency plan for severe weather includes reviewing the expected weather to determine if severe weather is in the forecast. Severe weather includes high winds over 30 miles per hour (mph), heavy rains or snow squalls, thunderstorms, tornados, and lightning storms. If severe weather is approaching, the decision to evacuate GEI personnel and subcontractor personnel from the Site will be the responsibility of GEI's field representative. Notification of evacuation will be made to the PM, the CHSO, and the Project Specific National Grid Representative. The field representative will account for GEI personnel and subcontractor personnel and report their status to the PM. If safe, work can resume 30 minutes after the last clap of thunder or flash of lightning.

13.5 Spills or Material Release

If a hazardous waste spill or material release occurs, if safe, the SSO or their representative will immediately assess the magnitude and potential seriousness of the spill or release based on the following:

- SDS for the material spilled or released;
- Source of the release or spillage of hazardous material;
- An estimate of the quantity released and the rate at which it is being released;
- The direction in which the spill or air release is moving;
- Personnel who may be or may have been in contact with the material, or air release, and possible injury or sickness as a result;
- Potential for fire and/or explosion resulting from the situation; and
- Estimates of area under influence of release.

If the spill or release is determined to be within the on-site emergency response capabilities, the SSO will verify implementation of the necessary remedial action. If the release is beyond the capabilities of the Site personnel, personnel will be evacuated from the immediate area and the local fire department will be contacted. The SSO will notify the PM, the CHSO, and the Project Specific National Grid Representative.

13.6 Alcohol and Drug Abuse Prevention

Alcohol and drugs will not be allowed on the work Site. Project personnel under the influence of alcohol or drugs will not be allowed to enter the Site.

14. Health and Safety Plan Sign-Off

GEI personnel conducting site activities will be familiar with the information in this HASP. After reviewing this plan, please sign the copy in the project files, and bring a copy of the plan with you to the Site.

Site Name: Downstate OMM

Investigation: OM&M

GEI Project No: 1702897 and 1905774

Print Name	Signature
Project Manager: Chris Morris	

Appendix A

Arverne – Site Specific Information

Google Maps **Beach 53rd St, Far Rockaway, NY 11691 to St. John's Episcopal Hospital** Drive 1.9 miles, 9 min

Map data ©2017 Google 1000 ft

Beach 53rd St

Far Rockaway, NY 11691

1. **Head east on Beach Channel Dr/Reverend Joseph May Dr toward Beach 51st St**
   Continue to follow Beach Channel Dr

0.8 mi

2. **Continue straight onto Seagirt Blvd**

0.8 mi

3. **Turn left onto Beach 19th St**
   Destination will be on the left

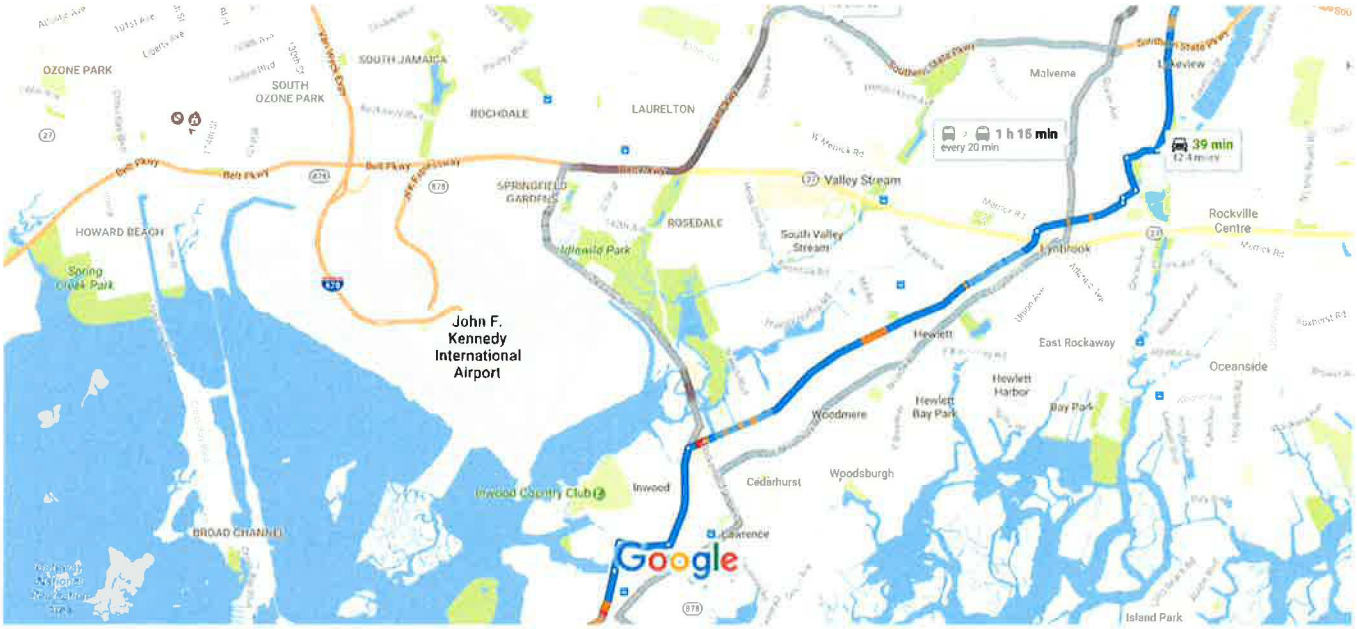
0.2 mi

St. John's Episcopal Hospital

327 Beach 19th St, Far Rockaway, NY 11691

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

Google Maps **Rockaway Beach Blvd & Beach 53rd St to Clinic One** Drive 12.4 miles, 39 min



Map data ©2017 Google 1 mi

Rockaway Beach Blvd & Beach 53rd St

Far Rockaway, NY 11691

Follow Rockaway Beach Blvd to Beach Channel Dr

3 min (0.8 mi)

1. Head northeast on Rockaway Beach Blvd toward Beach 52nd St

0.7 mi

2. Rockaway Beach Blvd turns slightly left and becomes Beach 37th St

400 ft

Continue on Beach Channel Dr. Take Nassau Expy, Peninsula Blvd and Woodfield Rd to Hempstead Turnpike in West Hempstead

35 min (11.5 mi)

3. Turn right onto Beach Channel Dr

0.1 mi

4. Slight left to stay on Beach Channel Dr

1.3 mi

5. Continue onto Sheridan Blvd

0.3 mi

6. Turn right onto Bayview Ave

0.5 mi

7. Turn left onto Nassau Expy

1.0 mi

8. Turn right onto Bay Blvd

0.2 mi

9. Continue onto Peninsula Blvd

3.8 mi

10. Slight right to stay on Peninsula Blvd

0.9 mi

11. Turn left onto Charles St

223 ft

12. Turn right onto Buckingham Pl

0.1 mi

13. Turn left onto Ocean Ave

0.3 mi

14. Turn right onto Lakeview Ave

0.3 mi

15. Turn left onto Woodfield Rd

2.5 mi

16. Use any lane to turn slightly left onto Westminster Rd

0.2 mi

17. Turn right onto Hempstead Turnpike

Destination will be on the right

279 ft

Clinic One

111 Hempstead Turnpike #121, West Hempstead, NY 11552

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

1. Emergency Contact Information

Table 1a. Arverne Emergency Information

Important Phone Numbers		Directions to Hospital
Local Police:	911	To Hospital and Occupational Health Clinic: See Attached Maps and Directions for each site in Appendix A Directions to Hospital: Head east on Beach Channel Drive toward Beach 51st Street. After 0.8 miles continue straight onto Seagirt Blvd. Turn left onto Beach 19th Street and the hospital will be on the left.
Fire Department:	911	
Ambulance:	911	
State Police or County Sheriff:	911	
St. John's Episcopal Hospital: 327 Beach 19th Street Far Rockaway, New York 11691	(718) 869-7000	
Clinic One: 111 Hempstead Turnpike #121 West Hempstead, NY 11552	(516) 493-9580	
Project Manager: Chris Morris	(631) 759-2967 office (631) 484-9152 cell	
Field Operations Manager: Mike Quinlan	(631) 708-8063 cell	
Corporate Health and Safety Officer : Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell	
Regional Health and Safety Officer Jeena Sheppard	(856) 608-5663 office (856) 298-7138 cell	
Client Contact: Sarah Aldridge	(516) 545-2568 office (860) 334-0554 cell	
Nearest Telephone Location: On-site cellular		

Arverne

Project Description:

Activities conducted at the Arverne Substation (Former Edgemere Substation) consist of an annual site-wide inspection and additional inspections of the composite cover systems on an as needed basis

Site Description:

The Arverne Substation is located on the Rockaway Peninsula, near the intersection of Rockaway Beach Boulevard and 53rd Street in Far Rockaway. The site is owned by LIPA, and is currently used by LIPA as an electric system substation (Arverne Substation). The site is currently operated and maintained by Public Service Enterprise Group (PSEG-LI) for LIPA. The site soil and groundwater are managed under the oversight of the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) under a Voluntary Agreement between the Long Island Lighting Company (LILCO) dba National Grid and the NYSDEC.

The site was remediated in 1998 under the Voluntary Agreement and included the removal of equipment, debris and 4 feet of soil (to the approximate depth of groundwater). The impacted material was transported offsite, the site was backfilled with clean fill, and a composite cover system installed. The new Arverne Substation was constructed in 2004.

Table 2: Activity Hazard Analysis

Activity	Potential Hazard	Control Measures
Electrical Substation Interior Entry	Electrocution, shock	• Wear proper personal protective equipment (PPE) including flame resistant clothing when working within the substation. • Follow Occupational Safety and Health Agency (OSHA) guidelines for working distance to equipment.
Excavation and Trenching Oversight (as needed)	Crushing, entrapment, falls, fire/explosion	• Prior to excavating, determine utility locations and have locations marked by utility companies and the property owner. • Utilities shall be properly supported and barriers should be erected around excavations in remote areas. • Backfill temporary excavations when work is completed. • Personnel must remain 2 feet from the face of the excavation. • Sides, slopes, and faces shall meet OSHA requirements. • Excavation entry will be allowed only with proper sloping or shoring. • See SOP HS-006
Heavy Equipment – Working Near	Struck-by, caught-in-between equipment, crushing, pinch points	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or (electrical hazard) EH-rated safety boots with composite toe and shank; safety glasses; nitrile/neoprene gloves; and earplugs. • Identify yourself and your work location to heavy equipment operators, so they may incorporate you into their operations. • Coordinate hand signals with operators. • Stay Alert! Pay attention to equipment backup alarms and swing radii. • Wear a high-visibility, reflective vest when working near equipment or motor vehicle traffic. • Position yourself in a safe location when filling out logs talking with the contractor. • Notify the contractor immediately if any problems arise. • Do not stand or sit under suspended loads or near any pressurized equipment lines. • Do not operate cellular telephones in the vicinity of heavy equipment operation. • See SOP HS-018
Site Cap Inspection (Annual)	Slips, Trips and Falls	• Keep trafficked areas free of slip/trip/fall hazards.

Appendix B

East Garden City – Site Specific Information

Google Maps

600 Stewart Ave, Garden City, NY 11530 to Winthrop University Hospital: D'Abreo Nina MD

Drive 2.1 miles, 9 min

Map data ©2017 Google 1000 ft

600 Stewart Ave

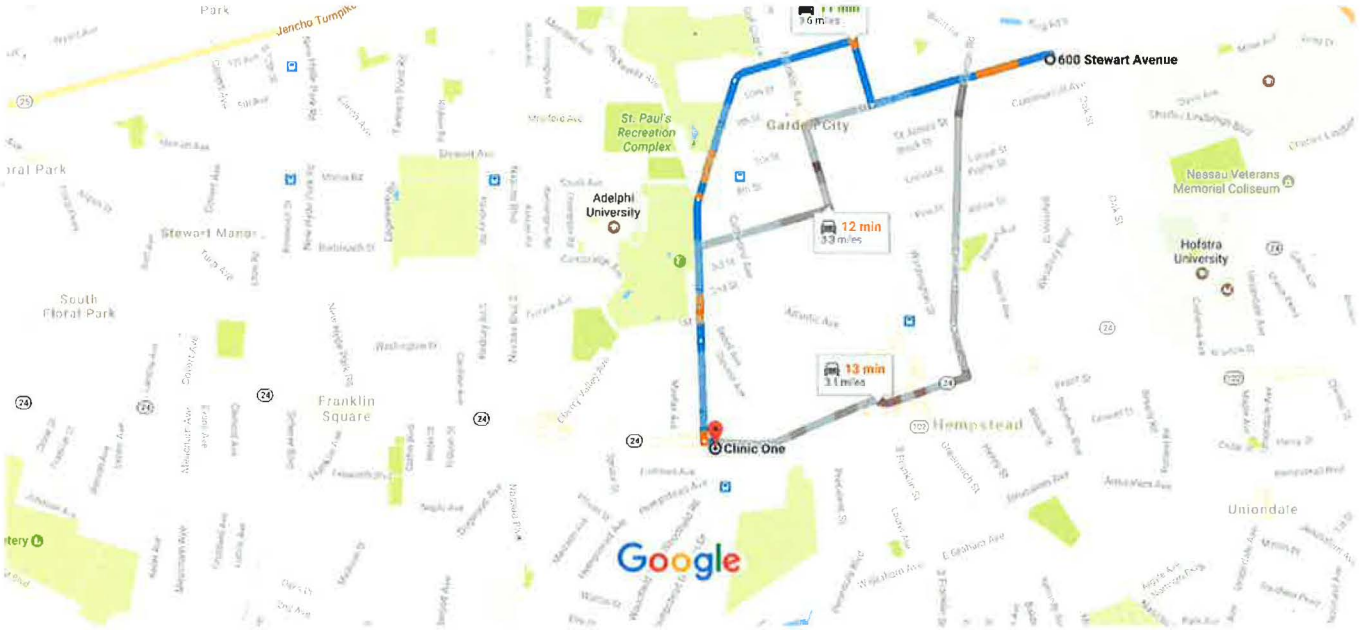
Garden City, NY 11530

1.	Head north toward Stewart Ave	89 ft
2.	Turn left onto Stewart Ave	0.9 mi
3.	Turn right onto Washington Ave	0.3 mi
4.	Turn left onto 11th St	0.2 mi
5.	Turn right onto County Seat Dr	0.5 mi
6.	Turn left onto Old Country Rd Destination will be on the right	0.1 mi

Winthrop University Hospital: D'Abreo Nina MD

200 Old Country Rd # 450, Mineola, NY 11501

Google Maps **600 Stewart Ave, Garden City, NY 11530 to Clinic One** Drive 3.6 miles, 11 min



Map data ©2017 Google 2000 ft

600 Stewart Ave
Garden City, NY 11530

1. Head north toward Stewart Ave

4 s (89 ft)

Continue on Stewart Ave to Garden City

4 min (1.2 mi)

2. Turn left onto Stewart Ave

0.9 mi

3. Turn right onto Washington Ave

0.3 mi

4. Turn left onto 11th St

2 min (0.6 mi)

Follow Cherry Valley Ave, Rockaway Ave and Westminster Rd to Hempstead Turnpike in West Hempstead

5 min (1.8 mi)

5. Continue onto Cherry Valley Ave

0.6 mi

6. Use the left 2 lanes to turn slightly left onto Rockaway Ave

0.7 mi

7. Continue onto Westminster Rd

0.5 mi

8. Turn left onto Hempstead Turnpike

Destination will be on the right

279 ft

Clinic One

111 Hempstead Turnpike #121, West Hempstead, NY 11552

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

1. Emergency Contact Information

Table 1b. East Garden City Emergency Information

Important Phone Numbers		Directions to Hospital
Local Police:	911	To Hospital and Occupational Health Clinic: See Attached Maps and Directions for each site in Appendix A Directions to Hospital: Head north toward Stewarts Avenue, then turn left onto Stewart Avenue. Turn right onto Washington Avenue, and then turn left onto 11th Street. Turn right onto County Sear Drive, then turn left onto Old Country Road, the hospital will be on the right.
Fire Department:	911	
Ambulance:	911	
State Police or County Sheriff:	911	
Winthrop University Hospital: 200 Old Country Road Mineola, NY 11501	(516) 663-9500	
Clinic One: 111 Hempstead Turnpike #121 West Hempstead, NY 11552	(516) 493-9580	
Project Manager: Chris Morris	(631) 759-2967 office (631) 484-9152 cell	
Field Operations Manager: Mike Quinlan	(631) 708-8063 cell	
Corporate Health and Safety Officer : Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell	
Regional Health and Safety Officer Jeena Sheppard	(856) 608-5663 office (856) 298-7138 cell	
Client Contact: Sarah Aldridge	(516) 545-2568 office (860) 334-0554 cell	
Nearest Telephone Location: On-site cellular		

East Garden City

Project Description:

Activities conducted at the East Garden City Holder Station consist of an annual site-wide inspection and annual groundwater sampling of three wells for cyanide.

Site Description:

The site is located at 600 Stewart Avenue in Garden City. The property is owned by the LIPA and an electric substation which is field operated by PSEG-LI, and a NG gas regulator station are currently located on the property.

Table 2: Activity Hazard Analysis

Activity	Potential Hazard	Control Measures
Carrying Equipment	Heavy lifting, strains/sprains, slips/trips/falls, pinch points	• Use proper lifting techniques as defined in the heavy lifting activity analysis below • Wear the proper type of glove to protect hands against sharp edges and skin/soft tissue injuries • Wear appropriate footwear • Be aware of hard to grip and hold items that may force your hand or wrist into awkward, stressful positions and cause disorders like tendinitis or carpal tunnel syndrome • Take breaks when carrying items frequently and/or for long distances • Do not over reach when picking up or placing items. • Use the buddy system when necessary • When climbing ladders, maintain three points of contact at all times. DO NOT carry equipment up or down ladders unless it is in a secure backpack or similar hands-free shoulder-strap bag or case. Lower or raise larger equipment by crane or rope
Drum Handling	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions Heavy Lifting , Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses and face shield as appropriate. • Use proper dollies or drum moving tools. • Use applicable tools to open/close drum lids. • Do not handle drums with bulging sides. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Use proper lifting techniques. • Ask fellow worker for help. • Keep trafficked areas free from slip/trip/fall hazards. • See SOP HS-003
Electrical Substation Interior Entry	Electrocution, shock	• Wear proper personal protective equipment (PPE) including flame resistant clothing when working within the substation. • Follow Occupational Safety and Health Agency (OSHA) guidelines for working distance to equipment.
Excavation and Trenching Oversight (as needed)	Crushing, entrapment, falls, fire/explosion	• Prior to excavating, determine utility locations and have locations marked by utility companies and the property owner. • Utilities shall be properly supported and barriers should be erected around excavations in remote areas. • Backfill temporary excavations when work is completed. • Personnel must remain 2 feet from the face of the excavation. • Sides, slopes, and faces shall meet OSHA requirements. • Excavation entry will be allowed only with proper sloping or shoring. • See SOP HS-006
Groundwater Sampling	Contaminant Exposure, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses and Nitrile/neoprene gloves. • Dispose of gloves after use and wash hands. • User proper lifting techniques. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.

Activity	Potential Hazard	Control Measures
Heavy Equipment – Working Near	Struck-by, caught-in-between equipment, crushing, pinch points	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or (electrical hazard) EH-rated safety boots with composite toe and shank; safety glasses; nitrile/neoprene gloves; and earplugs. • Identify yourself and your work location to heavy equipment operators, so they may incorporate you into their operations. • Coordinate hand signals with operators. • Stay Alert! Pay attention to equipment backup alarms and swing radii. • Wear a high-visibility, reflective vest when working near equipment or motor vehicle traffic. • Position yourself in a safe location when filling out logs talking with the contractor. • Notify the contractor immediately if any problems arise. • Do not stand or sit under suspended loads or near any pressurized equipment lines. • Do not operate cellular telephones in the vicinity of heavy equipment operation. • See SOP HS-018
Waste Characterization	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions, Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Keep trafficked areas free from slip/trip/fall hazards.
Monitoring well, soil vapor point and/or oxygen injection well installation and abandonment.	Contaminant Exposure, Noise, Contact with Utilities, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls, Drill Rig Proximity	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs. • Confirm utility locate has been completed. • Confirm adequate clearance from overhead utilities. • Dispose of gloves after use and wash hands. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards. • Maintain awareness of location of equipment. Subcontractor use of a spotter for equipment operation
Waste Management	Contaminant Exposure, Cuts/Scrapes	• Wear proper PPE during sampling including Tyvek or Tyvek apron with sleeves, Nitrile gloves, and face shield/safety glasses. • Wear work gloves over nitrile gloves.

Activity	Potential Hazard	Control Measures
Replace well boxes and associated concrete on monitoring wells, soil vapor points and/or oxygen injection wells	Jackhammer Proximity, Silica Dust Inhalation (From Grout/Cement Mixing), Noise	• Wear proper PPE, including safety glasses, hard hat, high visibility reflective vest, and EH rated safety boots. Maintain awareness of location of equipment. • Stay upwind of mixing area. Wear a dust mask if necessary. • Wear hearing protection.
Site Cap Inspection (Annual)	Slips, Trips and Falls	• Keep trafficked areas free of slip/trip/fall hazards.

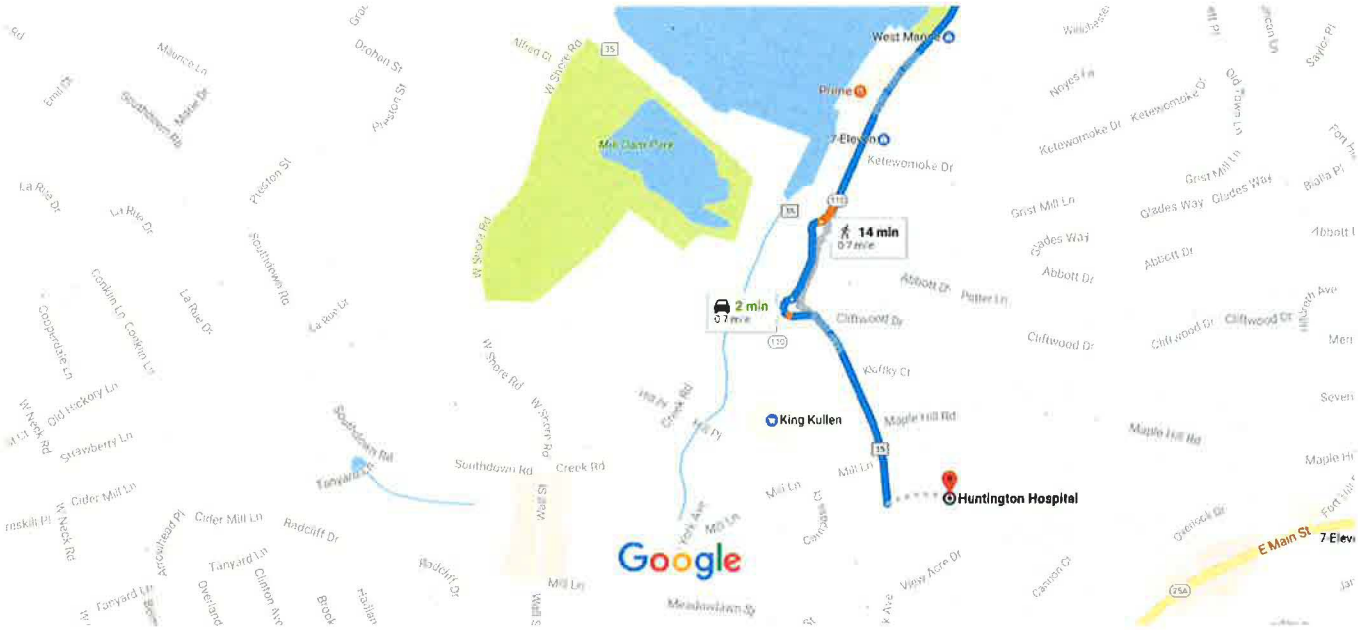
Appendix C

Halesite – Site Specific Information

Google Maps

18 New York Ave, Halesite, NY 11743 to Huntington Hospital

Drive 0.7 mile, 2 min



18 New York Ave

Halesite, NY 11743

1. Head southwest on New York Ave toward Anchorage Ln — 0.3 mi
2. At the traffic circle, take the 2nd exit and stay on New York Ave — 0.1 mi
3. At the traffic circle, take the 3rd exit onto Park Ave — 0.3 mi

Huntington Hospital

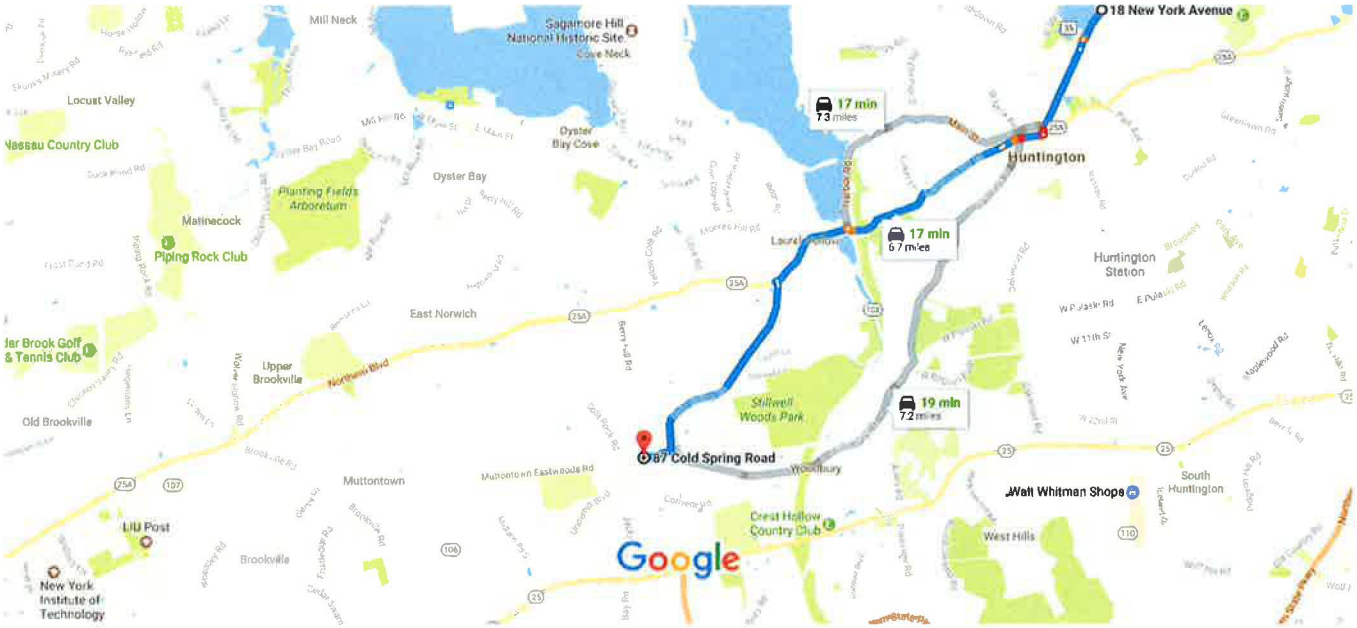
270 Park Ave, Huntington, NY 11743

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

Google Maps

18 New York Ave, Halesite, NY 11743 to 87 Cold Spring Rd, Syosset, NY 11791

Drive 6.7 miles, 17 min



Map data ©2017 Google 1 mi

18 New York Ave

Halesite, NY 11743

Follow New York Ave to Main St in Huntington

5 min (1.3 mi)

1. Head southwest on New York Ave toward Anchorage Ln

0.3 mi

2. At the traffic circle, take the 2nd exit and stay on New York Ave

0.1 mi

3. At the traffic circle, continue straight to stay on New York Ave

0.9 mi

Follow Main St to Lawrence Hill Rd

2 min (0.4 mi)

4. Turn right onto Main St

0.4 mi

5. Keep left to stay on Main St

171 ft

6. Continue onto Lawrence Hill Rd

4 min (1.7 mi)

7. Lawrence Hill Rd turns left and becomes N Hempstead Turnpike

2 min (0.9 mi)

Drive to Cold Spring Rd in Syosset

4 min (2.3 mi)

8. Turn left toward Cold Spring Rd

276 ft

9. Turn right onto Cold Spring Rd

● Destination will be on the right

2.3 mi

87 Cold Spring Rd

Syosset, NY 11791

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

1. Emergency Contact Information

Table 1c. Halesite Emergency Information

Important Phone Numbers		Directions to Hospital
Local Police:	911	To Hospital and Occupational Health Clinic: See Attached Maps and Directions for each site in Appendix A Directions to Hospital: From the entrance to the Halesite Former MGP Site, turn left (south) onto New York Avenue. Continue south on New York Avenue for approximately 0.4 miles. Veer left onto Park Avenue. Huntington Hospital is 0.29 miles ahead on the left
Fire Department:	911	
Ambulance:	911	
State Police or County Sheriff:	911	
Huntington Hospital: 270 Park Avenue Huntington, New York 11743	(631) 351-2000	
Plainview Medical Group: 87 Cold Spring Road Syosset, New York 11791	(516) 822-2541	
Project Manager: Chris Morris	(631) 759-2967 office (631) 484-9152 cell	
Field Operations Manager: Mike Quinlan	(631) 708-8063 cell	
Corporate Health and Safety Officer : Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell	
Regional Health and Safety Officer Jeena Sheppard	(856) 608-5663 office (856) 298-7138 cell	
Client Contact: Sarah Aldridge	(516) 545-2568 office (860) 334-0554 cell	
Nearest Telephone Location: On-site cellular		

Halesite

Project Description:

Activities conducted at the Halesite Former MGP Site consist primarily of operations, maintenance and monitoring (OM&M) tasks. These tasks include:

- Groundwater Monitoring
- Gauging and Recovery of Dense Non-Aqueous Phase Liquid (DNAPL)
- Oxygen Injection System Inspections and Maintenance of oxygen equipment
- Annual site-wide inspections including the caps, groundwater wells, and the groundwater treatment system.
- Site Management Plan (SMP) Implementation, which could include a variety of oversight tasks at, or in the immediate vicinity of the site.

Other activities may be conducted on an as needed basis. These activities may include:

- Site maintenance (such as the refurbishment or restoration of monitoring well caps and pads, replacement of signs, repainting, etc.).
- Installation and/or abandonment of monitoring wells, NAPL recovery wells, oxygen injection wells, and soil vapor points.

Soil vapor intrusion and indoor/outdoor air investigations on properties adjacent to the Halesite Former MGP Site.

Site Description:

The Site is approximately one acre in size and is located at 18 New York Avenue in Halesite. The Site is located in a mixed industrial, commercial and residential area adjacent to Huntington Harbor. An active LIPA electric substation is located on the western-third, or Lowland Area, of the Site. The remaining eastern two-thirds of the property, or Upland Area, is undeveloped land characterized by a steep slope. The NYSDEC approved the RAP for the site in 2006 and remedial construction was completed in 2009. The Final Engineering Report and the Final SMP were submitted to the NYSDEC in April and May 2014, respectively. An environmental easement was part of the SMP and exists for the Site. The remediation consisted of excavations to remove source material and the installation of a groundwater treatment system to treat off-site groundwater impacts and prevent the discharge of impacted water into Huntington Harbor

An oxygen injection system was installed around the perimeter of the Lowland Area to treat both groundwater and residual soil contamination. The purpose of the oxygen injection system is to infuse oxygen into groundwater to promote microbial reduction in groundwater impacts. The oxygen injection system became operational on May 4, 2009. The system consists of an oxygen injection equipment enclosure, which houses oxygen generation and distribution equipment; and

a series of 23 oxygen injection well clusters installed around the perimeter of the electrical substation, connected via underground tubing. Each injection well cluster consists of one shallow and one deep injection well.

Table 2: Activity Hazard Analysis

Activity	Potential Hazard	Control Measures
Carrying Equipment	Heavy lifting, strains/sprains, slips/trips/falls, pinch points	• Use proper lifting techniques as defined in the heavy lifting activity analysis below • Wear the proper type of glove to protect hands against sharp edges and skin/soft tissue injuries • Wear appropriate footwear • Be aware of hard to grip and hold items that may force your hand or wrist into awkward, stressful positions and cause disorders like tendinitis or carpal tunnel syndrome • Take breaks when carrying items frequently and/or for long distances • Do not over reach when picking up or placing items. • Use the buddy system when necessary • When climbing ladders, maintain three points of contact at all times. DO NOT carry equipment up or down ladders unless it is in a secure backpack or similar hands-free shoulder-strap bag or case. Lower or raise larger equipment by crane or rope
Dense Non-Aqueous Phase Liquid (DNAPL) Gauging and Recovery	Contaminant Exposure, Repetition, Slips/Trips/Falls	• Wear proper PPE during sampling including Tyvek or Tyvek apron with sleeves, Nitrile gloves, and face shield/safety glasses. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Drum Handling	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions Heavy Lifting , Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses and face shield as appropriate. • Use proper dollies or drum moving tools. • Use applicable tools to open/close drum lids. • Do not handle drums with bulging sides. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Use proper lifting techniques. • Ask fellow worker for help. • Keep trafficked areas free from slip/trip/fall hazards. • See SOP HS-003
Electrical Substation Interior Entry	Electrocution, shock	• Wear proper personal protective equipment (PPE) including flame resistant clothing when working within the substation. • Follow Occupational Safety and Health Agency (OSHA) guidelines for working distance to equipment.
Groundwater Sampling	Contaminant Exposure, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses and Nitrile/neoprene gloves. • Dispose of gloves after use and wash hands. • User proper lifting techniques. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.

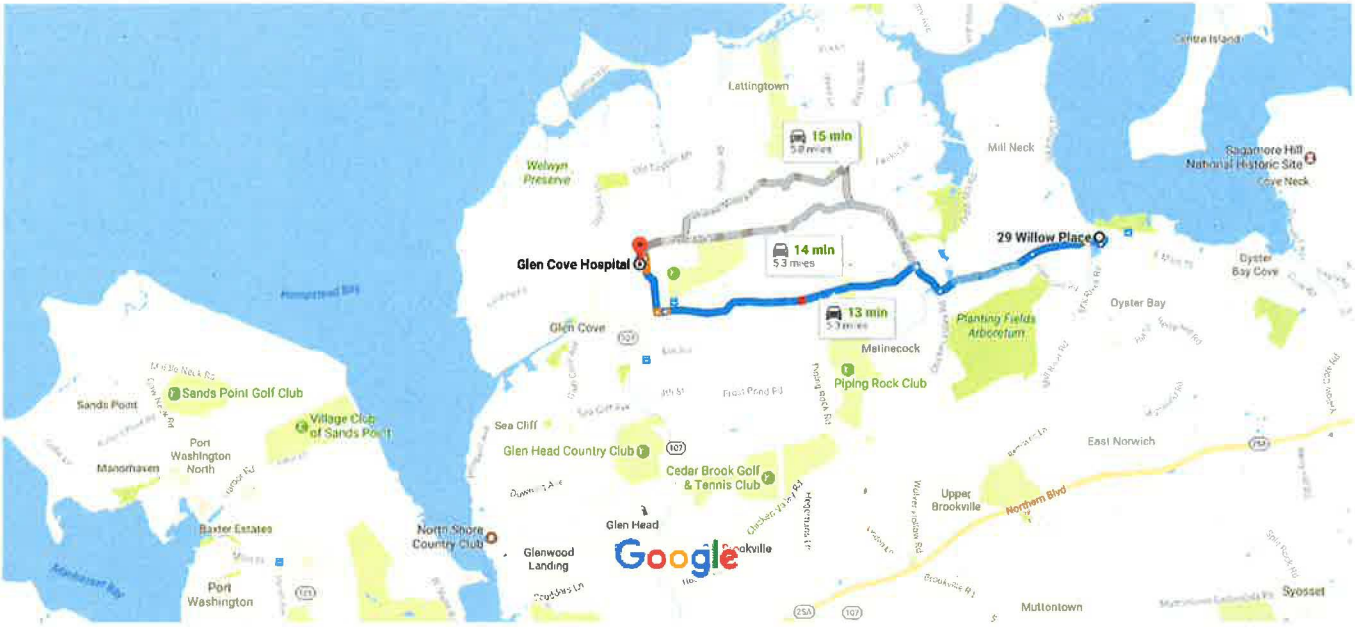
Activity	Potential Hazard	Control Measures
Heavy Equipment – Working Near	Struck-by, caught-in-between equipment, crushing, pinch points	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or (electrical hazard) EH-rated safety boots with composite toe and shank; safety glasses; nitrile/neoprene gloves; and earplugs. • Identify yourself and your work location to heavy equipment operators, so they may incorporate you into their operations. • Coordinate hand signals with operators. • Stay Alert! Pay attention to equipment backup alarms and swing radii. • Wear a high-visibility, reflective vest when working near equipment or motor vehicle traffic. • Position yourself in a safe location when filling out logs talking with the contractor. • Notify the contractor immediately if any problems arise. • Do not stand or sit under suspended loads or near any pressurized equipment lines. • Do not operate cellular telephones in the vicinity of heavy equipment operation. • See SOP HS-018
Soil Sampling/Soil Vapor Sampling	Contaminant Exposure, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs as necessary. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Excavation entry will be allowed only with proper sloping or shoring. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Waste Characterization	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions, Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Keep trafficked areas free from slip/trip/fall hazards.
Working near Water	Drowning, hypothermia	• While working near water stay inside guard rails and or barriers. • While working out of out of safety zones a personal flotation device (PFD) must be worn at all times and an approved 30-inch ring buoys will be readily available for emergency rescue operations. • Use appropriate fall protection. • Buddy system shall be in use. • See SOP HS-017

Activity	Potential Hazard	Control Measures
Monitoring well, soil vapor point and/or oxygen injection well installation and abandonment.	Contaminant Exposure, Noise, Contact with Utilities, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls, Drill Rig Proximity	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs. • Confirm utility locate has been completed. • Confirm adequate clearance from overhead utilities. • Dispose of gloves after use and wash hands. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards. • Maintain awareness of location of equipment. Subcontractor use of a spotter for equipment operation
Waste Management	Contaminant Exposure, Cuts/Scrapes	• Wear proper PPE during sampling including Tyvek or Tyvek apron with sleeves, Nitrile gloves, and face shield/safety glasses. • Wear work gloves over nitrile gloves.
Replace well boxes and associated concrete on monitoring wells, soil vapor points and/or oxygen injection wells	Jackhammer Proximity, Silica Dust Inhalation (From Grout/Cement Mixing), Noise	• Wear proper PPE, including safety glasses, hard hat, high visibility reflective vest, and EH rated safety boots. Maintain awareness of location of equipment. • Stay upwind of mixing area. Wear a dust mask if necessary. • Wear hearing protection.
Site Cap Inspection (Annual)	Slips, Trips and Falls	• Keep trafficked areas free of slip/trip/fall hazards.
Monthly System Check	Oxygen Explosion Hazard, Slips, Trips and Falls, Electrical Hazards From O2 System Equipment and Other Mechanical Equipment	• No smoking in and around injection shed. Assure fire hazards are removed from in and around shed. Maintain system components to avoid oxygen leaks and electrical shorts that may spark a fire. • Keep trafficked areas free of slip/trip/fall hazards. Maintain a safe distance from unprotected fall areas (south side of site next to 36 N. New York Avenue parking lot). • Adhere to all equipment warning labels and warnings in equipment manuals. Maintain equipment to avoid electrical shorts and other mechanical failures that may lead to electrical injury.

Appendix D

Oyster Bay – Site Specific Information

Google Maps **29 Willow Pl, Oyster Bay, NY 11771 to Glen Cove Hospital** Drive 5.3 miles, 13 min



Map data ©2017 Google 1 mi

29 Willow Pl

Oyster Bay, NY 11771

Take Willow Pl to W Main St

37 s (0.1 mi)

1. Head southeast on Willow Pl toward Bayside Ave

256 ft

2. Turn right onto Bayside Ave

249 ft

Take Oyster Bay Road and Duck Pond Rd to St Andrews Ln in Glen Cove

11 min (5.1 mi)

3. Turn right onto W Main St

0.1 mi

4. Turn left onto Mill Hill Rd

0.6 mi

5. Continue onto Oyster Bay Road

1.0 mi

6. Turn right to stay on Oyster Bay Road

0.3 mi

7. Turn left onto Duck Pond Rd

2.5 mi

8. Continue onto Town Path

377 ft

9. Turn right onto Walnut Rd

0.5 mi

10. Turn left onto St Andrews Ln

● Destination will be on the left

23 s (305 ft)

Glen Cove Hospital

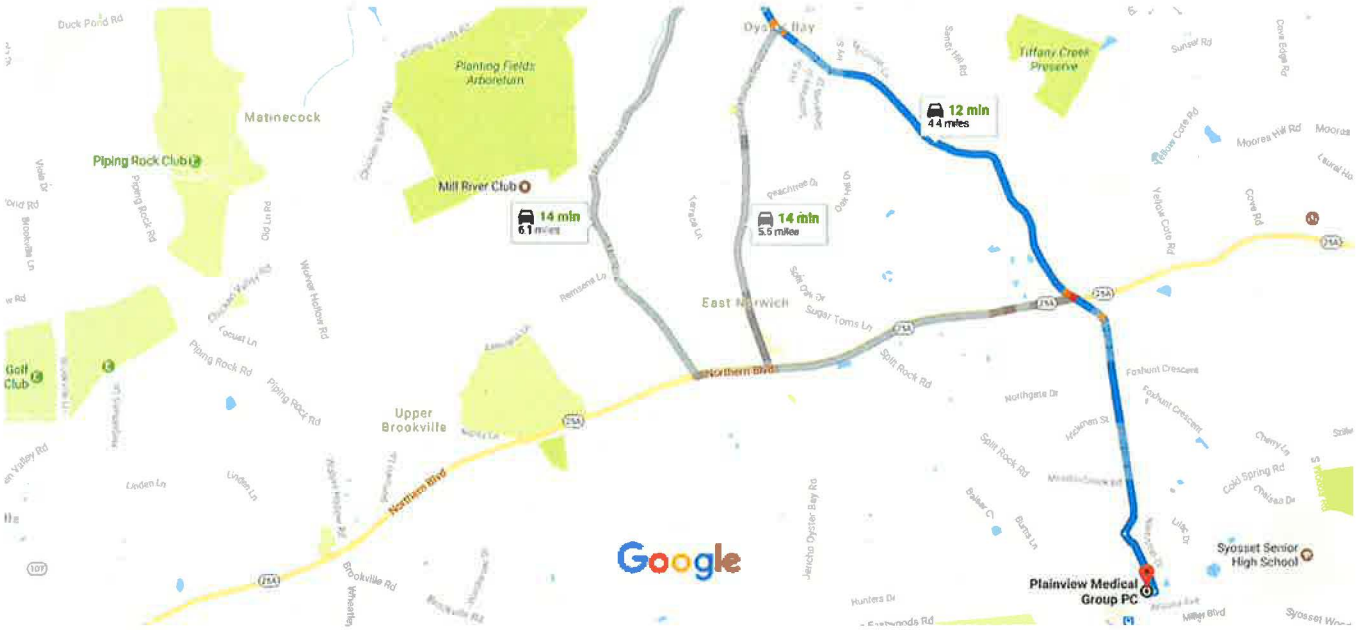
101 St Andrews Ln, Glen Cove, NY 11542

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

Google Maps

29 Willow Pl, Oyster Bay, NY 11771 to Plainview Medical Group PC

Drive 4.4 miles, 12 min



Map data ©2017 Google 2000 ft

29 Willow Pl

Oyster Bay, NY 11771

1. Head southeast on Willow Pl toward Bayside Ave — 256 ft
2. Turn right onto Bayside Ave — 249 ft
3. Turn left onto W Main St — 0.2 mi
4. Turn right onto Lexington Ave — 0.5 mi
5. Continue onto Berry Hill Rd — 3.3 mi
6. Turn left onto Woodbury Way — 0.3 mi
7. Turn right onto Cold Spring Rd — 190 ft

Destination will be on the right

Plainview Medical Group PC

87 Cold Spring Rd #1, Syosset, NY 11791

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

1. Emergency Contact Information

Table 1d. Oyster Bay Emergency Information

Important Phone Numbers		Directions to Hospital
Local Police:	911	To Hospital and Occupational Health Clinic: See Attached Maps and Directions for each site in Appendix A Directions to Hospital: Head southeast on Willow Place toward Bayside Avenue, then turn right onto Bayside Avenue. Turn right onto West Main Street, then turn left onto Mill Hill Road. Continue onto Oyster Bay Road and then after 1.0 miles turn right to stay on Oyster Bay Road. Turn left onto Duck Pond Road, then continue onto Town Path. Turn right onto Walnut Road, then turn left onto St. Andrews Lane, the hospital will be on the left.
Fire Department:	911	
Ambulance:	911	
State Police or County Sheriff:	911	
Glen Cove Hospital 101 Street Andrews Lane Glen Cove, NY 11542	(516) 674-7300	
Plainview Medical Group: 87 Cold Spring Road Syosset, New York 11791	(516) 822-2541	
Project Manager: Chris Morris	(631) 759-2967 office (631) 484-9152 cell	
Field Operations Manager: Mike Quinlan	(631) 708-8063 cell	
Corporate Health and Safety Officer : Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell	
Regional Health and Safety Officer Jeena Sheppard	(856) 608-5663 office (856) 298-7138 cell	
Client Contact: Sarah Aldridge	(516) 545-2568 office (860) 334-0554 cell	
Nearest Telephone Location: On-site cellular		

Oyster Bay

Project Description:

Activities conducted at Oyster Bay Hortonsphere consist of an annual site-wide inspection and additional continued documentation of the property as an electric substation.

Site Description:

The Site address is 29 Willow Place in Oyster Bay. The property encompasses approximately 18.29-acres; 7.41 acres is located on the landside and 10.88 acres are submerged beneath the Narrows of the New York Harbor. The Site is currently occupied by an active electric substation (northeast portion of the site), an outbuilding (former DC generator building), transformer pads, concrete pilings adjacent to the former DC generator building, and vacant wooded and grass covered land. The enclosed electric substation is operated by LIPA/PSEG. The western portion of the property is a tidal creek feeding Oyster Bay. The adjacent properties are primarily residential /commercial.

Table 2: Activity Hazard Analysis

Activity	Potential Hazard	Control Measures
Electrical Substation Interior Entry	Electrocution, shock	• Wear proper personal protective equipment (PPE) including flame resistant clothing when working within the substation. • Follow Occupational Safety and Health Agency (OSHA) guidelines for working distance to equipment.
Excavation and Trenching Oversight (as needed)	Crushing, entrapment, falls, fire/explosion	• Prior to excavating, determine utility locations and have locations marked by utility companies and the property owner. • Utilities shall be properly supported and barriers should be erected around excavations in remote areas. • Backfill temporary excavations when work is completed. • Personnel must remain 2 feet from the face of the excavation. • Sides, slopes, and faces shall meet OSHA requirements. • Excavation entry will be allowed only with proper sloping or shoring. • See SOP HS-006
Heavy Equipment – Working Near	Struck-by, caught-in-between equipment, crushing, pinch points	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or (electrical hazard) EH-rated safety boots with composite toe and shank; safety glasses; nitrile/neoprene gloves; and earplugs. • Identify yourself and your work location to heavy equipment operators, so they may incorporate you into their operations. • Coordinate hand signals with operators. • Stay Alert! Pay attention to equipment backup alarms and swing radii. • Wear a high-visibility, reflective vest when working near equipment or motor vehicle traffic. • Position yourself in a safe location when filling out logs talking with the contractor. • Notify the contractor immediately if any problems arise. • Do not stand or sit under suspended loads or near any pressurized equipment lines. • Do not operate cellular telephones in the vicinity of heavy equipment operation. • See SOP HS-018
Site Cap Inspection (Annual)	Slips, Trips and Falls	• Keep trafficked areas free of slip/trip/fall hazards.

Appendix E

Rockaway Park – Site Specific Information

Google Maps **108-03 Beach Channel Dr to St. John's Episcopal Hospital** Drive 4.8 miles, 18 min

Map data ©2017 Google 2000 ft

108-03 Beach Channel Dr
Far Rockaway, NY 11694

1. Head east on Beach Channel Dr toward Beach 108th St — 2.0 mi
2. Turn right onto Beach 67th St — 0.1 mi
3. Turn left onto Rockaway Fwy — 1.6 mi
4. Turn right onto Seagirt Blvd — 0.7 mi
5. Turn left onto Beach 19th St — 0.2 mi

   Destination will be on the left

St. John's Episcopal Hospital
327 Beach 19th St, Far Rockaway, NY 11691

Google Maps **108-03 Beach Channel Dr to Occupational Health Services** Drive 12.0 miles, 35 min

Map data ©2017 Google 2 mi

108-03 Beach Channel Dr

Far Rockaway, NY 11694

Take Cross Bay Blvd, Nassau Expy and I-678 N to 89th Ave

26 min (12.0 mi)

1. Head east on Beach Channel Dr toward Beach 108th St

0.7 mi

2. Slight right

43 ft

3. Slight left onto the Cross Bay Vet.Mem.Br ramp to Belt Pkwy
   Toll road

0.3 mi

4. Merge onto Cross Bay Blvd/Cross Bay Veterans Memorial Bridge/New York State Reference Rte 907J
   Continue to follow Cross Bay Blvd/Cross Bay Veterans Memorial Bridge
   Toll road

0.5 mi

5. Continue straight onto Cross Bay Blvd
   ⚠ Partial toll road

5.0 mi

6. Turn right onto the NY-878 E/NY-27 E/Nassau Expwy ramp to So Conduit Ave/Kennedy Airport

0.2 mi

7. Merge onto NY-27 E/NY-878/Nassau Expy
   Continue to follow NY-27 E/Nassau Expy

0.4 mi

8. Keep left to continue on Nassau Expy

1.7 mi

9. Use the right 2 lanes to take the Interstate 678 N/Van Wyck Expwy ramp to Bronx

0.4 mi

10. Merge onto I-678 N

2.6 mi

11. Take exit 6 for Jamaica Ave/Hillside Ave

459 ft

12. Merge onto Van Wyck Expy

154 ft

13. Turn left onto Jamaica Ave

253 ft

14. Turn left at the 1st cross street onto Van Wyck Expy

404 ft

Continue on 89th Ave. Drive to 135th St

47 s (400 ft)

15. Turn right onto 89th Ave

256 ft

16. Turn left onto 135th St
    Destination will be on the right

144 ft

Occupational Health Services

89-06 135th St, Richmond Hill, NY 11418

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

1. Emergency Contact Information

Table 1e. Rockaway Emergency Information

Important Phone Numbers		Directions to Hospital
Local Police:	911	To Hospital and Occupational Health Clinic: See Attached Maps and Directions for each site in Appendix A Directions to Hospital: Head east on Beach Channel Drive toward Beach 108th Street and after 2.0 miles turn right onto Beach 67th Street. Turn left onto Rockaway Fwy and after 1.6 miles turn right onto Seagirt Blvd. Turn left onto Beach 19th Street and the hospital will be on the left.
Fire Department:	911	
Ambulance:	911	
State Police or County Sheriff:	911	
St. John's Episcopal Hospital: 327 Beach 19th Street Far Rockaway, New York 11691	(718) 869-7000	
Occupational Health Services 89-06 135th Street Richmond Hill, NY 11418	(718) 206-6812	
Project Manager: Chris Morris	(631) 759-2967 office (631) 484-9152 cell	
Field Operations Manager: Mike Quinlan	(631) 708-8063 cell	
Corporate Health and Safety Officer : Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell	
Regional Health and Safety Officer Jeena Sheppard	(856) 608-5663 office (856) 298-7138 cell	
Client Contact: Sarah Aldridge	(516) 545-2568 office (860) 334-0554 cell	
Nearest Telephone Location: On-site cellular		

Rockaway

Project Description:

Activities conducted at the Rockaway Former MGP Site consist primarily of the following tasks.

- Annual site-wide inspection that includes the deep barrier wall, the NYC bulkhead area, site cap, wells, and other site features
- Quarterly gauging and Recovery of Dense Non-Aqueous Phase Liquid (DNAPL)
- Groundwater Monitoring

Other activities may be conducted on an as needed basis. These activities may include:

- Site maintenance (such as the refurbishment or restoration of monitoring well caps and pads, replacement of signs, repainting, etc.)
- Installation and/or abandonment of monitoring wells and dense non-aqueous phase liquid (DNAPL) recovery wells

Site Description:

The Site is located at 108-03 Beach Channel Drive in a commercial, industrial, and residential area and encompasses approximately 8.9 acres. A 0.6 acre New York City bulkhead area located on the north side of Beach Channel Drive is considered an off-site property. NG currently owns the Site and New York City Parks Department owns the bulkhead parcel and a Memorandum of Access (MOA) is in place. There will be an EE that is placed on the property. The main portion of the site has been remediated in accordance with a ROD which required onsite soil removal and the installation of a deep barrier wall to cut off potential NAPL migration. Site remediation was completed between 2010 and 2012 and the former LILCO/LIPA substation was remediated as part of the MGP site remediation. Offsite remediation, including a barrier wall and recovery wells, was completed on the NYC Bulkhead property in May 2016.

Table 2: Activity Hazard Analysis

Activity	Potential Hazard	Control Measures
Carrying Equipment	Heavy lifting, strains/sprains, slips/trips/falls, pinch points	• Use proper lifting techniques as defined in the heavy lifting activity analysis below • Wear the proper type of glove to protect hands against sharp edges and skin/soft tissue injuries • Wear appropriate footwear • Be aware of hard to grip and hold items that may force your hand or wrist into awkward, stressful positions and cause disorders like tendinitis or carpal tunnel syndrome • Take breaks when carrying items frequently and/or for long distances • Do not over reach when picking up or placing items. • Use the buddy system when necessary • When climbing ladders, maintain three points of contact at all times. DO NOT carry equipment up or down ladders unless it is in a secure backpack or similar hands-free shoulder-strap bag or case. Lower or raise larger equipment by crane or rope
Dense Non-Aqueous Phase Liquid (DNAPL) Gauging and Recovery	Contaminant Exposure, Repetition, Slips/Trips/Falls	• Wear proper PPE during sampling including Tyvek or Tyvek apron with sleeves, Nitrile gloves, and face shield/safety glasses. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Drilling Oversight/ Sampling	Contaminant Exposure, Noise, Contact with Utilities, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs. • Confirm utility locate has been completed. • Confirm adequate clearance from overhead utilities. • Dispose of gloves after use and wash hands. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Drum Handling	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions Heavy Lifting , Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses and face shield as appropriate. • Use proper dollies or drum moving tools. • Use applicable tools to open/close drum lids. • Do not handle drums with bulging sides. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Use proper lifting techniques. • Ask fellow worker for help. • Keep trafficked areas free from slip/trip/fall hazards. • See SOP HS-003
Electrical Substation Interior Entry	Electrocution, shock	• Wear proper personal protective equipment (PPE) including flame resistant clothing when working within the substation. • Follow Occupational Safety and Health Agency (OSHA) guidelines for working distance to equipment.

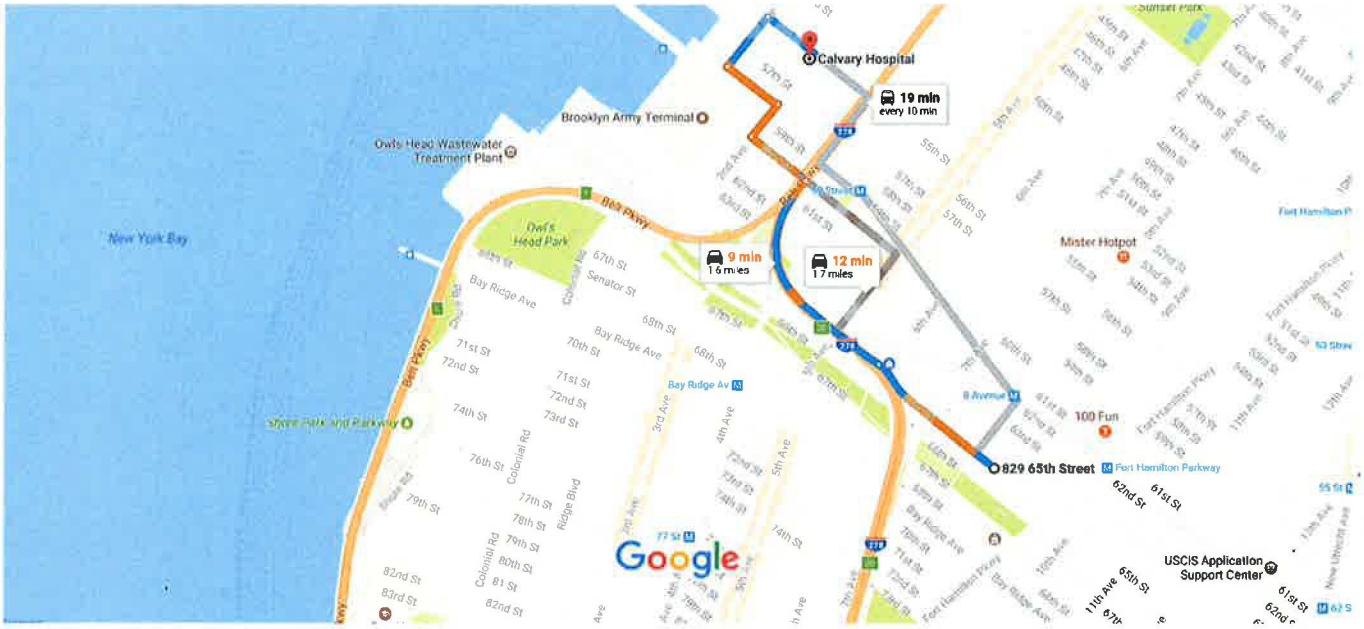
Activity	Potential Hazard	Control Measures
Excavation and Trenching Oversight (as needed)	Crushing, entrapment, falls, fire/explosion	• Prior to excavating, determine utility locations and have locations marked by utility companies and the property owner. • Utilities shall be properly supported and barriers should be erected around excavations in remote areas. • Backfill temporary excavations when work is completed. • Personnel must remain 2 feet from the face of the excavation. • Sides, slopes, and faces shall meet OSHA requirements. • Excavation entry will be allowed only with proper sloping or shoring. • See SOP HS-006
Groundwater Sampling	Contaminant Exposure, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses and Nitrile/neoprene gloves. • Dispose of gloves after use and wash hands. • User proper lifting techniques. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Heavy Equipment – Working Near	Struck-by, caught-in-between equipment, crushing, pinch points	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or (electrical hazard) EH-rated safety boots with composite toe and shank; safety glasses; nitrile/neoprene gloves; and earplugs. • Identify yourself and your work location to heavy equipment operators, so they may incorporate you into their operations. • Coordinate hand signals with operators. • Stay Alert! Pay attention to equipment backup alarms and swing radii. • Wear a high-visibility, reflective vest when working near equipment or motor vehicle traffic. • Position yourself in a safe location when filling out logs talking with the contractor. • Notify the contractor immediately if any problems arise. • Do not stand or sit under suspended loads or near any pressurized equipment lines. • Do not operate cellular telephones in the vicinity of heavy equipment operation. • See SOP HS-018
Soil Sampling/Soil Vapor Sampling	Contaminant Exposure, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs as necessary. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Excavation entry will be allowed only with proper sloping or shoring. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.

Activity	Potential Hazard	Control Measures
Waste Characterization	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions, Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Keep trafficked areas free from slip/trip/fall hazards.
Working near Water	Drowning, hypothermia	• While working near water stay inside guard rails and or barriers. • While working out of out of safety zones a personal flotation device (PFD) must be worn at all times and an approved 30-inch ring buoys will be readily available for emergency rescue operations. • Use appropriate fall protection. • Buddy system shall be in use. • See SOP HS-017
Monitoring well, soil vapor point and/or oxygen injection well installation and abandonment.	Contaminant Exposure, Noise, Contact with Utilities, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls, Drill Rig Proximity	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs. • Confirm utility locate has been completed. • Confirm adequate clearance from overhead utilities. • Dispose of gloves after use and wash hands. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards. • Maintain awareness of location of equipment. Subcontractor use of a spotter for equipment operation
Waste Management	Contaminant Exposure, Cuts/Scrapes	• Wear proper PPE during sampling including Tyvek or Tyvek apron with sleeves, Nitrile gloves, and face shield/safety glasses. • Wear work gloves over nitrile gloves.
Replace well boxes and associated concrete on monitoring wells, soil vapor points and/or oxygen injection wells	Jackhammer Proximity, Silica Dust Inhalation (From Grout/Cement Mixing), Noise	• Wear proper PPE, including safety glasses, hard hat, high visibility reflective vest, and EH rated safety boots. Maintain awareness of location of equipment. • Stay upwind of mixing area. Wear a dust mask if necessary. • Wear hearing protection.
Site Cap Inspection (Annual)	Slips, Trips and Falls	• Keep trafficked areas free of slip/trip/fall hazards.

Appendix F

Bay Ridge – Site Specific Information

Google Maps **829 65th St, Brooklyn, NY 11220 to Calvary Hospital** Drive 1.6 miles, 9 min



Map data ©2017 Google 1000 ft

829 65th St
Brooklyn, NY 11220

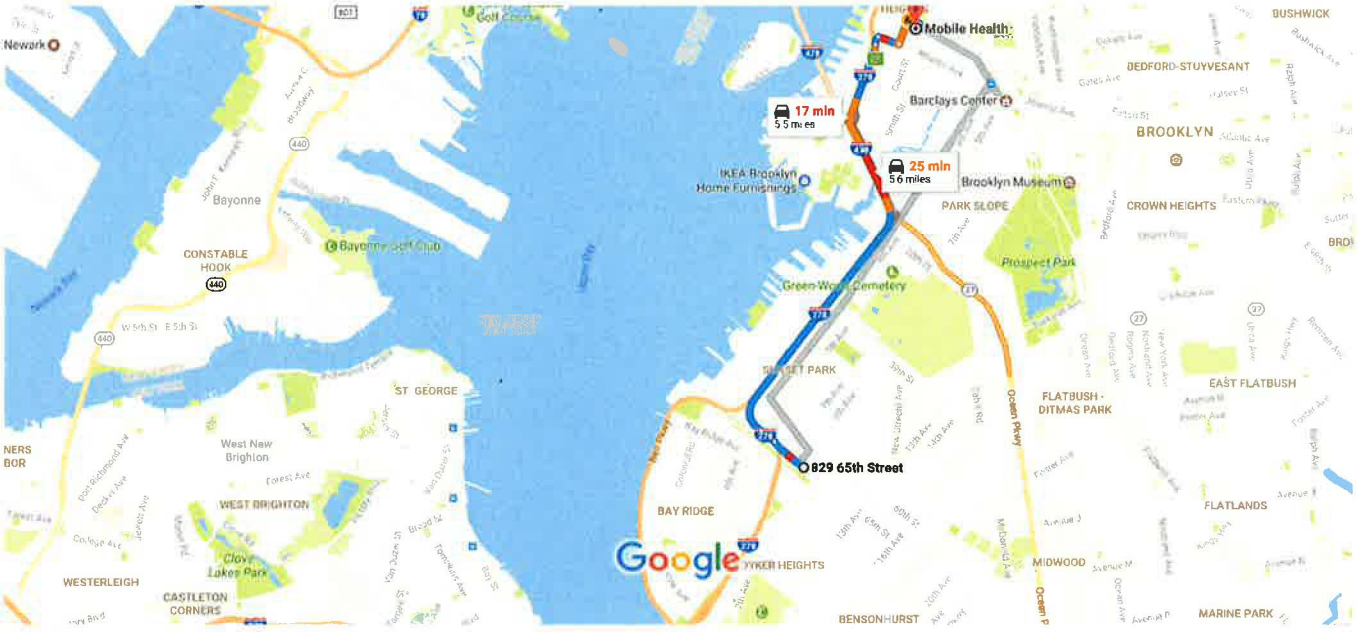
1. Head northwest on 65th St toward 8th Ave/Detective James V. Nemorin St — 0.4 mi
2. Keep left — 0.6 mi
3. Turn left onto 60th St — 0.2 mi
4. Turn right onto 2nd Ave — 0.1 mi
5. Turn left onto 58th St — 0.1 mi
6. Turn right onto 1st Ave — 0.2 mi
7. Turn right onto 55th St
   Destination will be on the right — 0.1 mi

Calvary Hospital

150 55th St, Brooklyn, NY 11220

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

Google Maps **829 65th St, Brooklyn, NY 11220 to Mobile Health** Drive 5.5 miles, 17 min



Map data ©2017 Google 1 mi

829 65th St
Brooklyn, NY 11220

Get on I-278 E

3 min (0.5 mi)

1. Head northwest on 65th St toward 8th Ave/Detective James V. Nemorin St

0.4 mi

2. Use the right lane to take the Interstate 278 E ramp to Manhattan/Queens

0.2 mi

Follow I-278 E to Atlantic Ave. Take exit 27 from I-278 E

9 min (4.4 mi)

3. Merge onto I-278 E

3.2 mi

4. Keep right at the fork to stay on I-278 E, follow signs for Bklyn Qns Expressway/Triboro Bridge

1.1 mi

5. Take exit 27 to merge onto Atlantic Ave

420 ft

Continue on Atlantic Ave. Take Clinton St to Court St

6 min (0.6 mi)

6. Merge onto Atlantic Ave

0.2 mi

7. Turn left onto Clinton St

0.2 mi

8. Turn right onto Remsen St

0.1 mi

9. Turn right onto Court St

Destination will be on the right

279 ft

Mobile Health

50 Court St # 1002, Brooklyn, NY 11201

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

1. Emergency Contact Information

Table 1f. Bay Ridge Emergency Information

Important Phone Numbers		Directions to Hospital
Local Police:	911	To Hospital and Occupational Health Clinic: See Attached Maps and Directions for each site in Appendix A Directions to Hospital: Head northwest on 65th Street toward 8th Avenue and then keep left. Turn left onto 60th Street, turn right onto 2nd Avenue, turn left onto 58th Street, turn right onto 1st Avenue and then finally turn right onto 55th Street and after 0.2 miles the hospital will be on the right.
Fire Department:	911	
Ambulance:	911	
State Police or County Sheriff:	911	
Calvary Hospital 150 55th Street Brooklyn, NY 11220	(718) 630-6666	
Mobile Health 50 Court Street # 1002 Brooklyn, NY 11201	(212) 695-5122	
Project Manager: Chris Morris	(631) 759-2967 office (631) 484-9152 cell	
Field Operations Manager: Mike Quinlan	(631) 708-8063 cell	
Corporate Health and Safety Officer : Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell	
Regional Health and Safety Officer Jeena Sheppard	(856) 608-5663 office (856) 298-7138 cell	
Client Contact: Sarah Aldridge	(516) 545-2568 office (860) 334-0554 cell	
Nearest Telephone Location: On-site cellular		

Bay Ridge

Project Description:

Activities conducted at the Bay Ridge Holder station consist of an annual site-wide inspection and groundwater monitoring.

Site Description:

The Site is comprised of two former Holder Stations, A and B, located between 8th and 9th Avenues, with Station A between 63rd and 64th Streets, and Station B between 65th and 66th Streets in Brooklyn (829-884 65th Street). NG owns the Holder Station B parcel and it is currently a gas regulator station and ballfields. There is a grocery store and parking lot located on the Holder Station A parcel. Remedial activities have not occurred at the site. The requirements under this Contract are only for Holder Station B parcel. No actions are required on the Holder Station A parcel.

Table 2: Activity Hazard Analysis

Activity	Potential Hazard	Control Measures
Carrying Equipment	Heavy lifting, strains/sprains, slips/trips/falls, pinch points	• Use proper lifting techniques as defined in the heavy lifting activity analysis below • Wear the proper type of glove to protect hands against sharp edges and skin/soft tissue injuries • Wear appropriate footwear • Be aware of hard to grip and hold items that may force your hand or wrist into awkward, stressful positions and cause disorders like tendinitis or carpal tunnel syndrome • Take breaks when carrying items frequently and/or for long distances • Do not over reach when picking up or placing items. • Use the buddy system when necessary • When climbing ladders, maintain three points of contact at all times. DO NOT carry equipment up or down ladders unless it is in a secure backpack or similar hands-free shoulder-strap bag or case. Lower or raise larger equipment by crane or rope
Drum Handling	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions Heavy Lifting , Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses and face shield as appropriate. • Use proper dollies or drum moving tools. • Use applicable tools to open/close drum lids. • Do not handle drums with bulging sides. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Use proper lifting techniques. • Ask fellow worker for help. • Keep trafficked areas free from slip/trip/fall hazards. • See SOP HS-003
Groundwater Sampling	Contaminant Exposure, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses and Nitrile/neoprene gloves. • Dispose of gloves after use and wash hands. • User proper lifting techniques. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Monitoring well, soil vapor point and/or oxygen injection well installation and abandonment.	Contaminant Exposure, Noise, Contact with Utilities, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls, Drill Rig Proximity	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs. • Confirm utility locate has been completed. • Confirm adequate clearance from overhead utilities. • Dispose of gloves after use and wash hands. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards. • Maintain awareness of location of equipment. Subcontractor use of a spotter for equipment operation

Activity	Potential Hazard	Control Measures
Replace well boxes and associated concrete on monitoring wells, soil vapor points and/or oxygen injection wells	Jackhammer Proximity, Silica Dust Inhalation (From Grout/Cement Mixing), Noise	• Wear proper PPE, including safety glasses, hard hat, high visibility reflective vest, and EH rated safety boots. Maintain awareness of location of equipment. • Stay upwind of mixing area. Wear a dust mask if necessary. • Wear hearing protection.
Site Cap Inspection (Annual)	Slips, Trips and Falls	• Keep trafficked areas free of slip/trip/fall hazards.

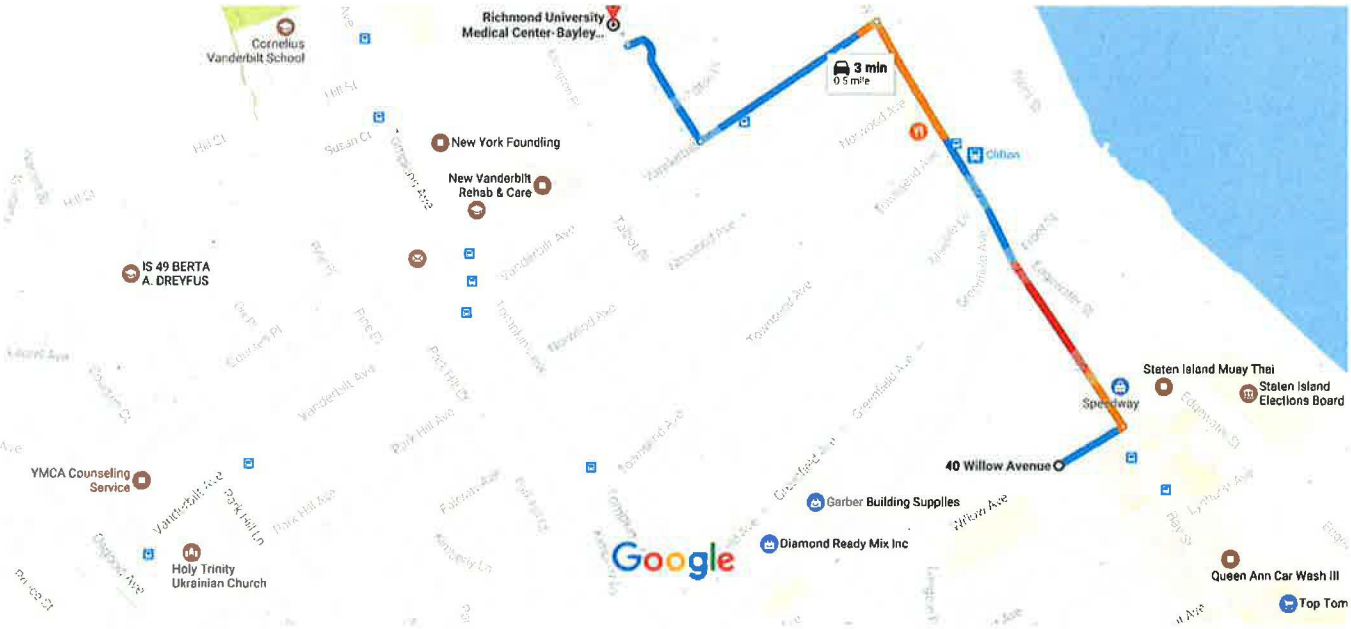
Appendix G

Clifton – Site Specific Information

Google Maps

40 Willow Ave, Staten Island, NY 10305 to Richmond University Medical Center-Bayley Seton Hospital

Drive 0.5 mile, 3 min



Map data ©2017 Google 200 ft

40 Willow Ave

Staten Island, NY 10305

1.	Head northeast on Willow Ave toward Bay St	236 ft
2.	Turn left onto Bay St	0.3 mi
3.	Turn left onto Vanderbilt Ave	0.1 mi
4.	Turn right	427 ft

Richmond University Medical Center-Bayley Seton Hospital

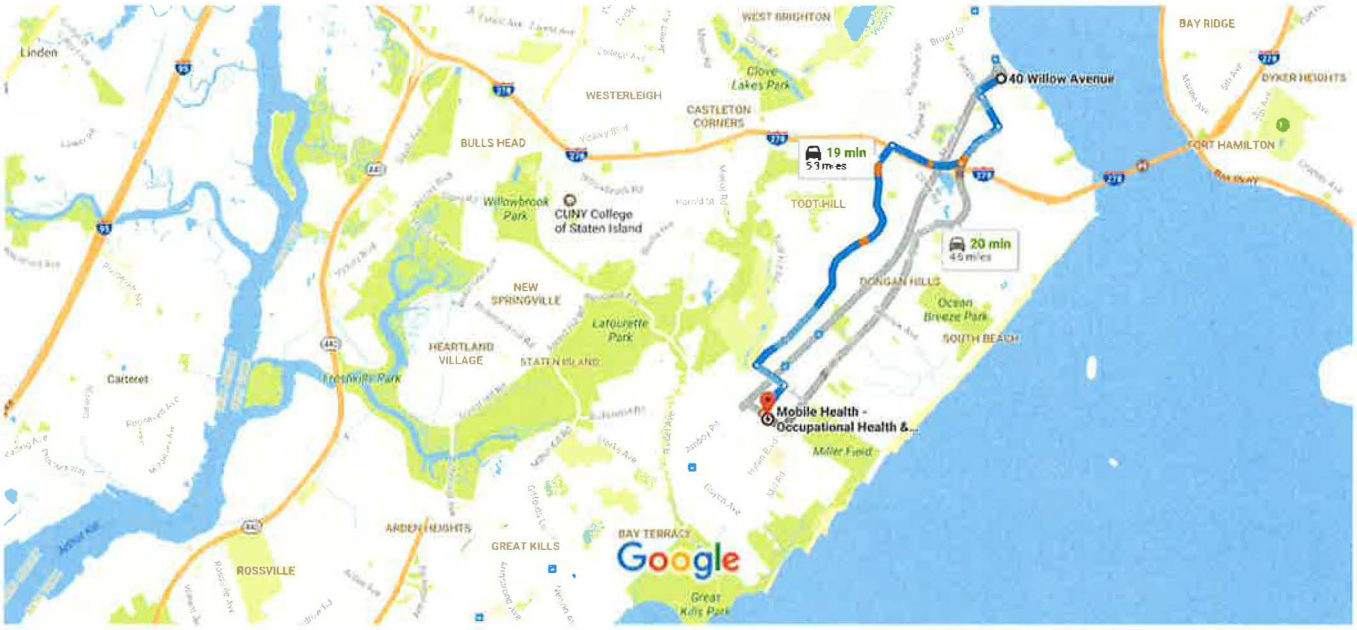
75 Vanderbilt Ave, Staten Island, NY 10304

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

Google Maps

40 Willow Ave, Staten Island, NY 10305 to Mobile Health - Occupational Health & Drug Testing

Drive 5.3 miles, 19 min



Map data ©2017 Google 1 mi

40 Willow Ave

Staten Island, NY 10305

1. Head southwest on Willow Ave toward Langere Pl

1 min (0.3 mi)

Take Richmond Rd to Edison St

16 min (4.6 mi)

2. Turn right onto Tompkins Ave

0.3 mi

3. Turn right onto Hylan Blvd

0.5 mi

4. Turn right onto Narrows Rd N

0.7 mi

5. Turn left onto Richmond Rd

2.7 mi

6. Turn left onto Bancroft Ave

0.3 mi

7. Turn right onto Edison St

2 min (0.3 mi)

8. Turn left onto New Dorp Ln

● Destination will be on the right

53 s (377 ft)

Mobile Health - Occupational Health & Drug Testing

294 New Dorp Ln 2D Floor, Staten Island, NY 10306

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

1. Emergency Contact Information

Table 1g. Clifton Emergency Information

Important Phone Numbers		Directions to Hospital
Local Police:	911	To Hospital and Occupational Health Clinic: See Attached Maps and Directions for each site in Appendix A Directions to Hospital: Head northeast on Willow Avenue toward Bay Street and then turn left onto Bay Street. After 0.3 miles turn left onto Vanderbilt Avenue. After 0.1 miles turn right towards the hospital.
Fire Department:	911	
Ambulance:	911	
State Police or County Sheriff:	911	
Richmond University Medical Center-Bayley Seton Hospital: 75 Vanderbilt Ave, Staten Island, NY 10304	(718) 818-6000	
Mobile Health - Occupational Health & Drug Testing: 294 New Dorp Lane 2D Floor Staten Island, NY 10306	(212) 695-5122	
Project Manager: Chris Morris	(631) 759-2967 office (631) 484-9152 cell	
Field Operations Manager: Mike Quinlan	(631) 708-8063 cell	
Corporate Health and Safety Officer : Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell	
Regional Health and Safety Officer Jeena Sheppard	(856) 608-5663 office (856) 298-7138 cell	
Client Contact: Sarah Aldridge	(516) 545-2568 office (860) 334-0554 cell	
Nearest Telephone Location: On-site cellular		

Clifton

Project Description:

Activities conducted at the Clifton Former MGP consist primarily of operations, maintenance and monitoring (OM&M) tasks. These tasks include:

- Annual site-wide inspection that includes the OU-1 Containment Cell, the composite cover cap, and other site features.
- Groundwater monitoring
- Groundwater treatment system, inspections, maintenance and monthly effluent samples.
- Gauging and Recovery of Dense Non-Aqueous Phase Liquid (DNAPL)

Other activities may be conducted on an as needed basis. These activities may include:

- Site maintenance (such as the refurbishment or restoration of monitoring well caps and pads, replacement of signs, repainting, etc.)
- Installation and/or abandonment of monitoring wells and dense non-aqueous phase liquid (DNAPL) recovery wells
- Additional inspections in the event of an emergency, natural disaster, or unforeseen failure of the containment system.

Site Description:

The Site is located at 40 and 25 Willow Avenue in Staten Island. There is a NG Regulator Station located at Operable Unit (OU)-1 (40 Willow Avenue) and vacant land at OU-2 (25 Willow Avenue). On-site remediation is complete and a Site Management Plan (SMP) is in place. An off-site parcel (One Edgewater Avenue) also is part of the OM&M Contractors scope.

The existing OU-1 Containment Cell was constructed of jet grout and sheet pile walls to contain dense non-aqueous phase liquid (DNAPL) tar-impacted soil and groundwater within and immediately adjacent to a Clifton Former MGP former Relief Holder. In 2016, a groundwater treatment system was commissioned to pump and treat groundwater from the OU-1 Containment Cell for permitted discharge to the NYCDEP sewer. This groundwater treatment system is required to maintain water levels in the containment cell. A low permeability concrete cap was constructed above ground surface to enclose the containment cell.

The One Edgewater Street parcel is located to the northeast of the site and is developed with a seven-story commercial office building and a paved parking lot. The property is secured with a chain link fence and a guarded entrance at the Willow Avenue/Edgewater Street intersection. A permitted storm water outfall is located along the northern portion of the Site, and a large combined sewer overflow (CSO) is located on the adjacent property to the south. As part of the approved SMP, the property owner, Edgewater Plaza Loft, LLC, is required to maintain the pavement off site at the One Edgewater Plaza property.

Table 2: Activity Hazard Analysis

Activity	Potential Hazard	Control Measures
Carrying Equipment	Heavy lifting, strains/sprains, slips/trips/falls, pinch points	• Use proper lifting techniques as defined in the heavy lifting activity analysis below • Wear the proper type of glove to protect hands against sharp edges and skin/soft tissue injuries • Wear appropriate footwear • Be aware of hard to grip and hold items that may force your hand or wrist into awkward, stressful positions and cause disorders like tendinitis or carpal tunnel syndrome • Take breaks when carrying items frequently and/or for long distances • Do not over reach when picking up or placing items. • Use the buddy system when necessary • When climbing ladders, maintain three points of contact at all times. DO NOT carry equipment up or down ladders unless it is in a secure backpack or similar hands-free shoulder-strap bag or case. Lower or raise larger equipment by crane or rope
Dense Non-Aqueous Phase Liquid (DNAPL) Gauging and Recovery	Contaminant Exposure, Repetition, Slips/Trips/Falls	• Wear proper PPE during sampling including Tyvek or Tyvek apron with sleeves, Nitrile gloves, and face shield/safety glasses. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Drum Handling	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions Heavy Lifting , Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses and face shield as appropriate. • Use proper dollies or drum moving tools. • Use applicable tools to open/close drum lids. • Do not handle drums with bulging sides. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Use proper lifting techniques. • Ask fellow worker for help. • Keep trafficked areas free from slip/trip/fall hazards. • See SOP HS-003
Groundwater Sampling	Contaminant Exposure, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses and Nitrile/neoprene gloves. • Dispose of gloves after use and wash hands. • User proper lifting techniques. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.

Activity	Potential Hazard	Control Measures
Heavy Equipment – Working Near	Struck-by, caught-in-between equipment, crushing, pinch points	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or (electrical hazard) EH-rated safety boots with composite toe and shank; safety glasses; nitrile/neoprene gloves; and earplugs. • Identify yourself and your work location to heavy equipment operators, so they may incorporate you into their operations. • Coordinate hand signals with operators. • Stay Alert! Pay attention to equipment backup alarms and swing radii. • Wear a high-visibility, reflective vest when working near equipment or motor vehicle traffic. • Position yourself in a safe location when filling out logs talking with the contractor. • Notify the contractor immediately if any problems arise. • Do not stand or sit under suspended loads or near any pressurized equipment lines. • Do not operate cellular telephones in the vicinity of heavy equipment operation. • See SOP HS-018
Monitoring well, soil vapor point and/or oxygen injection well installation and abandonment.	Contaminant Exposure, Noise, Contact with Utilities, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls, Drill Rig Proximity	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs. • Confirm utility locate has been completed. • Confirm adequate clearance from overhead utilities. • Dispose of gloves after use and wash hands. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards. • Maintain awareness of location of equipment. Subcontractor use of a spotter for equipment operation
Waste Management	Contaminant Exposure, Cuts/Scrapes	• Wear proper PPE during sampling including Tyvek or Tyvek apron with sleeves, Nitrile gloves, and face shield/safety glasses. • Wear work gloves over nitrile gloves.
Replace well boxes and associated concrete on monitoring wells, soil vapor points and/or oxygen injection wells	Jackhammer Proximity, Silica Dust Inhalation (From Grout/Cement Mixing), Noise	• Wear proper PPE, including safety glasses, hard hat, high visibility reflective vest, and EH rated safety boots. Maintain awareness of location of equipment. • Stay upwind of mixing area. Wear a dust mask if necessary. • Wear hearing protection.
Site Cap Inspection (Annual)	Slips, Trips and Falls	• Keep trafficked areas free of slip/trip/fall hazards.

Activity	Potential Hazard	Control Measures
System Operation, OM&M and Sampling	Slips, Trips and Falls, Electrical Hazards From Treatment System Equipment and Other Mechanical Equipment	• Keep trafficked areas free of slip/trip/fall hazards. Maintain a safe distance from unprotected fall areas. • Adhere to all equipment warning labels and warnings in equipment manuals. Maintain equipment to avoid electrical shorts and other mechanical failures that may lead to electrical injury. • Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses and Nitrile/neoprene gloves. • Dispose of gloves after use and wash hands. • User proper lifting techniques. • Take regular breaks and do not work in unusual positions for long periods of time. • Electric wires are to be considered live or active until documented otherwise. • Lock out tag out procedures. • Be aware of pinch points and moving mechanical parts. • Ensure emergency stop buttons are fully functional and be aware of location of emergency stop buttons.

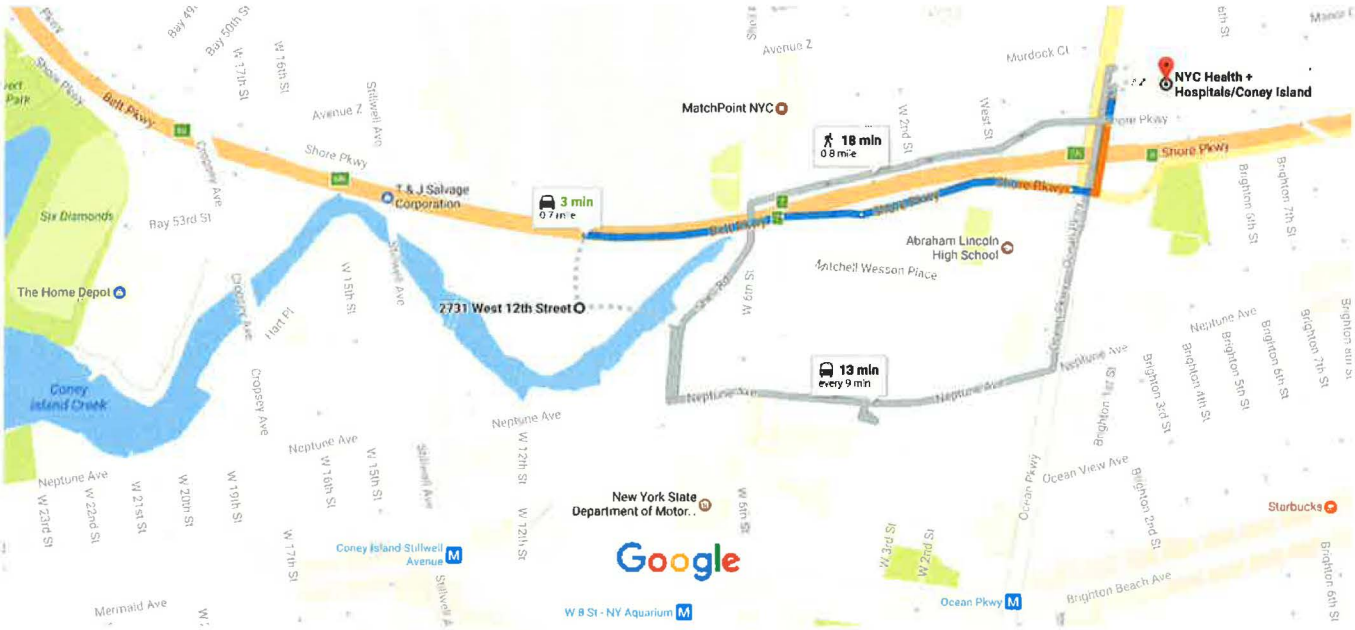
Appendix H

Coney Island – Site Specific Information

Google Maps

2731 West 12th Street, Brooklyn, NY to NYC Health + Hospitals/Coney Island

Drive 0.7 mile, 3 min



Map data ©2017 Google 500 ft

2731 W 12th St

Brooklyn, NY 11224

1.	Head east on Belt Pkwy/Leif Ericson Dr/Shore Pkwy	0.2 mi
2.	Take exit 7 toward Ocean Pkwy	0.1 mi
3.	Merge onto Shore Pkwy	0.3 mi
4.	Use the middle lane to turn left onto Ocean Pkwy	0.1 mi

NYC Health + Hospitals/Coney Island

2601 Ocean Pkwy, Brooklyn, NY 11235

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

Google Maps **2731 West 12th Street, Brooklyn, NY to Mobile Health** Drive 12.8 miles, 24 min

Map data ©2017 Google 2 mi

2731 W 12th St
Brooklyn, NY 11224

Take Belt Pkwy/Leif Ericson Dr to Shore Pkwy. Take exit 7 from Belt Pkwy/Leif Ericson Dr/Shore Pkwy

28 s (0.3 mi)

1. Head east on Belt Pkwy/Leif Ericson Dr/Shore Pkwy

0.2 mi

2. Take exit 7 toward Ocean Pkwy

0.1 mi

Get on Belt Pkwy/Leif Ericson Dr/Shore Pkwy

3 min (0.7 mi)

3. Merge onto Shore Pkwy

0.3 mi

4. Use the middle lane to turn left onto Ocean Pkwy

0.1 mi

5. Turn left at the 1st cross street onto Shore Pkwy

0.2 mi

6. Use the left lane to merge onto Belt Pkwy/Leif Ericson Dr/Shore Pkwy via the ramp to Verrazano Bridge

466 ft

Follow Belt Pkwy/Leif Ericson Dr/Shore Pkwy and I-278 E to Atlantic Ave. Take exit 27 from I-278 E

17 min (11.2 mi)

7. Merge onto Belt Pkwy/Leif Ericson Dr/Shore Pkwy

3.7 mi

8. Keep left to stay on Belt Pkwy/Leif Ericson Dr/Shore Pkwy

3.7 mi

9. Merge onto I-278 E

2.6 mi

10. Keep right at the fork to stay on I-278 E, follow signs for Bklyn Qns Expressway/Triboro Bridge

1.1 mi

11. Take exit 27 to merge onto Atlantic Ave

420 ft

Continue on Atlantic Ave. Take Clinton St to Court St

6 min (0.6 mi)

12. Merge onto Atlantic Ave

0.2 mi

13. Turn left onto Clinton St

0.2 mi

14. Turn right onto Remsen St

0.1 mi

15. Turn right onto Court St

Destination will be on the right

279 ft

Mobile Health

50 Court St # 1002, Brooklyn, NY 11201

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

1. Emergency Contact Information

Table 1h. Coney Island Emergency Information

Important Phone Numbers		Directions to Hospital
Local Police:	911	To Hospital and Occupational Health Clinic: See Attached Maps and Directions for each site in Appendix A Directions to Hospital: Head east on Belt Parkway and take exit 7 toward Ocean Parkway. Merge onto Shore Parkway and then use the middle land to turn left onto Ocean Parkway, the hospital will be on the right.
Fire Department:	911	
Ambulance:	911	
State Police or County Sheriff:	911	
NYC Health + Hospitals/Coney Island: 2601 Ocean Parkway Brooklyn, NY 11235	(844) 872-6639	
Mobile Health 50 Court Street # 1002 Brooklyn, NY 11201	(212) 695-5122	
Project Manager: Chris Morris	(631) 759-2967 office (631) 484-9152 cell	
Field Operations Manager: Mike Quinlan	(631) 708-8063 cell	
Corporate Health and Safety Officer : Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell	
Regional Health and Safety Officer Jeena Sheppard	(856) 608-5663 office (856) 298-7138 cell	
Client Contact: Sarah Aldridge	(516) 545-2568 office (860) 334-0554 cell	
Nearest Telephone Location: On-site cellular		

Coney Island

Project Description:

Activities conducted at the former Coney Island MGP Site consist primarily of the following tasks:

- Gauging of water levels and dense non-aqueous phase liquid (DNAPL) recovery wells
- Groundwater Monitoring
- Tri-Annual surface water and sediment sampling
- Single-beam bathymetric survey and cap thickness measurement in accordance with the SMP and Modification Proposal.

Other activities may be conducted on an as needed basis. These activities may include:

- Site maintenance (such as the refurbishment or restoration of monitoring well caps and pads, replacement of signs, repainting, etc.)
- Installation and/or abandonment of monitoring wells and dense non-aqueous phase liquid (DNAPL) recovery wells
- Installation of soil borings from a barge within Coney Island Creek

Site Description:

The Site is located at 2731 West 12th Street and occupies an area of approximately 17.6 acres in the Coney Island section of Brooklyn. The Site is vacant and comprises three properties, or portions thereof, owned by NG and the Metropolitan Transportation Authority (MTA). The area immediately surrounding the Site is a relatively flat, densely-populated commercial/ residential area.

In March 2001, the NYSDEC issued a Record of Decision (ROD) for the remediation of the uplands portion of the Site. In March 2002, the NYSDEC issued the ROD for the remediation of Coney Island Creek adjacent to the Site. The remedial work for OU-1 was completed in 2004 and the remedial work for OU-2 and OU-3 was completed in 2009.

Table 2: Activity Hazard Analysis

Activity	Potential Hazard	Control Measures
Carrying Equipment	Heavy lifting, strains/sprains, slips/trips/falls, pinch points	• Use proper lifting techniques as defined in the heavy lifting activity analysis below • Wear the proper type of glove to protect hands against sharp edges and skin/soft tissue injuries • Wear appropriate footwear • Be aware of hard to grip and hold items that may force your hand or wrist into awkward, stressful positions and cause disorders like tendinitis or carpal tunnel syndrome • Take breaks when carrying items frequently and/or for long distances • Do not over reach when picking up or placing items. • Use the buddy system when necessary • When climbing ladders, maintain three points of contact at all times. DO NOT carry equipment up or down ladders unless it is in a secure backpack or similar hands-free shoulder-strap bag or case. Lower or raise larger equipment by crane or rope
Boating/Barge Work	Drowning, fall hazards, pinch points, hypothermia	• Use caution when boarding the boat/barge. • Establish a safe area for boarding and de-boarding. • Do not stand in the boat. Avoid sudden movements. • Stay away from the edge of the boat/barge. • Wear a PDF at all times when on the water. • Have an extra set of clothing in case of drenching/soaking to prevent hypothermia. • See SOP HS-017
Dense Non-Aqueous Phase Liquid (DNAPL) Gauging and Recovery	Contaminant Exposure, Repetition, Slips/Trips/Falls	• Wear proper PPE during sampling including Tyvek or Tyvek apron with sleeves, Nitrile gloves, and face shield/safety glasses. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Drum Handling	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions Heavy Lifting , Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses and face shield as appropriate. • Use proper dollies or drum moving tools. • Use applicable tools to open/close drum lids. • Do not handle drums with bulging sides. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Use proper lifting techniques. • Ask fellow worker for help. • Keep trafficked areas free from slip/trip/fall hazards. • See SOP HS-003
Groundwater Sampling	Contaminant Exposure, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses and Nitrile/neoprene gloves. • Dispose of gloves after use and wash hands. • User proper lifting techniques. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.

Activity	Potential Hazard	Control Measures
Hand Augering	Repetition, pinch point, back/wrist/knee injury, cuts and scrapes	• Wear appropriate PPE including safety glasses and gloves that provide protection and grip. • Remove excavated soil only after stopping the hand auger. • Keep trafficked areas free from slip/trip/fall hazards. • A thorough underground utility survey must be conducted prior to intrusive activities. Coordination with utility locating services, property owner(s) or utility companies must be conducted. • Inspect hand auger prior to use to determine if it is functioning properly and free of metal burs. • Use the appropriate size hand auger for the job. • Use hand movements that exert minimum pressure on wrist bones. • Take regular breaks and do not work in unusual positions for long periods of time.
Heavy Equipment – Working Near	Struck-by, caught-in-between equipment, crushing, pinch points	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or (electrical hazard) EH-rated safety boots with composite toe and shank; safety glasses; nitrile/neoprene gloves; and earplugs. • Identify yourself and your work location to heavy equipment operators, so they may incorporate you into their operations. • Coordinate hand signals with operators. • Stay Alert! Pay attention to equipment backup alarms and swing radii. • Wear a high-visibility, reflective vest when working near equipment or motor vehicle traffic. • Position yourself in a safe location when filling out logs talking with the contractor. • Notify the contractor immediately if any problems arise. • Do not stand or sit under suspended loads or near any pressurized equipment lines. • Do not operate cellular telephones in the vicinity of heavy equipment operation. • See SOP HS-018
Soil Sampling/Soil Vapor Sampling	Contaminant Exposure, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs as necessary. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Excavation entry will be allowed only with proper sloping or shoring. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.

Activity	Potential Hazard	Control Measures
Surface Water Sampling	Contaminant Exposure, Heavy Lifting, Repetition, Slips/Trips/Falls, Drowning	• Wear required PPE including safety glasses, Nitrile/neoprene gloves, and PFD as necessary. • Be aware of your surroundings • Dispose of gloves after use and wash hands. • Follow applicable boating hazard control measures. • User proper lifting techniques. • Avoid going in water deeper than mid-thigh (some waders are chest waders). • Avoid areas with a combination of deep water and fast currents. • Wear proper footwear and become familiar and comfortable when walking in water with uneven and slippery bottoms. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Waste Characterization	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions, Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Keep trafficked areas free from slip/trip/fall hazards.
Working near Water	Drowning, hypothermia	• While working near water stay inside guard rails and or barriers. • While working out of out of safety zones a personal flotation device (PFD) must be worn at all times and an approved 30-inch ring buoys will be readily available for emergency rescue operations. • Use appropriate fall protection. • Buddy system shall be in use. • See SOP HS-017
Monitoring well, soil vapor point and/or oxygen injection well installation and abandonment.	Contaminant Exposure, Noise, Contact with Utilities, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls, Drill Rig Proximity	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs. • Confirm utility locate has been completed. • Confirm adequate clearance from overhead utilities. • Dispose of gloves after use and wash hands. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards. • Maintain awareness of location of equipment. Subcontractor use of a spotter for equipment operation
Waste Management	Contaminant Exposure, Cuts/Scrapes	• Wear proper PPE during sampling including Tyvek or Tyvek apron with sleeves, Nitrile gloves, and face shield/safety glasses. • Wear work gloves over nitrile gloves.

Activity	Potential Hazard	Control Measures
Replace well boxes and associated concrete on monitoring wells, soil vapor points and/or oxygen injection wells	Jackhammer Proximity, Silica Dust Inhalation (From Grout/Cement Mixing), Noise	• Wear proper PPE, including safety glasses, hard hat, high visibility reflective vest, and EH rated safety boots. Maintain awareness of location of equipment. • Stay upwind of mixing area. Wear a dust mask if necessary. • Wear hearing protection.
Site Cap Inspection (Annual)	Slips, Trips and Falls	• Keep trafficked areas free of slip/trip/fall hazards.
Coney Island Creek Soil Borings	Drowning, hypothermia	• Be aware of your surroundings • Follow applicable boating hazard control measures. • Keep trafficked areas free from slip/trip/fall hazards. • Work within safety area of barge whenever possible. • A personal flotation device (PFD) must be worn at all times and an approved 30-inch ring buoys will be readily available for emergency rescue operations. • See SOP HS-017 • Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs as necessary. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves.

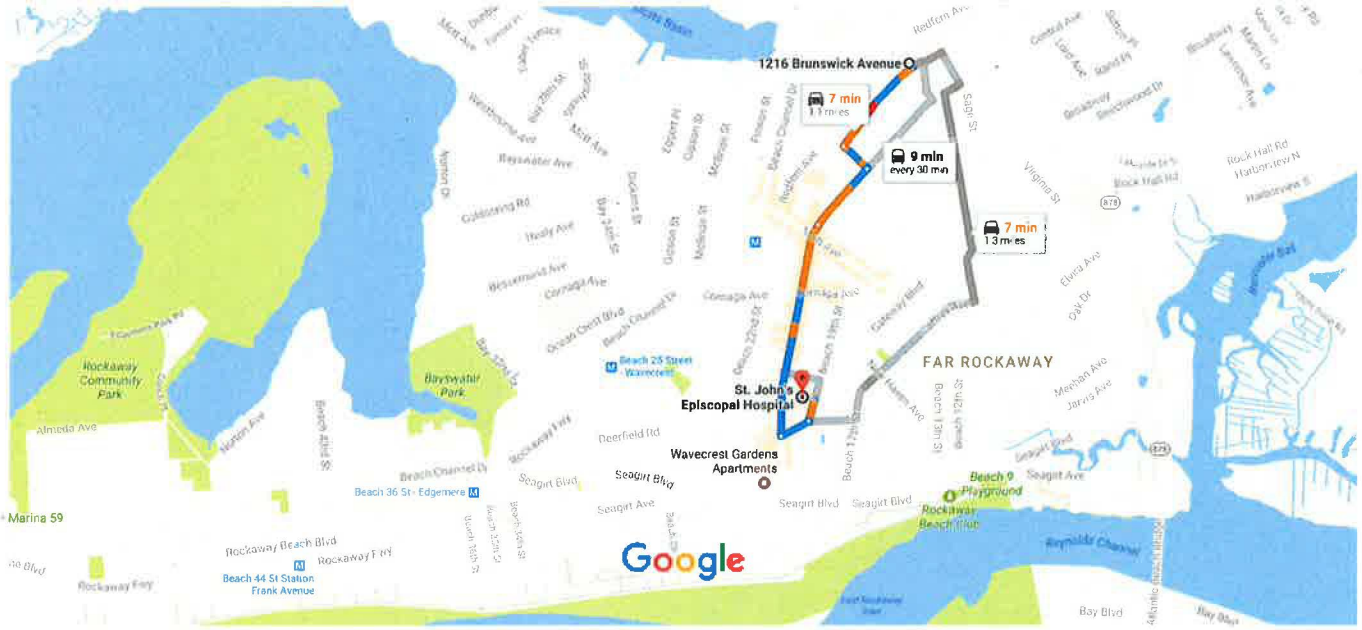
Appendix I

Far Rockaway – Site Specific Information

Google Maps

1216 Brunswick Ave, Far Rockaway, NY 11691 to St. John's Episcopal Hospital

Drive 1.1 miles, 7 min



Map data ©2017 Google 1000 ft

1216 Brunswick Ave

Far Rockaway, NY 11691

1. Head southwest on Brunswick Ave toward Minton St — 0.2 mi
2. Turn left onto Nameoke Ave — 413 ft
3. Turn right onto Central Ave — 0.2 mi
4. Continue onto Beach 20th St — 0.5 mi
5. Turn left onto Plainview Ave — 394 ft
6. Turn left onto Beach 19th St — 276 ft

Destination will be on the left

St. John's Episcopal Hospital

327 Beach 19th St, Far Rockaway, NY 11691

Google Maps

1216 Brunswick Ave, Far Rockaway, NY 11691 to Clinic One

Drive 9.9 miles, 28 min

Map data ©2017 Google 1 mi

1216 Brunswick Ave

Far Rockaway, NY 11691

1. Head northeast on Brunswick Ave toward Beach 12th St

1 min (0.2 mi)

Take Nassau Expy, Peninsula Blvd and Woodfield Rd to Hempstead Turnpike in West Hempstead

28 min (9.7 mi)

2. Turn left onto Doughty Blvd

0.2 mi

3. Turn right onto Bayview Ave

0.1 mi

4. Turn left onto Nassau Expy

1.0 mi

5. Turn right onto Bay Blvd

0.2 mi

6. Continue onto Peninsula Blvd

3.8 mi

7. Slight right to stay on Peninsula Blvd

0.9 mi

8. Turn left onto Charles St

223 ft

9. Turn right onto Buckingham Pl

0.1 mi

10. Turn left onto Ocean Ave

0.3 mi

11. Turn right onto Lakeview Ave

0.3 mi

12. Turn left onto Woodfield Rd

2.5 mi

13. Use any lane to turn slightly left onto Westminster Rd

0.2 mi

14. Turn right onto Hempstead Turnpike

Destination will be on the right

279 ft

Clinic One

111 Hempstead Turnpike #121, West Hempstead, NY 11552

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

1. Emergency Contact Information

Table 1i. Far Rockaway Emergency Information

Important Phone Numbers		Directions to Hospital
Local Police:	911	To Hospital and Occupational Health Clinic: See Attached Maps and Directions for each site in Appendix A Directions to Hospital: Head southwest on Brunswick Avenue toward Minton Street, then turn left onto Nameoke Avenue. Turn right onto Central Avenue and then continue onto Beach 20th Street. After 0.5 miles turn left onto Plainview Avenue. Turn left onto Beach 19th Street and the hospital will be on the left.
Fire Department:	911	
Ambulance:	911	
State Police or County Sheriff:	911	
St. John's Episcopal Hospital: 327 Beach 19th Street Far Rockaway, New York 11691	(718) 869-7000	
Clinic One: 111 Hempstead Turnpike #121 West Hempstead, NY 11552	(516) 493-9580	
Project Manager: Chris Morris	(631) 759-2967 office (631) 484-9152 cell	
Field Operations Manager: Mike Quinlan	(631) 708-8063 cell	
Corporate Health and Safety Officer : Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell	
Regional Health and Safety Officer Jeena Sheppard	(856) 608-5663 office (856) 298-7138 cell	
Client Contact: Sarah Aldridge	(516) 545-2568 office (860) 334-0554 cell	
Nearest Telephone Location: On-site cellular		

Far Rockaway

Project Description:

Activities conducted at the former Far Rockaway MGP site consist of an annual site-wide inspection and groundwater monitoring.

Site Description:

The Far Rockaway MGP is a one acre site located in a mixed commercial and residential area on the north side of Brunswick Avenue between Beach 12th Street and Milton Avenue in Queens (1216-1250 Brunswick Avenue). The site is flat and has three two-story buildings used for warehousing, shipping and distribution operations. The site also contains paved parking lots and landscaped areas. The site is not owned by NG. Remediation was completed in 2014.

Table 2: Activity Hazard Analysis

Activity	Potential Hazard	Control Measures
Carrying Equipment	Heavy lifting, strains/sprains, slips/trips/falls, pinch points	• Use proper lifting techniques as defined in the heavy lifting activity analysis below • Wear the proper type of glove to protect hands against sharp edges and skin/soft tissue injuries • Wear appropriate footwear • Be aware of hard to grip and hold items that may force your hand or wrist into awkward, stressful positions and cause disorders like tendinitis or carpal tunnel syndrome • Take breaks when carrying items frequently and/or for long distances • Do not over reach when picking up or placing items. • Use the buddy system when necessary • When climbing ladders, maintain three points of contact at all times. DO NOT carry equipment up or down ladders unless it is in a secure backpack or similar hands-free shoulder-strap bag or case. Lower or raise larger equipment by crane or rope
Drum Handling	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions Heavy Lifting , Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses and face shield as appropriate. • Use proper dollies or drum moving tools. • Use applicable tools to open/close drum lids. • Do not handle drums with bulging sides. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Use proper lifting techniques. • Ask fellow worker for help. • Keep trafficked areas free from slip/trip/fall hazards. • See SOP HS-003
Groundwater Sampling	Contaminant Exposure, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses and Nitrile/neoprene gloves. • Dispose of gloves after use and wash hands. • User proper lifting techniques. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Monitoring well, soil vapor point and/or oxygen injection well installation and abandonment.	Contaminant Exposure, Noise, Contact with Utilities, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls, Drill Rig Proximity	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs. • Confirm utility locate has been completed. • Confirm adequate clearance from overhead utilities. • Dispose of gloves after use and wash hands. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards. • Maintain awareness of location of equipment. Subcontractor use of a spotter for equipment operation

Activity	Potential Hazard	Control Measures
Replace well boxes and associated concrete on monitoring wells, soil vapor points and/or oxygen injection wells	Jackhammer Proximity, Silica Dust Inhalation (From Grout/Cement Mixing), Noise	• Wear proper PPE, including safety glasses, hard hat, high visibility reflective vest, and EH rated safety boots. Maintain awareness of location of equipment. • Stay upwind of mixing area. Wear a dust mask if necessary. • Wear hearing protection.
Site Cap Inspection (Annual)	Slips, Trips and Falls	• Keep trafficked areas free of slip/trip/fall hazards.

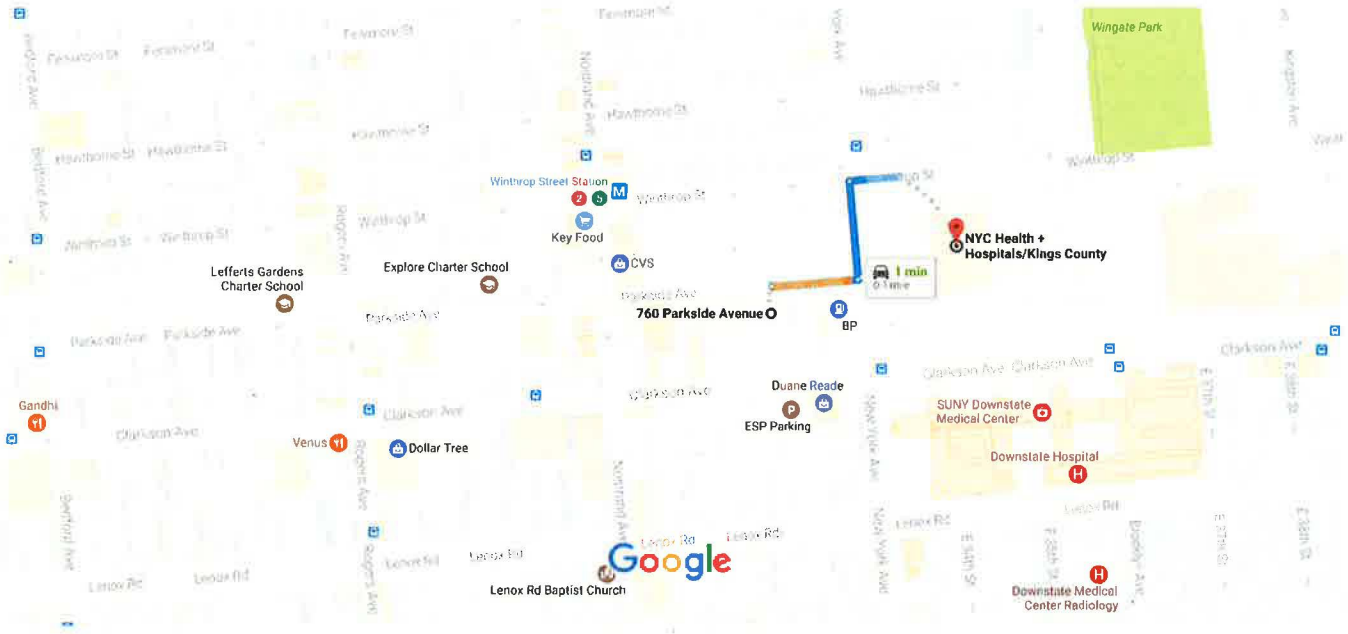
Appendix J

Flatbush – Site Specific Information

Google Maps

760 Parkside Ave, Brooklyn, NY 11226 to NYC Health + Hospitals/Kings County

Drive 0.1 mile, 1 min



Map data ©2017 Google 200 ft

760 Parkside Ave

Brooklyn, NY 11226

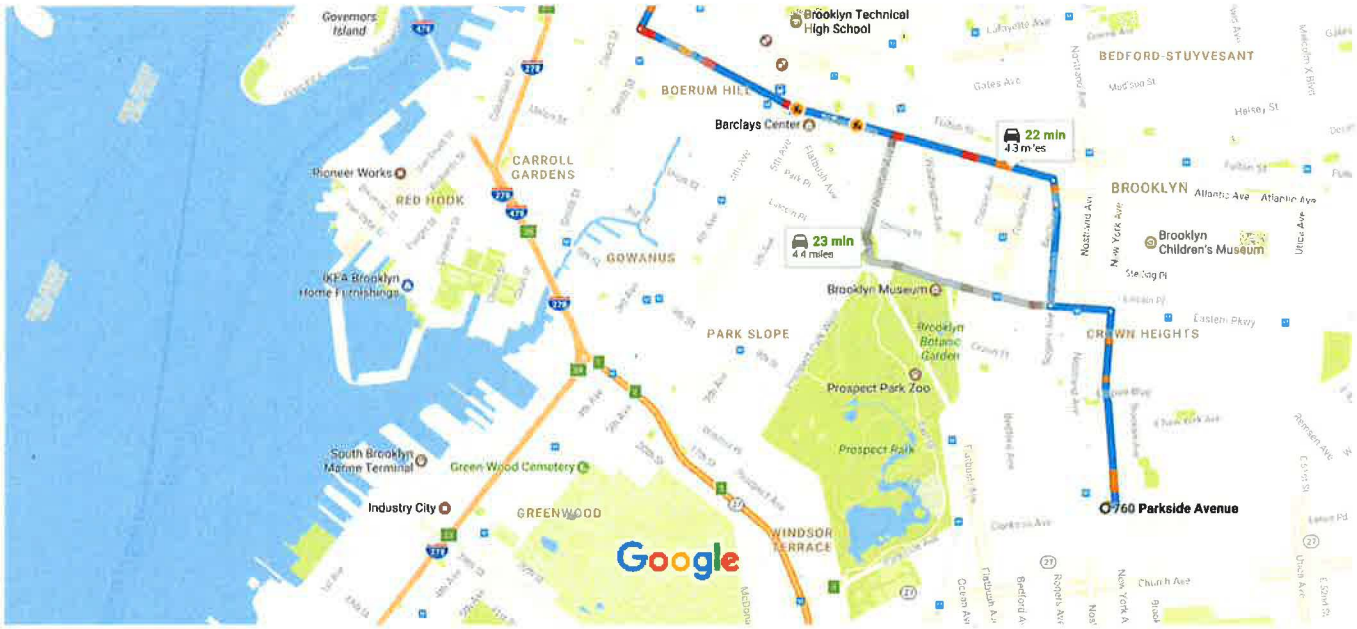
1. Head east on Parkside Ave toward New York Ave — 272 ft
2. Turn left onto New York Ave — 312 ft
3. Turn right at the 1st cross street onto Winthrop St — 157 ft

NYC Health + Hospitals/Kings County

451 Clarkson Ave, Brooklyn, NY 11203

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

Google Maps **760 Parkside Avenue, Brooklyn, NY to Mobile Health** Drive 4.3 miles, 22 min



Map data ©2017 Google 2000 ft

760 Parkside Ave

Brooklyn, NY 11226

1. Head east on Parkside Ave toward New York Ave

21 s (272 ft)

Continue on New York Ave. Take Rogers Ave and Atlantic Ave to Court St

24 min (4.3 mi)

2. Turn left onto New York Ave

0.9 mi

3. Turn left onto Eastern Pkwy

0.3 mi

4. Turn right onto Rogers Ave

0.5 mi

5. Use the left lane to merge onto Bedford Ave

0.1 mi

6. Turn left onto Atlantic Ave

1.1 mi

7. Continue straight to stay on Atlantic Ave

289 ft

8. Continue straight to stay on Atlantic Ave

1.0 mi

9. Turn right onto Boerum Pl

0.2 mi

10. Turn left onto Joralemon St

0.1 mi

11. Turn left onto Court St

Destination will be on the right

164 ft

Mobile Health

50 Court St # 1002, Brooklyn, NY 11201

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

1. Emergency Contact Information

Table 1j. Flatbush Emergency Information

Important Phone Numbers		Directions to Hospital
Local Police:	911	To Hospital and Occupational Health Clinic: See Attached Maps and Directions for each site in Appendix A Directions to Hospital: Head east on Parkside Avenue toward New York Avenue and then turn left onto New York Avenue. Turn right at the 1st cross street onto Winthrop Street and the hospital is on right.
Fire Department:	911	
Ambulance:	911	
State Police or County Sheriff:	911	
NYC Health + Hospitals/Kings County: 451 Clarkson Avenue Brooklyn, NY 11203	(718) 245-3131	
Mobile Health 50 Court Street # 1002 Brooklyn, NY 11201	(212) 695-5122	
Project Manager: Chris Morris	(631) 759-2967 office (631) 484-9152 cell	
Field Operations Manager: Mike Quinlan	(631) 708-8063 cell	
Corporate Health and Safety Officer : Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell	
Regional Health and Safety Officer Jeena Sheppard	(856) 608-5663 office (856) 298-7138 cell	
Client Contact: Sarah Aldridge	(516) 545-2568 office (860) 334-0554 cell	
Nearest Telephone Location: On-site cellular		

Flatbush

Project Description:

Activities conducted at the former Flatbush Holder/MGP site consist of an annual site-wide inspection and groundwater monitoring.

Site Description:

The site is located at 760 Parkside Avenue, 324 Winthrop Street, and 329 Clarkson Avenue in Brooklyn. There are a total of seven parcels associated with the footprint of the former MGP/holder site. The Brooklyn Union Gas Company dba National Grid owns Parcel 4827, Lot 30. This parcel was converted to a parking lot with subsurface gas system infrastructure. The Beneficial Fund for the Downstate Medical Center of SUNY owns Parcel 4827, Lot 24 and it is used as parking facilities. The Health Science Center at Brooklyn Foundation, Inc. owns Parcel 4828, Lots 13, 21, and 22 and uses them for laboratory/office buildings and parking. Audley O'Brian owns Parcel 4828, Lot 68. The New York City Department of Sanitation owns Parcel 4827, Lot 39. There is an approved SMP for the Site.

Table 2: Activity Hazard Analysis

Activity	Potential Hazard	Control Measures
Carrying Equipment	Heavy lifting, strains/sprains, slips/trips/falls, pinch points	• Use proper lifting techniques as defined in the heavy lifting activity analysis below • Wear the proper type of glove to protect hands against sharp edges and skin/soft tissue injuries • Wear appropriate footwear • Be aware of hard to grip and hold items that may force your hand or wrist into awkward, stressful positions and cause disorders like tendinitis or carpal tunnel syndrome • Take breaks when carrying items frequently and/or for long distances • Do not over reach when picking up or placing items. • Use the buddy system when necessary • When climbing ladders, maintain three points of contact at all times. DO NOT carry equipment up or down ladders unless it is in a secure backpack or similar hands-free shoulder-strap bag or case. Lower or raise larger equipment by crane or rope
Drum Handling	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions Heavy Lifting , Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses and face shield as appropriate. • Use proper dollies or drum moving tools. • Use applicable tools to open/close drum lids. • Do not handle drums with bulging sides. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Use proper lifting techniques. • Ask fellow worker for help. • Keep trafficked areas free from slip/trip/fall hazards. • See SOP HS-003
Groundwater Sampling	Contaminant Exposure, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses and Nitrile/neoprene gloves. • Dispose of gloves after use and wash hands. • User proper lifting techniques. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Monitoring well, soil vapor point and/or oxygen injection well installation and abandonment.	Contaminant Exposure, Noise, Contact with Utilities, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls, Drill Rig Proximity	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs. • Confirm utility locate has been completed. • Confirm adequate clearance from overhead utilities. • Dispose of gloves after use and wash hands. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards. • Maintain awareness of location of equipment. Subcontractor use of a spotter for equipment operation

Activity	Potential Hazard	Control Measures
Replace well boxes and associated concrete on monitoring wells, soil vapor points and/or oxygen injection wells	Jackhammer Proximity, Silica Dust Inhalation (From Grout/Cement Mixing), Noise	• Wear proper PPE, including safety glasses, hard hat, high visibility reflective vest, and EH rated safety boots. Maintain awareness of location of equipment. • Stay upwind of mixing area. Wear a dust mask if necessary. • Wear hearing protection.
Site Cap Inspection (Annual)	Slips, Trips and Falls	• Keep trafficked areas free of slip/trip/fall hazards.

Appendix K

Glenwood Landing – Site Specific Information

Appendix L

Hempstead-Clinton – Site Specific Information

Appendix M

Sag Harbor – Site Specific Information

Appendix N

Safety Data Sheets

ISO9001:2000 Certified

Material Safety Data Sheet

Nitric acid solutions, 0.4% - 50% v/v, 0.1N-6.0N

Section 1 - Chemical Product and Company Identification

MSDS Name:

Nitric acid solutions, 0.4% - 50% v/v, 0.1N-6.0N

Catalog Numbers:

LC17730, LC17750, LC17770, LC17800, LC17840, LC17850, LC17870

Synonyms:

Company Identification:

LabChem, Inc.
200 William Pitt Way
Pittsburgh, PA 15238

Company Phone Number:

(412) 826-5230

Emergency Phone Number:

(800) 424-9300

CHEMTREC Phone Number:

(800) 424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name:	Percent
7732-18-5	Water	balance
7697-37-2	Nitric acid	0.04-50

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: Colorless
Caution! Corrosive. May cause severe eye and skin irritation with possible burns.
Target Organs: None known.

Potential Health Effects

Eye:

Causes pain, photophobia, tearing, edema, corneal ulceration, severe burns, necrosis of deep tissue with permanent damage and blindness.

Skin:

Skin may turn brown-yellow. Deep burns are slow to heal and scarring may occur.

Ingestion:

Causes pain in mouth, throat, stomach followed by vomiting, bloody diarrhea, hypotension, oliguria, anuria, possible fatal circulatory collapse, asphyxia from glottal edema. Perforation burns of gastrointestinal tract possible with fever and peritonitis.

Inhalation:

May cause coughing, dizziness, weakness, dry throat/chest, chest pain, dyspnea, frothy sputum, hypotension, cyanosis, pneumonitis, fatal pulmonary edema.

Chronic:

Dermatitis, conjunctivitis, dental erosion, jaw necrosis, chronic cough, bronchitis, chemical pneumonitis, gastrointestinal disturbances.

Section 4 - First Aid Measures

Eyes:

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids until no evidence of chemical remains. Get medical aid at once. Cover burns with loose sterile non-medicated bandages.

Skin:

Get medical aid. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Remove contaminated clothing and shoes. Cover burns with a dry sterile bandage (secure, not tight).

Ingestion:

Get medical aid at once. Give 1 ounce of milk of magnesia. Give conscious victim large quantities of water to dilute acid. Give oxygen if respiration is depressed.

Inhalation:

Give artificial respiration if necessary. Get medical aid. Keep victim warm, at rest. Move victim to fresh air. Maintain airway and blood pressure.

Notes to Physician:

Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information:

Move container if possible, cool with flooding amounts of water. Avoid breathing corrosive vapors. Negligible fire and explosion hazard for solutions <5%. At higher concentration, increased flammability of combustibles, readily oxidizable materials. Severe explosion hazard by reaction with incombatibles (metallic powders, carbides, hydrogen sulfide, turpentine). In or near fire material emits toxic and reactive nitrogen oxides of gases.

Extinguishing Media:

For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam.

Autoignition Temperature:

No information found.

Flash Point:

No information found.

NFPA Rating:

CAS# 7732-18-5: Not published.
CAS# 7697-37-2: Not published.

Explosion Limits:

Lower: Upper:

Section 6 - Accidental Release Measures

General Information:

Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Absorb spill with an alkaline material such as soda ash or lime. Keep out of sewers/drains. Ventilate and wear protective clothing. Scoop material into suitable (plastic or glass) container, label for disposal as "corrosive".

Section 7 - Handling and Storage

Handling:

Avoid breathing dust, vapor, mist, or gas. Avoid contact with eyes, skin, and clothing. Handle as corrosive liquid, dispense with care; wear protective clothing, gloves, goggles.

Storage:

Store at room temperature. Store in glass or approved plastic containers only, keep capped. Protect from heat and incompatibles.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:

Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product.

Exposure Limits

Chemical Name:	ACGIH	NIOSH	OSHA
Water	None of the components are on this list.	None of the components are on this list.	None of the components are on this list.
Nitric acid	2 ppm TWA;4 ppm STEL	2 ppm TWA; 5 mg/m3 TWA	2 ppm TWA; 5 mg/m3 TWA;

OSHA Vacated PELs

Nitric acid: 2 ppm TWA; 5 mg/m3 TWA

Personal Protective Equipment

Eyes:

Do not wear contact lenses when working with chemicals. An eye wash fountain should be available in the immediate work area. Wear gloves, splash proof goggles and faceshield.

Skin:

Wear impervious gloves (viton, saranex).

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

PEL to 50ppm - SAF/SCBAF/SAF:PD,PP,CF.
>50ppm - SCBAF:PD,PP.
Firefighting - SCBAF:PD,PP. NOTE: DO NOT USE OXIDIZABLE SORBENTS IN RESPIRATORS.

Section 9 - Physical and Chemical Properties

Physical State:	Clear liquid
Color:	Colorless
Odor:	Acrid odor
pH:	Acidic
Vapor Pressure:	14 mm Hg @25c
Vapor Density:	0.7 - 2.2
Evaporation Rate:	>1 (ether=1)
Viscosity:	No information found.
Boiling Point:	181-212°F
Freezing/Melting Point:	-44 - 32°F
Decomposition Temperature:	No information found.
Solubility in water:	Soluble.
Specific Gravity/Density:	1.0-1.5
Molecular Formula:	No information found.
Molecular Weight	No information found.

Section 10 - Stability and Reactivity

Chemical Stability:

Stable under normal temperatures and pressures up to boiling point. Nitric oxides quietly evolved - sunlight catalyses oxide formation (yellow color, aging).

Conditions to Avoid:

Incompatible materials, easily oxidized materials.

Incompatibilities with Other Materials

Metals, acetic acid, acetic anhydride, acrylonitrile, alcohols, anhydrides, fluorine, organic acids, perchlorates, aldehydes (e.g. acetaldehyde, acrolein, chloral hydrate, formaldehyde), ketones (e.g. acetone, acetophenone, MEK, MIBK), metals as powders (e.g. hafnium, raney nickel), organics, carbides, acetonitrile, acetone, arsine, phosphides, dioxides, thiocyanates, inorganic acids, chlorine, cyclic compounds, halides.

Hazardous Decomposition Products

Nitrogen oxides, nitric acid vapors, catalyzed by sunlight.

Hazardous Polymerization

Has not been reported

Section 11 - Toxicological Information

RTECS:

CAS# 7732-18-5: ZC0110000.
CAS# 7697-37-2: QU5775000; QU5900000.

LD50/LC50:

CAS# 7732-18-5:
Oral, rat: LD50 = >90 mL/kg.
CAS# 7697-37-2:
Inhalation, rat: LC50 =67 ppm(NO2)/4H.

Carcinogenicity:

CAS# 7732-18-5: Not listed as a carcinogen by ACGIH, IARC, NIOSH, NTP, OSHA, or CA Prop 65.
CAS# 7697-37-2: Not listed as a carcinogen by ACGIH, IARC, NIOSH, NTP, OSHA, or CA Prop 65.

Epidemiology:

Severe eye, mucous membrane, and skin irritant.

Teratogenicity:

Reproductive:

Mutagenicity:

Neurotoxicity:

Section 12 - Ecological Information

No information found.

Section 13 - Disposal Considerations

Dispose of in accordance with Federal, State, and local regulations.

Section 14 - Transport Information

US DOT

	Nitric acid >2% W/W	Nitric acid <2% W/W
Shipping Name:	Nitric acid, Not more than 70%	Not regulated.
Hazard Class:	8	
UN Number:	UN2031	
Packing Group:	PG II	

Section 15 - Regulatory Information

US Federal

TSCA

CAS# 7732-18-5 is listed on the TSCA Inventory.
CAS# 7697-37-2 is listed on the TSCA Inventory.

SARA Reportable Quantities (RQ)

CAS# 7697-37-2: final RQ = 1000 pounds (454 kg)

CERCLA/SARA Section 313

This material contains Nitric acid (CAS# 7697-37-2, 0.04-50%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

OSHA - Highly Hazardous

CAS# 7697-37-2 is considered highly hazardous by OSHA.

US State

State Right to Know

Nitric acid can be found on the following state Right-to-Know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California Regulations

European/International Regulations

Canadian DSL/NDSL

CAS# 7732-18-5 is listed on Canada's DSL List.
CAS# 7697-37-2 is listed on Canada's DSL List.

Canada Ingredient Disclosure List

CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List.
CAS# 7697-37-2 is listed on Canada's Ingredient Disclosure List.

Section 16 - Other Information

MSDS Creation Date: November 17, 1997
Revision Date: August 13, 2007

Information in this MSDS is from available published sources and is believed to be accurate. No warranty, express or implied, is made and LabChem Inc. assumes no liability resulting from the use of this MSDS. The user must determine suitability of this information for his application.

ISO9001:2000 Certified

Material Safety Data Sheet
Methanol and Methanol, 50% v/v

Section 1 - Chemical Product and Company Identification

MSDS Name:
Methanol and Methanol, 50% v/v
Catalog Numbers:
LC16800, LC16810, LC16830
Synonyms:
Methyl alcohol, wood alcohol
Company Identification:
LabChem Inc
200 William Pitt Way
Pittsburgh, PA 15238
Company Phone Number:
(412) 826-5230
Emergency Phone Number:
(800) 424-9300
CHEMTREC Phone Number:
(800) 424-9300

Section 2 – Composition, Information on Ingredients

CAS#	Chemical Name:	Percent
67-56-1	Methanol	50-100
7732-18-5	Water (for 50% v/v solution)	balance

Section 3 - Hazards Identification

Emergency Overview

Appearance: *Clear, colorless solution*

Danger! Flammable liquid. Poison. Harmful or fatal if inhaled. May cause blindness if swallowed or absorbed through the skin. Central nervous system depressant. Cannot be made nonpoisonous. May cause irritation to eyes, skin, and respiratory tract.

Target Organs: *Eyes, skin, respiratory and gastrointestinal tracts, central nervous system, optic nerve, liver, kidneys, blood*

Potential Health Effects

Eye:
Causes eye irritation. May cause permanent vision impairment or loss.
Skin:
May cause skin irritation. May be absorbed through the skin in harmful amounts.
Ingestion:
May cause liver and kidney damage. Inhalation or ingestion causes narcotic intoxication, headache, cramps, severe pain, and blindness. Kidney and liver damage may occur with possible heart or respiratory failure to coma and death. Some symptoms may be delayed for days.

Inhalation:
May cause respiratory tract irritation. Symptoms of inhalation may be similar to those of ingestion.
Chronic:
May cause blurred or painful vision, blindness, defatting of skin, and liver and kidney damage. Experiments with laboratory animals have shown reproductive toxicity effects.

Section 4 - First Aid Measures

Eyes:
Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid at once. Do NOT allow victim to rub or keep eyes closed.
Skin:
Get medical aid at once. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Ingestion:
Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid at once.
Inhalation:
Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.
Notes to Physician:
Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information:
As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors are heavier than air and may travel to a source of ignition and flashback. Cool containers with water spray. Vapor-air mixtures are explosive.
Extinguishing Media:
For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam.
Autoignition Temperature:
Not applicable.
Flash Point:
12°C (for methanol, 100%); 30°C (for methanol, 50%)
NFPA Rating:
CAS# 67-56-1: Health- 1, Flammability- 3, Instability- 0.
CAS# 7732-18-5: Health- 0, Flammability- 0, Instability- 0.
Explosion Limits:
Lower: 6.7 Upper: 36

Section 6 - Accidental Release Measures

General Information:

Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Shut off ignition sources; avoid vapors. Use non-sparking tools and equipment. Absorb spills with absorbent (vermiculite, sand, fuller's earth) and place in suitable container labeled for later disposal. Label reclaimed spill material as flammable. Isolate and ventilate the spill area. Keep out of sewers and drains.

Section 7 - Handling and Storage

Handling:

Wash thoroughly after handling. Ground and bond containers when transferring material. Avoid breathing dust, vapor, mist, or gas. Keep away from flames and other sources of high temperatures that may cause material to form vapors or mists. Use explosion-proof equipment.

Storage:

Keep away from heat, sparks, and flame. Store tightly closed in a cool, dry, well-ventilated place.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits:

Chemical Name:	ACGIH	NIOSH	OSHA
Methanol	200 ppm TWA 250 ppm STEL	200 ppm TWA 250 ppm STEL 6000 ppm IDLH	200 ppm TWA 260 mg/m^3 TWA
Water	none listed	none listed	none listed

OSHA Vacated PELs:

Methanol: 200 ppm TWA, 260 mg/m^3 TWA, 250 ppm STEL, 325 mg/m^3 STEL

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State:	Liquid
Color:	Colorless
Odor:	Alcohol-like
pH:	Not available
Vapor Pressure:	97 mm Hg @ 20°C
Vapor Density:	1.11 (Air = 1.0)
Evaporation Rate:	5.2 (Ether = 1.0)
Viscosity:	0.55 cP @ 20°C
Boiling Point:	65°C (148°F)
Freezing/Melting Point:	-98°C (-144°F)
Decomposition Temperature:	Not available
Solubility in water:	Miscible
Specific Gravity/Density:	0.791
Molecular Formula:	CH_3OH
Molecular Weight:	32.04

Section 10 - Stability and Reactivity

Chemical Stability:
Stable under normal temperatures and pressures.

Conditions to Avoid:
Incompatible substances, heat, flames, sources of ignition.

Incompatibilities with Other Materials:
Strong oxidizers, strong acids, acid anhydrides, acid chlorides, strong bases, metals, peroxides.

Hazardous Decomposition Products:
Carbon monoxide, formaldehyde.

Hazardous Polymerization:
Has not been reported.

Section 11 - Toxicological Information

RTECS:
CAS# 7732-18-5: ZC0110000.
CAS# 67-56-1: PC1400000.

LD50/LC50:
CAS# 7732-18-5:
Oral, rat: 99999 mg/kg
CAS# 67-56-1:
Inhalation, rat: LC50 = 64000 ppm/4H
Inhalation, rat: LC50 = 83.2 mg/L/4H
Oral, rat: LD50 = 5628 mg/kg
Skin, rabbit: LD50 = 15800 mg/kg.

Carcinogenicity:
CAS# 7732-18-5: Not listed as a carcinogen by ACGIH, IARC, NIOSH, NTP, OSHA, or CA Prop 65.
CAS# 67-56-1: Not listed as a carcinogen by ACGIH, IARC, NIOSH, NTP, OSHA, or CA Prop 65.

Epidemiology:
Irritating to eyes, skin, and respiratory tract.

Teratogenicity:
Teratogenic effects have occurred in experimental animals.

Reproductive:
Reproductive toxicity has occurred in experimental animals.

Mutagenicity:
Mutagenic effects have occurred in experimental animals.

Neurotoxicity:
No information found

Section 12 - Ecological Information

Ecotoxicity: Freshwater fish: Oncorhynchus mykiss, LC50 = 13200 mg/L/96 h; Pimephales promelas, LC50 = 28100 mg/L/96 h

Section 13 - Disposal Considerations

Dispose of in accordance with Federal, State, and local regulations.

Section 14 - Transport Information

	US DOT*	
	100%	50%
Shipping Name:	Methanol	Flammable liquid, n.o.s. (Methanol)
Hazard Class:	3	3
UN Number:	UN1230	UN1993
Packing Group:	PG II	PGIII

* For international shipments, methanol has a subsidiary hazard class of 6.1.

Section 15 - Regulatory Information

US Federal

TSCA:
CAS# 7732-18-5 is listed on the TSCA Inventory.
CAS# 67-56-1 is listed on the TSCA Inventory.

SARA Reportable Quantities (RQ):
CAS# 67-56-1: final RQ = 5000 pounds (2270 kg)

CERCLA/SARA Section 313:
This material contains Methanol (CAS# 67-56-1, 50-100%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

OSHA - Highly Hazardous:
None of the chemicals in this product are considered highly hazardous by OSHA.

US State

State Right to Know:

Methyl alcohol can be found on the following state Right-to-Know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California Regulations:

None listed.

European/International Regulations

Canadian DSL/NDSL:

CAS# 7732-18-5 is listed on Canada's DSL List.
CAS# 67-56-1 is listed on Canada's DSL List.

Canada Ingredient Disclosure List:

CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List.
CAS# 67-56-1 is listed on Canada's Ingredient Disclosure List.

Section 16 - Other Information

MSDS Creation Date: May 5, 1998
Revision Date: September 8, 2009

Information in this MSDS is from available published sources and is believed to be accurate. No warranty, express or implied, is made and LabChem Inc. assumes no liability resulting from the use of this MSDS. The user must determine suitability of this information for his application.

Appendix O

Heat Stress and Cold Stress Guidelines

Heat Stress Guidelines

Form	Signs & Symptoms	Care	Prevention[3]
Heat Rash	Tiny red vesicles in affected skin area. If the area is extensive, sweating can be impaired.	Apply mild lotions and cleanse the affected area.	Cool resting and sleeping areas to permit skin to dry between heat exposures.
Heat Cramps	Spasm, muscular pain (cramps) in stomach area and extremities (arms and legs).	Provide replacement fluids with minerals (salt) such as Gatorade.	Adequate salt intake with meals[1]. ACCLIMATIZATION[2]
Heat Exhaustion	Profuse sweating, cool (clammy) moist skin, dizziness, confusion, pale skin color, faint, rapid shallow breathing, headache, weakness, and/or muscle cramps.	Remove from heat, sit or lie down, rest, replace lost water with electrolyte replacement fluids (water, Gatorade) take frequent sips of liquids in amounts greater than required to satisfy thirst.	ACCLIMATIZATION[2] Adequate salt intake with meals[1], only during early part of heat season. Ample water intake, frequently during the day.
Heat Stroke	HOT <u>Dry</u> Skin. Sweating has stopped. Mental confusion, dizziness, nausea, chills, severe headache, collapse, delirium, and/or coma.	HEAT STROKE IS A MEDICAL EMERGENCY • Remove from heat. • COOL THE BODY AS RAPIDLY AS POSSIBLE by immersing in cold (or cool) water, or splash with water and fan. • Call for Emergency Assistance. • Observe for signs of shock.	ACCLIMATIZATION[2] Initially moderate workload in heat (8 to 14 days). Monitor worker's activities.

<u>Footnotes</u>:

1.) American diets are normally high in salt, sufficient to aid acclimatization. However, during the early part of the heat season, (May, June), one extra shake of salt during one to two meals per day may help, so long as this is permitted by your physician. Check with your personal physician.

2.) ACCLIMATIZATION - The process of adapting to heat is indicated by worker's ability to perform hot jobs less fluid loss, lower concentrations of salt loss in sweat, and a reduced core (body) temperature and heart rate.

3.) Method to Achieve Acclimatization - Moderate work or exercise in hot temperatures during early part of heat season. Adequate salt (mineral) and water intake. Gradually increasing work time in hot temperatures. Avoid alcohol. Normally takes 8 to 14 days to achieve acclimatization. Lost rapidly, if removed from strenuous work (or exercise) in hot temperature for more than approximately 5 days.

Cold Stress Guidelines

Stress	Symptoms	What to do
Mild Hypothermia	• Body Temp 98 to 90°F • Shivering • Lack of coordination, stumbling, fumbling hands • Slurred speech • Memory loss • Pale, cold skin	• Move to warm area • Stay active • Remove wet clothes and replace with dry clothes or blankets • Cover the head • Drink warm (not hot) sugary drink

Moderate Hypothermia	• Body temp 90 to 86°F
	• Shivering stops
	• Unable to walk or stand
	• Confused and/or irrational
		• All of the above, plus:
		  ○ Call 911
		  ○ Cover all extremities completely
		  ○ Place very warm objects, such as hot packs on the victim's head, neck, chest, and groin

Severe Hypothermia	• Body temp 86 to 78°F • Severe muscle stiffness • Very sleepy or unconscious • Ice cold skin • Death	• Call 911 • Treat victim very gently • Do not attempt to re-warm
Frostbite	• Cold, tingling, stinging, or aching feeling in the frostbitten area, followed by numbness • Skin color turns red, then purple, then white or very pale skin • Cold to the touch • Blisters in severe cases	• Call 911 • Do not rub the area • Wrap in soft cloth • If help is delayed, immerse in warm (not hot) water
Trench Foot	• Tingling, itching, or burning sensation • Blisters	• Soak feet in warm water, then wrap with dry cloth bandages • Drink a warm (not hot) sugary drink

Heat Stress Guidelines

Form	Signs & Symptoms	Care	Prevention[3]
Heat Rash	Tiny red vesicles in affected skin area. If the area is extensive, sweating can be impaired.	Apply mild lotions and cleanse the affected area.	Cool resting and sleeping areas to permit skin to dry between heat exposures.
Heat Cramps	Spasm, muscular pain (cramps) in stomach area and extremities (arms and legs).	Provide replacement fluids with minerals (salt) such as Gatorade.	Adequate salt intake with meals[1]. ACCLIMATIZATION[2]
Heat Exhaustion	Profuse sweating, cool (clammy) moist skin, dizziness, confusion, pale skin color, faint, rapid shallow breathing, headache, weakness, and/or muscle cramps.	Remove from heat, sit or lie down, rest, replace lost water with electrolyte replacement fluids (water, Gatorade) take frequent sips of liquids in amounts greater than required to satisfy thirst.	ACCLIMATIZATION[2] Adequate salt intake with meals[1], only during early part of heat season. Ample water intake, frequently during the day.
Heat Stroke	HOT <u>Dry</u> Skin. Sweating has stopped. Mental confusion, dizziness, nausea, chills, severe headache, collapse, delirium, and/or coma.	HEAT STROKE IS A MEDICAL EMERGENCY • Remove from heat. • COOL THE BODY AS RAPIDLY AS POSSIBLE by immersing in cold (or cool) water, or splash with water and fan. • Call for Emergency Assistance. • Observe for signs of shock.	ACCLIMATIZATION[2] Initially moderate workload in heat (8 to 14 days). Monitor worker's activities.

<u>Footnotes</u>:

1.) American diets are normally high in salt, sufficient to aid acclimatization. However, during the early part of the heat season, (May, June), one extra shake of salt during one to two meals per day may help, so long as this is permitted by your physician. Check with your personal physician.

2.) ACCLIMATIZATION - The process of adapting to heat is indicated by worker's ability to perform hot jobs less fluid loss, lower concentrations of salt loss in sweat, and a reduced core (body) temperature and heart rate.

3.) Method to Achieve Acclimatization - Moderate work or exercise in hot temperatures during early part of heat season. Adequate salt (mineral) and water intake. Gradually increasing work time in hot temperatures. Avoid alcohol. Normally takes 8 to 14 days to achieve acclimatization. Lost rapidly, if removed from strenuous work (or exercise) in hot temperature for more than approximately 5 days.

Cold Stress Guidelines

Stress	Symptoms	What to do
Mild Hypothermia	• Body Temp 98 to 90°F • Shivering • Lack of coordination, stumbling, fumbling hands • Slurred speech • Memory loss • Pale, cold skin	• Move to warm area • Stay active • Remove wet clothes and replace with dry clothes or blankets • Cover the head • Drink warm (not hot) sugary drink

Moderate Hypothermia	• Body temp 90 to 86°F
	• Shivering stops
	• Unable to walk or stand
	• Confused and/or irrational
		• All of the above, plus:
		  ○ Call 911
		  ○ Cover all extremities completely
		  ○ Place very warm objects, such as hot packs on the victim's head, neck, chest, and groin

Severe Hypothermia	• Body temp 86 to 78°F • Severe muscle stiffness • Very sleepy or unconscious • Ice cold skin • Death	• Call 911 • Treat victim very gently • Do not attempt to re-warm
Frostbite	• Cold, tingling, stinging, or aching feeling in the frostbitten area, followed by numbness • Skin color turns red, then purple, then white or very pale skin • Cold to the touch • Blisters in severe cases	• Call 911 • Do not rub the area • Wrap in soft cloth • If help is delayed, immerse in warm (not hot) water
Trench Foot	• Tingling, itching, or burning sensation • Blisters	• Soak feet in warm water, then wrap with dry cloth bandages • Drink a warm (not hot) sugary drink

Appendix P

Forms

Safety Briefing Log

GEI Consultants

Project Number:	**Project Name:**
Date:	**Time:**
Briefing Conducted by:	**Signature:**

This sign-in log documents the tailgate briefing conducted in accordance with the HASP. Personnel who perform work operations on site are required to attend each briefing and to acknowledge receipt of each briefing.

TOPICS COVERED (check all those covered):

☐ General PPE Usage	☐ Confined Space	☐ Excavation Safety
☐ Hearing Conservation	☐ Slips, Trips, Falls	☐ Confined Space
☐ Respiratory Protection	☐ Heat Stress	☐ Traffic Safety
☐ Personal Hygiene	☐ Cold Stresses	☐ Changes to the HASP
☐ Exposure Guidelines	☐ Site Control	☐ Initial Review of Hazard Evaluation
☐ Decon Procedures	☐ Work Zones	☐ Other (Specify):
☐ Emergency Procedures (include route to hospital)	☐ Lockout/Tagout	☐ Other (Specify):

Personnel Sign-in List

Printed Name	Signature	Company Name

Project Safety Briefing Form

Project Number:	**Project Name:**	
Date:	**Time:**	**Project Manager:**
Briefing Conducted by:		**Signature:**

This sign-in log documents the project specific-briefing conducted in accordance with the HASP and GEI H&S policy. GEI personnel who perform work on site are required to attend the Project briefing and to acknowledge it's receipt. Applicable health and safety SOPs are also required to be reviewed in this briefing and attached as an appendix to the HASP. Prior to the start of the project **or upon the start of a new on-site project team member**, this form must be completed. Please email this completed form to Health&SafetyCommittee@geiconsultants.com.

TOPICS COVERED (check all those covered):

☐	General PPE Usage	☐	Excavation Safety	☐	SOP:
☐	Hearing Conservation	☐	Confined Space	☐	SOP:
☐	Respiratory Protection	☐	Traffic Safety	☐	SOP:
☐	Personal Hygiene	☐	Changes to the HASP	☐	SOP:
☐	Exposure Guidelines	☐	Site Control	☐	SOP:
☐	Decon Procedures	☐	Work Zones	☐	SOP:
☐	Emergency Procedures (include route to hospital)	☐	Lockout/Tagout	☐	SOP:
		☐	Review of Hazard Evaluation	☐	SOP:
☐	Confined Space			☐	SOP:
☐	Slips, Trips, Falls	☐	Other (Specify):	☐	SOP:
☐	Heat Stress	☐	Other (Specify):	☐	SOP:
☐	Cold Stress	☐	Other (Specify):	☐	SOP:

Personnel Sign-in List

Printed Name	Signature

GEI Consultants

Accident/Incident Report Form

Please complete this form and send it to your Branch Manager, HR and CHSO ***within 24 hours*** of the incident.

SECTION A — ACCIDENT/INCIDENT DETAILS

EMPLOYEE INFORMATION:

Name: _____

Home Address: _____
Street Address City State Zip Code

Contact Information: ( ) _____ ( ) _____
Primary Secondary

Date of Birth: _____

Date of Hire: _____

Branch: _____

Supervisor: _____

OTHER INJURED (IF APPLICABLE):

Name: _____

Home Address: _____
Street Address City State Zip Code

Contact Information: ( ) _____ ( ) _____
Primary Secondary

Date of Birth: _____

Date of Hire: _____

Branch: _____

Supervisor: _____

Date and Time Accident/Incident	Date and Time Reported
_____ /_____ /_____ Month Day Year	_____ /_____ /_____ Month Day Year
_____ A.M. _____ P.M.	_____ A.M. _____ P.M.

LOCATION OF INCIDENT/ACCIDENT

Project Name: _____

Client and Location: _____

or _____

Office Location: _____

INCIDENT TYPE: (Check All That Applies)

- ☐ **Personal Injury/Illness**
- ☐ **Vehicle Accident**
- ☐ **Property Damage**
- ☐ **Environmental Spill**
- ☐ **Other**

WITNESS INFORMATION

Name: _____

Contact Number: _____

Company: _____

WHAT HAPPENED TO THE INJURED PARTY: ☐ First Aid Administered ☐ Refused Treatment/Transport ☐ Transported to Hospital ☐ Returned to Work ☐ Went Home ☐ Went to Physician ☐ Unknown

Clinic/Hospital or Treating Physician: _____ Phone: _____
Name Street Address City State Zip Code

SECTION B — PERSONAL INJURY

Cause of Injury: _____

Part of Body Injured: _____ Multiple Injuries: ☐ Y ☐ N

Was PPE worn when injured? : ☐ Y ☐ N What PPE was worn? _____

WAS INJURY A RESULT OF THE USE A MOTOR VEHICLE: ☐ **YES** ☐ **NO** **(If yes, complete Section C)**

GEI Consultants

Accident/Incident Report Form

Please complete this form and send it to your Branch Manager, HR and CHSO ***within 24 hours*** of the incident.

SECTION C — AUTO ACCIDENT ONLY

DRIVER/VEHICLE INFORMATION

Name of Insured: _____

Department: _____

Driver's License Number: _____

DOB: ____/____/____ State: _____

Description of Vehicle: License Plate Number: _____

Make: _____ Model: _____ Year:_____ Color:_____

Owner: _____

Name of Other Driver: _____

Driver's License Number: _____

State: _____

Description of Vehicle: License Plate Number: _____

Make: _____ Model:_____ Year:_____ Color:_____

Insurance Carrier: _____

Policy Number: _____ Ph. Number:_____

SECTION D — PROPERTY DAMAGE OR CHEMICAL RELEASE ONLY

Type of Damage(s): _____

Cause of Damage(s): _____

Type of Chemical Released (if known): _____

Quantity of Chemical Released: _____

Spill Measures Employed: _____

SECTION E — NATURE OF ACCIDENT/INCIDENT AND EXTENT OF INJURIES/DAMAGES

(Please give a detailed description of what happened. Attach a sketch or picture if applicable)

_____

_____

_____

_____

_____

_____

_____

_____

_____

I hereby certify that the above information is true and correct to my understanding of this accident/incident.

_____ _____

Employee/Preparer's Name **Date and Time**

NEAR MISS REPORT

A near miss is a potential hazard or incident that has not resulted in any personal injury. Unsafe working conditions, unsafe employee work habits, improper use of equipment, or use of malfunctioning equipment have the potential to cause work related injuries. It is everyone's responsibility to report and/or correct these potential accidents/incidents immediately. Please complete this form as a means to report these near-miss situations. Send a copy of the completed form to the Project Manager, Regional Health and Safety Officer and the Corporate Health and Safety Officer.

Location: _____ Site Name: _____

Date: _____ Time: _____ ☐ a.m. ☐ p.m.

Weather conditions, site operations taking place during near miss. _____

Please check all appropriate conditions:

☐ Unsafe Act ☐ Unsafe equipment

☐ Unsafe Condition ☐ Unsafe use of equipment

Description of incident or potential hazard: _____

Employees or sub-contractors involved if applicable._____

Employee Signature _____ Date _____

Print Name _____

NEAR MISS INVESTGATION

Description of the near-miss condition: _____
Causes (primary & contributing) _____
Corrective action taken (Remove the hazard, replace, repair, or retrain in the proper procedures for the task) _____
Actions not yet taken_____

Signed: _____ Date Completed: _____

Print Name
Not completed for the following reason: _____Date:_____

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Appendix Q

GEI's Health and Safety SOPs

STANDARD OPERATING PROCEDURE

DM-006 Geoprobe® Direct Push Boring

1. Objective

Describe standard operating procedures (SOP) for drilling of overburden soil borings using Geoprobe® and MacroCore® technologies.

2. Execution

- Confirm that appropriate measures have been taken for clearance of potential subsurface utilities. The responsibility for clearance may vary, depending on the client.
- Inspect the drilling rig to make sure it is clean and that the down-hole equipment has been decontaminated (QA-001). Record condition of all down-hole drilling equipment.
- Make sure the sampler is fitted with a piston rod assembly to block the sample tube until the desired subsurface sample interval is attained. Upon reaching the target sample depth, the piston tip will be released and the discrete sampler device is then advanced to collect the representative sample. This reduces the volume of slough that is collected.
- When the sampler is brought to the ground surface, it should be opened immediately, and the length of recovery should be measured and recorded.
- Log the soil sample using USCS procedures (SOP SM-003). Collect analytical samples if necessary (SOP SM-001).
- Decontaminate the cutting shoe if necessary (SOP QA-001 Equipment Decontamination) and have driller reassemble the parts with a new liner.
- Repeat the procedure described above until refusal or the boring is terminated.
- Periodically verify that depths cited by drillers are accurate.

3. Limitations

- If significant unanticipated contamination is encountered during drilling, stop drilling to confer with the project manager and re-evaluate health and safety conditions.
- Arrange for the storage of contaminated soil cuttings and water in drums or other appropriate containers in a secure place at the site (see SOP SC-003, *Investigation Derived Waste Management*).
- If possible, plan the drilling program to drill borings from the least to most contaminated areas. Be prepared in advance and know where alternative drilling locations are in the event that problems are encountered at soil boring locations. These locations must also have been cleared by the state or local utility service prior to drilling.

4. References

ASTM D6001-05 Guide for Direct Push Water Sampling for Geoenvironmental Investigations, April 2005

Geoprobe Systems, "Geoprobe MacroCore MC-5 1.25-inch Light Weight Center Rod Soil Sample System SOP", Technical Bulletin No. MK 3139, November 2006

5. Attachments

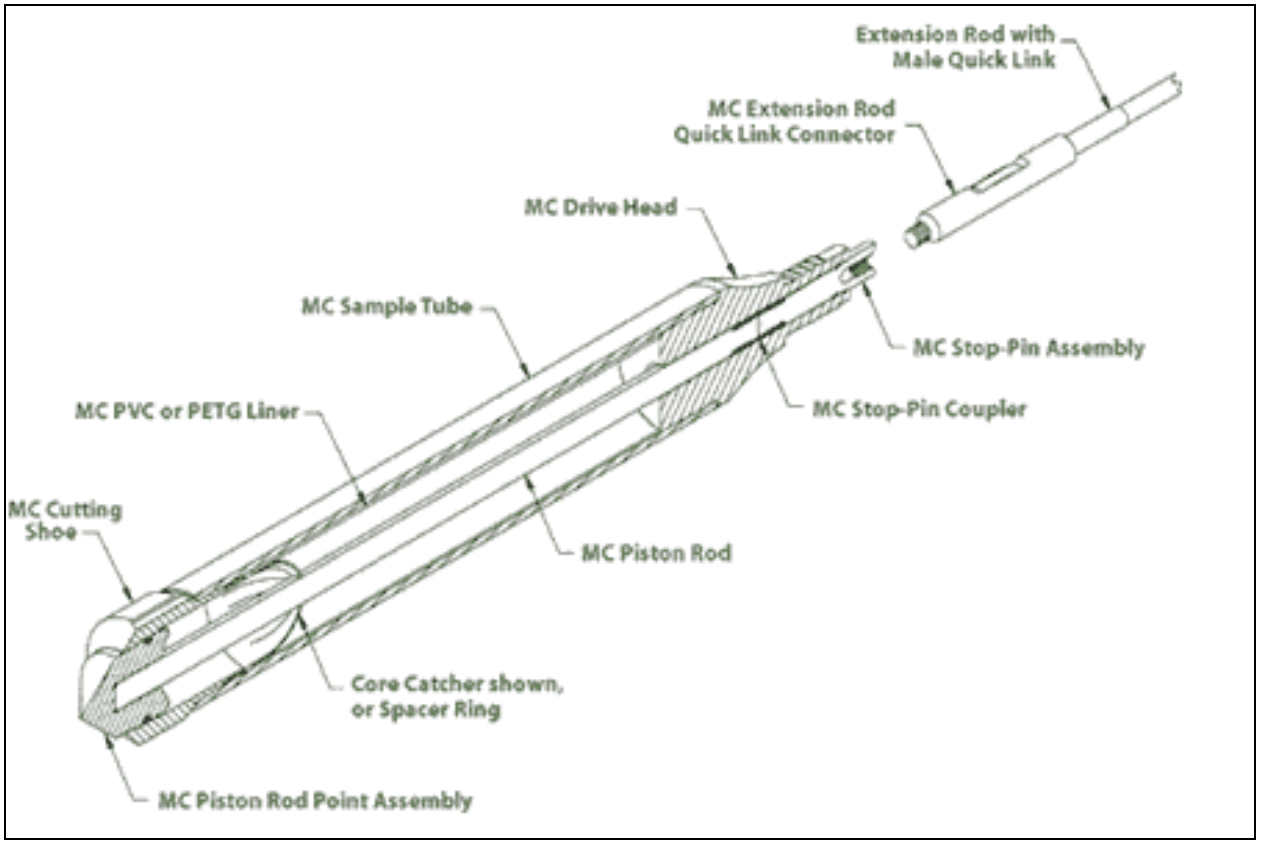
Attachment A – Geoprobe® with Macrocore® Sampler Assembly

6. Contact

Melissa Felter
Cathy Johnson

SOP DM-006

Attachment A – GeoProbe® with Macrocore® Sampler Assembly



Above: Diagram of a Macrocore® sampler

Right: A track-mounted GeoProbe ® Rig

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STANDARD OPERATING PROCEDURE

GW-003 Low Flow (Low Stress) Groundwater Sampling

1. Objective

Describe methods to collect groundwater samples most likely to produce results that represent aquifer conditions.

Low-flow purging is limited to wells that, with sustained pumping, exhibit no continuous drawdown.

2. Execution

- Prior to groundwater sampling consult with the project manager to confirm that the type of pump is appropriate and consistent with the approved work plan.
- Record activities in the field notebook (see SOP FD-001 Field Notebook) and on a Monitoring Well Sampling Record such as the examples in Attachment A. Use a separate form for each sampling location and event. You may forego the forms and record all information in the field notebook if the Project Manager approves.
- Calibrate pH, temperature, Specific Conductance (SC), turbidity, Dissolved Oxygen (DO), and Oxidation-Reduction Potential (ORP) on the meter(s). Use calibration methods provided by the manufacturer of the equipment. Note that appropriate calibration for dissolved oxygen requires a water saturated air environment, along with measured temperature and barometric pressure.
- Begin with the monitoring well believed to have the least contaminated groundwater and proceed systematically to the well with the most contaminated groundwater. Check the well, the lock, and the locking cap for damage or evidence of tampering.
- Slowly and gently measure the depth to water with a water level probe and/or oil-water interface probe. Do not measure depth to well bottom at this time (wait until sampling has been completed). Measure water level in accordance with SOP GW-001 Water Level Measurement.
- Attach new polyethylene or Teflon lined tubing to the sampling pump and the flow-through cell that contains the meter probes.
- Slowly and gently insert new polyethylene or Teflon lined tubing to the pump intake (or use dedicated tubing that remains in the well) and to the middle of the saturated screened interval or to the pre-determined sampling depth.
- The tubing intake should be kept at least two (2) feet above the bottom of the well to prevent disturbance or suspension of any sediment or Non-Aqueous Phase Liquid (NAPL) present in the bottom of the well. Record the depth of the pump intake.

- If possible, position your sampling equipment and tubing so that it is in the shade. The goal is to minimize the effect of sunlight raising the temperature of water being collected.
- Start the pump on the lowest setting and increase slowly until flow begins. Adjust the pumping rate so that drawdown in the well is minimal (0.3 feet or less, is desirable but not mandatory). Use a pumping rate between 100 to 1,000 milliliters per minute (mL/min) (or approximately 0.1 to 1 quarts per minute). Measure flow rate on the pump or using a graduated container every 3 to 5 minutes and record. The minimum purge volume will be twice the combined volumes of the sampling string (i.e. pump, tubing, and flow-through cell).
- While purging, record water levels every 3 to 5 minutes and monitor and record the water quality indicator parameters: pH, temperature, specific conductance (SC), dissolved oxygen (DO), and turbidity. If specified in the field sampling plan also include ORP.
- Purging is complete when, after three consecutive measurements, the water quality parameters have stabilized as follows:

    - pH (+/- 0.1 standard units)
    - temperature (+/- 3%)
    - SC (+/- 3%)
    - turbidity (+/- 10% if >5 NTU; if 3 values are <5 NTU, consider the values as stabilized)
    - DO (+/-10% if >0.5 mg/L; if 3 values are <0.5 mg/L, consider the values as stabilized)
    - ORP (+/- 10 mV)

- Dispose of purge water according to the field plan.

Sample Collection:

- Following purge, remove the discharge tubing from the flow-through cell. Do not disturb pump and tubing between stabilization and sample collection.
- Fill sample containers directly from the sampling device in order of decreasing volatility (i.e., Volatile Organic Compounds (VOC) samples are collected first; see SOP SC-002 Sampling Handling). Fill all containers from the discharge end of the tubing. Collect samples at a flow rate equal to the steady state purge rate.
- If not using a dedicated pump, remove sampling device and decontaminate (see SOP QA-001 Equipment Decontamination). Discard used tubing.
- Store samples in a cooler on ice for transport to the laboratory.
- Measure depth to bottom of well.

- Secure the well cap.

3. Limitations

- Prior to departure for the field, obtain available information on well construction for use in field investigation (i.e., screen and riser material, well diameter and depth, screened interval, optimum sampling depth, etc.).
- If possible, when using dedicated equipment, install equipment into well at least 24 hours before sample collection to minimize disturbance of the water column and/or suspension of sediments or NAPL on bottom.
- If water quality indicator parameters do not stabilize after removing 3 to 5 well volumes or 2 hours, contact the Project Manager. Three options will be available: 1) continue purging until stabilization; 2) discontinue purging and do not sample; or 3) discontinue purging and sample.
- The key indicator parameter for VOCs is DO. The key indicator parameter for all other samples is turbidity.
- Fill all sample containers with minimal turbulence by allowing the groundwater to flow from the tubing gently down the inside of the container.
- Consult with the project manager before field filtering samples for metals if using low-flow sampling.
- Be aware of any preservatives in the sample bottles and handle with care, in accordance with the Health and Safety Plan.

4. References

Standard Reference for Monitoring Wells (April 19, 1991), Massachusetts DEP, DEP Publication No. WSC-310-91.

Reproducible Well-Purging Procedures and VOC Stabilization Criteria for Ground Water Sampling (1994), M.J. Barcelona, H. A. Wehram, and M.D. Varljen, Ground Water, Vol. 32, No. 1, 12-22.

Low-Flow Purging and Sampling of Ground Water Monitoring Wells with Dedicated Systems (1995), R.W. Puls, and C.J. Paul, Groundwater Monitoring and Review, Summer 1995 116-123.

Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells (2010), EQASOP-GW 001 Low Stress (Low Flow) SOP, Revision 3, U.S. Environmental Protection Agency, Region I, January 19, 2010.

Ground Water Sampling Procedure Low Stress (Low Flow) Purging and Sampling, (1998), Ground-Water Sampling SOP, Final, U.S. Environmental Protection Agency, Region II, March 16, 1998.

RCRA Ground-Water Monitoring: Draft Technical Guidance, (1993), U.S. Environmental Protection Agency, EPA/530-R-93-001.

To Filter, or Not to Filter, That is the Question, (1997), Special Topics Subcommittee Letter Report EPA-SAF-EEC-LTR-97-011, April 29, 1997, Meeting, U.S. Environmental Protection Agency, Science Advisory Board Environmental Engineering Committee, September 5, 1997.

Should Filtered or Unfiltered Groundwater and Surface Water Samples be Collected for the Risk Assessment?, (1995), MCP Q&A: Subparts I and J, Special #4, Bureau of Waste Site Cleanup, Massachusetts Department of Environmental Protection (DEP), February, 1995.

5. Attachments

Attachment A - Monitoring Well Sampling Record

6. Contacts

Brian Conte
Saskia Oosting

MONITORING WELL SAMPLING RECORD

PID Reading _____ Job Name _____

Job Number _____ By _____ Date _____

Location _____ Measurement Datum _____

Well Number _____

Pre-Development Information Time (start) _____

Water Level _____ Total Depth of Well _____

One Purge Vol _____ Three Well Volume _____

Water Characteristics

Color _____ _____ Clear _____ Cloudy

Odor _____ None _____ Weak _____ Moderate _____ Strong

Any films or immiscible material _____

***Volume* (gal)**	**Time**	**pH**	**Temp (°C)**	**Spec. Conductance (µS/cm)**	**Turbidity (NTU)**	**DO Conc. (mg/L)**	**ORP (mV)**	**TDS**

Total Volume Removed (gal) _____ pH _____

Temperature (°C) _____ Specific Conductance (µS/cm) _____

DO Concentration (mg/L) _____ ORP (mV) _____

TDS _____

Post Development Information

Time (Finished) _____

Water Level _____ Total Depth of Well _____

Approximate Volume Removed (gal) _____

Water Characteristics

Color _____ ____ Clear ____ Cloudy

Odor ____ None ____ Weak ____ Moderate ____ Strong

Any films or immiscible material _____

Comments

Low-Flow Groundwater Sampling Form

Project number and name ______________________ Sampling personnel ______________________ Sample date ____________ Well ID ____________

Well location description: ____________
____

Well Construction

Well diameter ____________

Well measurement point ____________

Roadbox condition ____________

Well screen interval ____________

Well depth ____________

Sampling Information

Initial depth to water ____________ Time: ____________

Sample intake depth ____________

Pump type and ID ____________

Stabilized flow rate ____________

Stabilized flow rate = flow rate with no further drawdown

Samples Collected

VOCs 8260	
SVOCs 8270	
VPH	
EPH	
Metals	
PCBs	
Other	

Field values at time of sample collection:

Time: ____________ Depth to water:

Sp.Cond. ____________ mS/cm ____________

DO ____________ mg/L

ORP ____________ mV

pH ____________ s.u.

Temp. ____________ °C

Turb. ____________ NTU

Cumulative Time (min.)	**Volume (gal)**	**Water depth (ft)**	**Temp. (°C)**	**Sp.Cond. (mS/cm)**	**D.O. (mg/L)**	**pH (s.u.)**	**ORP (mV)**	**Turb. (NTU)**
Typical Groundwater Values			5 to 15	0.05 to 5	0 to 4	5 to 7	-100 to +500	aim for <10

Sample Information:

Sample ID ____________

Sample Time: ____________

Color: ____________

Turbidity: ____________

Field Filtered YES / NO Analyses: ____________

Filter type: ____________

Odor/Sheen/NAPL ____________

Duplicate Collected YES / NO

If yes, duplicate ID: ____________

Purge water disposal? to ground drummed other:

Well Volume Conversion:

Diam. (in)	Factor (gal/ft)
1	0.04
1.5	0.09
2	0.16
4	0.65
6	1.50

well volume =
3.14 x (r)^2 x 7.48 gal/ft
where r = 1/2 diameter in ft

Stabilization Criteria:
Sp.Cond. +/- 3%
DO +/- 10%
ORP +/- 10 mV
pH +/- 0.1 Std Units
Temp. +/- 3%
Turb. +/- 10% if values >1 NTU

Guidance:

1 Position tubing at midpoint of saturated screened interval

2 Minimize drop in water level and purge until parameters are stable

3 Disconnect flow thru cell during sampling

4 Call Project Manager if issues arise (e.g. stabilization takes more than 2 hrs, well goes dry, odd data).

5 For VPH and VOC samples, if stabilization flow rate is less than 200 ml/min, contact PM

Notes: ______________________

STANDARD OPERATING PROCEDURES

SOP No. HS-001 Biological Hazards

1.1 Objective

The objective of this Standard Operating Procedure (SOP) is to prevent or limit the potential for GEI personnel to encounter biological hazards during field activities.

1.2 General

This SOP is intended for use by employees engaged in work with the potential for contact with biological hazards such as animals, insects, plants, and sewage. The site-specific health and safety plan (HASP) should include a hazard assessment for the project that identifies the potential for encounters with biological hazards and the control methods to be implemented by GEI employees. These hazards must be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.3 Mammals

During some site operations, animals such as stray or domesticated dogs or cats, raccoons, snakes, bears, rats, bats, etc. may be encountered. Employees should use discretion and attempt to avoid contact with animals. If these animals present a problem, efforts will be made to remove these animals from the site by contacting a licensed animal control technician.

1.3.1 Rabies

The rabies virus is transmitted through the bite of an infected animal or contact with saliva or brain/nervous system tissue of an infected animal. The rabies virus infects the central nervous system, causing disease in the brain. The early symptoms of rabies in people are fever, headache, and general weakness or discomfort. As the disease progresses, more specific symptoms appear and may include insomnia, anxiety, confusion, slight or partial paralysis, excitation, hallucinations, agitation, hypersalivation (increase in saliva), difficulty swallowing, and hydrophobia (fear of water). Death usually occurs within days of the onset of these symptoms.

If you are bitten or think you may be exposed, wash any wounds immediately and thoroughly with soap and water. Then go to the hospital emergency room and notify the Project Manager and the People Safety Team. The doctor, possibly in consultation with the state or local health department, will decide if you need a rabies vaccination. Decisions to start series of vaccinations will be based on your type of exposure and the animal you were exposed to, as well as laboratory and surveillance information for the geographic area where the exposure occurred. If possible have someone document what type of animal it was, how it was behaving prior to the bite, what caused it to bite the

employee, and if it's not a domestic animal that would be easy to find again in the future, try to get animal control on site to capture it. An Incident Report Form must be completed and submitted, per GEI's Incident reporting procedures. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

1.4 Insects and Arachnids

Insects, including bees, wasps, hornets, mosquitoes, ticks, spiders, etc., may be present at a job site making the chance of a bite/sting possible. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life-threatening condition. Some insect bites can transmit diseases such as Lyme disease or a virus such as West Nile. The following is a list of preventive measures:

- Apply insect repellent prior to performing field work and as often as needed throughout the work shift.
- Wear proper personal protective equipment (PPE), including protective clothing (work boots, socks, and light colored clothing).
- Wear shoes, long pants with bottoms tucked into boots or socks, and a long-sleeved shirt when outdoors for long periods of time, or when many insects are most active (between dawn and dusk).
- When walking in wooded areas, avoid contact with bushes, tall grass, or brush as much as possible.
- Field personnel who have or may have insect allergies must have insect allergy medication onsite and must inform the Site Safety Officer (SSO) and the People and Safety Team of their particular allergy prior to commencing work.
- Field personnel should perform a self-check at the end of the day for ticks.

1.4.1 Tick-borne Diseases

Lyme Disease

Lyme disease is caused by infection from a deer tick that carries a spirochete (a bacterium). During the painless tick bite, the spirochete may be transmitted into the bloodstream, often after feeding on the host for 12 to 24 hours. The ticks that cause the disease are often no bigger than a poppy seed or a comma in newsprint. The peak months for human infection are from May to September.

Symptoms appear in three stages. First symptoms usually appear from 2 days to a few weeks after a person is bitten by an infected tick. Symptoms usually consist of a ring-like red rash on the skin where the tick was attached. The rash is often bulls-eye like with red around the edges and clear in the center. The rash may be warm, itchy, tender, and/or "doughy." This rash appears in only 60 to 80 percent of infected persons. An infected

person also has flu-like symptoms of a stiff neck, chills, fever, sore throat, headache, fatigue, and joint pain. These symptoms often disappear after a few weeks.

The second stage symptoms, which occur weeks to months later include meningitis, severe headache, drooping of the muscles on the face, called Bell's Palsy, encephalitis, numbness, withdrawal, and lethargy. These symptoms may last for several weeks to several months. Third stage symptoms, which occur months or years later include arthritis, heart problems, and loss of memory. The third stage symptoms may mimic multiple sclerosis and Alzheimer's disease.

When in areas that could harbor deer ticks, employees should wear light color clothing, and visually check themselves and check and be checked by another employee when coming from wooded or vegetated areas. If a GEI employee has a tick bite, the People and Safety Team and Project Manager must be contacted immediately. The employee will be offered the option for medical treatment by a physician, which typically involves antibiotics. An Incident Report form must be completed in compliance with the Incident Reporting procedures. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

If personnel feel sick or have signs similar to those mentioned above, the SSO and the People and Safety Team must be notified immediately.

Figure 1: From left to right, the deer tick adult female, adult male, nymph, and larva on a centimeter scale.

How to Remove a Tick

A tick can be removed from the skin by pulling gently at the head with tweezers. If tweezers are not available, use tissue paper or cloth to grasp the tick. It is important to grasp the tick as close to the site of attachment and use a firm steady pull to remove it. Wash hands immediately after with soap and water. The affected area should also be washed with soap and water, then disinfected with an antiseptic wipe, if available. All mouth parts must be removed from the skin. If the tick was removed by breaking off the

mouth parts, an irritation or infection may occur because the organism that is causing the disease can still enter the body through the skin.

Treatment for Lyme Disease

Treatment with antibiotics is effective and recovery is usually complete. For first stage symptoms, antibiotics are usually given orally. However, treatment for second and third stage symptoms is prolonged and recovery may take longer. Antibiotic treatment is usually provided intravenously for second and third stage Lyme disease.

Babesiosis

The deer tick can also cause Babesiosis, an infection of the parasite Babesia Microti. Symptoms of Baesiosis may not be evident, but may also include fever, fatigue and hemolytic anemia lasting from several days to several months. Babesiosis is most commonly diagnosed in the elderly or in individuals whose immune systems are compromised. If there are no signs or symptoms of Babesiosis, usually no treatment it needed. If an employee believes they might have Babesiosis they'll see a physician to be tested. Treatment usually consists of taking prescription medications for 7 to 10 days.

Ehrlichiosis

Ehrlichiosis is a tick-borne disease which can be caused by either of two different organisms. Human monocytic ehrlichiosis (HME) is caused by *Ehrlichia chaffeensis*, which is transmitted by the lone star tick (*Amblyomma americanum*). Human granulocytic anaplasmosis (HGA), previously known as human granulocytic ehrlichiosis (HGE), is caused by *Anaplasma phagocytophilia*, which is transmitted by the deer tick (*Ixodes scapularis*).

Ehrlichiosis is transmitted by the bite of infected ticks, including the deer tick and the lone star tick. The symptoms of HME and HGE are the same and usually include fever, muscle aches, weakness and headache. Patients may also experience confusion, nausea, vomiting and joint pain. Unlike Lyme disease or Rocky Mountain spotted fever, a rash is not common. Infection usually produces mild to moderately severe illness, with high fever and headache, but may occasionally be life-threatening or even fatal. Symptoms appear 1 to 3 weeks after the bite of an infected tick. However, not every exposure results in infection. For those that become infected a drug called Doxcycline will be prescribed.

Rocky Mountain Spotted Fever

Rocky Mountain spotted fever is a tick-borne disease caused by a rickettsia (a microbe that differs somewhat from bacteria and virus). In the eastern United States, children are infected most frequently, while in the western United States, disease incidence is highest among adult males. Disease incidence is directly related to exposure to tick-infested habitats or to infested pets. Rocky Mountain spotted fever is characterized by a sudden onset of moderate to high fever (which can last for 2-3 weeks), severe headache, fatigue, deep muscle pain, chills and rash. The rash begins on the legs or arms, may include the

soles of the feet or palms of the hands and may spread rapidly to the trunk or rest of the body. Symptoms usually appear within 2 weeks of the bite of an infected tick. Like Ehrlichiosis the prescription drug Doxcycline is the first line treatment option.

1.4.2 Mosquito-Borne Disease

West Nile Virus
West Nile Virus is a mosquito-borne infection transmitted through the bite of an infected mosquito. The symptoms of West Nile Virus can be asymptomatic (no symptoms) or in more serious cases can lead to West Nile Fever. West Nile Fever can include fever, headache, tiredness, body ache, an occasional rash on the trunk of the body, and swollen lymph glands, In severe cases, people have developed West Nile Encephalitis or Meningitis which symptoms include fever, headache, neck stiffness, tremors, coma, and in some cases death. The incubation period for the disease is usually 2 to 15 days. The symptoms can range from a few days to several weeks. Most mosquitoes are not infected and the chance of infection from a mosquito bite of an on-site employee is very small.

1.5 Repellants

The following precautions will be used to help reduce the risk of mosquito bites:

Reduce mosquito-breeding areas by making sure wheelbarrows, buckets, and other containers are turned upside down when not used so that they do not collect standing water. According to the Environmental Protection Agency (EPA), many mosquitoes can breed in pooled water that's minimal enough to fill a bottle cap.

Wear shoes, long pants with bottoms tucked into boots or socks, and a long-sleeved shirt when outdoors for long periods of time, or when many mosquitoes are most active (between dawn and dusk).

Use mosquito repellant according to the manufacturer's directions when outdoors for long periods of time and when mosquitoes are most active.

Centers for Disease Control and Prevention (CDC) evaluation of information contained in peer-reviewed scientific literature and data available from the EPA has identified several EPA-registered products that provide repellent activity sufficient to help people avoid the bites of disease carrying mosquitoes. Products containing these active ingredients typically provide reasonably long-lasting protection:

- **DEET** (Chemical Name: N,N-diethyl-m-toluamide or N,N-diethly-3-methyl-benzamide)
- **Picaridin** (KBR 3023, Chemical Name: 2-(2-hydroxyethyl)-1-piperidinecarboxylic acid 1-methylpropyl ester)

- **Oil of Lemon Eucalyptus** or **PMD** (Chemical Name: para-Menthane-3,8-diol) the synthesized version of oil of lemon eucalyptus
- **IR3535** (Chemical Name: 3-[N-Butyl-N-acetyl]-aminopropionic acid, ethyl ester)
- **Permethrin** (3-Phenoxybenzyl (1RS)-cis,trans-3-(2,2-dichlorovinyl) -2,2-dimethylcyclopropanecarboxylate) **–** Permethrin kills ticks and can be used on clothing (but not skin)

The EPA characterizes the active ingredients DEET and Picaridin as "conventional repellents" and Oil of Lemon Eucalyptus, PMD, and IR3535 as "biopesticide repellents", which are derived from natural materials.

In general, higher concentrations of active ingredient provide longer duration of protection, regardless of the active ingredient, although concentrations above approximately 50 percent do not offer a marked increase in protection time. Products with less than 10 percent active ingredient may offer only limited protection, often from 1 to 2 hours. Products that offer sustained release or controlled release (micro-encapsulated) formulations, even with lower active ingredient concentrations, may provide longer protection times. Regardless of what product you use, if you start to get mosquito bites reapply the repellent according to the label instructions or remove yourself from the area with biting insects if possible.

Clothing and other products can be purchased pre-treated, or products can be treated using EPA-registered products. Permethrin is the only pesticide approved by the EPA for these uses. Permethrin binds tightly to the fabrics, resulting in little loss during washing and minimal transfer to the skin. Permethrin is poorly absorbed through the skin, although sunscreens and other products may increase the rate of skin absorption.

If you decide to use permethrin-treated clothing, consider these tips:

- Read the application instructions carefully and apply the product according to the label directions. Do not over-treat products.
- Permethrin treatments are only intended for use on fabrics; do not apply them directly to the skin or other items.
- Do not apply permethrin to clothing while it is being worn.
- Apply the product to clothing outdoors in well ventilated areas that are protected from wind.
- Hang treated fabrics outdoors and allow them to dry completely before wearing them.
- Wash permethrin treated clothing separately from other clothing items.

1.6 Poisonous Plants

The potential for contact with poisonous plants, such as poison ivy, oak, and sumac exists when performing fieldwork in wooded or boggy areas. Urushiol, an oily organic allergen found in plants, can cause an allergic reaction when in contact with the leaves or vines.

Poison ivy can be found as vines on tree trunks or as upright bushes. Poison ivy consists of three leaflets with notched edges. Two leaflets form a pair on opposite sides of the stalk, and the third leaflet stands by itself at the tip. Poison ivy is red in the early spring and turns shiny green later in the spring. Poison ivy grows throughout much of North America, including all states east of the Rocky Mountains. It is normally found in wooded areas, especially along edge areas where the tree line breaks and allows sunshine to filter through. It also grows in exposed rocky areas, open fields, and disturbed areas.

Poison oak can be present as a sparsely-branched shrub. Poison oak can grow anywhere in the United States with the exception of Hawaii, Alaska, and some southwest areas that have desert climates. Poison oak is similar to poison ivy in that it has the same leaflet configuration; however, the leaves have slightly deeper notches.

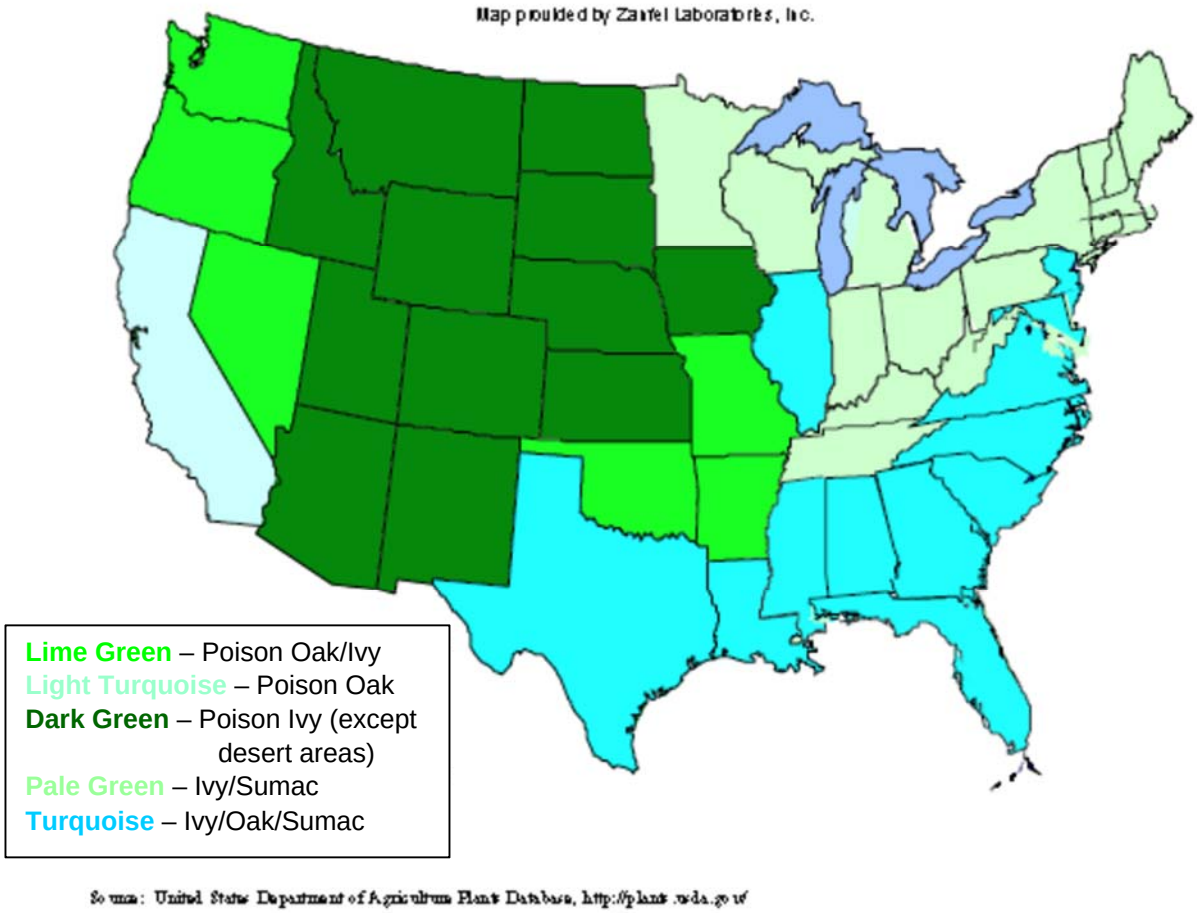
Poison sumac can be present in the form of a flat-topped shrub or tree. It has fern-like leaves, which are velvety dark green on top and pale underneath. The branches of immature trees have a velvety “down.” Poison sumac has white, “hairy” berry clusters. Poison sumac grows exclusively in very wet or flooded soils, usually in swamps and peat bogs, in the eastern United States.

Poison Ivy

Poison Oak

Poison Sumac

U.S. Prevalence of Poison Ivy, Oak & Sumac



Source: United State Department of Agriculture Plant Database, http://plants.usda.gov/

To prevent exposure to these poisonous plants:

- Wear proper PPE, including long sleeves, long pants, boots, and gloves.
- Barrier skin creams, such as lotion containing bentoquatum (Tecnu®), may offer some protection prevent the occurrence of exposure symptoms.
- Contact with poison ivy, sumac, or oak may lead to a skin rash, characterized by reddened, itchy, blistering skin which needs first aid treatment. Employees with known allergies should identify themselves to the SSO or Project Manager prior to starting field work as a precautionary measure. If you believe you have contacted one of these plants:
    - Immediately wash skin thoroughly with soap and water, taking care not to touch your face or other body parts.
    - Contact the People and Safety Team and Project Manager immediately after caring for affected skin.

- Wash exposed clothing separately in hot water with detergent.

- After use, clean tools, and soles of boots with rubbing alcohol or soap and lots of water. Urushiol can remain active on the surface of objects for up to 5 years.
- If a rash occurs, contact the People and Safety Team and complete and submit an Incident Report Form. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

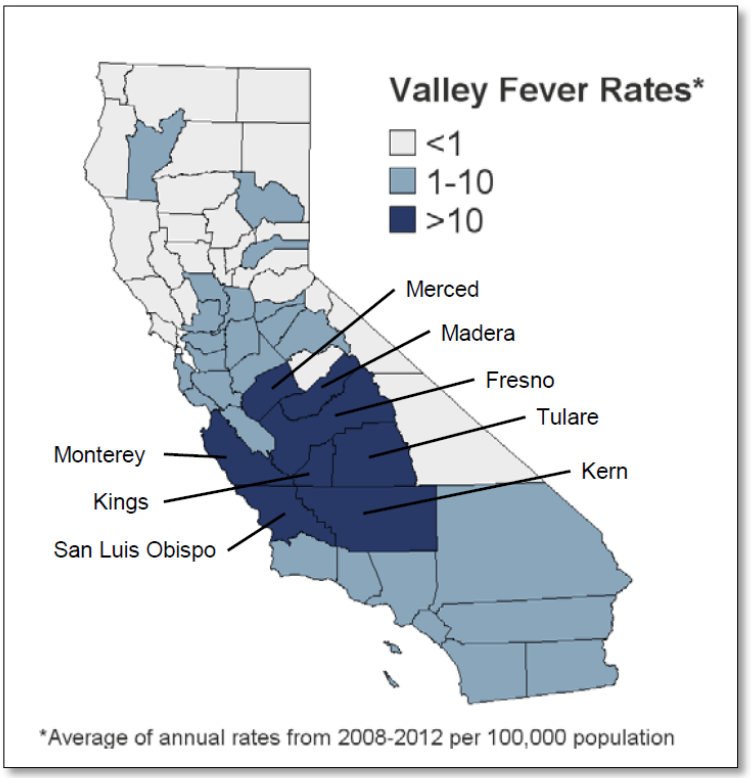
1.7 Sewage and Bacterial Impacted Sediments

Some project work may be conducted at sites that serve or have served as a combined sewer overflow and consequently may have received untreated sanitary sewage from numerous sources. Decomposed sewage can potentially be encountered within sites and their sediments. Sediments could contain soil and marine microorganisms, and bacterium associated with sewage. Many of these bacterium can cause illness through ingestion, direct contact, or the inhalation of a bio-aerosol possibly in the form of dust. Potential respiratory exposure to biological agents can also occur through the inhalation of aerosols produced during sediment handling activities. PPE as identified in the site-specific HASP will be worn to minimize potential exposures. Employees will follow the decontamination or disposal procedures identified in the HASP.

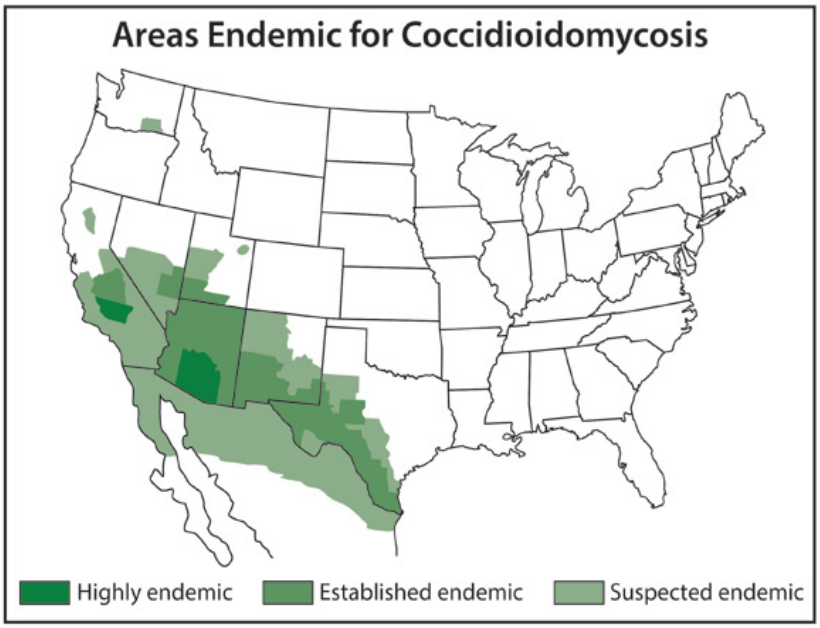
1.7.1 Fungal Spores in Soil – Valley Fever

Valley Fever is an illness that usually affects the lungs. It is caused by the fungus *Coccidioides immitis* that lives in the top 2 to 12 inches of soil in many parts of California. When fungal spores are present, any work activity that disturbs the soil, such as digging, grading, or other earth moving operations, or vehicle operation on dirt roads, can cause the spores to become airborne, therefore increasing the risk of Valley Fever. All employees on sites where the fungus is present, and who are exposed to dusty conditions and wind-blown dusts are at increased risk of becoming infected.

Valley Fever fungal spores are too small to be seen, and there is no reliable way to test the soil for spores before working in a particular place. Valley Fever can be found throughout the southwestern United States, parts of Mexico, and South America. Some California counties consistently have Valley Fever fungus present in the soil. In these regions Valley Fever is considered endemic. Health departments track the number of cases of Valley Fever illness that occur. This information is used to map illness rates as seen on the figures below from the Center of Disease Control Valley Fever Awareness website.



Rates of reported Valley Fever cases in California counties from 2008–2012. Darkest colored counties had the highest rates of Valley Fever.



When present, symptoms usually occur between 7 to 21 days after breathing in spores, and can include:

- Cough
- Fever
- Chest pain
- Headache
- Muscle aches
- Rash on upper trunk or extremities
- Joint pain in the knees or ankles
- Fatigue

Symptoms of Valley Fever can be mistaken for other diseases such as the flu (influenza) and TB (tuberculosis), so it is important for employees to obtain medical care for an accurate diagnosis and possible treatment.

While there is no vaccine to prevent Valley Fever, the following important steps must be taken in order to limit risk:

- Determine if the worksite is in an endemic area. Contact the local health department for more information about the risk in the county GEI is performing work that may disturb soils.
- Prepare work plans and work practices that reduce employee's exposure, which may include:
    - Provide air conditioned cabs with properly maintained dust filters for vehicles that generate heavy dust and make sure employees keep windows and vents closed.
    - Suspend work during heavy winds.
- When exposure to dust is unavoidable, National Institute for Occupational Safety and Health (NIOSH)-approved respiratory protection with particulate filters rated as N95, N99, N100, P100, or High Efficiency Particulate Air (HEPA) must be provided. The Project Manager must work with the Safety Team to develop and implement a respiratory protection program in accordance with California's Occupational Safety and Health Administration (Cal/OSHA's) Respiratory Protection standard (8 CCR 5144) for the project.
- Take measures to reduce transporting spores offsite, such as:
    - Clean tools, equipment, PPE, and vehicles before transporting offsite.
    - If employee's clothing is likely to be heavily contaminated with dust, provide coveralls and change rooms, and showers where possible.

1.8 Injury Reporting

If a GEI employee suffers an injury, bite, or sting on the job that is not life threating, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.9 Limitations

Follow safety procedures as defined in the site-specific HASP. Appropriate PPE must be worn correctly to provide the intended level of protection.

1.10 References

http://www.cdc.gov/ncidod/dvbid/westnile/index.htm
http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect_repellent.htm
http://www.epa.gov/pesticides/health/mosquitoes/insectrp.htm
http://www.cdc.gov/niosh/topics/lyme/
Protecting Yourself from Ticks and Mosquitoes, NIOSH Fast Facts, Publication No. 2010-119
http://npic.orst.edu/pest/mosquito/ptc.html
http://www.cdc.gov/features/valley-fever-10-things/
https://www.cdph.ca.gov/HealthInfo/discond/Documents/VFGeneral.pdf
https://blog.epa.gov/blog/tag/mosquitoes/

1.11 Attachments

None

1.12 Contact

Health&SafetyTeam@geiconsultants.com

1.13 Review History

- June 2016
- June 2014
- November 2013
- October 2010

STANDARD OPERATING PROCEDURE
HS-004 Driver Safety

1.1 Objective

GEI has implemented a Safe Driving Program to encourage safe driving habits and promote the ongoing safety of our staff and the communities where we work. For more information, refer to the Operation of Vehicles section of GEI's Employee Handbook.

This Standard Operating Procedure (SOP) provides requirements and recommendations to minimize the potential risks while operating or riding in a motor vehicle.

1.2 General

GEI employees will adhere to the following requirements when operating a vehicle while conducting business on behalf of GEI. These requirements apply to GEI-owned, rental, and personal vehicles used to conduct GEI business:

- Employees must maintain a valid and current driver's license.
- Employees using a personal vehicle for work-related travel must have proper insurance coverage that meets the requirements in the state in which they reside.
- Employees must wear their safety belt while in a moving vehicle.
- Vehicle incidents will be reported in accordance with GEI's Incident Reporting procedures (*refer to* GEI's Safety App for smart phones or the Safety page on the GEI intranet.).
- Vehicles will be properly maintained and safely operated (*refer to* GEI's Fleet Maintenance Program).
- Employees will follow safe driving behaviors, which include limiting distractions such as manipulating radios or other equipment that may cause a distraction. Employees should not exceed the posted speed limit and should maintain a safe distance between other vehicles.
- When parking a vehicle at a job site, the employee should position the vehicle in a manner which reduces or eliminates the need to operate the vehicle in reverse. It is recommended, a safety cone should be placed at the rear of the vehicle after parking the vehicle and be removed prior to moving the vehicle. This precautionary measure makes the employee aware of other vehicles, equipment, and structures within the backup radius of the vehicle.

When driving an unfamiliar vehicle (rental or GEI-owned), it is the driver's responsibility to orient themselves to the vehicle by:

- Walking around the vehicle to observe the condition of the vehicle and hazards that could be within the travel path.
- Becoming familiar with the size of the vehicle.
- Note if the vehicle has anti-lock braking system (ABS[1]).
- Adjusting mirrors (rear and side).
- Adjust seats to be situated as far back as safely practical, away from the air bag, located in the steering wheel.
- Becoming familiar with dashboard, center console, and steering controls.
- Locating the turn signals, windshield wipers, lights, emergency flashers, and the heating, air conditioning, and defrost controls.

1.3 Driving Defensively

Driving defensively means not only taking responsibility for oneself and actions but also keeping an eye on "the other guy." Good defensive drivers may be able to anticipate what the other driver will do next. GEI recommends the following guidelines to help reduce risks while driving:

- Do not start the vehicle until each passenger and any belongings are secured in the vehicle.
- Remember that driving above or below the speed limit can increase the likelihood of a collision.
- Be aware of impaired drivers; if a car is straddling the center line, weaving, making wide turns, stopping abruptly, or responding slowly to traffic signals, the driver may be impaired or using a cellular telephone. Avoid an impaired driver by turning right at the nearest corner or exiting at the nearest exit.
    - If it appears that an oncoming car is crossing into your lane, pull over to the roadside, sound the horn, and flash the headlights.
    - If an unsafe or suspicious driver is observed, notify the police.
- Follow the rules of the road. Do not contest the "right of way" or try to race another car during a merge. Always be respectful of other motorists.

[1] ABS is a mechanism that allows the wheels on a vehicle to maintain contact with the surface of the road, based on inputs from the driver (braking), to prevent the wheels from locking up (ceasing rotation) and to avoid an uncontrolled skid.

- Allow large vehicles, including tractor trailers, extra breaking distance, turning radius, and avoid traveling in the other driver's blind spots.
- Do not follow too closely. GEI employees should use a minimum of "3-second following distance."
- While driving, be cautious, aware, and responsible.
- Use extra caution, observe road signs, and reduce speed in construction areas and school zones.
- Always be aware of pedestrians, bicyclists, and motorcyclists.

1.4 Cellular Phone Use and Other Distractions

Refer to the *Portable Communication Device Use While Driving* section of the GEI Employee Handbook for GEI's policy on the use of cellular telephones while operating a vehicle.

1.5 Drugs and Alcohol

The use of illegal drugs or alcohol is prohibited when driving a vehicle on GEI business. Be aware of the side effects of prescription and over-the-counter medications which can impair an employee's ability to drive.

1.6 Adverse Driving Conditions

When operating a vehicle, its possible adverse driving conditions may be encountered. Below is a list of possible conditions and how they can be mitigated.

1.6.1 Driving at Night

Vision maybe limited at night due to impairment of the driver's depth perception, color recognition, and peripheral vision. Another factor adding danger to night or early morning driving is fatigue. Drowsiness makes driving more difficult by dulling concentration and slowing reaction time. Effective measures to minimize these hazards by preparing the car and following guidelines:

- Check the headlights to ensure they are properly aimed. If you notice the headlights are not properly aimed, report it to the Branch Manager, or if applicable the rental car agent. Misaimed headlights blind other drivers and reduce the driver's ability to see the road.
- In addition to the known hazards of consuming alcohol prior to driving, night driving can potentially be affected because the recovery rate of glare from headlights is prolonged. Thus reducing your ability to see.

- Smoking in GEI vehicles and rentals is not permitted. When driving a personal vehicle for business, avoid smoking while driving. Nicotine and carbon monoxide may hamper night vision.
- Observe driving safety as soon as the sun goes down. Twilight is one of the most difficult times to drive, because the eyes' pupils are constantly changing to adapt to the growing darkness Always use headlights at dusk and at dawn; lights will not help the driver see better in early twilight, but they will make it easier for other drivers to see your car. Drive at a speed that allows you to see the road that is within the headlights span. Driving in a manner that prevents you from seeing hazards as they are illuminated is known as overdriving the headlights; it may be necessary for the driver to reduce speed to be prepared to brake within the illuminated area of the headlights.
- If an oncoming vehicle does not lower beams from high to low, avoid glare by watching the right edge of the road and using it as a steering guide.
- The driver should make frequent stops for light snacks and exercise. If the driver is too tired to drive, stop in a safe area and get some rest.

1.6.2 Snow/Freezing Conditions

When snow and ice are present, be prepared by following these winter driving safety tips.

1.6.2.1 Prepare the Vehicle Before a Snowstorm

- Check under the hood and take a look at the vehicles cooling system. Make sure the vehicle contains adequate antifreeze and the hoses are in good condition.
- Test heaters and defrosters ahead of time to make sure they are in good working condition.
- Test the windshield wipers and check the condition of the wiper blades. If wipers leave streaks on the windshields, replace the blades at the next possible opportunity. Keep the receipt to expense the cost with GEI or with the car rental company.
- It is recommended that a windshield washer/antifreeze solution is used during winter conditions.
- Check the lights on the vehicle and periodically clear them of snow and dirt.
- Vehicle batteries need extra power in cold conditions. Make sure the battery's terminals are clean and cables are secure.
- Determine if the vehicle has a anti-lock brake (ABS) system.
- Keep the gas tank at least half-full in the winter to help avoid gas line freeze up.

1.6.2.2 Driving During and After a Snowstorm

- Wear sunglasses to aid in limiting reflection from snow.
- Be aware of blind spots created by snow banks.
- Be extra cautious of pedestrians and other vehicles in intersections.
- Allow extra time for braking and increase the distance between your car and the car immediately in front of the car.
- Reduce speed and do not exceed the posted limit.
- If the tires starts to lose traction, remove the foot off the gas and gradually reduce speed. Accelerate slowly once traction is regained.
- If the vehicle starts to skid, and does not have anti-lock brakes, steer into the skid. This will bring the back end of the car in line with the front. Avoid using the brakes. If the vehicle does have anti-lock brakes, firmly brake as you steer into the skid.

1.6.3 Driving In the Rain

To prevent losing control of the car on wet pavement, take these preventive measures.

- Prevent skids by driving slowly and carefully, especially on curves.
- Steer and brake with a light touch.
- When necessary to stop or slow, do not brake hard or lock the wheels.
- Maintain mild pressure on the brake pedal.

Skidding
If the car begins to skid, ease the foot off the gas, and carefully steer the car in the direction you want the front of the car to go. For cars without anti-lock brakes, avoid using the brakes. This procedure, known as “steering into the skid,” will bring the back end of the car in line with the front. If the car has anti-lock brake systems (ABS), brake firmly as you steer into the skid.

Hydroplanning
Hydroplaning happens when the water in front of the tires builds up faster than the car’s weight can push it out of the way. The water pressure causes the car to lose contact with the road surface and slide on a thin layer of water between the tires and the road. At this point, the car can be completely out of contact with the road, making it possible for the driver to skid or drift out of the lane, or even off the road.

To avoid hydroplaning, keep the tires properly inflated and maintain good tread on the tires. If tires need to be replaced on a company vehicle, notify the branch manager or their designee. Slow down when roads are wet, and stay away from puddles. Try to drive in the tire tracks left by the cars in front of the vehicle. If the car begins to hydroplane, do not brake or turn suddenly. This could throw the car into a skid. Ease the foot off the gas until the car slows; accelerate slowly once traction is regained. If braking is needed, do so gently with light pumping actions. If the car has ABS, brake normally; the car's computer will mimic a pumping action, as necessary.

If weather conditions worsen to the point where the driver is not comfortable driving, pull the vehicle over to a safe location until conditions improve. Do not drive during severe weather conditions. Do not attempt to drive on roads with standing water or that have been flooded. Find an alternate route if these conditions exist.

1.6.4 Off Road

If operation of a vehicle is required off public or private roads or in situations where four-wheel-drive vehicles are required, the appropriate vehicle for the situation will be used.

Be sure any gear or equipment is secured inside the vehicle so it doesn't bounce around while the vehicle is off-road.

- Know the underside of the vehicle. Look under the vehicle and learn where the lowest-hanging parts are located so they are not damaged.
- Scout tricky terrain on foot. Don't hesitate to get out of the vehicle to examine, up close, the terrain and soil conditions. And be sure to scout out what's on the other side of a hill ahead of time so there are no surprises.
- Drive cautiously. Drive, "as slow as possible, as fast as necessary." Remember to use the gears to efficiently manage engine power, braking, and torque.
- Create a mental picture. Look ahead and visualize the paths to the vehicle will travel. Follow those paths.
- Drive straight up and down hills. Avoid diagonal lines that put the vehicle in a situation where it might roll.

1.7 Driver Training

GEI employees are required to complete driver safety training every 3 years. This training is managed by the People Team and will be assigned through GEI's e-learning provider.

1.8 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threating, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Health & Safety Officer (RHSO).

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on GEI's Safety App (for smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the RHSO will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health & Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.9 Limitations

Follow safety procedures as defined in the site-specific HASP.

1.10 References

National Safety Council
Oklahoma Safety Council
GEI Consultants, Inc. Employee Handbook

1.11 Attachments

None

1.12 Contact

Health&Safetyteam@geiconsultants.com

1.13 Review History

- November 2016
- May 2014
- November 2013
- January 2011

STANDARD OPERATING PROCEDURES

SOP No. HS-006 Excavations and Trenches

1.1 Objective

The objective of this Standard Operating Procedure (SOP) is to highlight the hazards and safety procedures when work activities include excavations and/or trenches. The following guidelines will be followed when excavations or trenches are present on GEI projects.

1.2 General

This SOP is intended for use by employees engaged in work on project sites that include trenching and/or excavation operations. The site-specific health and safety plan (HASP) must include a hazard assessment for the project that identifies the potential for trenching and excavation hazards and the control methods to be implemented by GEI employees. These hazards must be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

An “excavation” is any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal.

A “trench” (trench excavation) is a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet.

Do not enter a trench or excavation without consulting with the Project Manager, Corporate Health and Safety Officer (CHSO), or Regional Health and Safety Officer (RHSO).

1.2.1 Personal Protective Equipment

Employees will be provided with the personal protective equipment (PPE) necessary to help protect them from the hazards of work activities related to excavations and/or trenches. All employees will wear a hard hat, steel toe or composite toe boots, and safety glasses at a minimum. In addition, face shields, gloves, fall protection and hearing protection may be required. PPE must be maintained in good condition, kept clean and properly stored when not in use. More information regarding PPE is located in Section 6 of GEI’s Corporate Health and Safety Program.

1.3 Hazards

Hazards associated with excavations and trenches can include collapse, falls, falling objects, hazardous atmospheres, and incidents involving mobile equipment. One cubic yard of soil can weigh as much as a car.

1.4 Entry

GEI employees will not enter trenches or excavations that do not comply with OSHA 29 CFR 1926.650. If a project requires GEI employees to enter a trench or excavation, the trench or excavation must meet the following requirements described in the following sections.

Do not enter a trench or excavation without consulting with the Project Manager, Corporate Health and Safety Officer (CHSO), or Regional Health and Safety Officer (RHSO).

1.4.1 Competent Person

The excavation must be inspected prior to the start of each shift by a competent person who most likely will work for the contactor performing the work. The competent person is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to workers, soil types and protective systems required, and who is authorized to take prompt corrective measures to eliminate these hazards and conditions. GEI generally does not act as the competent person.

1.4.2 Soil Type

The competent person for the project will determine what the soil type is and what type of protective system will be implemented. The type of soil where the excavation or trench is being dug has significant influence on what type of protective system will need to be in place. There are four types of soil: stable rock, type A, type B, and type C. As you progress from stable rock to type C, the cohesive properties of the soil change the soil becomes less stable.

1.4.3 Protective System

A protective system is required for trenches or excavations greater than 5 feet in depth unless the excavation is made entirely in stable rock. In special situations the competent person may require a protection system for an excavation that is less than 5 feet deep. The competent person is responsible for assessing the soil type and the protective systems required for a specific trench when an excavation is less than 20 feet deep. If the excavation is greater than 20 feet in depth, the protection system requires a design by a registered professional engineer or based on tabulated data prepared and/or approved by a registered professional engineer.

The protective system will be designed based on soil type, depth of excavation, water level, loads adjacent to the excavation, changes in weather conditions, or other operations in the area. Protective systems can include sloping or benching of the sidewalls, shoring the sidewalls using an approved support system, or shielding workers with a trench box or other similar type of support.

The different types of protective systems include:

Benching is a method of protecting workers from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels of steps, usually with vertical or near vertical surfaces between levels. Benching cannot be done with Type C soil.

Sloping involves cutting back the trench wall at an angle inclined away from the excavation.

Shoring requires installing aluminum hydraulic or other types of support structures to prevent soil movement and cave-ins.

Shielding protects workers by using trench boxes or other types of supports to prevent soil cave-ins.

Designing a protective system can be complex because many factors must be considered: soil classification, depth of cut, water content of soil, changes caused by weather or climate, surcharge loads (e.g., spoil, other materials to be used in the trench) and other operations in the vicinity.

1.4.4 Access and Egress

Excavations and trenches greater than 4 feet in depth require a safe access and egress including ladders, steps, or ramps. These points of access and egress are to be no greater than 25 feet of lateral travel in any direction.

1.4.5 Atmospheric Hazards

Where oxygen deficiency (atmospheres containing less than 20.7% oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation will be tested before employees enter excavation.

1.5 Subcontractor Oversight

When GEI is overseeing excavation activities performed by a subcontractor, the following safety hazards should be monitored:

- Care must be taken not to create new hazards like narrow walkways along edges of an excavation.
- Heavy equipment must not be parked or working at the edge of the excavation.
- Spoils should not be stockpiled within 2 feet of the trench edges.
- Confirm with subcontractor that underground utilities have been located before any excavation or trenching activities begin (*refer to* SOP HS-014 Utility Mark-out).
- Confirm with the subcontractor that the excavation or trench has been tested for hazardous atmospheres before entering.
- Confirm with the subcontractor that the excavation or trench has been inspected by a competent person before each work shift and after any type of precipitation. If hazards are identified during this inspection, verify that the hazards are controlled prior to entering the trench or excavation.
- GEI employees will not work under raised or suspended loads.
- Excavations/trenches must be protected at the end of a work shift if they are to be left open. These trenches/excavations must be covered and a sign that reads "Hole" must be placed in a location that will notify anyone of the hazard. Or a secure barricade will need to be installed.

In circumstances where GEI employees are working on sites where a contractual agreement with the excavation contractor does not exist and we cannot confirm the above stated conditions, entry into trenches or excavations will not be conducted. Any safety concerns that arise should be communicated to the Project Manager and, if necessary, the client.

1.6 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threating, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened.

The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.7 Limitations

Follow safety procedures as defined in the site-specific HASP. Appropriate PPE must be worn correctly to provide the intended level of protection.

Some states, including Massachusetts, require a trench permit prior to trenching or excavation activities. Verification of local requirements will be evaluated in the planning stage.

1.8 References

OSHA 29 CFR 1926.650 – Subpart P; *Excavations*
OSHA Construction eTool – http://www.osha.gov/SLTC/etools/construction/index.html
OSHA FactSheet Trenching and Excavation Safety – viewed on 9/13/2016
https://www.osha.gov/OshDoc/data_Hurricane_Facts/trench_excavation_fs.pdf

1.9 Attachments

None

1.10 Contact

Health&SafetyTeam@geiconsultants.com

1.11 Review History

- September 2016
- May 2014
- November 2013
- January 2011
- Initial Version Date Unknown

STANDARD OPERATING PROCEDURES

SOP No. HS-010 Inclement Weather

1.1 Objective

This Standard Operating Procedure (SOP) is intended for use by employees engaged in work with the potential to be affected by inclement weather. The site-specific health and safety plan (HASP) should include a hazard assessment for the project that identifies the potential for working in inclement weather and the control methods to be implemented by GEI employees. These hazards should be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.2 General

Employees should be aware of local weather conditions and monitor advisories issued by the National Weather Service and other local reporting services. Depending on location and season, storms are capable of producing heavy rain, floods, extreme temperatures, high wind conditions, lighting, tornados, and/or snowfall.

1.2.1 Heavy Rain

If working or driving in a rain storm, use extreme caution. When driving, turn your low beam lights on when the rainfall becomes heavy. Employees should be aware of the following:

- Heavy rain decreases visibility, especially when driving.
- Surfaces and tools become slippery.
- If you are working in the rain and your clothes become wet there is a risk of hypothermia when exposed to winds, even in warm temperatures.
- If the storms are going to produce thunder and/or lightning, leave the work area immediately and move to a safe area.
- Use your best judgment to determine if the rainfall becomes too heavy to continue working safely.

1.2.2 Lightning

Lightning can strike as far as 10 miles from the area where it is raining. That's approximately the distance you can hear thunder. **If you can hear thunder, you are within striking distance. Seek safe shelter immediately.** This can be within a building or vehicle. Wait 30 minutes after the last clap of thunder or flash of lightning before going outside again.

1.2.3 Flooding

Flooding may occur as a result of heavy rain in a short period of time. Flooding can be particularly acute in canyon areas where dry creek beds can turn into raging rivers from rainfall in distant or higher elevation areas. Be aware of this and your surroundings and move to a safe place if you begin to see signs that flooding may occur. Signs of potential flooding include sudden appearance of water in dry creek beds, increased water flow in rivers or streams, or quick rise in water levels.

Do not attempt to drive through areas or streets that are flooded. Seek alternate routes. Be particularly cautious at night when flooded areas are difficult to see. Urban flooding can stop traffic; increase the potential for traffic accidents; and can trap people in vehicles.

1.2.4 Extreme Temperatures

Work activities may take place in extreme heat or cold. Be prepared if these conditions are anticipated. Have the appropriate personal protective equipment (PPE) available; exercise proper fluid intake; and take breaks to prevent heat and cold stress. For more information about these conditions see the heat stress and cold stress programs found in GEI's Health and Safety Program.

1.2.5 High Winds, Tropical Storms, and Tornados

High Winds can be extremely dangerous. Appropriate measures will be taken to secure equipment and loose items when working in windy conditions. The project manager should be contacted about the weather conditions and, if necessary, work should be postponed.

Tropical storms are described as storms with sustained winds ranging from 39 to 73 miles per hour (mph) and hurricanes produce sustained winds that exceed 74 mph. When winds approach 40 mph (gale force winds) twigs begin to break off of trees and vehicles will veer off of the road. When winds approach 40 mph or the GEI employee feels unsafe based on the activities being performed, stop work and seek shelter as soon as possible. Blowing or falling debris and overhanging limbs/signs can be a significant hazard. If possible, avoid driving in these conditions; 70 percent of injuries during hurricanes are a result of vehicle accidents. Note that tall or elevated equipment will have manufacturer's safe operating wind speeds defined that could be less than 40 mph. The operator's manual should be consulted prior to operation of the equipment.

A tornado is a violent, dangerous, rotating column of air that is in contact with both the surface of the earth and a cumulonimbus cloud or, in rare cases, the base of a cumulus cloud. The Fujita Scale is used to rate the intensity of a tornado by examining the damage caused by the tornado after it has passed over a man-made structure. Based on the Fujita Scale, or F-Scale, numbers begin at F0: 40-72 mph and go to F6: 319-379 mph (F6 is

generally theoretical). Nearly three-fourths of tornados are on the weak F0-F1 scale with just over two-thirds of deaths resulting from the violent F4-F5 tornados.

If a tornado is seen, stop work and seek shelter immediately. If a tornado siren is sounded move immediately to safety indoors and then move to a windowless interior space, basement, stairwell, or designated fall-out shelter. Windows should not be opened before an oncoming tornado. If there is no shelter available, seat belt yourself into your stationary vehicle or seek a depression or low spot on the land surface.

1.2.6 Snowfall and Ice Conditions

Working in the winter months may result in activities taking place during periods of snowfall or icy conditions. If you are working during or after snow has fallen, dress appropriately for the conditions. Snow and ice can cause working surfaces to become slippery. Clear snow and ice from work areas to prevent slip hazards. Use caution when performing snow or ice removal activities to prevent injuries. Driving in snowy and icy conditions is also hazardous. Reduce speed and use caution if you must drive in these conditions.

If the weather conditions deteriorate and you do not feel safe working in these conditions, stop work, move to a safe indoor location, and contact your project manager to let them know the weather, work conditions, and your location.

1.3 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threating, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.4 Limitations

Follow safety procedures as defined in the site-specific HASP. Appropriate PPE must be worn correctly to provide the intended level of protection. Protection in extreme weather conditions can best be accomplished if the conditions are anticipated and actions are taken. Monitor local weather conditions prior to starting work.

1.5 References

Center for Disease Control and Prevention – Natural Disasters and Severe Weather
http://www.bt.cdc.gov/disasters/

National Lightning Safety Institute

NOAA, National Weather Service

Office of Climate, Water, and Weather Services

1.6 Attachment

None

1.7 Contact

Safety Team
Health&SafetyTeam@geiconsultants.com

1.8 Review History

- Previous revision dates were not documented
- May 2014
- July 2016

STANDARD OPERATING PROCEDURES

SOP No. HS-011 Ladders – Fixed and Portable

1.1 Objective

GEI employees may be required to use ladders to access equipment or work areas as part of work activities. Ladders can be used on construction or manufacturing sites and in office settings. All GEI employees will receive training on the use and hazards associated with ladders. The following guidelines must be followed when GEI employees use a fixed ladder or a portable ladder, such as an extension or stepladder.

1.2 General

This standard operating procedure (SOP) is intended for use by all employees. The site-specific health and safety plan (HASP) must include a hazard assessment for the project that identifies ladder usage by GEI employees. These hazards must be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.3 Ladder Selection

The selection of the ladder will be dependent on the intended use of the ladder. Factors to consider when selecting the proper ladder are:

- Expected working height
- Expected load to be placed on the ladder
- Conductivity of the ladder material.

1.4 Ladder Inspection

Ladders must be inspected before use by a competent person. Items to look for include:

- The ladder must be Occupational Safety and Health Administration (OSHA) and American National Standard Institute (ANSI) compliant.
- The weight placed on the ladder (person and equipment) must not exceed the ladder's specified load capacity noted on the ladder.
- Rungs, cleats, and steps must be parallel, level, and uniformly spaced when the ladder is in position for use; round rungs are prohibited.

  If a structural defect in the ladder is observed (e.g., cracks, loose rungs, slivers, sharp edges, oil, grease, mud, and other slipping hazards), the ladder must be immediately removed from service for repair or disposal. Tag defective ladders "Out of Service" and do not use them; notify your Branch Manager so that the ladder can be replaced or repaired. If the ladder cannot be repaired it must be labeled as broken or disassembled and then disposed of properly. GEI does not issue or permit the use of unsafe ladders.

1.5 Use of Ladders

- Ladders are to be used only for the purpose for which they were designed.
- Ladders will not be tied or fastened together to provide longer sections unless they are specifically designed for such use.
- Placement of a ladder will only be on a stable, level surface unless secured to prevent accidental displacement.
- Areas around the top and bottom of ladders will be kept clear of equipment and debris.
- Ladders used near exposed energized electrical equipment will have nonconductive side-rails.
- When climbing or descending a ladder the employee must face the ladder, maintain three points of contact, and not carry objects or use backpacks that may throw off balance and cause a fall.
- The top or top step of a ladder will not be used as a step or work surface.
- The second to top step will also not be used.
- Do not lean away from a ladder; stay centered on the ladder.

1.6 Use of Portable Ladders

A portable ladder is one that can be readily moved or carried. The two common types of portable ladders are extension ladders and stepladders.

- When using an extension ladder, the base of the ladder must be placed at a working angle of one quarter (¼) of the working length of the ladder from the top support. For example: when using a 12-foot ladder, the base of the ladder must be 3-feet away from the structure.
- If an extension ladder is being used to access an upper landing surface, the ladder side rails must extend a minimum of 3 feet above the landing surface.
- If a stepladder is to be used, a metal spreader or locking device must be present and locked in place prior to use.
- The cross-bracing on the rear section of the stepladder will not be used for climbing unless the ladder is designed and steps are provided for climbing on both the front and rear sections.
- The top or top step of a stepladder will not be used as a step or work surface.
- The second to top step will also not be used.
- If a structural defect in the ladder is observed (e.g., cracks, loose rungs, slivers, sharp edges, oil, grease, mud, and other slipping hazards), the ladder must be immediately

removed from service for repair or disposal. Tag defective ladders “Out of Service” and do not use them; notify your Branch Manager so that the ladder can be replaced or repaired. If the ladder cannot be repaired it must be labeled or disassembled and then disposed of properly. GEI does not issue or permit the use of unsafe ladders.

1.7 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threating, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.8 Limitations

Follow safety procedures as defined in the site-specific HASP.

1.9 References

OSHA 29 CFR 1926.1053 – Subpart X; *Stairways and Ladders*
OSHA Construction eTool - http://www.osha.gov/SLTC/etools/construction/falls/4ladders.html

1.10 Attachments

None

1.11 Contact

Health&SafetyTeam@geiconsultants.com

1.12 Review History

- June 2016
- May 2014
- November 2013
- August 2011
- October 2010

STANDARD OPERATING PROCEDURE

SOP HS-014 Utility Mark-out

1.1 Objective

This Standard Operating Procedure (SOP) provides guidance for utility mark-out procedures related to drilling, excavation, or other sub-surface or intrusive activities to avoid injury to GEI employees or property damage. This SOP is applicable when GEI is responsible for its operation or our subcontractor's operation for utility mark-out. A utility mark out is when paint, flags or other markers are put in place to identify the location of an underground utility.

Clients or local agencies may have additional requirements or procedures to mark out of utilities. If local utility mark-out procedures differ from those described within this SOP, applicable state or municipal regulations should be followed.

1.2 General

This SOP is intended for use by employees engaged in work with sub-surface or intrusive activities. The site-specific health and safety plan (HASP) should include a hazard assessment for the project that identifies the potential for subsurface hazards and the control methods to be implemented by GEI employees. These hazards should be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.2.1 Contractor/GEI Responsibilities

- The contractor or GEI employee will pinpoint each exploration area with white paint, flags, or stakes. personal protection equipment (PPE), including eye protection when using spray paint will be worn.
- Exploration locations should be marked-out with sample identification number(s) and type of sample (e.g., boring, test-pit, or monitoring well).
- The contractor compiles information about the work areas on a request form specified by the state utility mark-out program and submits it. Work area location maps can be sent to the utility mark-out program to clarify locations.
- The mark-out program customer service representative will provide a mark-out ticket number and a list of utilities notified upon receipt of the request information. This information will be recorded on the GEI documentation form in Appendix B and/or in other project documents.
- If known, the contractor or GEI employee will also notify non-member utility operators (e.g., apartment complexes, commercial complexes, railroads with communication cables, etc.).

1.2.2 Utility Mark Outs

- Utility companies or their sub-contractors will only mark-out, or clear, utilities under their responsibility. Generally, this means that they will only mark-out utilities within the public right-of-way up to private property boundaries. Information needed to determine the location of utilities on private properties will be requested from the property owner. This may include available property drawings or as-built figures. If this information is not available, additional non-intrusive surveys of the property may be required by a private utility locator to find underground utilities by using techniques such as ground penetrating radar (GPR).
- American Public Works Association (APWA) Uniform Color Code For Marking Underground Utility Lines are:
    1. **White** – Proposed Excavation
    2. **Pink** – Temporary Survey Markings
    3. **Red** – Electric Power Lines, Cables, Conduit and Lighting Cables
    4. **Yellow** – Gas, Oil, Steam, Petroleum, and Gaseous Material
    5. **Orange** – Communications, Alarm, Signal Lines, Cables or Conduit
    6. **Blue** – Water
    7. **Purple** – Radioactive Materials
    8. **Green** – Sanitary and Storm Sewers and Drain Lines

1.2.3 Utility Mark Out Review

- Before the intrusive work activities begin, the contractor or GEI employee will verify that each utility company has completed a utility location for the work area or the location has been cleared by a private locator and record this on the mark-out request information sheet.
- A visual survey of the project area will be done prior to the start of intrusive activities. This visual inspection will be done to identify signs, manholes, utility boxes, or other evidence of an underground utility is present and has been considered.
- The contractor or GEI employee can begin work on the scheduled work date and time if the utility operators have responded, taking care to find and preserve markings that have been made.
- Completed clearance documentation will be located on the excavation site during excavation activities and kept in project files.

1.2.4 Excavations

- When excavating near a buried utility, observe the approximate location around that utility.
- If exposing a utility, proper support and protection must be provided so that the utility will not be damaged.
- If the excavation work requires significant spans of the utility to be exposed, it is the contractor's responsibility to support the infrastructure (to prevent sagging or collapse) as needed. Contact the utility operator for support, guidance, or assistance.
- When the excavation is complete, provide proper backfill for utilities that have been exposed.
- Take care not to damage the conduit or protective coating of a utility. If the damage occurs, leave the damaged utility exposed and immediately call the utility owner.
- If a gas line is encountered, everyone will be evacuated according to the site evacuation procedures and the contractor must notify police, fire, and emergency personnel. No attempt should be made to tamper with or correct the damaged utility. All site personnel are to evacuate to the site's predetermined meeting point or a location a minimum of 300 feet away from the incident location.
- If the contractor needs to dig within the approximate location of a combustible, hazardous fluid, or gas line (natural gas, propane or gasoline), soft digging is required (hand digging, vacuum extraction) to a maximum depth of 5 feet. The approximate location is defined as 24 inches on either side of the designated center line of the utility if the diameter is not provided or 24 inches from each outside edge if the diameter is provided.

1.3 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threating, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Health & Safety Officer (RHSO).

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification and/or the receipt of the Incident Report Form, RHSO will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.4 Limitations

- Follow safety procedures as defined in the site-specific HASP. Appropriate PPE must be worn correctly to provide the intended level of protection.
- Mark-out notification time usually does not include holidays. Make sure holidays are considered and mark-out time is scheduled accordingly. Under no circumstances are intrusive activities allowed to be performed prior to the required mark-out.
- Do not use white paint if precipitation is eminent. Consider using stakes if snow is predicted.

1.5 References

Reference the website for the "Call Before You Dig – 811" for the utility mark-out agency for the state you working in prior to site work. If you have issues locating the appropriate agency, contact the Safety Team for assistance.

1.6 Attachments

Attachment A – Standard Utility Color Codes

Attachment B – GEI Utility Clearance Documentation Form

1.7 Contact

Health&SafetyTeam@geiconsultants.com

1.8 Review History

- June 2016
- May 2014
- November 2013
- February 2011
- November 2010

ATTACHMENT A

COLOR CODE FOR UTILITY MARKING

(BASED ON 'THE AMERICAN PUBLIC WORKS ASSOCIATION' RECOMMENDATIONS AND THE ANSI STANDARD Z-53.1 FOR SAFETY COLORS)

UTILITY	COLOR
PROPOSED EXCAVATION	WHITE
ELECTRIC POWER LINES, CABLES, CONDUIT AND LIGHTING CABLES	RED
POTABLE WATER	BLUE
STEAM, CONDENSATE, GAS OR OIL COMPRESSED AIR	YELLOW
TELECOMMUNICATIONS, ALARM OR SIGNAL LINES, CABLES OR CONDUIT	ORANGE
TEMPORARY SURVEY MARKINGS	PINK
SEWER AND STORM DRAINS	GREEN
CHILLED WATER, RECLAIMED WATER, IRRIGATION AND SLURRY LINES	PURPLE
OTHER	LIGHT BLUE

ATTACHMENT B

Utility Clearance Documentation

Please print clearly. *For more room, use back of page.*

Client: _____

GEI Project Name & Number: _____

Site: _____

Excavation/Drilling Location ID: _____

Excavator/Driller: _____

GEI PM: _____ GEI Field Team Leader: _____

Utility Drawings Reviewed: _____

Provided By: _____ Reviewed By: _____

Utility Clearance Call Date: _____ Name of Utility: _____

Utility Clearance Call Date: _____ Name of Utility: _____

Utility Clearance Received from (utility & rep name): _____ Date: _____

Utility Clearance Received from (utility & rep name): _____ Date: _____

Company that completed clearance: _____ Date: _____

GEI Staff Responsible for Oversight: _____

Metal Detector Survey (yes/no): _____ Drilling Location Cleared by: _____

Contractor Name: _____ Company Name: _____

Contractor Signature: _____ Date: _____

GEI Staff Responsible for Oversight: _____

Private Location Clearance Required (yes/no): _____ Date: _____

Contractor Name: _____ Company Name: _____

Contractor Signature: _____ Date: _____

Methods used for utility location (i.e. GPR, electronic pipe location) _____

GEI Staff Responsible for Oversight: _____

Hand clearing Performed (yes/no): _____ Methods: _____ Date: _____

Contractor Name: _____ Company Name: _____

Contractor Signature: _____ Date: _____

GEI Staff Responsible for Oversight: _____

GEI Consultants, Inc. Representative (name & title): _____

GEI Consultants, Inc. Representative Signature: _____ Date: _____

Based upon the best available information, appropriate utility clearance procedures were performed for the invasive work specified. If client ordered site specific deviations from existing GEI utility clearance procedures, they are approved by the client signature below:

Client Representative (name & title): _____

Client Representative Signature: _____ Date: _____

Notes:

STANDARD OPERATING PROCEDURES

SOP No. HS-016 Traffic Hazard Management

1.1 Objective

The objective of this Standard Operating Procedure (SOP) is to prevent or limit the potential for GEI personnel to encounter traffic hazards during field activities.

1.2 General

This SOP is intended for use by employees engaged in work with the potential for traffic hazards. The site-specific health and safety plan (HASP) will include a hazard assessment for the project that identifies the potential for exposure to traffic hazards and the control methods to be implemented by GEI employees, including review or attainment of necessary permits, traffic control plans, and flagger/police detail requirements for the local jurisdiction. Routine checks of the work zone will be made to ensure there are adequate levels of protection. These hazards will be reviewed in the project safety briefing and documented on the Project Safety Briefing form, found on the Safety page of the GEI intranet.

1.3 Traffic Hazard Management

Traffic Hazard Management is the process of identifying and managing the potential risks associated with the movement of traffic through, around, or past a work area. This Traffic Hazard Management SOP is designed to assist employees in identifying and managing these hazards. Work areas should be as safe as possible. It is the responsibility of GEI employees to follow the Traffic Hazard Management SOP and adhere to these safety standards. Safety is not negotiable.

Under no circumstances are GEI employees permitted to commence work in a situation that the employee believes or knows their health and safety, or the health and safety of others, is at risk.

Major risk factors for work site Traffic Hazard Management include:

- The speed of traffic moving through a work site.
- The distance and clearance between moving traffic, workers, vehicles and equipment, and over-head power lines.
- Traffic volume and vehicle composition.
- Nature and conditions at the work site and approaches to the work site.

- Other factors such as the time of day, sight distance, weather, presence of pedestrians, or cyclists, and the type of work being carried out.
- Other hazards in proximity to the work site (e.g., power lines, open excavations) that may have conflicting safety management measures that need to be considered when developing the HASP.

1.4 Site Preparation

The following management measures will be considered whenever working in traffic areas. In addition, remain aware of the amount of traffic around the working area. The work space should be large enough for the job to be completed safely. Check permit, traffic control plans, and flagger/police detail requirements for the local jurisdiction. Perform routine checks of the work zone to make sure there are adequate levels of protection.

1.4.1 Traffic Barriers and Warning Signs

GEI employees will comply with the U.S. Department of Transportation's (DOT) Manual on Uniformed Traffic Control Devices (MUTCD) and/or state regulations for temporary traffic barriers (cones, barriers) and sign placement when required for working in traffic areas. Clearly define the work site by placing traffic barriers around the work space to indicate the space that is needed to safely perform the work. The traffic barrier will help make the work site more visible to other workers, pedestrians, cyclists, and moving vehicles. Place traffic barriers in such a way as to give yourself and equipment adequate space to work within the barriers. OSHA suggests placing the first warning sign at a distance calculated to be 4 to 8 times (in feet) the speed limit (in MPH).

1.4.2 Adequate Light

Requirements for night conditions and work areas with poor visibility are similar to day requirements. However there are a number of additional things to consider, such as visibility of the work site to advancing traffic and sufficient lighting. OSHA requires lighting for workers on foot and equipment operators to be at least 5-foot-candles or greater.

Visibility of the work area can be increased by employing the following measures:

- Using parked vehicles hazard and flashing lights.
- Wearing reflective personal protective equipment (PPE), such as a safety vest, in good condition.
- Providing adequate lighting to illuminate the work area with lights positioned so that there is no glare to approaching drivers.
- Placing reflective advance warning signs and traffic barriers so that they are visible to road users.

1.4.3 Distance from the Nearest Traffic Lane

Work areas located along roadsides will have a minimum clearance as defined by DOT's MUTCD and/or state or local DOT regulations for traffic barrier and sign placement.

1.4.4 PPE

The proper PPE, as outlined in the project HASP, will be worn when appropriate. The color/type of safety vest will comply with site regulations.

1.5 Equipment Operation

Vehicles and heavy equipment operators should use a spotter when possible if it is necessary to drive in reverse to reduce risk of collision with oncoming traffic. If it is necessary to drive against the flow of traffic make sure this area is within the work zone and properly blocked off from oncoming traffic.

1.6 Pedestrian Safety

When working near pedestrian traffic, a safe alternate pedestrian route will be established. Refer to local regulations when establishing pedestrian walkways.

1.7 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threating, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Health & Safety Officer (RHSO).

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the RHSO will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.8 Limitations

Follow safety procedures as defined in the site-specific HASP, federal DOT, and local jurisdictions. Appropriate PPE must be worn correctly to provide the intended level of protection.

1.9 References

DOT's Manual on Uniformed Traffic Control Devices (2009 Edition)

Hazard Exposure and Risk Assessment Matrix for Hurricane Response and Recovery Work: https://www.osha.gov/SLTC/etools/hurricane/work-zone.html

1.10 Attachments

None

1.11 Contact

Health&SafetyTeam@geiconsultants.com

1.12 Review History

- November 2016
- May 2014
- November 2013
- August 2011
- October 2010 Initially HS-027 Traffic Hazards

STANDARD OPERATING PROCEDURES
HS-017 Water Safety

1.1 Objective

The objective of this Standard Operating Procedure (SOP) provides requirements and best practices for GEI personnel during field activities taking place on board a boat/barge or when working in or near water. If conducting aquatic surveys or electrofishing activities, please *refer to* **HS-022 Aquatic Ecological Surveys and Electrofishing Safety** for additional safety information for working in or near water.

1.2 General

This SOP is intended for use by employees where there is the potential to perform work while on board a boat/barge or when working in or near water. The site-specific health and safety plan (HASP) will include a hazard assessment for the project that identifies the potential hazards and the control methods to be implemented by GEI employees. The site-specific HASP, project hazards, and control methods will be reviewed during the project safety briefing and documented on the Project Safety Briefing form found on the Safety page of the GEI intranet.

1.3 Working near Water

OSHA Construction Industry Standards (29 CFR 1926.106) state, "…employees working over or near water, **where the danger of drowning exists**, will be provided a U.S. Coast Guard-approved life jacket or buoyant work vests." (*Emphasis added, not in original text*) OSHA General Industry Standards (1910) do not address working over or near water; therefore, GEI uses the OSHA Construction Standard for any work near water.

The following safety devices, when appropriate, will be used by employees working near water:

- **Life Jacket or Personal Flotation Devices (PFD).** Employees will be required to wear U.S. Coast Guard-approved personal flotation devices that are marked or labeled Type III PFD or a Type V PFD that is marked or labeled for use as a work vest for commercial use or for use on vessels. GEI employees will inspect personal floatation devices for defects that could alter their strength or buoyancy prior to, and after, each use. Tag worn, damaged, or defective PFDs "Out of Service" and do not use them; notify the Branch Manager so that the PFD can be disposed of and replaced. GEI does not issue or permit the use of unsafe PFDs.
- **Ring Buoys.** U.S. Coast Guard-approved ring buoys with at least 90 feet of line will be readily available for emergency rescue operations. Distance between ring buoys will not exceed 200 feet.

- **Life-saving Skiff.** When GEI employees are working over or adjacent to water, at least one lifesaving skiff will be immediately available for potential rescue purposes.

These requirements can be superseded by the use of 100 percent fall protection. If an employee cannot fall into the water as a result of the use of active or passive fall protection, there is no danger of drowning and the bullet points above are not required. The type of fall protection or the need for the above mentioned safety measures will be described in the site specific HASP. If 100 percent fall protection is in place, the boat will, at a minimum, have U.S. Coast Guard-approved PFDs on board for each person and at least one throw-able flotation device, such as a ring buoy.

GEI employees will not work alone when working near water.

1.4 Boat/Barge Safety Practices

Boat safety practices will be conducted in general accordance with guidance provided in the U.S. Army Corps of Engineers (USACE) Safety and Health Requirements Manual (EM) 385-1-1 and the U.S. Coast Guard. The following safety practices will be adhered to:

- If there is an accident the U.S. Coast Guard must be notified. The attached U.S. Coast Guard accident report form can be used to document the accident. Federal law requires the operator, or owner, if the operator is deceased or unable to make the report, to file a boating accident report with the state reporting authority when, as a result of an occurrence that involves a boat or its equipment:
    - Incident involving a fatality.
    - A person disappears from the vessel under circumstances that indicate death or injury.
    - A person is injured and requires medical treatment beyond first aid.
    - Damage to vessels and other property totals $2,000 (lower amounts in some states and territories) or more.
    - The boat is destroyed.
- Boats operated by GEI will comply with U.S. Coast Guard regulations.
- Any GEI employee that is operating a boat is required to take a Boating Safety Course. The course will be in accordance with the requirements of the state in which the boat will be operated. Documentation of course completion will be sent to the People & Safety Team.
- The boat operator will be familiar with United States Geological Survey navigation rules.

- Any boat operator, whether GEI or a subcontractor, is not to exceed 12 hours of duty time in a 24-hour period.
- GEI employees will wear a PFD as described in Section 1.3 when on board a boat /barge.
- For a boating activity where the vessel launches and is no longer in view of on-shore personnel, a Float Plan will be completed and left with a reliable person who can be depended upon to notify the U.S. Coast Guard, or other rescue organizations, should you not return or check-in as planned. If there is a change of plans after leaving, be sure to notify the person holding the Float Plan. Please *see* the attached U.S. Coast Guard Float Plan form.
- For a task requiring more than 1 day, daily communications with the reliable person will be maintained.
- The consumption of alcoholic beverages and the use of illegal drugs will not be permitted aboard boats/barges on which GEI employees are conducting company business, this includes boats/barges that may belong to someone else (subcontractor, client, etc.).
- Employees working on a boat will monitor the weather, incorporating, as appropriate, National Oceanic and Atmospheric Administration (NOAA) marine weather broadcasts and other local commercial weather forecasting services as may be available.
- For retrieving a person overboard, the boat operator, or other competent person will throw a life ring, that is attached to the boat with at least 90 feet of rope, and use a ladder attached to the boat or the boat step transom to allow the person to climb out of the water.
- Emergency procedures for fire, person overboard, and capsizing will be reviewed on the first day of operations and when there is a change of personnel occurs.
- Check with your local and state agency to verify their boat law/regulations.
- Beware of carbon monoxide poisoning when the boat engine is running in closed or poorly ventilated areas.

1.4.1 Boating Safety Equipment

The U.S. Coast Guard requires particular safety equipment to be aboard a boat. This list includes those items as well as other equipment that GEI requires as a minimum. Other safety equipment may be required based on the type and size of the boat being operated. The boat will be equipped with:

- At least one mounted ABC-1 type U.S. Coast Guard-approved portable fire extinguisher.
- A Type IV life ring attached to at least 90 feet line. Distance between ring buoys will not exceed 200 feet.
- A Coast Guard approved PFD for each person on board as well as one.
- A visual distress signal, such as flare.
- VHF-FM Marine Radio with Digital Selective Calling System.
- An efficient sound-producing device, such as a whistle or horn.
- One U.S. Coast Guard approved backfire flame arrestor device on each carburetor of all gasoline engines installed after April 25, 1940, except outboard motors.
    - Devices will be marked to show compliance with SAE J-1928 or UL 1111 Standards.
- Ladder attached to the boat or the boat step transom.
- An adequately-sized first aid kit.
- Charts and navigation aids.

1.5 Training

1.5.1 General

Training will be conducted for employees unfamiliar with the use of safety equipment and personal protective equipment (PPE) required by this SOP. Employees working over or near water will be trained in their responsibilities and the safe work practices associated with working on or near water.

1.5.2 Operating a Boat

A Boating Safety Course is required for employees that will be operating a boat. The course will in accordance with the requirements of state in which the boat will be operated. There is no regulated refresher date; therefore, GEI will require the course be retaken every 5 years to demonstrate continued proficiency. Documentation of course completion will be sent to the Safety Team.

1.6 Wading In Water

GEI employees may be required to wade in water during the performance of project work including but not limited to aquatic surveys and other ecological activities. Employees will be familiar with safe wading procedures and emergency preparedness as described below. Working in and around water can be an inherently hazardous activity (hypothermia, drowning risk) for which safety will be the primary concern.

1.6.1 General Safety

Field sampling operations in and around water will not be carried out alone. A minimum team size is two people. Employees will wear appropriate clothing and PPE in accordance with Section 1.6.2, Personal Protective Equipment Requirements for Wading, as defined below and as discussed in HS-022 Aquatic Ecological Survey and Electrofishing Safety.

Instream crews will have a First Aid kit onsite during wading operations and will work in a manner that is safe for themselves and their co-workers. The crew leader is the recognized authority and operational decision-maker. Crew members have the duty to comply with all of the crew leader's instructions concerning their health and safety and to report to the crew leader anything that is likely to be hazardous to their health or safety or to that of other employees or persons granted access to the work area.

Employees undertaking instream sampling or wading operations will be familiar with the hazards associated with those activities and agree to use common sense and safe wading practices during sampling. Field staff will have up-to-date Cardio-Pulmonary Resuscitation (CPR) and First Aid training.

1.6.2 Personal Protective Equipment Requirements for Wading

The following PPE is required when wading in water and will be provided by GEI:

- Leak-free chest waders or hip waders (neoprene, heavy weight polyurethane, PVC, or high-quality breathables), dependent upon depth. Hip waders can be worn when water depth is known not to be over "knee-deep" on any employee wearing hip waders.
- Non-slip footwear (felt wading shoe or boot, as well as stream wading cleat).
- Wading belt (nylon or rubber acceptable, worn on outside of chest waders).
- Polarized sunglasses (side shields or 'wrap around' style is/are recommended) and a hat with a visor is recommended (e.g., baseball cap style).
- PFDs will be worn where the crew leader considers the water is of sufficient depth or velocity for a PFD to be effective as protection from risk of drowning. PFDs will be U. S. Coast Guard approved personal flotation devices that are marked or labeled Type III or V PFD. Wading should not be carried out where water depth is greater than waist deep.
- In some situations, a wading staff might be useful as a "third leg" to help stabilize personnel during stream crossing or other wading operations.

1.6.3 Safety Procedures for Wading Operations

Office Preparation

- The crew leader will verify all employees have received instruction in the fundamentals of wading safety and working around water.
- It is the crew leader's responsibility to verify that employees are properly outfitted for the intended work.
- Where available, employees should attempt to identify any information on known instream hazards at the intended field site, including current discharge stage.
- Each instream sampling team will establish a means of emergency communication such as using walking talkies or specific hand signals.

Field Preparation

- A crew leader will be designated for activities in water.
- Crew members will be equipped with the personal equipment detailed in Section 1.6.2, Personal Protective Equipment Requirements for Wading.
- Each instream work site will be visually inspected for hazards such as deep holes, submerged logs, animals, etc. before commencing wading operations.
- In order to aid in identifying underwater hazards, all crew members will be equipped with polarized sunglasses. Glasses also protect against eye injury caused by sticks and branches. Wide brimmed hats or 'baseball' style caps are also beneficial in increasing the effectiveness of polarized glasses.
- Using visible landmarks, personnel will assess flow stage for the waterbody and continue to monitor for changes in water level during sampling operations. Changes in water level could indicate the onset of a flash flood.
- Clear command signals will be established between crew members prior to beginning operation. Crew members will inform the crew leader of any dangerous situations. Do not go into water that is above the level you have experienced before and are physically capable of handling.

1.6.4 Wading Procedures

- Operate slowly and carefully. Footing in most streams is poor and most falls occur when crew members are hurrying. Operations should cease when fatigue sets in.
- Plan a route that minimizes your exposure to the strongest currents/deepest water. Sand and gravel bottoms are usually secure and safe bottoms to wade on. Avoid standing on large, smooth rocks as much as possible.

- Plan on generally working in a downstream to upstream direction, ensuring solid footing before shifting positions
- Be aware of floating debris and changing water levels.
- In shallow water, less than knee deep, it may be possible to walk "normally" with a modified, wide stance. As water gets deeper and footing becomes obscured by water depth or turbidity, sidestepping will help maintain a wide, stable base.
- In moderate currents, position your feet so that you are facing upstream with your body side-on to the current to brace yourself and reduce your profile in the current.
- When crossing streams, it is easier and safer to move at a slight downstream angle with the current than to move directly across or upstream against the current.
- In difficult situations, take small shuffling steps, angling your body slightly upstream. If using a wading staff, position it upstream, maintaining two points of contact with the bottom at all times.
- In particularly difficult situations, use a buddy system in which you and a partner cross the stream together arm in arm, one upstream of the other so that you are supporting each other
- If you do happen to lose your footing and begin to float downstream, don't try to swim. Bring your knees up and roll over on your back with your feet downstream, working your way to the sides or to a suitable place to get out.

1.7 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threating, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health and Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.8 Limitations

Follow safety procedures as defined in the site-specific HASP. Appropriate PPE will be worn correctly to provide the intended level of protection.

1.9 References

Occupational Safety and Health Administration (OSHA) 29 CFR 1926.106 – Subpart E: Personal Protective and Life Saving Equipment: Working Over or Near Water.

U.S. Code of Federal Regulations (CFR) Title 33 – Navigation and Navigable Waters; Chapter I – United States Coast Guard.

United States Army Corps of Engineers, Safety and Health Requirements Manual (EM), 385-1-1. November 3, 2003 – Section 19 Floating Plant and Marine Activities

United States Army Corps of Engineers, Safety and Health Requirements Manual (EM), 385-1-1 September 15, 2008 – Section 01.C Physical Qualifications of Employees

1.10 Attachments

U.S. Coast Guard Float Plan Form

U.S. Coast Guard Navigation Rules

U.S. Coast Guard Accident Report Form

1.11 Contact

Health&SafetyTeam@geiconsultants.com

1.12 Review History

- November 2016
- November 2015
- December 2014
- November 2013
- August 2011
- June 2008 –previously HS-024

STANDARD OPERATING PROCEDURES

SOP No. HS-023 Scaffolding

1.1 Objective

GEI employees may be required to use various types of scaffolding as part of project activities. These procedures and best practices described in this document apply to working on and around supported and suspended scaffolds in order to provide GEI employees with a basic awareness of scaffolding systems and the hazards associated with them. GEI employees are not considered the "scaffold competent person" and will not erect, dismantle, move, or alter scaffolding.

This Standard Operating Procedure (SOP) does not cover aerial lifts or elevating platforms. Refer to SOP HS-020 Aerial Lifts for information on these types of mobile equipment.

1.2 Terminology

Competent Person: Person who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authority to take prompt corrective measures to eliminate the hazard.

Coupler: A device for locking together the ends of a tube and coupler scaffold.

Elevating Platform: A platform that rises to any desired working height.

Guardrail System: A vertical barrier erected to prevent employees from falling off a scaffold platform or walkway to lower levels. Guardrail systems consist of top-rails, mid-rails, toe boards, and posts.

Live Load: The load to which a structure is subjected in addition to its own weight.

Mid-Rail: Horizontal rail installed halfway between the top guardrail and the working platform.

Mobile Scaffold: A powered or unpowered, portable, caster- or wheel-mounted supported scaffold.

Mudsill: Platforms designed to distribute scaffold weight. The size of mud sills used is based on ground support conditions and maximum anticipated loads on the scaffold legs.

Outrigger: Structural member of a supported scaffold used to increase the base width of a scaffold in order to provide support for and increase stability of the scaffold.

Qualified Person: One who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, the work, or the project.

Scaffold: Any temporary elevated platform and its supporting structure, used for supporting employees and/or materials.

Supported Scaffold: Supported scaffolds consist of one or more platforms supported by outrigger beams, brackets, poles, legs, uprights, posts, frames, or similar rigid support.

Suspended Scaffold: Suspended scaffolds are platforms suspended by ropes, or other non-rigid means, from an overhead structure.

Toe board: A vertical barrier installed at deck level along the sides and ends of a platform or scaffold.

Top-Rail: Horizontal rail installed at the top of a guardrail system.

1.3 General Requirements for all Scaffolds

Common hazards associated with all types of scaffolding include falls from elevation due to the lack of fall protection, collapse of the scaffold system by instability or overloading, being struck by falling objects, and electrocution due to the proximity of the scaffold to electrical power lines. To minimize the exposure to scaffolding hazards, the following considerations must be made prior to working on or around scaffolding systems:

- Scaffolds will be furnished and erected in accordance with the Occupational Safety and Health Administration (OSHA) Subpart L Scaffolding standards for persons engaged in work that cannot be done safely from the ground or from solid construction.
- All scaffolds will be designed by a qualified person.
- All scaffolds will be constructed and loaded in accordance with the design.
- All scaffolding, either leased or purchased, will have the manufacturer's safety instructions available for erection and use. Scaffolding must be erected and used following the manufacturer's instructions.
- Scaffolds are to be erected, moved, dismantled, or altered only by experienced and trained employees who have been selected for that work by the competent person. GEI employees are not considered the scaffold competent person and will not erect, dismantle, move or alter scaffolding.
- GEI employees should visually check the scaffold prior to use for their own safety or confirm with the competent person that the scaffold is ready for use.
- Scaffold components manufactured by different vendors will not be mixed.
- Scaffolding more than 10 feet above a lower level will require fall protection (i.e. fall harness).
- The front edge of the platform cannot be more than 14 inches from the face of the work unless the front edge is protected by a guardrail and/or personal fall arrest system.

- Scaffolds and their components will be capable of supporting, without failure, at least four times the maximum intended load.
- Each platform, on all working levels of scaffolds, will be fully planked or decked according to 29 CFR (Code of Federal Regulations) Part 1926.451(b).
- Scaffolds will be maintained in safe condition.
- Scaffolds will not be altered or moved horizontally while they are in use or occupied.
- Hard hats are required for workers on or around scaffolding when there is a danger of falling objects and head injury.
- Working on scaffolds or platforms during storms, high winds, or when covered with snow or ice is prohibited.
- Scaffolds must not be erected, used, dismantled, altered ,or moved when the scaffold or any conductive material on them might come closer to power lines than 10 feet for insulated lines and uninsulated lines of more than 300 volts and less than 50 kilovolts.
    - If greater than 50 kilovolts the minimum distance will be 10 feet plus 0.4 inches for each kilovolt over 50 kilovolts.
    - Insulated lines of less than 300 volts have a 3-foot minimum distance.
- A visual inspection will be conducted by the scaffold competent person immediately when a scaffold or platform has been damaged or weakened by any cause. GEI employees will not occupy the structure until the inspection has been completed and all identified discrepancies corrected.
- Frames and accessories for scaffolds will be maintained in good repair. Every defect, unsafe condition, or noncompliance with the manufacturer's specifications or recommendations will be corrected immediately. Any broken, bent, rusted, altered, or otherwise structurally damaged item/section or accessory will not be used.
- Ladders or make-shift devices are strictly prohibited and will not be used to increase the height of a scaffold or platform.
- Scaffolds will not be loaded in excess of the working load for which they are designed.
- Slippery conditions on scaffolds and platforms will be eliminated as soon as they occur.
- Cross braces, runners, and bearers will not be used for climbing. Access to scaffolds will be by stairs and ladders only.
- Tools and parts will not be carried in hands or pockets when ascending or descending access ladders. Tool belts, tool buckets and ropes, or other acceptable means will be used to raise and lower such items.
- Each employee on a scaffold greater than 10 feet from a lower level must be protected from falling (i.e. fall harness).

1.3.1 Erectors and Dismantlers

Erectors and dismantlers are workers whose principal activity involves assembling and disassembling scaffolding before other work can commence, and after that work, or a portion of it, has been completed. GEI employees will not act as an erector or dismantler of scaffolds.

1.4 Supported Scaffolding

Supported scaffolds are the most common type of scaffold and consist of one or more platforms supported by outrigger beams, brackets, poles, legs, uprights, posts, frames, or similar rigid support. Frame or fabricated frame scaffolds, manually-propelled or mobile scaffolds, pump jack scaffolds, ladder jack scaffolds, pole scaffolds, and other specialty type scaffolds are all examples of supported scaffolds.

When working on supported scaffolding the following must be followed:

- The assembly, erection, operations, use and maintenance of tubular welded frame scaffolds will meet manufacturer's requirements and recommendations.
- In order to assure stability, supported scaffolds must be set on:
    - Base plate,
    - Mud sills
    - Or other adequate firm foundation
- Footings must be capable of supporting the loaded scaffold without settling or displacement.
- Unstable objects may not be used to support scaffolds or platform units
- Scaffold poles, posts, legs and uprights must be plumb. Additionally, poles, posts, legs, and uprights will be securely and rigidly braced to prevent swaying and displacement.
- Frames and panels must be connected by cross, horizontal, or diagonal braces, alone or in combination, which secure vertical members together laterally.
- As frames are stacked, cross braces must be of such length as will automatically keep the scaffold plumb, level, and square.
- All brace connections must be secured to prevent dislodging.
- Spacing of the panels or frames will be consistent throughout the scaffold being assembled.
- Frames and panels must be joined together vertically by coupling or stacking pins or equivalent means.
- Frames and panels must be locked together to prevent uplift, where uplift can occur. Uplift is the separation of a frame from the frame below it.
- Employees must be able to safely access any level of a scaffold that is 2 feet above or below an access point.

- OSHA standards specifically forbid climbing cross-braces as a means of access.
- The scaffold competent person is responsible for determining the safety and feasibility of installing and using safe means of access, based on site conditions and the type of scaffold involved.
- Each platform must be fully planked or decked between the front uprights and the guardrail supports.
- Platforms used solely as walkways, or during erection or dismantling, require only the planking that the competent person establishes is necessary to provide safe working conditions.
- No gaps greater than 1 inch are permitted between adjacent planks or deck units, or between the platform and the uprights, unless the competent person can demonstrate that a wider space is necessary. In such cases, the gap will be as small as possible and not exceed 9.5 inches.
- Wooden planking must not be covered with opaque finishes, except that platform edges may be marked for identification. Platforms may be coated periodically with wood preservatives, fire retardants, and slip-resistant finishes, provided they do not obscure the top or bottom wood surfaces.
- Scaffold platforms and walkways must be at least 18 inches wide, unless they are used in areas that are so narrow that they must be less than 18 inches wide. In such cases, the platforms must be as wide as feasible, and fall protection must be provided.
- Nothing that could cause a slip, trip or fall (i.e. tools, scrap material, chemicals, snow, ice, etc.) is allowed to accumulate on the platform.
- All planking will be Scaffold Grade as recognized by grading rules for the species of wood used.
- Scaffolds and scaffold components must be inspected for visible defects before each shift by a competent person, and after each occurrence that could affect a scaffold's integrity (such as being struck by a crane).
- Any part of a scaffold that has been damaged or weakened so that it no longer meets OSHA strength requirements must either be repaired, replaced, braced, or removed from service by the competent person.

1.5 Suspended Scaffolding

- The safe use of a suspended scaffold begins with secure anchorage. The weight of the scaffold and its occupants must be supported by both the structure to which it is attached and by each of the scaffold components that make up the anchorage system. These components include:
    - Tiebacks

  - Counter weights
  - Direct Connections

- A scaffold competent person must evaluate all direct connections, tiebacks, and counter weights, *prior to use* to confirm that the supporting surfaces are able to support the imposed load. Because the platform is the work area of a suspended scaffold, an inspection requires safety checks of both the platform structure and how the platform is used by the scaffold competent person. GEI employees should confirm with the scaffold competent person that the checks have been performed prior to scaffold use.
- Adjustable suspension scaffolds are designed to be raised and lowered while occupied by workers and materials, and must be capable of bearing their load whether stationary or in motion.
- Scaffolds and scaffold components must be capable of supporting, without failure, their own weight and at least four times their maximum intended load.
- Each suspension rope, including connecting hardware, must be capable of supporting, without failure, at least six times the maximum intended load applied to that rope while the scaffold is operating at the greater of either:
  - the rated load of the hoist, or
  - two times the stall load of the hoist
- Scaffolds will be altered only under the supervision and direction of a competent person.
- Employees must be able to safely access any level of a scaffold that is 2 feet above or below an access point.
- Direct access to or from another surface is permitted only when the scaffold is not more than 14 inches horizontally and not more than 24 inches vertically from the other surface.
- For two-point adjustable suspension scaffolds, access to one platform from another may only take place when the platforms:
  - are the same height
  - are abutting
  - have walk-through stirrups specifically designed for that purpose
- Fall protection consists of either personal fall arrest systems or guardrail systems, and must be provided on any scaffold 10 feet or more above a lower level (two-point scaffolds require both personal fall arrest systems and guardrail systems). This is especially critical with suspended scaffolds, because they often are operated at extreme elevations.
- Even if a suspended scaffold has been assembled in compliance with every applicable standard, GEI employees must exercise caution and use sound work practices to assure their safety. Extreme weather, excessive loads, or damage to structural components can all affect a scaffold's stability.

- A competent person must evaluate all direct connections prior to use to confirm that the supporting surfaces are able to support the imposed load.
- All suspension scaffolds must be tied or otherwise secured to prevent them from swaying, as determined by a scaffold competent person.
- A scaffold competent person must inspect ropes for defects *prior to each work-shift* and *after every occurrence that could affect a rope's integrity*.
- When lanyards are connected to horizontal lifelines or structural members on single-point or two-point adjustable scaffolds, the scaffold must have additional independent support lines equal in number and strength to the suspension lines and have automatic locking devices.
- Emergency escape and rescue devices must not be used as working platforms, unless designed to function as suspension scaffolds and emergency systems.

1.6 Inspections

All scaffolds and their components will be thoroughly inspected, prior to use, by a scaffold competent person before each erection to ensure the soundness of the scaffold. GEI employees may not act as the scaffold competent person. At a minimum:

- The scaffold competent person will supervise the erection, modification, and disassembly of scaffolds.
- A visual inspection will be made of all tubular components by the competent person. All foreign objects on the inside of the tubular part will be removed. If the object cannot be moved, the part will not be used.
- The exterior and interior of all legs, runners, braces, and bearers will be inspected by the competent person for corrosion. All corrosion found will be corrected. A professional engineer will verify that the part which contained the corrosion meets the design criteria after the corrosion has been removed. Components with corrosion should not be used since their strength is unknown.
- Before scaffold is erected, the surface of the proposed location will be inspected by the competent person for stability, level, potential obstructions, and electrical hazards.
- Erected scaffolds will be visually inspected by the competent person before each day's use and/or each work shift to insure a safe condition is maintained. All inspections will be documented.
- Unsafe equipment or conditions must be tagged out by a competent person, and must be complied with. When tags are used to document inspections by the competent person GEI employees will comply with the requirements of the tagging system. Scaffolds that have been tagged as unsafe by the competent person will not be used by GEI employees.

1.7 Training

GEI employees will have safety training prior to scaffolding use. If the training is taken outside of RedVector than a copy of the training certificate must be submitted to the Safety Team.

1.7.1 Scaffold Users

Scaffold users are those whose work requires them, at least some of the time, to be supported by scaffolding to access the area of a structure where that work is performed.

Each employee who performs work while on a scaffold is required to complete scaffold user training assigned by the Regional Health and Safety Officer (RHSO). The training will allow employees to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. Training will include:

- The nature of any electrical hazards, fall hazards, and falling object hazards in the work area.
- The correct procedures for dealing with those hazards.
- The proper use of the scaffold and the proper handling of materials on the scaffold.
- The maximum intended load and the load-carrying capacity of the scaffold.
- Any other pertinent requirements.

GEI will retrain an employee when they have reason to believe that the employee lacks the skill or understanding to use a scaffold. Such retraining is required in at least the following situations:

- Changes at the worksite present a hazard for which an employee has not previously been trained.
- Changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard for which an employee has not previously been trained.
- Inadequacies in an affected employee's work indicate that the employee has not retained the necessary proficiency.

1.8 Injury Reporting

If a GEI employee suffers an injury on the job that is not life threating, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and RHSO.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or supervisor/project manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the RHSO will conduct an investigation and evaluation on what happened and how and why it happened. The CHSO will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.9 Limitations

In addition to these procedures, follow all safety procedures as defined in the site-specific health and safety plan (HASP) and other GEI Health and Safety SOPs.

1.10 References

OSHA 29 CFR 1926.450 to 454 – Subpart L; Scaffolds

OSHA Scaffolding eTool - http://www.osha.gov/SLTC/etools/scaffolding/index.html

1.11 Attachments

None

1.12 Contact

Health&SafetyTeam@geiconsultants.com

1.13 Review History

- November 2016 rev 4
- November 2015 Rev 3
- May 2014 rev 2
- Created date unknown

STANDARD OPERATING PROCEDURES

SOP No. HS-025 Manual Lifting

1.1 Objective

The purpose of this Standard Operating Procedure (SOP) is to identify and reduce potential work-related musculoskeletal disorder (WMSD) hazards. The SOP is intended to comply with state regulations and safe work practices developed by the Occupational Safety and Health Administration (OSHA). Modifications to meet these requirements will be made to this program as changing laws or regulations dictate.

1.2 General

Lifting heavy items is one of the leading causes of injury in the workplace. Overexertion and cumulative trauma when lifting are significant factors for injuries. When employees use smart lifting practices and work in their “power zone”, they are less likely to suffer from back sprains, muscle pulls, wrist/elbow/spinal and other injuries caused by lifting heavy objects. Common things to consider prior to lifting an object are: weight of the object, awkward postures, high-frequency and long duration lifting, inadequate handholds, and physical/environmental factors.

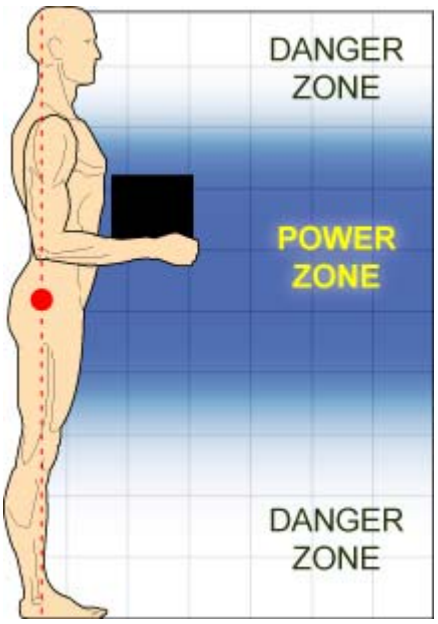


Figure 1: Lifting Power Zone

1.3 Safe Lifting Guidelines

The following safe lifting guidelines will be followed by employees involved in manual lifting activities:

- Before manual lifting is performed, a hazard assessment must be completed. The assessment must consider size, bulk, and weight of the object(s), if mechanical lifting equipment is required, if two-man lift is required, whether vision is obscured while carrying and the walking surface and path where the object is to be carried.
- Get a co-worker to help if equipment or other item is too heavy to lift.
- If possible, use powered equipment instead of manually lifting heavy materials. Lifting equipment such as dollies, hand trucks, lift-assist devices, jacks, or carts can be provided for employees.
- Reduce lifts from shoulder height and from floor height by repositioning the shelf or bin to closer to the power zone.
- Make sure walkways are clear of tripping hazards before moving materials.
- Use your legs and keep your back in a natural position while lifting. Keep the load close to your torso.

- Test the load to be lifted to estimate its weight, size, and bulk and to determine the proper lifting method.
- Do not twist while carrying a load. Instead, shift your feet and take small steps in the direction you want to turn.
- Make sure there are appropriately marked and sufficiently safe clearances for aisles and at loading docks or passageways where mechanical-handling equipment is used.
- Properly stack loose or unboxed materials which might fall from a pile by blocking, interlocking, or limiting the height of the pile to prevent falling hazards.
- Bags, containers, bundles, etc. should be stored in tiers that are stacked, blocked, interlocked, and limited in height so that they are stable and secure to prevent sliding or collapse.

- Storage areas should be kept free from accumulation of materials that could lead to tripping, fire, or explosion.
- Work methods and stations should be designed to minimize the distance between the person and the object being handled.

Supervisors should periodically evaluate work areas and employees' work techniques to assess the potential for and prevention of injuries. New operations should be evaluated to engineer out hazards before work processes are implemented.

1.4 Regulations

OSHA does not have a standard which sets limits on how much a person may lift or carry. They do however state that lifting loads heavier than about 50 pounds will increase the risk of injury.

The National Institute for Occupational Safety and Health (NIOSH) has developed a mathematical model that helps predict the risk of injury based on the weight being lifted and other criteria. The NIOSH model is based on previous medical research into the compressive forces needed to cause damage to bones and ligaments of the back. The mathematical model is incorporated in the *Applications Manual for the Revised NIOSH Lifting Equation*, which can be found on the NIOSH website (http://www.cdc.gov/niosh/docs/94-110/). It should be noted, however, that this NIOSH document provides only voluntary guidelines.

If there is a situation that arises where an employee is required to perform manual lifting on a reoccurring basis, the NIOSH Lifting Equation will be used to determine the appropriate weight that employee can safely lift. The lifting equation establishes a maximum load of 50 pounds for employees that are less likely to have to lift something, and don’t have to do any long distance travel or maneuvering of the item. This 50 pounds is then adjusted to account for:

- how often the employee is lifting
- twisting the back during lifting
- the vertical distance the load is lifted
- the distance of the load from the body
- the distance the employee must move while lifting the load
- how easy it is to hold onto the load

GEI uses 50 pounds as a standard. However each individual should not attempt to carry loads heavier than they can safely manage.

1.5 Training

Training will include general principles of ergonomics, correct manual lifting techniques to avoid musculoskeletal injuries, recognition of hazards and injuries, procedures for reporting hazardous conditions, and methods and procedures for early reporting of injuries.

1.6 Lifting Assistance

If employees are assigned a task that involves repetitive lifting and carrying of equipment the Safety Team and Project Manager should be contacted to conduct an ergonomic evaluation. The task should be discussed to determine if there is an alternative method that can be used. The alternative method should institute an engineering or administrative control to reduce/limit the amount of lifting that is required of the employee. Some examples include providing smaller containers to reduce the weight of what needs to be lifted; providing a device that helps carry awkwardly-shaped objects easier; or using a winch, fork lift, or other device to lift the item(s) for the employee.

1.7 Injury Reporting

Injuries experienced during manual lifting activities should receive prompt medical attention. If a GEI employee suffers an injury on the job that is not life threating, call Medcor Triage at 1-800-775-5866 to speak with a medical professional. Then, immediately report the injury to the Supervisor/Project Manager and Regional Health and Safety Officer.

After verbal notification has been made, an Incident Report Form is to be completed by the employee and/or Supervisor/Project Manager and submitted to the People & Safety Team immediately following care of the incident. This form is available on the Safety App (smart phones) and on the Safety page on the GEI intranet.

Upon notification from a Branch or Office Manager, Human Resources, and/or the receipt of the Incident Report Form, the Regional Health & Safety Officer (RHSO) will conduct an investigation and evaluation on what happened and how and why it happened. The Corporate Health & Safety Officer (CHSO) will then recommend (as necessary) engineering controls, personal protection equipment, training or other appropriate measures to minimize the potential for future musculoskeletal injuries. The CHSO/RHSO may develop educational information based on lessons learned for distribution to GEI employees.

1.8 Limitations

Follow safety procedures for manual lifting.

1.9 References

OSHA Technical Manual (OTM), Section VII: Chapter 1 - Back Disorders and Injuries
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=29936 (Viewed 7/12/2016)
https://www.osha.gov/SLTC/etools/electricalcontractors/materials/heavy.html (Viewed 7/12/2016)

1.10 Attachments

None

1.11 Contact

Health&SafetyTeam@geiconsultants.com

1.12 Review History

- July 2016
- August 2014

STANDARD OPERATING PROCEDURE

SG-001 General Guidance on Soil Vapor Intrusion Evaluations

1. Objective

The goal of a soil vapor intrusion evaluation is to assess whether complete exposure pathways of soil vapor to indoor air exist. A complete exposure pathway exists if vapors from constituents are migrating through various pathways into residential or commercial buildings at concentrations that may result in an unacceptable human health risk. If a complete exposure pathway does not exist, then further assessment of soil vapor intrusion is not required.

Depending on the status of investigation performed at the site it may be appropriate to approach an evaluation of soil vapor intrusion at different tiers. If little work has been performed relative to the potential for contaminants to affect soil vapor near a structure, then a screening level assessment is an appropriate first step. However, if a plume is well delineated and the potential for groundwater impacts, or nearby source material, to affect soil vapor near a potential receptor structure is well understood, then it may be more appropriate to directly develop and implement a soil vapor and/or indoor air sampling plan. To accommodate the potential varied states of knowledge when a vapor intrusion evaluation is required, a flexible approach is needed that incorporates the following elements.

- SOP SG-002 Soil Vapor Sample Collection
- SOP SG-003 Sub-Slab Soil Vapor Collection
- Indoor Air Sampling
- SOP SG-004 Ambient Air Sample Collection

Soil vapor intrusion evaluations should be approached on a site-specific basis and depending on the site-specific setting and proximity to impacted groundwater or source material, it may be appropriate to proceed in a hierarchical fashion through each tier of evaluation or a variety of tiers may be combined and implemented simultaneously. The SOPs presented in this SOP address each of these sampling procedures.

2. Execution

2.1. Implementation Triggers

Soil vapor intrusion evaluations may be implemented at various times based on event triggers throughout the Site Characterization (SC), Remedial Investigation (RI), and site remedial action plan. The following event triggers would require the implementation of this soil vapor intrusion investigation.

- Identification of a potential complete exposure pathway
- Private property owner request for sampling

- State or Federal administrative order

2.2. Factors Affecting Soil Vapor Intrusion

Prior to conducting a soil vapor intrusion assessment at a private property, an analysis of the factors contributing to the migration of soil vapor to indoor air should be conducted. The completion of this analysis should take into account the two types of factors: environmental and building factors.

2.2.1. Environmental Factors

Environmental factors include site specific conditions in the subsurface and above the ground surface that may affect the rate and direction at which soil vapor may migrate.

The soil and groundwater conditions between the contamination and the residential/commercial building should be evaluated and recorded in any soil vapor intrusion investigation. If the SC/RI has been completed, then the data are available for this review. If the SC/RI has not been completed, then at a minimum the nature and extent of impacted soil and/or groundwater between the site and the residential/commercial building should be defined.

After compiling the necessary site-specific data, that information should be reviewed to determine groundwater conditions at the site. The potential for man-made or natural preferential pathways for vapor migration in the vadose zone and/or for groundwater migration in the saturated zone should also be determined at this time.

- The depth to groundwater below the residential or commercial building will be determined. For example, in cases where groundwater intersects the foundation there is no vadose zone to collect a sub-slab sample. In cases where the groundwater is close to the foundation, there is a risk of causing/exacerbating groundwater intrusion through the foundation during periods of high groundwater.

Additional Site Observations

- Direction of groundwater flow from the contaminant source to the residential or commercial building;
- The location, depth, extent, and concentration of potential constituents in unsaturated soil and groundwater on the property; and,
- Presence of an overlying water bearing zone that does not have impacts beneath the residential or commercial building. An un-impacted shallow water zone will significantly retard or completely prohibit the potential for deeper impacted groundwater to affect soil vapor.
- Potential “smear zones” (residual non-aqueous phase liquid (NAPL) present at depths over which the water table fluctuates) should also be identified as they may also affect the rate of soil vapor migration.
- Location, depth, extent of NAPL, if present.

Soils which are highly organic, wet, and/or of low permeability should be identified. If these soils are present beneath a structure and above impacted groundwater or soil, they may effectively shield the building from potential vapor intrusion. Conversely, dry and porous soils underlying a building may provide a less inhibited soil vapor intrusion pathway. The limits of backfill surrounding residential or commercial building should be also noted.

2.2.2. Building Factors

Building Factors include the physical characteristics, such as structure, floor layout, air flow, and physical conditions. These conditions will be documented during the evaluation. The New York State Department of Health (NYSDOH) Center for Environmental Health's Indoor Air Quality Questionnaire and Building Inventory form is presented in Attachment A. At a minimum, the following information should be recorded.

- Building foundation construction characteristics (basement, footers, crawl spaces, etc), including potential preferential vapor intrusion pathways such as foundations cracks and utility penetrations.
- Basement wall materials (hollow block, stone, or poured concrete, etc.)
- Presence of an attached garage.
- Recent renovations to the building such as new paint or new carpet.
- Mechanical heating/cooling equipment that may affect air flow.
- Use and storage of petroleum products such as home heating oil storage tanks, underground storage tanks (USTs), or kerosene heaters.
- Recent use of petroleum-based finish or other products containing volatile organic compounds (VOCs).
- Areas of pavement on the property should also be identified in the event sub slab vapor sampling is not feasible or appropriate due to a high groundwater table. Paved areas could serve as surrogate locations in lieu of sub slab soil vapor sampling if high water table conditions exist.

The construction materials and integrity of the floor of the structure closest to the potential point of entry for soil vapor (basement level or first floor for slab-on-grade constructions) should be identified. In addition to the foundation type and integrity, this survey should note any preferential pathways (utility lines/pipes, sumps, etc.) that may exist within the bottom-most level of the structure.

The operation and presence of heating systems, including fireplaces and clothes dryers, may create a pressure differential between the structure and the outside environment, causing an increase of migration of soil vapor into the building. The NYSDOH guidance document suggests limiting indoor air sampling to the heating season (with the exception of immediate inhalation hazard situations), which is roughly defined as November 15th to March 31st. However, sampling may be completed at any time during the year for any sampling completed in response to a request by a community member. In situations where non-heating season sampling

has taken place, consideration should be given to re-sampling the property within the heating season. The operation of HVAC systems should be noted on the building inventory form (Attachment A).

During the initial building assessment and visit, and again when sub-slab soil vapor and/or indoor air sampling are performed, differential pressure measurements between indoor air, ambient air, and soil vapor should be collected and recorded to document the potential effect building conditions have on soil vapor migration.

2.2.3. Property Visit

A property visit will be conducted prior to sampling. During the site visit, technical representatives will complete site visit observations, inventories and occupant questionnaire forms (Appendix A). During the course of the interview, observations will be made to identify any potential areas or issues of concern or the presence of any odors, and if sampling appears necessary, identify potential sampling points and general building characteristics. The questionnaire is also used to identify potential sources and activities that may interfere with sampling results. The questionnaire will specifically address the activities of the occupant's (e.g., smoking, work place activities) that may contribute to indoor air concentrations of volatile chemicals.

The responses to the questionnaire will be evaluated and a determination will be made as to whether additional investigation is required.

2.2.4. Chemical Inventory

The chemical inventory complements the identification of the building factors affecting soil vapor intrusion. The chemical inventory will identify the occurrence and use of chemicals and products throughout the building. These products can be used to develop an indoor environmental profile. A separate inventory should be prepared for each room on the floor being tested as well as any other indoor areas physically connected to the areas being tested. Inventories will include product names, chemical ingredients, or both. If possible, photographs of the products should be taken of the location and condition of the inventoried products and the photographic records should be indexed with the inventory records. The products inventory can also be used to document odors and if possible portable vapor monitoring equipment measurements should be taken and recorded. A product inventory will be repeated prior to each round of testing at the building. If available, the volatile ingredients should be recorded for each product. If the ingredients are not listed on the label, record the manufacturer's name and address or phone number if available. The product inventory form is presented in Attachment A.

2.2.5. Water Table Conditions and Vapor Intrusion Assessment Approach

Sub-slab soil vapor sampling is intended to evaluate the potential for vapor intrusion. However, there are circumstances where collection of sub-slab soil vapor samples may not be feasible if the water table is near, at, or above the elevation of a buildings foundation slab. An evaluation of the water table elevation relative to the

building slab should be made before attempting to install a sub-slab vapor sampling point.

If the water table is found to be sufficiently below the building slab and sub-slab vapor sampling can be performed, then the following Low Water Table Scenario should be followed.

2.2.5.1. Low Water Table Scenario

If the water table elevation is lower than the basement slab, then the following samples should be collected.

- Sub-slab soil vapor samples
- Indoor air samples from basement level
- Indoor air samples from main living space (First floor)
- Outdoor ambient air sample

If the water table is deemed to be at too high of an elevation to allow sub-slab vapor sampling, then alternate means of evaluating the potential for vapor intrusion must be employed. If a building has a groundwater sump, the sump should be evaluated to determine if there is water present in the sump and if that water is representative of groundwater or if the water is stagnant. If water in the sump represents groundwater, then a sample from the sump should be collected. The High Water Scenario below summarizes the methods to evaluate potential vapor intrusion if sub-slab vapor sampling cannot be conducted due to high groundwater conditions.

2.2.5.2. High Water Table Scenario

If the water table elevation is higher than the basement slab, then the following tasks should be performed.

- Determine if a sump pump is present and actively pumping water.
- If sump is actively pumping, collect a sample of groundwater from the sump.
- Collect an indoor air sample from basement level.
- Collect an indoor air sample from main living space (first floor).
- Identify exterior soil vapor sample location near foundation (outside of foundation backfill) and preferably beneath a surrogate vapor cap (e.g. paved driveway, patio).
- Collect soil vapor samples from exterior soil vapor location
- Collect an outdoor ambient air sample.

3. References

USEPA modified Method TO-15 and helium via ASTM D-1945.

Section 2.7.1 of the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, dated October 2006.*

4. Attachments

Attachment A - NYSDOH Center for Environmental Health's Indoor Air Quality Questionnaire and Building Inventory Form

5. Contact

Chris Berotti

ATTACHMENT A

Off-Site Property Sampling Documentation Form

Property Location/Address: _____

Property: _____

Sampling Date: _____

Property Location/Address: _____
Property: _____
Sampling Date: _____

Preparer's Name: _____ Date/Time Prepared: _____

Preparer's Affiliation: _____ Phone No.: _____

Purpose of Investigation:_____

1. OCCUPANT Interviewed: Yes □ No □

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants_____

2. OWNER OR LANDLORD (Check if same as occupant __) Interviewed: Yes □ No □

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. CONTACT NAME (Check if same as Occupant ____, Owner ____)

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

4. PROPERTY LOCATION: _____

Relative to Site:

Direction _____ Direction to Nearest Cross Street: _____

Distance _____ Distance to Nearest Cross Street: _____

Surrounding Land Use:

North: _____ East: _____

South: _____ West: _____

Property Location/Address: _____
Property: _____
Sampling Date: _____

5. PROPERTY BOUNDARIES

Delineate the boundaries of the property (on a separate project map, outline property location, private well location, septic/leachfield location, groundwater flow, compass direction, windrose.)

6. BUILDING CONSTRUCTION

Type of Building (Circle appropriate response)

Residential	School	Commercial/Multi-use
Industrial	Church	Other: _____

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Yes □ No □

If yes, how many? _____

Other characteristics:

Number of floors_____ Building age_____

Is the building insulated? Yes □ No □ How air tight? Tight / Average / Not Tight

Construction Material _____

7. BASEMENT AND CONSTRUCTION CHARACTERISTICS

Does the building have a basement and/or crawl space, or is it slab-on-grade construction?

_____

Describe the construction of the basement/crawl space (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick
b. Basement type:	full	crawlspace	slab	other _____

Property Location/Address: _____
Property: _____
Sampling Date: _____

c. Basement floor:	concrete	dirt	stone	other _____
d. Basement floor surface:	uncovered	covered	covered with _____	
e. Concrete floor:	unsealed	sealed	sealed with _____	
	unpainted	painted	painted with _____	
f. Foundation walls:	poured	block	stone	other _____
g. Foundation walls:	unsealed	sealed	sealed with _____	
h. The basement is:	wet	damp	dry	moldy
i. The basement is:	finished	unfinished	partially finished	

Does your basement have a sump? Yes □ No □

Is, is there water in the sump? Yes □ No □

Describe sump conditions:_____

_____

Have you observed standing water in your basement? Yes □ No □

If so, what is the frequency of this observation? _____During rain events? □

Have you observed sheen atop the standing water? Yes □ No □

Basement/Lowest level depth below grade: _____(feet)

Are there any cracks in the floor of your basement? Yes □ No □

Description: _____

_____

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

Description: _____

_____

What activities occur in the finished basement?

Description: _____

_____

Approximately how many hours per day (or week) do you spend in your basement? _____

8. HEATING, VENTING AND AIR CONDITIONING

Type of heating system(s) used in building: (Circle all that apply – note primary)

Property Location/Address: _____
Property: _____
Sampling Date: _____

Hot Air Circulation	Hot Water Baseboard	Steam Radiation
Electric Baseboard	Heat Pump	Wood Stove
Space Heaters	Radiant Floor	Outdoor wood boiler

Unvented Kerosene Heater Other _____

The primary type of fuel used is:

Fuel Oil	Natural Gas	Electric
Kerosene	Propane	Solar
Wood	Coal	Other? _____

Time of use of each type of heating? _____

Domestic hot water tank fueled by: _____

Boiler/furnace located in: Basement Outdoors Main Floor Other_____

Air conditioning: Central Air Window units Open Windows None

Are there air distribution ducts present? Yes □ No □

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

_____

_____

_____

_____

Type of insulation (e.g. blown, fiber, etc.)? _____

Does building have energy efficient windows (e.g. double paned) Yes □ No □

Was weather-stripping recently added/upgraded? Yes □ No □

Particleboard used in construction? Yes □ No □

9. OCCUPANCY

Property Location/Address: _____
Property: _____
Sampling Date: _____

Level General Use of Each Floor (e.g., family room, bedroom, laundry, workshop, storage)

Basement _____

1st Floor _____

2nd Floor _____

3rd Floor _____

4th Floor _____

10. BULK PETROLEUM STORAGE

Aboveground storage tank on the property Yes ☐ No ☐

If yes, how old is tank? _____ Condition? _____

Last inspected? _____ Location: _____

Describe conduits to building (type, location, and entry portal condition): _____

_____

Underground storage tank on the property. Yes ☐ No ☐

If yes, how old is tank? _____ Condition? _____

Last inspected? _____ Location: _____

Describe conduits to building (type, location, and entry portal condition): _____

_____

11. WATER AND SEWAGE

Water Supply:

Public Water Drilled Well Driven Well Dug Well Other _____

Is there use of groundwater water for irrigation purposes? Yes ☐ No ☐

Sewage Disposal:

Public Sewer Septic Tank Leach Field Dry Well Other _____

12. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? Yes ☐ No ☐

If not, is there a separate garage or carport? Yes ☐ No ☐

b. Does the garage have a separate heating unit? Yes ☐ No ☐ NA ☐

Property Location/Address: _____
Property: _____
Sampling Date: _____

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, ATV, car)
Yes ☐ No ☐ NA ☐ Please specify_____

Is gasoline stored in the garage? Yes ☐ No ☐

Quantity? _____

d. Has the building ever had a fire? Yes ☐ No ☐

When?_____

e. Is a kerosene or unvented gas space heater present? Yes ☐ No ☐

Where? _____

f. Is there a workshop or hobby/craft area? Yes ☐ No ☐

Where & Type? _____

g. Is there smoking in the building? Yes ☐ No ☐

How frequently? _____

h. Have cleaning products been used recently? Yes ☐ No ☐

When & Type? _____

i. Have cosmetic products been used recently? Yes ☐ No ☐

When & Type? _____

j. Has painting/staining been done in the last 6 months? Yes ☐ No ☐

Where & When? _____

Is house paint stored inside? Yes ☐ No ☐

Where? _____

k. Is there new carpet, drapes or other textiles? Yes ☐ No ☐

Where & When? _____

l. Have air fresheners been used recently? Yes ☐ No ☐

When & Type? _____

m. Is there a kitchen exhaust fan? Yes ☐ No ☐

If yes, where vented?_____

n. Is there a bathroom exhaust fan? Yes ☐ No ☐

If yes, where vented?_____

o. Is there a clothes dryer? Yes ☐ No ☐

If yes, is it vented outside? Yes ☐ No ☐

p. Has there been a pesticide/chemical fertilizer application? Yes ☐ No ☐

Property Location/Address: _____
Property: _____
Sampling Date: _____

When & Type?_____

Conducted by Owner or Private Yard Service _____

Is yard waste/trash burned on-site? Yes □ No □

Do any of the building occupants use solvents at work? Yes □ No □

(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Yes □ No □

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, Use dry-cleaning regularly (weekly) No

Use dry-cleaning infrequently (monthly or less) Unknown

Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Yes □ No □

Date of Installation: _____

Is the system active or passive? Active □ Passive □

Are there any recent/past improvements to building? Yes □ No □

Interior painting? _____

Any landscaping improvements that involved bringing fill on site? Yes □ No □

Other _____

Approximately when (how long ago) did these improvements occur? _____

Does anyone living here engage in any of the following activities or hobbies?

a. Art projects (e.g. oil painting, ceramics, pottery, stained glass, metal sculpture)

Yes □ No □

Name: _____ Age: _____ Sex: _____

Name: _____ Age: _____ Sex: _____

Property Location/Address: _____
Property: _____
Sampling Date: _____

b. Furniture refinishing Yes □ No □

Name: _____ Age: _____ Sex: _____

Name: _____ Age: _____ Sex: _____

c. Model building(e.g. planes,boats,cars) Yes □ No □

Name: _____ Age: _____ Sex: _____

Name: _____ Age: _____ Sex: _____

d. Gardening Yes □ No □

Name: _____ Age: _____ Sex: _____

Name: _____ Age: _____ Sex: _____

e. Automotive work Yes □ No □

Name: _____ Age: _____ Sex: _____

Name: _____ Age: _____ Sex: _____

f. Ammunition reloading Yes □ No □

Name: _____ Age: _____ Sex: _____

Name: _____ Age: _____ Sex: _____

Is there a wood burning stove? Yes □ No □

If so, how frequently is it used?

_____

_____

Is there a barbeque grill? Yes □ No □

If so, how frequently is it used? What is the type of fuel?

_____

_____

Has the building ever had fumigation? Yes □ No □

Property Location/Address: _____
Property: _____
Sampling Date: _____

If so, when and how frequently? Type?

_____

_____

13. ODOR SUMMARY

Have the occupants observed any unusual odors? _____

_____

_____

_____

_____

History of odor observation – date of onset, duration, severity, etc.

_____

_____

_____

_____

_____

_____

_____

14. PRODUCT INVENTORY

Record the specific products found in building that have the potential to affect indoor air quality on the attached product inventory form.

15. INDOOR SKETCH

Draw a plan view sketch (on grid paper) of the basement, first floor, and any other floor where sampling was conducted in the building as well as any outdoor sample locations. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Property Location/Address: _____
Property: _____
Sampling Date: _____

Product Inventory
Off-Site Property Sampling Documentation
Soil Vapor Intrusion Investigation

Property Address:	**Performed by:**
Date of Inventory:	**Field Instrument Make & Model:**

Location	**Product Description**	**Size (units)**	**Condition ***	**Chemical Ingredients**	**Field Instrument Reading (units)**	**Photo ** Y/N**

Notes

* Describe the condition of the product containers as Unopened (UO), Used (U), or Deteriorated (D)

** Photographs of the front and back of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

STANDARD OPERATING PROCEDURE

SG-002 Soil Vapor Sample Collection

1. Objective

This procedure outlines the general steps to collect soil vapor samples. The site-specific Sampling and Analysis Work Plan should be consulted for proposed sample locations, sample depths, and sampling duration.

2. Execution

Permanent and temporary soil vapor probes should be installed using the procedures outlined below. All soil vapor probes should be installed using a direct-push drill rig (e.g., Geoprobe® or similar), hand auger, or manually using a slide hammer.

2.1. Document Field Conditions

Document pertinent field conditions prior to installation of any probe points.

- Record weather information (precipitation, temperature, barometric pressure, relative humidity, wind speed, and wind direction) at the beginning of the sampling event. Record substantial changes to these conditions that may occur during the course of sampling. The information may be measured with on-site equipment or obtained from a reliable source of local measurements (e.g., a local airport). Data should be obtained for the past 24 to 48 hours.
- If sampling near a commercial or industrial building, uses of volatile chemicals during normal operations of the facility should be identified.
- Outdoor plot sketches should be drawn that include the site, area streets, neighboring commercial or industrial facilities (with estimated distance to the site), outdoor air sampling locations (if applicable), and compass orientation (North);
- Any pertinent observations should be recorded, such as odors and readings from field instrumentation.

2.2. Soil Vapor Point Installation Specifications

Each soil vapor point should be constructed as follows:

- Six-inch stainless steel Geoprobe® AT86 series Permanent Implants (soil vapor screens) or equivalent and threaded to an (expendable) stainless steel anchor point.
- The implants should be fitted with inert Teflon or stainless steel tubing of laboratory or food grade quality.
- The annular space surrounding the vapor screen interval and a minimum of 6-inches above the top of the screen should be filled with a porous backfill

material (e.g., glass beads or coarse silica sand) to create a sampling zone 1 foot in length.

For temporary points, a hydrated bentonite surface seal should be created at the surface to minimize infiltration. For permanent points, the additional measures described below should be included.

- The soil vapor points should be sealed above the sampling zone with a bentonite slurry for a minimum distance of 3 feet (or to grade, whichever is smaller) to prevent ambient air infiltration.
- If needed, the remainder of the borehole should be backfilled with clean material.
- A protective casing should be set around the top of the point tubing and grouted in place to the top of the bentonite to minimize infiltration of water or ambient air, as well as to prevent accidental damage to the soil vapor point.
- The tubing top should be fitted with a Swagelok® and cap to prevent moisture and foreign material from infiltrating the tubing.

2.3. Soil Vapor Sample Collection

Soil vapor samples should be collected as indicated in the work plan and in accordance with applicable state or federal guidance documents. Specifically, samples from the points should be collected as follows:

- Permanent soil vapor points should not be sampled or purged for a minimum of 24 hours after installation. Temporary points may be purged and sampled immediately following installation.
- Document pertinent field conditions prior to sampling as described above.
- A suction pump should be used to remove a minimum of three implant volumes from the soil vapor points prior to sampling. Include the volume of any additional tubing added to affix sampling equipment and the annular space between the probe and the native material if sand or glass beads were used.
- The purge rate shall not exceed 0.2 liters per minute.
- Samples should be collected for volatile organic compounds (VOCs) in an individually laboratory certified clean 1-liter SUMMA® canister (or equivalent) using a certified flow controller calibrated for the anticipated sample duration (4 minutes). The regulator flow rate should not exceed 0.2 liters per minute.
- A helium tracer gas should be used to identify any potential migration or short circuiting of ambient air during sampling as described below.
- Remove the protective brass plug from the canister. Connect the pre-calibrated flow controller to the canister.
- Record the identification numbers for the canister and flow controller.
- Record the initial canister pressure on the vacuum gauge (check equipment-specific instructions for taking this measurement). A canister with a significantly different pressure than originally recorded by the testing

laboratory should not be used for sampling. Record these numbers and values on the chain-of-custody form for each sample.

- Connect the tubing from the soil vapor probe to the flow controller.
- Open the valve on the canister. Record the time that the valve was opened (beginning of sampling) and the canister pressure on the vacuum gauge.
- Photograph the canister and the area surrounding the canister.
- Monitor the vacuum pressure in the canister routinely during sampling.
- Stop sample collection when the canister still has a minimum amount of vacuum remaining. Check with the laboratory supplying the canister and flow controller for the ideal final vacuum pressure. Typically, the minimum vacuum is between 2 and 5 inches of mercury, but not zero. If there is no vacuum remaining, the sample should be rejected and collected again in a new canister.
- Record the final vacuum pressure and close the canister valve. Record the date and time that sample collection was stopped.
- Remove the flow controller from the canister and replace the protective brass plug.
- Attach labels/tags (sample name, time/date of sampling, etc.) to the canister as directed by the laboratory.
- Place the canister and other laboratory-supplied equipment in the packaging provided by the laboratory.
- Enter the information required for each sample on the chain-of-custody form, making sure to include the identification numbers for the canister and flow controller, and the initial and final canister pressures on the vacuum gauge.
- Samples should be analyzed for VOCs and naphthalene via modified USEPA modified Method TO-15 and helium via ASTM D-1945.
- Include the required copies of the chain-of-custody form in the shipping packaging, as directed by the laboratory. Maintain a copy of the chain-of-custody for the project file.
- Deliver or ship the samples to the laboratory as soon as practical.
- All laboratory analytical data should be validated by a data validation professional in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, January 2005 and the USEPA Region II Standard Operating Procedure (SOP) for the Validation of Organic Data modified to accommodate the USEPA Method TO-15 and natural gas analysis by ASTM D-1945.

2.4. Tracer Gas Evaluation

The tracer gas evaluation provides a means to evaluate the integrity of the soil vapor probe seal and assess the potential for introduction of ambient air into the soil vapor sample.

A tracer gas evaluation should be conducted on the each temporary soil vapor probe to be sampled in a sampling event. A tracer gas evaluation should be conducted on

the each permanent soil vapor probe during the initial sampling event and a minimum of 10% of the soil vapor probes during subsequent sampling events.

The following tracer gas evaluation procedure uses helium as a tracer gases which can be measured through laboratory analysis or by a portable detector.

Retain the tracer gas around the sample probe by filling an air-tight chamber (such as a plastic bucket) positioned over the sample location.

- Make sure the chamber is suitably sealed to the ground surface.
- Introduce the tracer gas into the chamber. The chamber should have tubing at the top of the chamber to introduce the tracer gas into the chamber and a valved fitting at the bottom to let the ambient air out while introducing tracer gas. Close the valve after the chamber has been enriched with tracer gas at concentrations >10%.
- The chamber should have a gas-tight fitting or sealable penetration to allow the soil vapor sample probe tubing to pass through and exit the chamber.
- After the chamber has been filled with tracer gas, attach the sample probe tubing to a pump that should be pre-calibrated to extract soil vapor at a rate of no more than 0.2 liters per minute. Purge the tubing using the pump. Calculate the volume of air in the tubing and probe and purge one to three tubing/probe volumes prior collecting an analytical sample or using a portable device to measuring the tracer gas concentration.
- Samples collected from vapor points during a tracer gas evaluation should be analyzed for VOCs and naphthalene via modified USEPA modified Method TO-15 and helium via ASTM D-1945.
- Alternately, a tracer gas detector may be used to verify the presence of the tracer gas in the chamber by affixing it to the valve fitting at the bottom of the chamber. The tracer gas detector may also be used to measure the tracer gas concentration in the pump exhaust during purging. If used, then record the tracer gas concentrations in the chamber and in the soil vapor sample.
- Based on the concentrations of the tracer gas detected during analysis or direct measurement, determine whether additional gas tracer evaluations are necessary.

If the evaluation on a probe indicates a high concentration of tracer gas in the sample (>10% of the concentration of the tracer gas in the chamber), then the surface seal is not sufficient and requires improvement via repair or replacement prior to commencement subsequent sample collection.

A non-detectable level of tracer gas is preferred, however, if the evaluation on a probe indicates a low potential for introduction of ambient air into the sample (<10% of the concentration of the tracer gas in the chamber), then proceed with the soil

vapor sampling. While lower concentrations of tracer gas are acceptable, the impact of the detectable leak on sample results should be evaluated in the sampling report.

3. References

USEPA modified Method TO-15 and helium via ASTM D-1945

Section 2.7.1 of the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, dated October 2006.*

4. Contact

Chris Berotti

STANDARD OPERATING PROCEDURE

SG-003 Sub-slab Soil Vapor Collection

1. Objective

This procedure outlines the general steps to collect sub-slab soil vapor samples. The site-specific Sampling and Analysis Work Plan should be consulted for proposed sample locations, sample depths, and sampling duration.

2. Execution

Permanent and temporary sub-slab soil vapor probes will be installed using the procedures outlined below. All sub-slab soil vapor probes will be installed using a direct-push drill rig (e.g., Geoprobe® or similar), hand auger, or manually using a slide hammer.

2.1. Document Field Conditions

Document pertinent field conditions prior to installation of any probe locations.

- Record weather information (precipitation, temperature, barometric pressure, relative humidity, wind speed, and wind direction) at the beginning of the sampling event. Record substantial changes to these conditions that may occur during the course of sampling. The information may be measured with on-site equipment or obtained from a reliable source of local measurements (e.g., a local airport). Data should be obtained for the past 24 to 48 hours. Record the indoor conditions (temperature, heating/cooling system active, windows open/closed, etc.).
- Measure the differential pressure at the building. Measure the indoor and outdoor barometric pressure using a high resolution device. Where possible, measure the sub-slab barometric pressure at the sampling point.
- If sampling near a commercial or industrial building, uses of volatile chemicals during normal operations of the facility should be identified.
- Indoor floor plan sketches should be drawn that include the floor layout with sampling locations, chemical storage areas, garages, doorways, stairways, location of basement sumps or subsurface drains and utility perforations through building foundations, heating, ventilating and air conditioning (HVAC) system air supply and return registers, compass orientation (North), footings that create separate foundation sections, and any other pertinent information should be completed;
- Outdoor plot sketches should be drawn that include the building site, area streets, outdoor air sampling locations (if applicable), compass orientation (north), and paved areas.
- Any pertinent observations should be recorded, such as odors and readings from field instrumentation.

2.2. Sub-Slab Soil Vapor Point Installation Specifications

Each sub-slab soil vapor point will be constructed as follows:

- Drill an approximately 3/8-inch hole through the slab. If necessary, advance the drill bit 2-3 inches into the sub-slab material to create an open cavity.
- Using dedicated inert Teflon or stainless steel tubing of laboratory or food grade quality, insert the inlet of the tubing to the specified depth below the slab. For permanent installation, only stainless steel tubing and fittings will be used.
- For permanent point installations, the annular space surrounding the vapor probe tip will be filled with a porous backfill material (e.g., glass beads or coarse silica sand) to cover 1-inch of the above the tip of the probe.
- Seal the annular space between the hole and the tubing using an inert non-shrinking sealant such as melted 100% beeswax, permagum grout, putty, etc. For permanent installations, cement may be used.
- For permanent points, a protective casing will be set around the top of the point tubing and grouted in place minimize infiltration of water or ambient air, as well as to prevent accidental damage to he permanent point.
- The tubing top will be fitted with a Swagelok® and cap to prevent moisture and foreign material from infiltrating the tubing.

In cases where sub-slab sampling is impractical or infeasible, a surrogate location (attached garage, concrete patio, asphalt driveway, etc.) may be used if it is representative of sub-slab conditions. In surrogate locations, the vapor sampling point may be installed in accordance with SOP SG-002 Soil Vapor Collection.

2.3. Sub-Slab Soil Vapor Sample Collection

Sub-slab soil vapor samples will be collected as indicated in the site-specific Sampling and Analysis Work Plan and in accordance with state or Federal guidance documents. Specifically, sub-slab samples from the points will be collected as follows:

- Document pertinent field conditions prior to sampling as described above.
- A suction pump will be used to remove one to three implant volumes from the sub-slab soil vapor points prior to sampling. Include the volume of any additional tubing added to affix sampling equipment and the annular space between the probe and the native material if sand or glass beads were used.
- The purge rate shall not exceed 0.2 liters per minute.
- Samples will be collected in an individually laboratory certified clean 1-liter SUMMA® canister (or equivalent) using a certified flow controller calibrated for the anticipated sample duration (4 minutes). The regulator flow rate will not exceed 0.2 liters per minute.
- A helium tracer gas will be used to identify any potential migration or short circuiting of ambient air during sampling as described below.

- Remove the protective brass plug from the canister. Connect the pre-calibrated flow controller to the canister.
- Record the identification numbers for the canister and flow controller.
- Record the initial canister pressure on the vacuum gauge (check equipment-specific instructions for taking this measurement). A canister with a significantly different pressure than originally recorded by the testing laboratory should not be used for sampling. Record these numbers and values on the chain-of-custody form for each sample.
- Connect the tubing from the sub-slab soil vapor probe to the flow controller.
- Open the valve on the canister. Record the time that the valve was opened (beginning of sampling) and the canister pressure on the vacuum gauge.
- Photograph the canister and the area surrounding the canister.
- Monitor the vacuum pressure in the canister routinely during sampling.
- Stop sample collection when the canister still has a minimum amount of vacuum remaining. Check with the laboratory supplying the canister and flow controller for the ideal final vacuum pressure. Typically, the minimum vacuum is between 2 and 5 inches of mercury, but not zero. If there is no vacuum remaining, the sample will be rejected and collected again in a new canister.
- Record the final vacuum pressure and close the canister valve. Record the date and time that sample collection was stopped.
- Remove the flow controller from the canister and replace the protective brass plug.
- Attach labels/tags (sample name, time/date of sampling, etc.) to the canister as directed by the laboratory.
- Place the canister and other laboratory-supplied equipment in the packaging provided by the laboratory.
- Enter the information required for each sample on the chain-of-custody form, making sure to include the identification numbers for the canister and flow controller, and the initial and final canister pressures on the vacuum gauge.
- Samples will be analyzed for volatile organic compounds (VOCs) and naphthalene via modified USEPA modified Method TO-15 and helium via ASTM D-1945
- Include the required copies of the chain-of-custody form in the shipping packaging, as directed by the laboratory. Maintain a copy of the chain-of-custody for the project file.
- Deliver or ship the samples to the laboratory as soon as practical.
- All laboratory analytical data will be validated by a data validation professional in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, January 2005 and the USEPA Region II Standard Operating Procedure (SOP) for the Validation of Organic Data modified to accommodate the USEPA Method TO-15 and natural gas analysis by ASTM D-1945.

2.4. Tracer Gas Evaluation

The tracer gas evaluation provides a means to evaluate the integrity of the sub-slab soil vapor probe seal and assess the potential for introduction of indoor air into the sub-slab soil vapor sample. A tracer gas evaluation should be conducted on the each temporary sub-slab soil vapor probe to be sampled in a sampling event. A tracer gas evaluation should be conducted on the each permanent sub-slab soil vapor probe during the initial sampling event and a minimum of 10% of the sub-slab soil vapor probes during subsequent sampling events.

The following tracer gas evaluation procedure uses helium as a tracer gases which can be measured through laboratory analysis or by a portable detector.

- Retain the tracer gas around the sub-slab sample probe by filling an air-tight chamber (such as a plastic bucket) positioned over the sample location.
- Make sure the chamber is suitably sealed to the ground surface.
- Introduce the tracer gas into the chamber. The chamber will have tubing at the top of the chamber to introduce the tracer gas into the chamber and a valved fitting at the bottom to let the ambient air out while introducing tracer gas. Close the valve after the chamber has been enriched with tracer gas at concentrations >10%.
- The chamber will have a gas-tight fitting or sealable penetration to allow the sub-slab soil vapor sample probe tubing to pass through and exit the chamber.
- After the chamber has been filled with tracer gas, attach the sample probe tubing to a pump that will be pre-calibrated to extract sub-slab soil vapor at a rate of no more than 0.2 lpm. Purge the tubing using the pump. Calculate the volume of air in the tubing and purge one to three tubing volumes prior collecting an analytical sample or using a portable device to measuring the tracer gas concentration.
- Samples collected from vapor points during a tracer gas evaluation will be analyzed for VOCs and naphthalene via modified USEPA modified Method TO-15 and helium via ASTM D-1945.
- Alternately, a tracer gas detector may be used to verify the presence of the tracer gas in the chamber by affixing it to the valve fitting at the bottom of the chamber. The tracer gas detector may also be used to measure the tracer gas concentration in the pump exhaust during purging. If used, then record the tracer gas concentrations in the chamber and in the soil vapor sample.
- Based on the concentrations of the tracer gas detected during analysis or direct measurement, determine whether additional gas tracer evaluations are necessary:

If the evaluation on a probe indicates a high concentration of tracer gas in the sample (>10% of the concentration of the tracer gas in the chamber), then the

surface seal is not sufficient and requires improvement via repair or replacement prior to commencement subsequent sample collection.

A non-detectable level of tracer gas is preferred; however, if the evaluation on a probe indicates a low potential for introduction of ambient air into the sample (<10% of the concentration of the tracer gas in the chamber), then proceed with the soil vapor sampling. While lower concentrations of tracer gas are acceptable, the impact of the detectable leak on sample results should be evaluated in the sampling report.

3. References

USEPA modified Method TO-15 and helium via ASTM D-1945.

Section 2.7.1 of the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006.

4. Contact

Chris Berotti

STANDARD OPERATING PROCEDURE

SG-004 Ambient Air Sample Collection

1. Objective

Describe procedures to collect ambient air samples. The site-specific Work Plan should be consulted for proposed sample locations and sampling duration.

2. Execution

2.1. Document Field Conditions

Document pertinent field conditions prior to sample collection:

- Record weather information, if available (such as precipitation, temperature, barometric pressure, relative humidity, wind speed, and wind direction) at the beginning of the sampling event. Record substantial changes to these conditions that may occur during the course of sampling. The information may be measured with on-site equipment or obtained from a reliable source of local measurements (e.g., a local airport). Data should be obtained for at least the past 12 hours.
- If sampling near a commercial or industrial building, uses of volatile chemicals during normal operations of the facility should be identified.
- Outdoor plot sketches should be drawn that include the site, area streets, neighboring commercial or industrial facilities (with estimated distance to the site), outdoor air sampling locations (if applicable), and compass orientation (North).
- Any pertinent observations should be recorded, such as odors and readings from field instrumentation.

2.2. Sample Collection

- Samples should be collected in laboratory-certified clean SUMMA® canister (or equivalent) using a flow controller calibrated for the anticipated sample duration (1-hour, 8-hour, etc.). The regulator flow rate should not exceed 0.2 liters per minute.
- Place the canister at the sampling location. If the sample is collected from breathing height (e.g., 3 to 5 feet above ground), then mount the canister on a stable platform such that the sample inlet should be at the proper height.
- Remove the protective brass plug from canister. Connect the pre-calibrated flow controller to the canister.
- Record the identification numbers for the canister and flow controller.
- Record the initial canister pressure on the vacuum gauge (check equipment-specific instructions for taking this measurement). A canister with a significantly different pressure than originally recorded by the testing laboratory should not be used for sampling. Record these numbers and values on the chain-of custody form for each sample.

- Connect the tubing to the flow controller.
- Open the valve on the canister. Record the time that the valve was opened (beginning of sampling) and the canister pressure on the vacuum gauge.
- Photograph the canister and the area surrounding the canister.
- If possible, monitor the vacuum pressure in the canister routinely during sampling. During monitoring, note the vacuum pressure on the gauge.
- Stop sample collection after the scheduled duration of sample collection but make sure that the canister still has a minimum amount of vacuum remaining. Check with the laboratory supplying the canister and flow controller for the ideal final vacuum pressure. Typically, the minimum vacuum is between 2 and 5 inches of mercury, but not zero. If there is no vacuum remaining, call the laboratory and discuss the sample viability with them. Determine whether another sample will be taken after sharing the laboratory's opinion with your project manager.
- Record the final vacuum pressure and close the canister valves. Record the date and time that sample collection was stopped.
- Remove the flow controller from the canister and replace the protective brass plug.
- Attach labels/tags (sample name, time/date of sampling, etc.) to the canister as directed by the laboratory.
- Place the canister and other laboratory-supplied equipment in the packaging provided by the laboratory.
- Enter the information required for each sample on the chain-of-custody form, making sure to include the identification numbers for the canister and flow controller, and the initial and final canister pressures on the vacuum gauge.
- Include the required copies of the chain-of-custody form in the shipping packaging, as directed by the laboratory. Maintain a copy of the chain-of-custody for the project file.
- Deliver or ship the samples to the laboratory as soon as practical.

3. References

USEPA modified Method TO-15 and helium via ASTM D-1945

Section 2.7.1 of the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, dated October 2006.*

4. Contacts

Chris Berotti
Bill Simons

STANDARD OPERATING PROCEDURE

SI-002 Ozone System Inspection

1. Objective

The purpose of this Standard Operating Procedure (SOP) is to identify key procedures needed to maintain maximum system uptime of the ozone injection and soil vapor extraction (SVE) systems, and to ensure the system inspections are conducted safely.

2. Important Documents

- The system operator should be familiar with the documents listed below prior to conducting system inspections or maintenance on the system.
- System Operations Maintenance and Monitoring (OM&M) Plan – This is a site-specific document. This document specifies inspection schedules, analytical monitoring schedules, and specific inspection procedures.
- Manufacturer's Owner's Manual – This is a system specific document created by the manufacturer. This document contains system component information, maintenance and troubleshooting information, and instructions on how to use the system control logic. A copy of this document is retained at the Ozone Building.
- Training Videos – System training videos are available and located on GEIs network under the link below:

H:\TECH\project\Keyspan\BayShore\OU-1Ozone System\Training\Training Videos

3. System Process

- The ozone Injection system is designed to generate a 1-3 percent ozone gas mixture and sparge it directly into the subsurface through a series of stainless steel injection wells**.**
- Compressed air is first generated by a compressor. The compressed air is then passed through a series of filters before it is dried and cooled by a refrigerated dryer and a desiccant dryer, effectively bringing the dew point down to a maximum of -70 degrees Fahrenheit. The compressed air is then passed through the ozone generator where the ozone concentration is increased to 1 to 3 percent ozone gas mixture. The injection process is controlled by the human machine interface (HMI), three remote system manifolds, solenoid valves, and the control logic.

- A SVE system is also in place to capture any fugitive ozone gas or impacted soil vapor. The system consists of 11 soil vapor extraction laterals spaced throughout the injection well field. Vacuum is applied by the regenerative blower. The extracted vapor is passed through the blower and through two 500-pound carbon vessels and an ozone destruct unit prior to discharge through the stack.
- There are two identical system trains in place for both the SVE and ozone injection system. If one system goes down the other system will automatically start, maintaining near 100 percent system uptime.

4. System Components

- System components for a complete system train are listed below. The operator should reference the manufactures Owners Manual for details on each component.
- Ozone Injection System
- Kaeser Rotary SX-6 Screw Air Compressor
- Coalescing Filter (x2)
- Particulate Filter (x2)
- Condensate Filter
- Kaeser refrigerated dryer
- Kaeser desiccant dryer
- Cold Shot Split Water Chiller
- Ozonia Ozone Generator
- Ozone Delivery Manifold
- Ozone Compressor Pumps
- Remote system manifolds (x3)
- Injection Control Logic – HMI
- SVE System
- Rentron Regenerative Blower
- 240 gallon moisture separator
- 500 pound TetraSolve Granular Activated Carbon Vessel (x2)
- 250 pound TetraSolve Liquid Granular Activated Carbon Vessel (x2)
- Swhift Ozone Destruct Unit
- 11 SVE Laterals
- 1 Exterior SVE Manifold

5. System Inspections

The SVE system and the ozone injection system are monitored at least once per week to confirm that the systems are operating according to design and manufacture.

The inspections include:

- Inspection of the mechanical components.
- Recording of the operational pressures, temperatures, flow rates, and operational hours of the system components. These values should be compared to historical values to determine if there are any discrepancies.
- Emptying any condensate collection basins into properly labeled drums.
- Maintaining the drum storage area.
- Recording the injection pressures and flow rates at each injection point during a normal operational cycle. These values should be compared to historical values to determine if there are any discrepancies (semi-annual).
- Recording the vacuum pressures and flow rates at the SVE manifold.
- Monitoring the SVE effluent with a photoionization detector (PID).
- Analytical sampling of the SVE effluent at three locations, Pre-treatment, Mid-treatment, and Post-treatment (monthly).
- All information will be recorded on the inspection logs.

6. Regular Maintenance

Manufacturer recommended maintenance is performed twice to three times annually by an approved mechanic. Maintenance includes changing of the oil, filter elements, belts, and filter mats, as specified in the individual system component manual which are provided in the manufacturers Operations Manual. The system operator should keep a log of anything out of the ordinary and provide to the appropriate maintenance personnel. Typical things that should be noted are listed below:

- Rattling of solenoid valves can indicate that the valve is dirty and needs to be replaced.
- Drifting O3 percentage could indicate a problem with the UV lamp within the ozone monitor.
- Record any potential fluid or air leaks.
- Irregularity in the typical system component sounds. Listen to the operation of the compressor, ozone generator, booster pump, and dryer. If something doesn't sound right, it probably isn't.
- Report any of the items listed above to the system manager.

7. Alarm Acknowledgement

The SVE and ozone injection systems are equipped with a telemetry function that notifies the operator when the system goes down. The alarm is transmitted by email. The system operator will investigate the problem once an alarm message is received. Once the problem is identified, the system operator should contact the system manager. A decision will then be made

on how the problem will be resolved. The system manager will then inform National Grid of the problem and the steps being taken to resolve the problem.

8. Health and Safety

Anyone entering the system will comply with the site-specific Health and Safety Plan (HASP). Additional Health and Safety hazards include:

- Elevated ozone levels – The PEL for ozone is 0.1 parts per million (ppm). The system will shut itself down if concentrations within the Ozone Generation Room meet or exceed this value. The system operator should verify ozone levels prior to entering the Ozone Generation Room at the office computer. The system operator will scan the breathing air within the room with a hand held ozone analyzer.
- Mechanical hazards when working on equipment – The system operator will ensure that the power is disconnected from the system components when maintenance has to be completed. This will be completed by shutting down the individual circuit breakers. Proper lock out/tag out procedures will be implemented in accordance with the HASP.

9. Site Contacts

Key site personnel are listed below. Refer to site-specific work plan for updated list.

- **System Manager**
  Jeff Parillo
  GEI Consultants, Inc.
  Office – 860.368.5374
  Cell – 631.481.5949
- **System Operator**
  Chris Berotti
  GEI Consultants, Inc.
  Office – 631.759.2961
  Cell – 631.481.5868
- **System Manufacturer**
  PIPER Environmental
  Anthony Rutland, System Technician
  Office – 831.632.2700

- **Maintenance Vender**
  Fenley and Nicol Environmental, Inc.
  Office – 631.586.4900
  Mike Ryan, Mechanic
  Cell – 516.768.8765
  Mathew Schieferstein, Project Manager
  Cell – 516.702.0025
- **Kaeser Representative**
  Industrial Sales and Service
  Tom Nelan, President
  Cell – 631.420.4800
  Office – 516.807.0463
- **Cold Shot Chiller Representative**
  The TurboChyll Company
  Sean Libby
  Office – 516.223.6494
  Fax – 516.223.6496

STANDARD OPERATING PROCEDURE

SI-002A - Ozone Injection System Fresh Air Purge

1. Objective

The purpose of this Standard Operating Procedure (SOP) is to identify the procedures needed to purge ozone from the injection lines and injection manifolds. Fresh air purges are a tool that the system operator can use to clear ozone gas from ozone generation equipment and piping.

Fresh air purges will be completed prior to conducting any maintenance on the ozone injection system and during any leak/pressure testing activities to ensure that the system maintenance is conducted safely with minimal chance of ozone exposure.

2. Fresh Air Purge Execution

The ozone Injection system is designed to generate a 1.0 to 3.0 percent ozone gas mixture and inject it directly into the subsurface through a series of stainless steel injection wells. There are two identical system trains in place for the Ozone injection system. Only one train is in operation at any given time. The injection process is controlled by the Human Machine Interface (HMI), three remote system manifolds, solenoid valves, and the control logic. The following steps will direct the system operator on how to conduct a fresh air purge.

2.1 Accessing the Ozone Generation Room and the HMI

- Follow proper health and safety procedures when entering the system from lobby area.
- Prior to entering, review ambient ozone levels and alarm history at the main computer.
- Before entering the ozone generation room, verify ambient ozone levels on the ozone monitor located outside of the doorway.
- Confirm the levels by using a handheld ozone monitor by screening through the fixed sampling port.
- If elevated ozone levels are present (0.1 parts per million (ppm) or above), do not enter the room. Once ozone levels reach 0.1 ppm, the system is programmed to shut down automatically. Wait until the ventilation system has had enough time to clear the room of ozone before entering.
- Enter the ozone generation room once you confirm that it is safe.
- The HMI is located on the eastern wall of the ozone generation room. Activate the touch screen by pressing anywhere on the screen.

2.2 Running the System in Rapid Cycle

- Access the Ozone System Run Screen* and shut off the operating ozone generation train. Follow the prompt on the screen and allow the system to purge.
- Access the Rapid Cycle Run Screen*, select all valves and desired purge time per valve. The default purge time is set at one minute per valve. Each of the 63 valves should be purged at least twice for a total purge time of 126 minutes. Choose the most recent ozone generation train in operation and turn rapid cycle on. The compressor on the injection skid will start running and compressed air will be injected though the lines. Confirm that the voltage reading on the ozone generators are reading 0 volts.
- The system should run in rapid cycle so that each injection point has been purged with air.
- Once the purge has completed, maintenance activities may begin.

*A security code is required to access the Ozone System Run Screen as well as the Rapid Cycle Run Screen. The security code will be provided by management as needed.

STANDARD OPERATING PROCEDURE

SI-002B - Ozone Injection Skid Maintenance

1. Objective

The purpose of this Standard Operating Procedure (SOP) is to identify the procedures needed to safely perform maintenance on the ozone injection skid, and limit the potential for exposure to ozone.

2. Ozone Injection Skid Maintenance Execution

The ozone injection skid includes ozone compressors that pressurize the ozone enriched air and delivers it through stainless steel piping to the injection manifolds located in the outbuildings. There are two ozone compressors, one for each treatment train. One ozone compressor is in operation at a time. Maintenance is conducted on the manifolds twice a year and includes checking the pump seals for leakage or ware and replacement as necessary. Additional maintenance may be needed if leaks develop.

Please follow all health and safety protocols and SOPs (SI-002 and SI-002A) before entering the ozone generation room. All injection skid maintenance will be performed by a minimum of two trained personnel.

2.1 Ozone Compressor Maintenance

- Operate the ozone injection system in rapid cycle (please see SI – 002A for rapid cycle operation) for a minimum of 30 minutes per train to clear any ozone from the injection lines, injection skid manifold, and ozone compressors.
- Please note that both ozone injection trains will need to be purged individually prior to conducting any maintenance.
- Isolate the train operating in rapid cycle. On the dormant pump, close the valve between the pump and the injection piping.
- While the system is operating in rapid cycle, determine which outbuilding manifold is injecting. Close the valves on the ozone manifold that are not injecting. Turn off rapid cycle. Immediately following the ozone compressor shut down, close the last ozone manifold valve. This should prevent back flow of ozone enriched air back into the injection skid and ozone compressors.
- Ozone injection lines will remain pressurized. When breaking any connection in the ozone injection line, a handheld ozone monitor must be used to verify the presence of any ozone levels contained inside the lines. The handheld ozone monitor sampling intake should be held as close to the opening as work will allow. If ozone is present, proper health and

safety precautions will be taken. If ozone is not observed at or above 0.1 parts per million (ppm), work will continue as planned.

- Once the ozone compressor maintenance is complete, open all valves and restart the system in rapid cycle. Leak test the entire manifold. Once you confirm that there aren't any leaks, initiate ozone injection through the Human Machine Interface (HMI).
- Screen each joint of the ozone compressor with the hand held monitor during ozone operation to confirm that ozone is not leaking. Once confirmed, the maintenance is complete.

STANDARD OPERATING PROCEDURE

SI-002C - Ozone Injection System Outbuilding Access

1. Objective

The purpose of this Standard Operating Procedure (SOP) is to identify procedures used to physically enter the remote outbuildings and to ensure that maintenance tasks are conducted safely with minimal chance of exposure to ozone. Potential maintenance includes sensor calibration/repair/replacement, leak testing, and valve/plumbing replacement.

2. Ozone Outbuilding Access

Three ozone injection manifolds are located in the well field on the southern side of the Groundwater Treatment Building. Each ozone injection manifold is housed in an outbuilding that covers the manifold and a portion of the trenching.

Each outbuilding is considered a permit required confined space unless the roof is removed and the sliding door on the south side of each building is open. The outbuilding roofs are heavy and will require two people using proper lifting methods to open properly. No personnel will enter the building unless these requirements are met:

- There must be two trained personnel on-site for the duration of any maintenance inside the outbuildings.
- Complete a fresh air purge prior to entering the outbuildings (please see section SI-002A).
- Before removing the outbuilding roof, screen ozone levels using a hand held ozone monitor. Insert the monitor in the screening port located on the northern wall of the outbuilding. Once the outbuilding roof has been removed and the door is open, screen the area for the presence of ozone. Start from the top and work your way down to the trench.
- Ozone injection lines will remain pressurized. When breaking any connection in the ozone injection lines, use a handheld ozone monitor to verify any ozone levels contained inside lines. The handheld ozone monitor sampling intake should be held as close to the opening as work will allow. If ozone is present, proper health and safety precautions will be taken. If no ozone is present, work will continue as planned.
- Complete all necessary maintenance. If a connection is broken, once re-plumbed, conduct a leak test using a fresh air purge.

The outbuildings must be closed if no one is on-site. The entrance procedure must be followed each time access is required.

STANDARD OPERATING PROCEDURE

SM-002 VOC Soil Sample Collection and Preservation Method

1. Objective

Describe methods to collect and preserve soil samples for analysis of Volatile Organic Compounds (VOCs) in accordance with the U.S. Environmental Protection Agency (EPA) Method 5035.

Some states have adopted soil sampling and preservation methods that vary from the procedures presented herein. Confirm that this method is appropriate for your project.

2. Execution

VOCs evaporate readily at normal temperatures and pressures. Care should be taken during sampling and preservation to limit the potential for VOCs to off-gas from the soil sample prior to being analyzed by the laboratory.

Soil samples should be obtained utilizing a small diameter core sampler such as a 10 milliliter (ml) plastic disposable syringe, an EnCore® sampler, an EasyDraw Syringe®. The EnCore® sampler is the only EPA-approved small diameter core sampler that can be used to collect the sample, store the sample, and transport the sample to the lab.

A separate soil sample must be collected and submitted to the laboratory for percent solids testing. At least approximately 20 grams of soil must be collected in a separate glass or plastic sampling container.

2.1. Collection and Preservation of Soil Samples

Three types of soil samples may be collected for VOCs analysis:

- High (typically >200 µg/kg) VOC concentration soil sample (Section 2.2 below)
- Low (typically 0.05-200 µg/kg) VOC concentration soil sample (Section 2.3 below)
- Synthetic Precipitation Leaching Procedure/Toxicity Characteristic Leaching Procedure (SPLP/TCLP) soil sample (Section 2.4 below)

2.2. Collection and Preservation of a Soil Sample with "High" Concentrations of VOCs (typically >200 µg/kg)

2.2.1. Option 1 – Methanol Preservation Method

Supplies include: an electronic field balance (in some cases), two VOC vials (per sample) with 10 ml methanol (the number of vials and amount of methanol might vary among labs), and a small diameter core sampler to collect an approximately 10 gram soil sample. Some labs, and EPA method 5035, specify a 5 gram soil sample. Check with the lab or project manager for the amount to collect.

Sampling Procedure:

- Weigh the VOC vials containing the methanol and record the weight. Some laboratories provide pre-weighed VOC vials.
- If you are weighing your samples, take a test sample with the sampler and weigh it to evaluate how close you are to the appropriate sample weight. If the laboratory VOC vial is pre-marked with a line, then you do not need to weigh the soil, just fill the VOC vial with soil until the methanol and soil mixture reaches the line.
- Collect the sample using the sampling device and extrude the sample into the preserved VOC vial. Be sure that the VOC vial and cap threads are free of soil, and then screw the cap tightly onto the VOC vial. Gently swirl the methanol in the VOC vial to coat the soil sample. Do not vigorously shake the vial.
- If necessary, weigh the VOC vial and record the weight. Some laboratories will weigh the vials at the lab, and it is not required in the field.
- Collect separate soil samples from the same area for percent solids and head space sampling.
- Samples must be frozen or analyzed within 14 days.

2.2.2. Option 2 – EnCore® Sampling Method

Supplies needed: One 5 or 10 ml EnCore® sampler.

Sampling Procedure:

- Label the EnCore® sampling container.
- Collect the soil sample quickly, wipe the sampler free of soil, and seal the sampler.
- Place sampler in a clean ziplock bag and place on ice in a cooler.
- Collect separate samples in separate containers for percent solids and head space sampling.
- Samples must be frozen, or preserved, or analyzed within 48 hours (requires coordination with the laboratory).

2.3. Collection and Preservation of a Soil Sample with "Low" Concentrations of VOCs (typically 0.5 to 200 µg/kg)

2.3.1. Option 1 – Water Preservation Method

Supplies required: an electronic field balance, two 40 ml VOC vials pre-weighed and containing 5 ml of water, a magnetic stirrer, and a sampling device.

Sampling Procedure:

- Use a small diameter core sampler to collect two soil samples (5 grams each) into pre-weighed 40 ml VOC vials with 5 ml of water and a magnetic stirrer. Wipe threads and cap and seal the VOC vial. Repeat for the second VOC vial.
- Weigh the VOC vials and record the weights.
- Collect separate samples in separate containers for percent solids and head space sampling.
- Samples must be frozen or analyzed within 14 days.

2.3.2. Option 2 – Collection into Unpreserved VOC Vials

Supplies required: electronic field balance, two 40 ml VOC vials pre-weighed, and a sampling device.

Sampling Procedure:

- Collect the sample using the sampling device and extrude the sample into the VOC vial. Be sure that the threads are free of soil, and cap and seal the VOC vial. Repeat for the second vial.
- Weigh the VOC vials and record the weights.
- Collect separate samples in separate containers for percent solids and head space sampling.
- Samples must be frozen or analyzed within 48 hours (requires coordination with the laboratory).

2.3.3. Option 3 – Collection in VOC Vials Preserved with Sodium Bisulfate

Supplies required: electronic field balance, two VOC vials pre-weighed with 5 ml of sodium bisulfate, a magnetic stir bar, and a sampling device.

Sampling Procedure:

- Collect the sample using the sampling device and extrude a 5 gram sample into the VOC vial containing the sodium bisulfate. Wipe threads and cap and seal the VOC vial. Repeat for the second VOC vial.
- Weigh the VOC vials and record the weights.

- Collect separate samples in separate containers for percent solids and head space sampling.
- Samples must be frozen or analyzed within 14 days.

2.3.4. Option 4 –EnCore® Sampling Method

Supplies required: two 5 gram EnCore® samplers.

Sampling Procedure:

- Label the EnCore® sampling container.
- Collect the soil sample quickly, wipe the sampler free of soil, and seal the sampler.
- Place sampler in a clean ziplock bag and place on ice in a cooler.
- Collect separate samples in separate containers for percent solids and head space sampling.
- Repeat previous steps with the second EnCore® device.
  Samples must be frozen, or preserved, or analyzed within 48 hours (requires coordination with the laboratory).

2.4. Collection of samples being analyzed for VOCs by the TCLP or SPLP method

Sampling methods for TCLP or SPLP are similar to the methods presented above. The appropriate method is determined by local regulations. If using an EnCore® sampler, a 25 gram sampler should be used.

3. General Guidance

- Each state and federal regulatory agency has unique soil preservation requirements. Always verify collection and preservation methods with governing bodies.
- Verify preservation techniques with laboratory prior to sample collection.

4. Contacts

Lynn Willey
Mark Ensign

STANDARD OPERATING PROCEDURE

SM-003 Classification of Soil Samples in the Field

1. Objective

Describe methods to classify soil samples collected in the field in a consistent manner.

2. Execution

- Describe soil samples according to *ASTM D2488-09a, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) and* Attachments A and B*.* This standard is the basis for the Unified oil Classification System.
- Identify and record the soil in terms of the major and minor constituents (i.e., sand gravel, silt, clay), Unified Soil Classification Symbol, sample structure, plasticity and dilatancy for fine-grained soils, color, local or geologic name if known (e.g., Boston Blue Clay or glacial till), odor, presence of iron or other staining, and presence of organic matter, shells, debris, or other unusual characteristics of the same.
- If a soil split-spoon sample contains more than one soil type (for example, the upper portion is silty sand and the lower portion is clay) describe each type separately.
- Record sampler type, blow counts, soil description, etc. on the boring log (see Attachment C).
- GEI consistently applies one modification to the ASTM standard: Use "widely graded" and "narrowly graded" instead of "well-graded" and "poorly graded," respectively.

3. Limitations

Certain projects or clients will require the use of other classification systems. Other classification systems should not be used unless specifically required by the client. If the client requires that we use the Burmister method, obtain the details from the client. An example breakdown is shown below, but some clients (MassDOT, for example) have their own breakdown.

- “and” = 35-50%
- “some” = 20-35%
- “little” = 10-20%
- “trace” = 1-10%

- Describing soil samples is often difficult during cold or wet weather. Make sure your field notes describe these conditions. When possible, collect archive samples and verify sample descriptions in the office.

- The ASTM Standard Practice for Classification of Soils for Engineering Purposes (D2487) may be used in conjunction with the Visual-Manual Method to confirm the soil classification. D2487 includes laboratory testing.

4. References

ASTM D2487-06e1, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System), ASTM, 2006.

ASTM D2488-09a, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), ASTM, 2009.

Field Guide for Soil and Stratigraphic Analysis, Midwest Geosciences Group Press, 2001-2005.

Coarse-Grained Soils Visual-Manual Descriptions, GEI Consultants, Soil Description Chart.

Fine-Grained Soils Visual-Manual Descriptions, GEI Consultants, Soil Description Chart.

5. Attachments

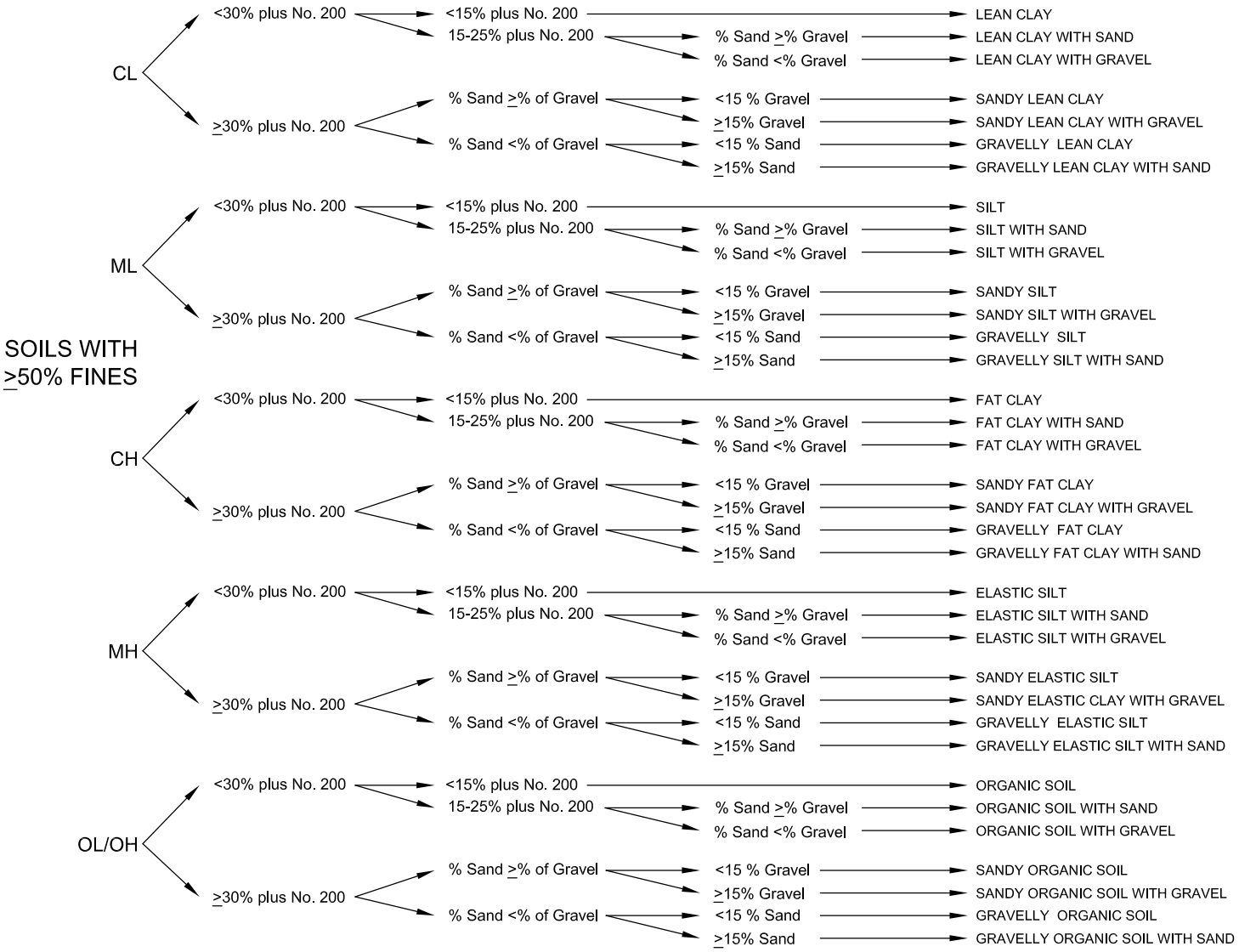
Attachment A – GEI Soil Description Charts (2007)
Attachment B – Visual Manual Descriptions with example boring log
Attachment C – Describing the Plasticity of Soil Samples

6. Contacts

Lynn Willey
Cathy Johnson

GEI Consultants

FINE-GRAINED SOILS
VISUAL-MANUAL DESCRIPTIONS



ID OF INORGANIC FINE SOILS FROM MANUAL TESTS

Symbol	Name	Dry Strength	Dilatancy	Toughness*
ML	Silt	None to low	Slow to rapid	Low or thread cannot be formed
CL	Lean Clay	Medium to high	None to slow	Medium
MH	Elastic Silt	Low to medium	None to slow	Low to medium
CH	Fat Clay	High to very high	None	High

1. GROUP NAME and (SYMBOL)
2. Describe fines, sand, and gravel components, in order of predominance. Include plasticity of fines. Include percentages of sand and gravel.
3. Color
4. Sheen, odor, roots, ash, brick, cementation, torvane and penetrometer results, etc.
5. "Fill," local name or geologic name, if known

PEAT

Peat refers to a sample composed primarily of vegetable matter in varying stages of decomposition. The description should begin: PEAT (PT) and need not include percentages of sand, gravel or fines.

CRITERIA FOR DESCRIBING PLASTICITY

Description	Criteria
Nonplastic ML	A 1/8-in. (3 -mm) thread cannot be rolled at any water content
Low Plasticity ML, MH	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit *
Medium Plasticity MH, CL	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit
High Plasticity CH	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit

* Toughness refers to the strength of the thread near plastic limit. The lump refers to a lump of soil drier than the plastic, similar to dry strength.

COARSE-GRAINED SOILS

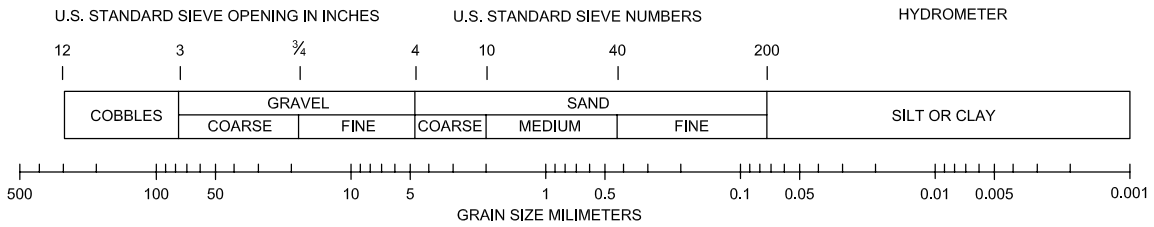
VISUAL-MANUAL DESCRIPTIONS

GEI Consultants

TYPICAL SOIL COLORS

- YELLOW
- OLIVE
- LIGHT BROWN
- BROWN
- REDDISH BROWN
- RED
- GRAY
- BLACK

				GROUP SYMBOL	GROUP NAME
GRAVEL (% Gravel > % Sand)	≤5% Fines	WIDELY GRADED		GW	<15% Sand → WIDELY GRADED GRAVEL
					≥15% Sand → WIDELY GRADED GRAVEL WITH SAND
		NARROWLY GRADED		GP	<15% Sand → NARROWLY GRADED GRAVEL
					≥15% Sand → NARROWLY GRADED GRAVEL WITH SAND
	~10% Fines	WIDELY GRADED	Fines = ML or MH	GW-GM	<15% Sand → WIDELY GRADED GRAVEL WITH SILT
					≥15% Sand → WIDELY GRADED GRAVEL WITH SILT AND SAND
			Fines = CL or CH	GW-GC	<15% Sand → WIDELY GRADED GRAVEL WITH CLAY
					≥15% Sand → WIDELY GRADED GRAVEL WITH CLAY AND SAND
		NARROWLY GRADED	Fines = ML or MH	GP-GM	<15% Sand → NARROWLY GRADED GRAVEL WITH SILT
					≥15% Sand → NARROWLY GRADED GRAVEL WITH SILT AND SAND
			Fines = CL or CH	GP-GC	<15% Sand → NARROWLY GRADED GRAVEL WITH CLAY
					≥15% Sand → NARROWLY GRADED GRAVEL WITH CLAY AND SAND
	≥15% Fines		Fines = ML or MH	GM	<15% Sand → SILTY GRAVEL
					≥15% Sand → SILTY GRAVEL WITH SAND
			Fines = CL or CH	GC	<15% Sand → CLAYEY GRAVEL
					≥15% Sand → CLAYEY GRAVEL WITH SAND
SOILS WITH <50% FINES					
SAND (% Sand ≥ % Gravel)	≤5% Fines	WIDELY GRADED		SW	<15% Gravel → WIDELY GRADED SAND
					≥15% Gravel → WIDELY GRADED SAND WITH GRAVEL
		NARROWLY GRADED		SP	<15% Gravel → NARROWLY GRADED SAND
					≥15% Gravel → NARROWLY GRADED SAND WITH GRAVEL
	~10% Fines	WIDELY GRADED	Fines = ML or MH	SW-SM	<15% Gravel → WIDELY GRADED SAND WITH SILT
					≥15% Gravel → WIDELY GRADED SAND WITH SILT AND GRAVEL
			Fines = CL or CH	SW-SC	<15% Gravel → WIDELY GRADED SAND WITH CLAY
					≥15% Gravel → WIDELY GRADED SAND WITH CLAY AND GRAVEL
		NARROWLY GRADED	Fines = ML or MH	SP-SM	<15% Gravel → NARROWLY GRADED SAND WITH SILT
					≥15% Gravel → NARROWLY GRADED SAND WITH SILT AND GRAVEL
			Fines = CL or CH	SP-SC	<15% Gravel → NARROWLY GRADED SAND WITH CLAY
					≥15% Gravel → NARROWLY GRADED SAND WITH CLAY AND GRAVEL
	≥15% Fines		Fines = ML or MH	SM	<15% Gravel → SILTY SAND
					≥15% Gravel → SILTY SAND WITH GRAVEL
			Fines = CL or CH	SC	<15% Gravel → CLAYEY SAND
					≥15% Gravel → CLAYEY SAND WITH GRAVEL



1. GROUP NAME and (SYMBOL)
2. Structure , if any. (stratified layer thicknesses, lenses, varves, gradational changes)
3. Describe sand, gravel and fines components, with percentages, in order of predominance. Include max gravel size. For test pits give percent cobbles and boulders, by volume, and include max size.
4. Color
5. Sheen, odor, roots, ash, brick, cementation, reaction with HCL, etc.
6. "Fill," local name or geologic name, if known

Describing the Plasticity of Soil Samples

M. Paster – November 2008

References ASTM D 2487 – Soil descriptions – lab
ASTM D 2488 – Soil descriptions – field
ASTM D 4318 – Atterberg limits testing

GEI Practice for Boring and Test Pit Logs

Describe the fines as:

Non-plastic
Low plasticity (The GEI laminated sheets incorrectly use "slightly plastic" for "low plasticity.")
Medium plasticity
High plasticity

Example: ~25% low plasticity fines

Toughness and dry strength:

You should use these tests to help decide how plastic the fines are. Record the results in the remarks column of the field log, but not in the soil description and not necessarily in the typed log.

On final logs, if Atterberg limits tests have been performed:

Do not use the descriptive terms non-plastic, low plasticity, etc. for samples on which Atterberg limits tests have been run. Instead, just give the percentage of fines and then report the actual Atterberg limits at the end of the description.

For example, the end of a silty sand description might be:
. . . ~25% fines, ~10% gravel max size ½ inch, gray. PL=23, LL=35.

(Atterberg limits tests are performed on the fraction of the sample finer than the No. 40 sieve, not just the fines. So the Atterberg limits data applies to the sample, not just to the fines.)

Hints:

High plasticity soils are rare in New England. If you think it's high plasticity, it's probably medium. Some Boston blue clay and some Connecticut River varved clays are high plasticity, but if you think you've found some, check with the project manager.

In New England, if ~10% fines or more, generally stick with GM, SM, ML, and CL. Occasionally GC, SC, CH. Don't use MH unless you have Atterberg limits data.

Estimating plasticity in the field, GEI guidance based on ASTM D 2488:

Plasticity	1/8-inch thread	Dry strength	Toughness
non	Cannot be rolled at any water content.	Dry specimen crumbles when handled.	Only slight pressure needed to roll thread near plastic limit.
low	Thread can barely be rolled.	Dry specimen crumbles with some finger pressure.	Slight to medium pressure needed to roll thread near plastic limit.
medium	Thread is easy to roll. Not much time needed to reach plastic limit.	Dry specimen crumbles with considerable finger pressure.	Medium pressure needed to roll thread near plastic limit.
high	Takes considerable time rolling and kneading to reach plastic limit.	Dry specimen cannot be broken with finger pressure.	Considerable pressure needed to roll thread near plastic limit.

Non-plastic vs. low plasticity:

ASTM D 2488 (soil descriptions - field) defines non-plastic and low plasticity based on the 1/8-inch thread as shown in the table above.

ASTM D 4318 (Atterberg limits testing) indicates that a sample should be called non-plastic for either of the following cases:

- The liquid limit test (dropping the cup) or the plastic limit test (rolling out the thread) cannot be performed because the plasticity is too low.
- The plastic limit is greater than or equal to the liquid limit.

Unfortunately, there are some soils that are low plasticity based on D 2488 (a thread can be rolled), but are non-plastic based on D 4318 (the liquid limit cannot be measured or PL≥LL).

GEI considers these soils to have low plasticity, because that is how they "look" and "feel." We want to document this information so that other people will have a better feel for what the soil looks like and how it behaves. So, if the soil was low plasticity based on D 2488, but non-plastic based on D 4318, that should be explained in the letter or report, and possibly in a note on the log.

BORING LOCATION Maple Ave Sidewalk
GROUND ELEVATION (NGVD) _____
GROUNDWATER EL. _____ DATE _____
DATE START/FINISH 2/14/07 - 2/15/07
DRILLED BY Geologic: M. Costigan
LOGGED BY T. Kahl/M. Yako TOTAL DEPTH (FT) 25

B101

PG. 1 OF 1

EL. FT.	DEPTH FT.	SAMPLE TYPE and NO.	SAMPLE BLOWS PER 6 IN.	SAMPLE PEN IN.	SAMPLE REC IN.	PID JAR HS / REMARKS	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
							FILL	4" pavement
	2.5	S1	13-9 17-14	24	0	0.5 ppm		S1: Redrove 0.5 to 3.5 ft. Recovery 11": WIDELY GRADED SAND (SW) ~85% sand, ~10% gravel to 1", <5% nonplastic fines, brown. Contains brick fragments and ash. Fill.
						hard drilling 3 to 4 ft, possible boulder		
	5	S2	7-7 11-13	24	8	2.0 ppm		S2: NARROWLY GRADED SAND WITH SILT AND GRAVEL (SP-SM) ~65% mostly fine sand, ~25% gravel to 3/4 inch ~10% non-plastic fines, brown. Fill.
	7.5	S3	9-10 2-1	24	16	0.0 ppm	ORGANICS	S3 (0-10"): Similar to S2.
	10							S3 (10"-16"): ORGANIC SILT (OL) ~100% slightly plastic fines, dark gray, organic odor, contains white shell fragments.
	12.5	S4	WOH 1-2 1	24	15	0.0 ppm		S4: Similar to S3, bot 6".
	15					hard drilling at 15.5 ft	TILL	S5: SILTY SAND WITH GRAVEL (SM) ~60% mostly fine sand, ~25% slightly plastic fines, ~15% gravel to 1/2 inch, olive. Glacial Till.
	17.5	S5	20-35 50/3"	15	8	Top of rock ~19 ft. Roller bit to 20 ft.	ROCK	C1: SCHIST, hard, slight weathering at joint surfaces, joints at ~30 degrees from horizontal and generally parallel to foliation, gray. Marlborough Formation.
	20							
	22.5	C1	RQD 70%	60	54	lost ~10 gallons drill fluid from 23 to 25 ft		
	25							Bottom of Boring 25 ft
	27.5							Truck-mounted drill rig. 4-inch casing to 19 ft. Safety-hammer with rope and cathead for SPT. Backfilled with drill cuttings.
	30							

BLOWS PER 6 IN.–140 LB. HAMMER FALLING 30 IN. TO DRIVE A 2.0 IN. OD SPLIT SPOON SAMPLER
PEN–PENETRATION LENGTH OF SAMPLER OR CORE BARREL
REC–RECOVERY LENGTH OF SAMPLE
RQD–LENGTH OF SOUND CORES > 4 IN./ LENGTH CORED, %
S–SPLIT SPOON SAMPLE
U–UNDISTURBED SAMPLES, UF–FIXED PISTON UO–OSTERBERG
▽ GROUNDWATER

NOTES:
1: Groundwater at 10 ft depth at start of day 2/15/07.

PROJECT 07999-0
DATE

GEI Consultants

EXAMPLE SOIL DESCRIPTIONS

SANDY SILT (ML) ~60% slightly plastic fines, ~40% mostly fine sand, 1" thick layer of fine to medium sand with <20% fines, gray.

LEAN CLAY (CL) ~90% moderately plastic fines, ~10% fine sand, olive. Boston Blue Clay. Sv = 0.5, 0.5, 0.8 tsf, Qp = 1.0, 1.5, 1.6 tsf

Stratified CLAYEY SAND (SC) and WIDELY GRADED SAND (SW) SC layers 1 to 2 inches thick consist of fine sand with ~30% moderately plastic fines, gray. SW layers 1 to 4 inches thick consist of fine to coarse sand, ~10% gravel to 1/2 inch, <5% fines, brown. Hydraulic Fill.

EXAMPLE ROCK DESCRIPTIONS

(0-9"): GRANITE, hard, one piece, joint surface slightly weathered, pink.
(6-60"): PHYLLITE, joints ~ 45° generally parallel to foliation, 9" to 44" moderate to severe jointing and joint weathering. 44" to 60" single piece, green-gray.

ARGILLITE, medium hard, moderately weathered joints, gray. Cambridge Argillite.

GEOPROBE AND ROTOSONIC

When SPTs are not performed, note sample density (sands) or stiffness (clays) in description.

CRITERIA FOR DESCRIBING DILATANCY OF FINE-GRAINED SOILS

Description	Criteria
None	No visible change in the specimen
Slow	Water appears slowly on the surface of the specimen during shaking and does not disappear or disappears slowly upon squeezing.
Rapid	Water appears quickly on the surface of the specimen during shaking and disappears quickly upon squeezing.

SPT: Standard Penetration Test

30-inch drop with 140-lb hammer
1 3/4 to 2 1/4 turns around cathead
2-inch O.D. split spoon sampler

ENV'L TERMINOLOGY FOR SOIL DESCRIPTIONS

- **Ash -** Typically silt-size to medium sand-size.
- Do not use the term "cinders." This is not a technical term. Instead, use "ash," "burnt wood," "burnt material," or a similar term.
- **Coal-like material -** If it looks like coal but you aren't sure.
- **Clinker -** Vitrified (glass-like) or heat-fused material. Often burned impurities in coal. Often looks like pumice, but heavier.
- **Slag -** Similar to clinker, but normally refers to residue from metal ore processing.

- **Sheen -** Iridescent petroleum-like sheen. Not to be used for a "bacterial sheen," which can be distinguished by its tendency to break up on the water surface at angles. Petroleum sheen will be continuous and will not break up.
- **Stained -** Use with a color ("brown-stained") to indicate that the soil is stained a color other than its natural (unimpacted) color.
- **Coated -** Soil grains are coated with NAPL (oil, tar, etc.). There is not enough NAPL to saturate the pore spaces. ("Split spoon sampler coated with brown oil." "Soil grains coated with gray substance with slight gasoline-like odor.")
- **Saturated -** The entire sample pore space is saturated with NAPL. If you use this term, be sure it is not water saturating the pore spaces. Depending on viscosity, the NAPL may drain from a soil sample. ("Sample saturated with green, sticky substance.")
- **Blebs -** Discrete sphericals of NAPL in a soil matrix that was not visibly coated or saturated. ("Occasional blebs of reddish-brown tar.")
- **Oil -** Exhibits a petroleum odor, different from MGP odors.
- **Tar -** Exhibits an MGP odor (e.g. naphthalene-like odor).

- **Odors -** Use terms such as "naphthalene-like odor" or "petroleum-like odor." Use modifiers (strong, moderate, slight) to indicate odor intensity.

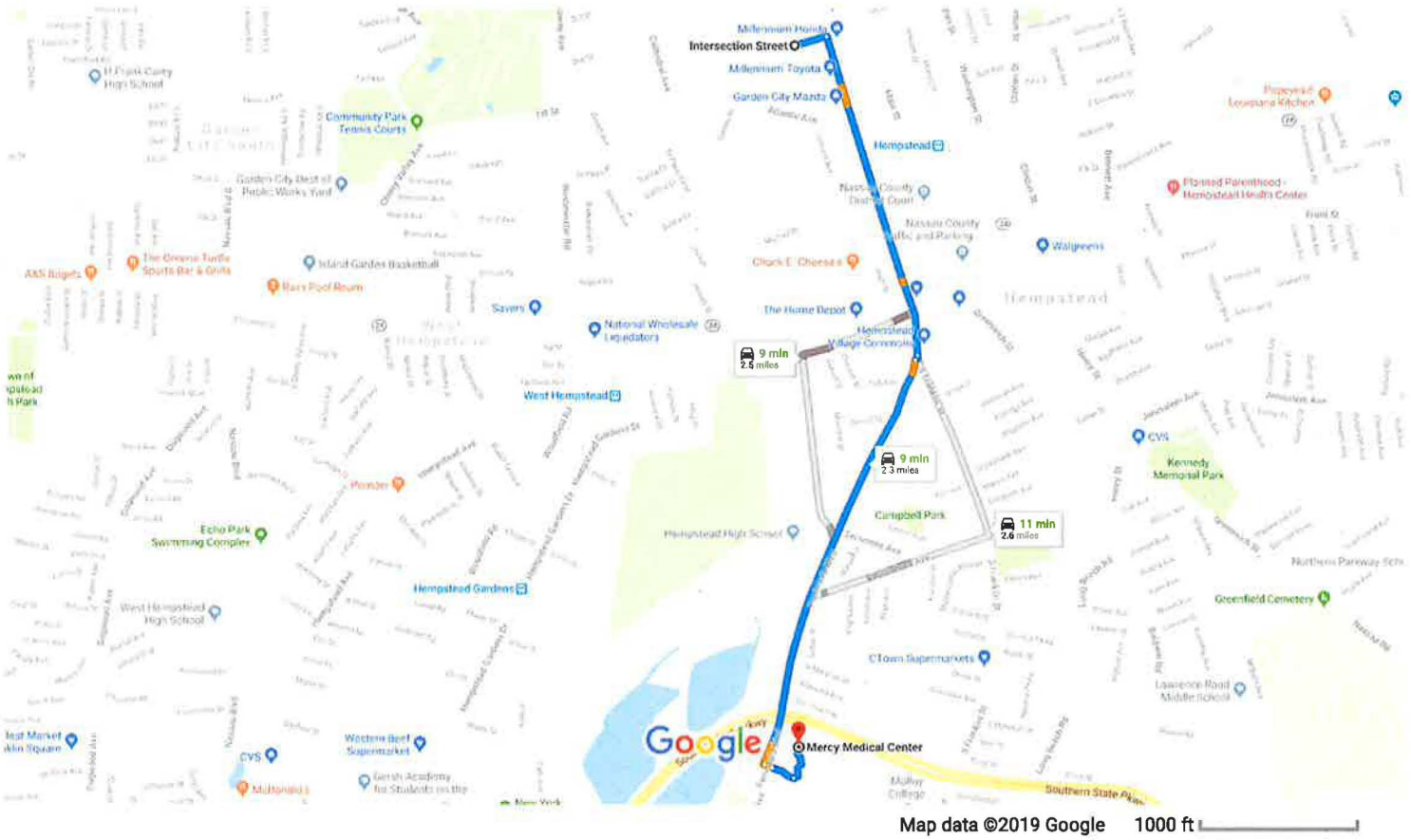
Appendix R

Hempstead Intersection – Site Specific Information

Google Maps

Intersection St, Hempstead, NY 11550 to Mercy Medical Center

Drive 2.3 miles, 9 min



Intersection St

Hempstead, NY 11550

1. Head east on Intersection St toward N Franklin St

469 ft

2. Turn right onto N Franklin St

0.9 mi

3. Slight right onto Adams Ave

85 ft

4. Continue straight onto W Peninsula Blvd

1.2 mi

5. Turn left

121 ft

6. Continue straight

341 ft

7. Turn left

Destination will be on the right

420 ft

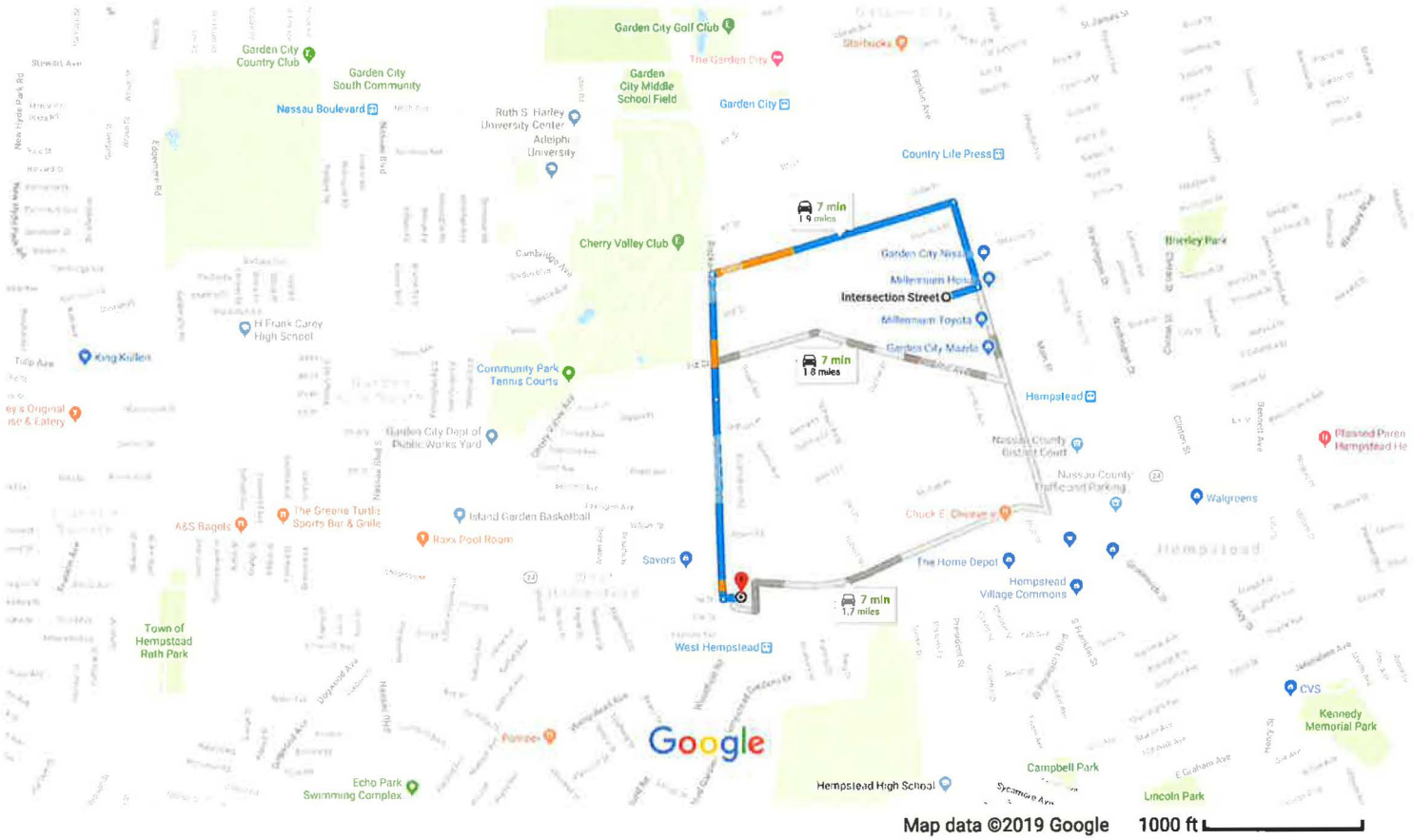
Mercy Medical Center

1000 N Village Ave, Rockville Centre, NY 11570

Google Maps

Intersection St, Hempstead, NY 11550 to Clinic One Urgent Care

Drive 1.9 miles, 7 min



Intersection St

Hempstead, NY 11550

1. Head east on Intersection St toward N Franklin St

469 ft

2. Turn left onto N Franklin St

0.2 mi

3. Turn left onto 3rd St

0.7 mi

4. Turn left onto Rockaway Ave

0.3 mi

5. Continue onto Westminster Rd

0.5 mi

6. Turn left at Ivy St

Destination will be on the left

154 ft

Clinic One Urgent Care

111 Hempstead Turnpike #121, West Hempstead, NY 11552

1. Emergency Contact Information

Table 1r. Hempstead Intersection Emergency Information

Important Phone Numbers		Directions to Hospital
Local Police:	911	To Hospital and Occupational Health Clinic: See Attached Maps and Directions for each site in Appendix A Directions to Hospital: Head East on Intersection Street towards N. Franklin Street then turn right on N. Franklin Street. Turn right onto Adams Avenue and continue straight onto Peninsula Blvd. After 1.2 miles turn left and make another left and the hospital will be on the right.
Fire Department:	911	
Ambulance:	911	
State Police or County Sheriff:	911	
Mercy Medical Center: 1000 North Village Avenue Rockville Centre, NY 11570	(516) 705-2525	
Clinic One: 111 Hempstead Turnpike #121 West Hempstead, NY 11552	(516) 493-9580	
Project Manager: Chris Morris	(631) 759-2967 office (631) 484-9152 cell	
Field Operations Manager: Mike Quinlan	(631) 708-8063 cell	
Corporate Health and Safety Officer : Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell	
Regional Health and Safety Officer Jeena Sheppard	(856) 608-5663 office (856) 298-7138 cell	
Client Contact: Sarah Aldridge	(516) 545-2568 office (860) 334-0554 cell	
Nearest Telephone Location: On-site cellular		

Hempstead-Intersection

Project Description:

Activities conducted at the Halesite Former MGP Site consist primarily of operations, maintenance and monitoring (OM&M) tasks. These tasks include:

- Groundwater Monitoring
- Gauging and Recovery of Dense Non-Aqueous Phase Liquid (DNAPL)
- Oxygen Injection Systems Inspections and Maintenance of oxygen equipment
- Annual site-wide inspections including the caps, groundwater wells, and the oxygen injection systems.
- Site Management Plan (SMP) Implementation, which could include a variety of oversight tasks at, or in the immediate vicinity of the site.

Other activities may be conducted on an as needed basis. These activities may include:

- Site maintenance (such as the refurbishment or restoration of monitoring well caps and pads, replacement of signs, repainting, etc.).
- Installation and/or abandonment of monitoring wells, NAPL recovery wells, oxygen injection wells, and soil vapor points.

Site Description:

The Site is located in the Villages of Hempstead and Garden City, in the Town of Hempstead, Nassau County, New York and encompasses multiple properties. The former MGP portion of the Site is bordered to the north by Second Street, east by a LIRR inactive railroad ROW, south by Intersection Street, and west by a municipal property owned by the Village of Garden City. Other surrounding areas, some portions of which are included in the Site, include a Professional Office Building to the southwest, the POB parking lot to the south, and an active oil storage terminal (Oswego Oil) to the southeast. An active National Grid natural gas regulator station is located within the northwestern portion of the Site. The adjacent properties are commercial and residential. A SMP was established for the site.

Table 2: Activity Hazard Analysis

Activity	Potential Hazard	Control Measures
Carrying Equipment	Heavy lifting, strains/sprains, slips/trips/falls, pinch points	• Use proper lifting techniques as defined in the heavy lifting activity analysis below • Wear the proper type of glove to protect hands against sharp edges and skin/soft tissue injuries • Wear appropriate footwear • Be aware of hard to grip and hold items that may force your hand or wrist into awkward, stressful positions and cause disorders like tendinitis or carpal tunnel syndrome • Take breaks when carrying items frequently and/or for long distances • Do not over reach when picking up or placing items. • Use the buddy system when necessary • When climbing ladders, maintain three points of contact at all times. DO NOT carry equipment up or down ladders unless it is in a secure backpack or similar hands-free shoulder-strap bag or case. Lower or raise larger equipment by crane or rope
Dense Non-Aqueous Phase Liquid (DNAPL) Gauging and Recovery	Contaminant Exposure, Repetition, Slips/Trips/Falls	• Wear proper PPE during sampling including Tyvek or Tyvek apron with sleeves, Nitrile gloves, and face shield/safety glasses. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Drum Handling	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions Heavy Lifting, Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses and face shield as appropriate. • Use proper dollies or drum moving tools. • Use applicable tools to open/close drum lids. • Do not handle drums with bulging sides. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Use proper lifting techniques. • Ask fellow worker for help. • Keep trafficked areas free from slip/trip/fall hazards. • See SOP HS-003
Groundwater Sampling	Contaminant Exposure, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses and Nitrile/neoprene gloves. • Dispose of gloves after use and wash hands. • User proper lifting techniques. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.

Activity	Potential Hazard	Control Measures
Waste Characterization	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions, Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Keep trafficked areas free from slip/trip/fall hazards.
Heavy Equipment – Working Near	Struck-by, caught-in-between equipment, crushing, pinch points	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or (electrical hazard) EH-rated safety boots with composite toe and shank; safety glasses; nitrile/neoprene gloves; and earplugs. • Identify yourself and your work location to heavy equipment operators, so they may incorporate you into their operations. • Coordinate hand signals with operators. • Stay Alert! Pay attention to equipment backup alarms and swing radii. • Wear a high-visibility, reflective vest when working near equipment or motor vehicle traffic. • Position yourself in a safe location when filling out logs talking with the contractor. • Notify the contractor immediately if any problems arise. • Do not stand or sit under suspended loads or near any pressurized equipment lines. • Do not operate cellular telephones in the vicinity of heavy equipment operation. • See SOP HS-018
Site Cap Inspection (Annual)	Slips, Trips and Falls	• Keep trafficked areas free of slip/trip/fall hazards.
Monitoring well, soil vapor point and/or oxygen injection well installation and abandonment.	Contaminant Exposure, Noise, Contact with Utilities, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls, Drill Rig Proximity	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs. • Confirm utility locate has been completed. • Confirm adequate clearance from overhead utilities. • Dispose of gloves after use and wash hands. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards. • Maintain awareness of location of equipment. Subcontractor use of a spotter for equipment operation
Waste Management	Contaminant Exposure, Cuts/Scrapes	• Wear proper PPE during sampling including Tyvek or Tyvek apron with sleeves, Nitrile gloves, and face shield/safety glasses. • Wear work gloves over nitrile gloves.

Activity	Potential Hazard	Control Measures
Replace well boxes and associated concrete on monitoring wells, soil vapor points and/or oxygen injection wells	Jackhammer Proximity, Silica Dust Inhalation (From Grout/Cement Mixing), Noise	• Wear proper PPE, including safety glasses, hard hat, high visibility reflective vest, and EH rated safety boots. Maintain awareness of location of equipment. • Stay upwind of mixing area. Wear a dust mask if necessary. • Wear hearing protection.
Monthly System Check	Oxygen Explosion Hazard, Slips, Trips and Falls, Electrical Hazards From O2 System Equipment and Other Mechanical Equipment	• No smoking in and around injection shed. Assure fire hazards are removed from in and around shed. Maintain system components to avoid oxygen leaks and electrical shorts that may spark a fire. • Keep trafficked areas free of slip/trip/fall hazards. Maintain a safe distance from unprotected fall areas (south side of site next to 36 N. New York Avenue parking lot). • Adhere to all equipment warning labels and warnings in equipment manuals. Maintain equipment to avoid electrical shorts and other mechanical failures that may lead to electrical injury.

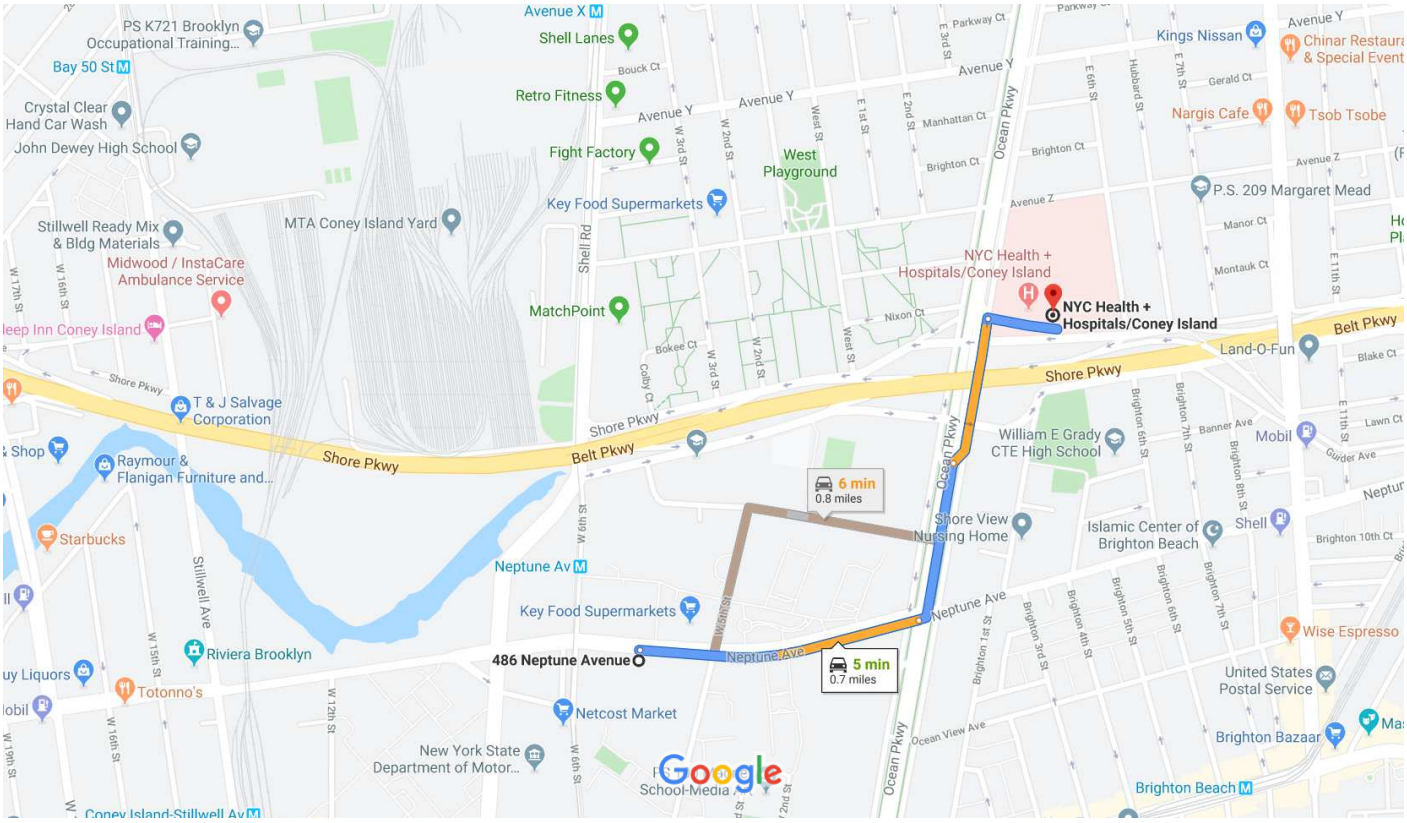
Appendix S

Dangman Park – Site Specific Information

Google Maps

486 Neptune Avenue, Brooklyn, NY to NYC Health + Hospitals/Coney Island

Drive 0.7 mile, 5 min



Map data ©2019 500 ft

486 Neptune Ave

Brooklyn, NY 11224

1. Head east on Neptune Ave toward W 5th St/Marsha Rapaport Way

0.3 mi

2. Turn left onto Ocean Pkwy

0.2 mi

3. Slight right onto Ocean Parkway Service Rd

0.2 mi

4. Turn right

Destination will be on the left

397 ft

NYC Health + Hospitals/Coney Island

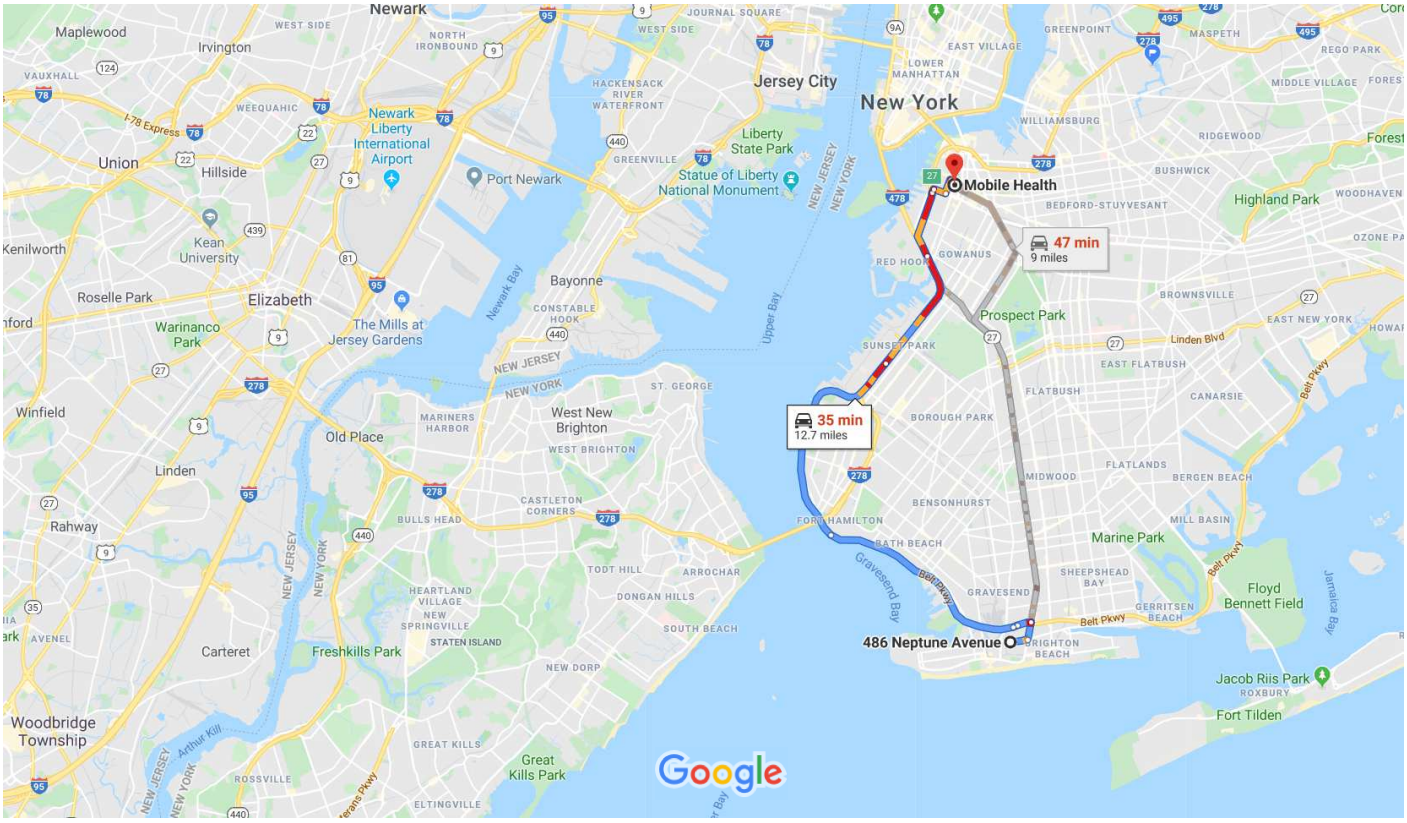
2601 Ocean Pkwy, Brooklyn, NY 11235

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

Google Maps

486 Neptune Avenue, Brooklyn, NY to Mobile Health

Drive 12.7 miles, 35 min



Map data ©2019 Google 2 mi

486 Neptune Ave

Brooklyn, NY 11224

Get on Belt Pkwy/Leif Ericson Dr/Shore Pkwy from Neptune Ave and Ocean Pkwy

5 min (0.9 mi)

1. Head east on Neptune Ave toward W 5th St/Marsha Rapaport Way

0.3 mi

2. Turn left onto Ocean Pkwy

0.3 mi

3. Use the left 2 lanes to turn left onto Shore Pkwy

0.2 mi

4. Use the left lane to merge onto Belt Pkwy/Leif Ericson Dr/Shore Pkwy via the ramp to Verrazano Bridge

456 ft

Follow Belt Pkwy/Leif Ericson Dr/Shore Pkwy and I-278 E to Atlantic Ave. Take exit 27 from I-278 E

20 min (11.2 mi)

5. Merge onto Belt Pkwy/Leif Ericson Dr/Shore Pkwy

3.7 mi

6. Keep left to stay on Belt Pkwy/Leif Ericson Dr/Shore Pkwy

4.0 mi

7. Merge onto I-278 E

2.2 mi

8. Keep right at the fork to stay on I-278 E, follow signs for Bklyn Qns Expressway/Triboro Bridge

1.2 mi

9. Take exit 27 to merge onto Atlantic Ave

358 ft

Continue on Atlantic Ave. Take Clinton St to Court St

5 min (0.6 mi)

10. Merge onto Atlantic Ave

0.2 mi

11. Turn left before Key Food Supermarkets

0.2 mi

12. Turn right onto Remsen St

0.1 mi

13. Turn right onto Court St

Destination will be on the right

279 ft

Mobile Health

50 Court St # 1002, Brooklyn, NY 11201

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

1. Emergency Contact Information

Table 1s. Dangman Park Emergency Information

Important Phone Numbers		Directions to Hospital
Local Police:	911	To Hospital and Occupational Health Clinic: See Attached Maps and Directions Directions to Hospital: Head east on Neptune Avenue toward West 5th Street/Marsha Rapaport Way. Turn left onto Ocean Parkway and head north. Take a slight right onto Ocean Parkway Service Road, the hospital will be on the right.
Fire Department:	911	
Ambulance:	911	
State Police or County Sheriff:	911	
NYC Health + Hospitals/Coney Island: 2601 Ocean Parkway Brooklyn, NY 11235	(844) 872-6639	
Mobile Health 50 Court Street # 1002 Brooklyn, NY 11201	(212) 695-5122	
Project Manager: Chris Morris	(631) 759-2967 office (631) 484-9152 cell	
Field Operations Manager: Mike Quinlan	(631) 708-8063 cell	
Corporate Health and Safety Officer : Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell	
Regional Health and Safety Officer Jeena Sheppard	(856) 608-5663 office (856) 298-7138 cell	
Client Contact: Sarah Aldridge	(516) 545-2568 office (860) 334-0554 cell	
Nearest Telephone Location: On-site cellular		

Dangman Park

Project Description:

Activities conducted at the former Dangman Park MGP Site may be conducted on an as needed basis. These activities may include:

- Installation of soil borings within Neptune Avenue.

Site Description:

The Site is located at 486 Neptune Avenue and occupies an area of approximately 1 acre in the Coney Island section of Brooklyn. The Site occupies portions of two parcels identified as Block 7273 and Lots 1 and 25. These lots are bounded by Neptune Avenue to the north, West 5th Street to the east, a residential property to the south, and a commercial shopping center to the west. The area immediately surrounding the Site is a relatively flat, densely-populated commercial/ residential area.

Table 2: Activity Hazard Analysis

Activity	Potential Hazard	Control Measures
Carrying Equipment	Heavy lifting, strains/sprains, slips/trips/falls, pinch points	• Use proper lifting techniques as defined in the heavy lifting activity analysis below • Wear the proper type of glove to protect hands against sharp edges and skin/soft tissue injuries • Wear appropriate footwear • Be aware of hard to grip and hold items that may force your hand or wrist into awkward, stressful positions and cause disorders like tendinitis or carpal tunnel syndrome • Take breaks when carrying items frequently and/or for long distances • Do not over reach when picking up or placing items. • Use the buddy system when necessary • When climbing ladders, maintain three points of contact at all times. DO NOT carry equipment up or down ladders unless it is in a secure backpack or similar hands-free shoulder-strap bag or case. Lower or raise larger equipment by crane or rope
Drum Handling	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions Heavy Lifting , Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses and face shield as appropriate. • Use proper dollies or drum moving tools. • Use applicable tools to open/close drum lids. • Do not handle drums with bulging sides. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Use proper lifting techniques. • Ask fellow worker for help. • Keep trafficked areas free from slip/trip/fall hazards. • See SOP HS-003
Heavy Equipment – Working Near	Struck-by, caught-in-between equipment, crushing, pinch points	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or (electrical hazard) EH-rated safety boots with composite toe and shank; safety glasses; nitrile/neoprene gloves; and earplugs. • Identify yourself and your work location to heavy equipment operators, so they may incorporate you into their operations. • Coordinate hand signals with operators. • Stay Alert! Pay attention to equipment backup alarms and swing radii. • Wear a high-visibility, reflective vest when working near equipment or motor vehicle traffic. • Position yourself in a safe location when filling out logs talking with the contractor. • Notify the contractor immediately if any problems arise. • Do not stand or sit under suspended loads or near any pressurized equipment lines. • Do not operate cellular telephones in the vicinity of heavy equipment operation. • See SOP HS-018

Activity	Potential Hazard	Control Measures
Soil Sampling	Contaminant Exposure, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs as necessary. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Excavation entry will be allowed only with proper sloping or shoring. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Waste Characterization	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions, Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Keep trafficked areas free from slip/trip/fall hazards.
Waste Management	Contaminant Exposure, Cuts/Scrapes	• Wear proper PPE during sampling including Tyvek or Tyvek apron with sleeves, Nitrile gloves, and face shield/safety glasses. • Wear work gloves over nitrile gloves.

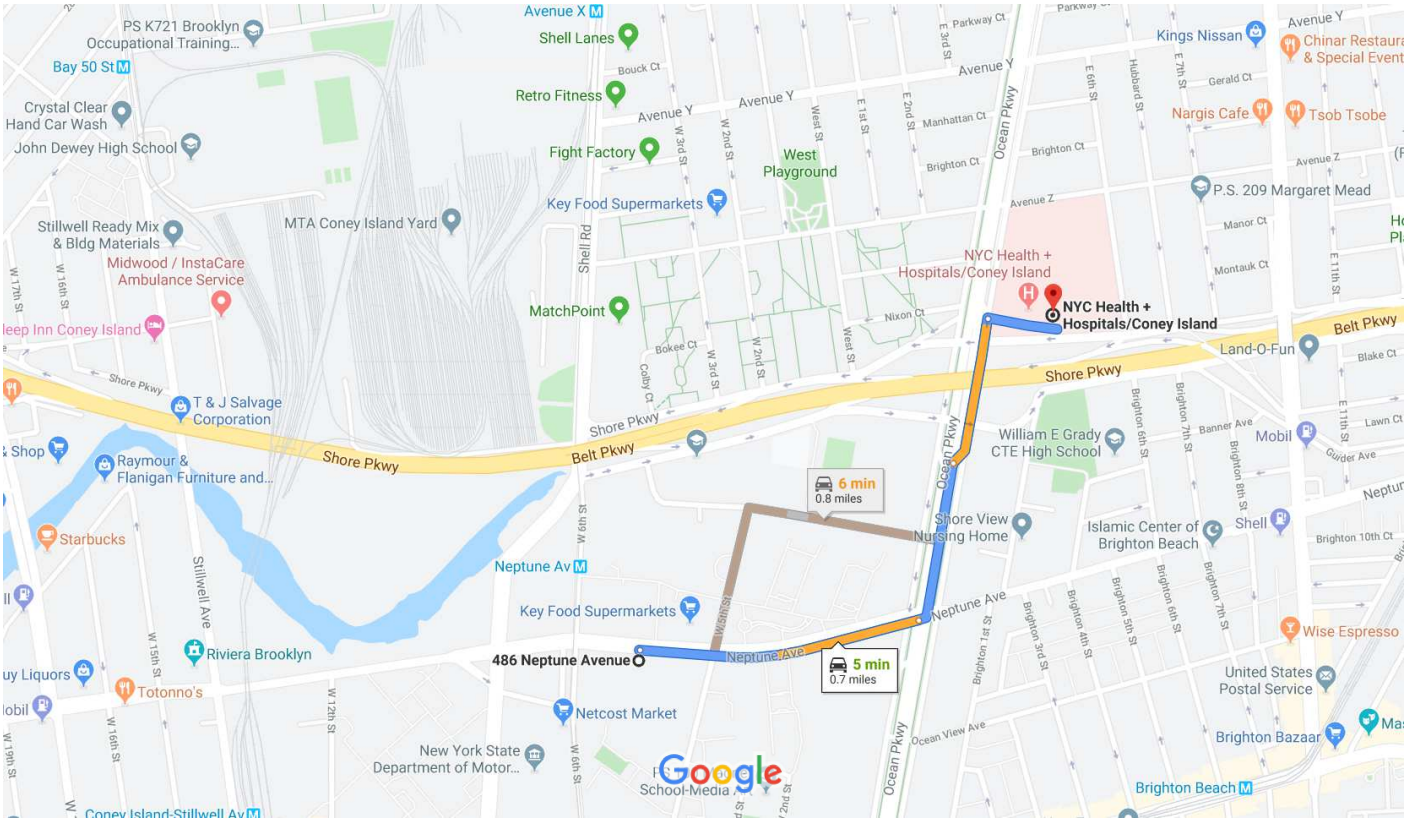
Appendix T

Inwood – Site Specific Information

Google Maps

486 Neptune Avenue, Brooklyn, NY to NYC Health + Hospitals/Coney Island

Drive 0.7 mile, 5 min



Map data ©2019 500 ft

486 Neptune Ave

Brooklyn, NY 11224

1. Head east on Neptune Ave toward W 5th St/Marsha Rapaport Way

0.3 mi

2. Turn left onto Ocean Pkwy

0.2 mi

3. Slight right onto Ocean Parkway Service Rd

0.2 mi

4. Turn right

Destination will be on the left

397 ft

NYC Health + Hospitals/Coney Island

2601 Ocean Pkwy, Brooklyn, NY 11235

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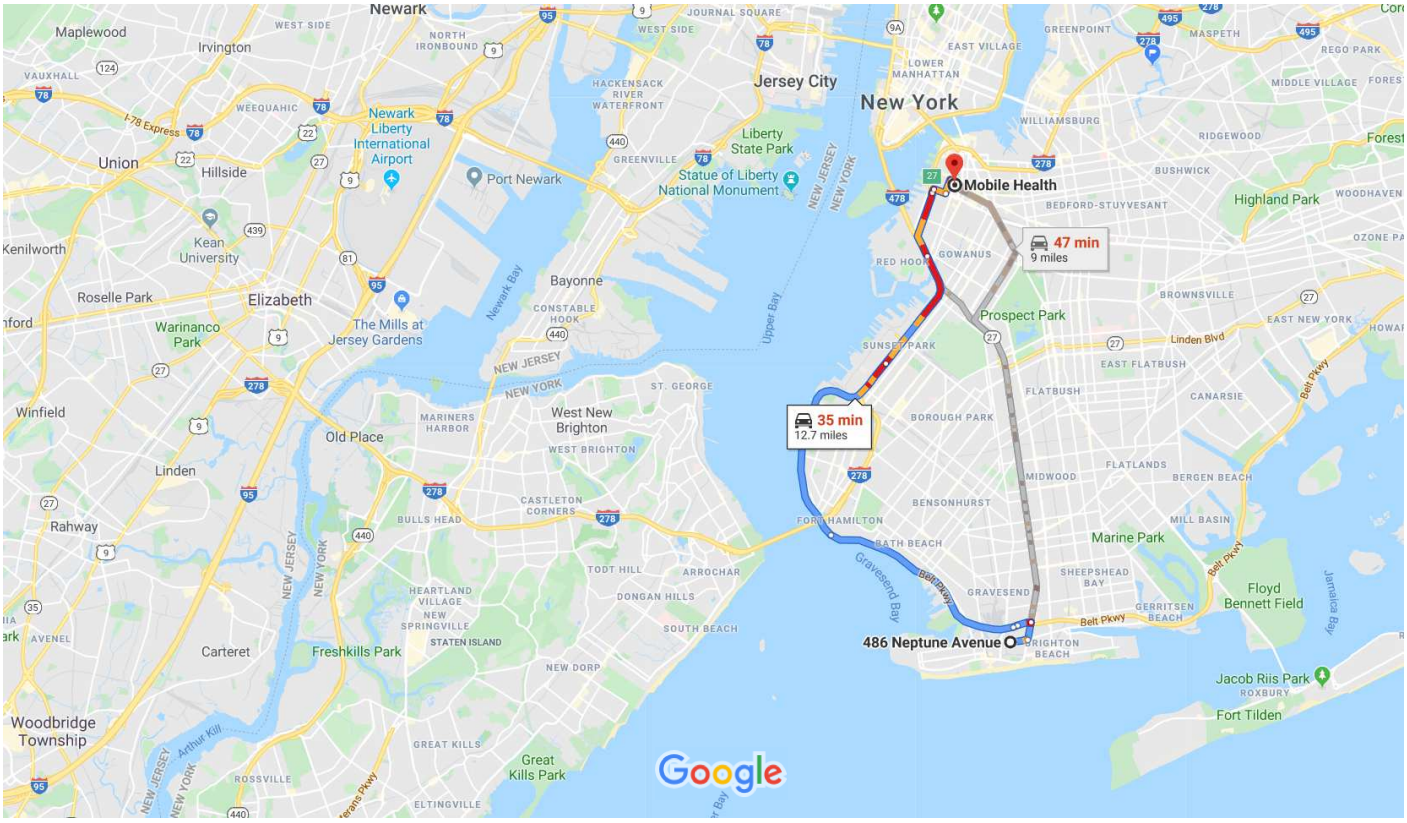
Google Maps

486 Neptune Avenue, Brooklyn, NY to Mobile Health

Drive 12.7 miles, 35 min



Map data ©2019 Google 2 mi

486 Neptune Ave

Brooklyn, NY 11224

Get on Belt Pkwy/Leif Ericson Dr/Shore Pkwy from Neptune Ave and Ocean Pkwy

5 min (0.9 mi)

1. Head east on Neptune Ave toward W 5th St/Marsha Rapaport Way

0.3 mi

2. Turn left onto Ocean Pkwy

0.3 mi

3. Use the left 2 lanes to turn left onto Shore Pkwy

0.2 mi

4. Use the left lane to merge onto Belt Pkwy/Leif Ericson Dr/Shore Pkwy via the ramp to Verrazano Bridge

456 ft

Follow Belt Pkwy/Leif Ericson Dr/Shore Pkwy and I-278 E to Atlantic Ave. Take exit 27 from I-278 E

20 min (11.2 mi)

5. Merge onto Belt Pkwy/Leif Ericson Dr/Shore Pkwy

3.7 mi

6. Keep left to stay on Belt Pkwy/Leif Ericson Dr/Shore Pkwy

4.0 mi

7. Merge onto I-278 E

2.2 mi

8. Keep right at the fork to stay on I-278 E, follow signs for Bklyn Qns Expressway/Triboro Bridge

1.2 mi

9. Take exit 27 to merge onto Atlantic Ave

358 ft

Continue on Atlantic Ave. Take Clinton St to Court St

5 min (0.6 mi)

10. Merge onto Atlantic Ave

0.2 mi

11. Turn left before Key Food Supermarkets

0.2 mi

12. Turn right onto Remsen St

0.1 mi

13. Turn right onto Court St

Destination will be on the right

279 ft

Mobile Health

50 Court St # 1002, Brooklyn, NY 11201

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

1. Emergency Contact Information

Table 1s. Dangman Park Emergency Information

Important Phone Numbers		Directions to Hospital
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Fire Department:	911	
Ambulance:	911	
State Police or County Sheriff:	911	
NYC Health + Hospitals/Coney Island: 2601 Ocean Parkway Brooklyn, NY 11235	(844) 872-6639	
Mobile Health 50 Court Street # 1002 Brooklyn, NY 11201	(212) 695-5122	
Project Manager: Chris Morris	(631) 759-2967 office (631) 484-9152 cell	
Field Operations Manager: Mike Quinlan	(631) 708-8063 cell	
Corporate Health and Safety Officer : Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell	
Regional Health and Safety Officer Jeena Sheppard	(856) 608-5663 office (856) 298-7138 cell	
Client Contact: Sarah Aldridge	(516) 545-2568 office (860) 334-0554 cell	
Nearest Telephone Location: On-site cellular		

Dangman Park

Project Description:

Activities conducted at the former Dangman Park MGP Site may be conducted on an as needed basis. These activities may include:

- Installation of soil borings within Neptune Avenue.

Site Description:

The Site is located at 486 Neptune Avenue and occupies an area of approximately 1 acre in the Coney Island section of Brooklyn. The Site occupies portions of two parcels identified as Block 7273 and Lots 1 and 25. These lots are bounded by Neptune Avenue to the north, West 5th Street to the east, a residential property to the south, and a commercial shopping center to the west. The area immediately surrounding the Site is a relatively flat, densely-populated commercial/ residential area.

Table 2: Activity Hazard Analysis

Activity	Potential Hazard	Control Measures
Carrying Equipment	Heavy lifting, strains/sprains, slips/trips/falls, pinch points	• Use proper lifting techniques as defined in the heavy lifting activity analysis below • Wear the proper type of glove to protect hands against sharp edges and skin/soft tissue injuries • Wear appropriate footwear • Be aware of hard to grip and hold items that may force your hand or wrist into awkward, stressful positions and cause disorders like tendinitis or carpal tunnel syndrome • Take breaks when carrying items frequently and/or for long distances • Do not over reach when picking up or placing items. • Use the buddy system when necessary • When climbing ladders, maintain three points of contact at all times. DO NOT carry equipment up or down ladders unless it is in a secure backpack or similar hands-free shoulder-strap bag or case. Lower or raise larger equipment by crane or rope
Drum Handling	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions Heavy Lifting , Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses and face shield as appropriate. • Use proper dollies or drum moving tools. • Use applicable tools to open/close drum lids. • Do not handle drums with bulging sides. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Use proper lifting techniques. • Ask fellow worker for help. • Keep trafficked areas free from slip/trip/fall hazards. • See SOP HS-003
Heavy Equipment – Working Near	Struck-by, caught-in-between equipment, crushing, pinch points	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or (electrical hazard) EH-rated safety boots with composite toe and shank; safety glasses; nitrile/neoprene gloves; and earplugs. • Identify yourself and your work location to heavy equipment operators, so they may incorporate you into their operations. • Coordinate hand signals with operators. • Stay Alert! Pay attention to equipment backup alarms and swing radii. • Wear a high-visibility, reflective vest when working near equipment or motor vehicle traffic. • Position yourself in a safe location when filling out logs talking with the contractor. • Notify the contractor immediately if any problems arise. • Do not stand or sit under suspended loads or near any pressurized equipment lines. • Do not operate cellular telephones in the vicinity of heavy equipment operation. • See SOP HS-018

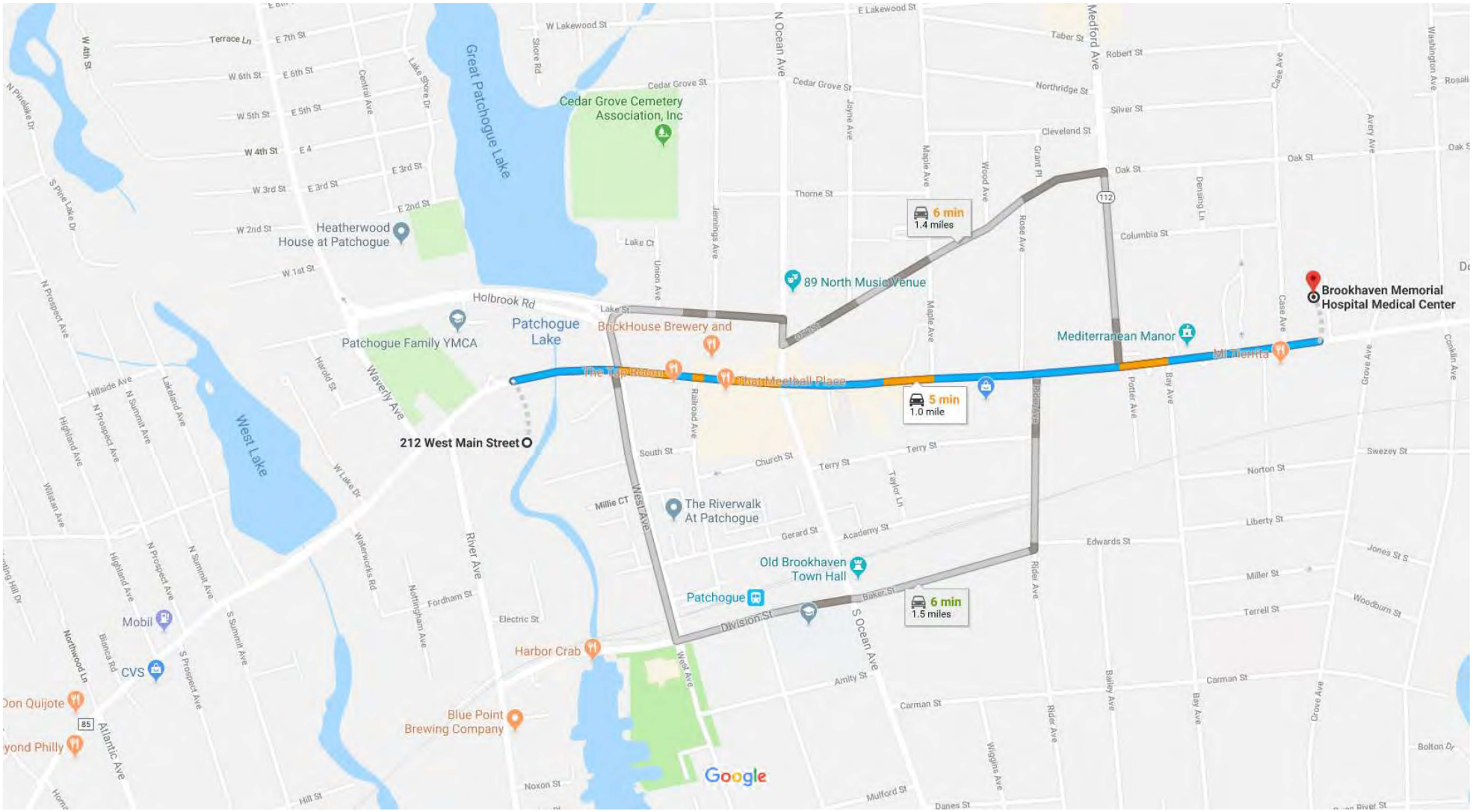
Activity	Potential Hazard	Control Measures
Soil Sampling	Contaminant Exposure, Cuts/Scrapes, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses; Nitrile/neoprene gloves; and earplugs as necessary. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Excavation entry will be allowed only with proper sloping or shoring. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Waste Characterization	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions, Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Keep trafficked areas free from slip/trip/fall hazards.
Waste Management	Contaminant Exposure, Cuts/Scrapes	• Wear proper PPE during sampling including Tyvek or Tyvek apron with sleeves, Nitrile gloves, and face shield/safety glasses. • Wear work gloves over nitrile gloves.

Appendix U

Patchogue – Site Specific Information

Google Maps 212 W Main St, Patchogue, NY 11772 to Brookhaven Memorial Hospital Medical Center

Drive 1.0 mile, 5 min



212 W Main St

Patchogue, NY 11772

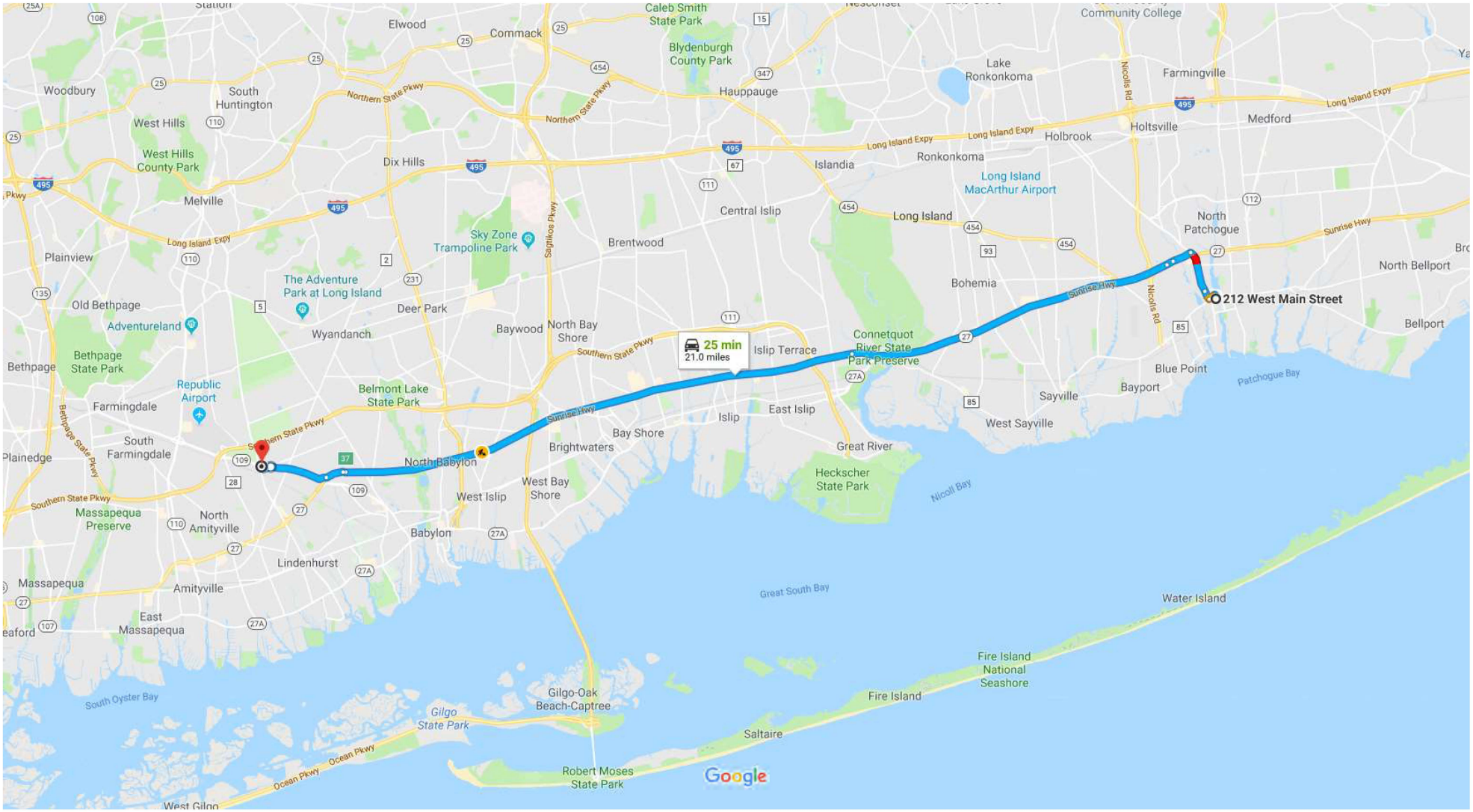
1. Head east on W Main St
   Destination will be on the left

1.0 mi

Brookhaven Memorial Hospital Medical Center

365 E Main St, Patchogue, NY 11772

Google Maps 212 W Main St, Patchogue, NY 11772 to 910 NY-109 Drive 21.0 miles, 25 min



212 W Main St

Patchogue, NY 11772

Get on NY-27 W in North Patchogue from Waverly Ave and Sunrise Hwy North Service Rd

5 min (1.7 mi)

1. Head west on W Main St toward River Ave

0.1 mi

2. Turn right onto Waverly Ave

0.2 mi

3. At the traffic circle, take the 1st exit and stay on Waverly Ave

0.9 mi

4. Use the left lane to turn left onto Sunrise Hwy North Service Rd

0.4 mi

5. Use the left lane to take the New York 27 ramp

0.1 mi

Follow NY-27 W to Sunrise Hwy North Service Rd in West Babylon. Take exit 37 from NY-27 W

17 min (17.5 mi)

6. Merge onto NY-27 W

6.7 mi

7. Keep left to stay on NY-27 W

10.7 mi

8. Take exit 37 toward Farmingdale/Babylon

322 ft

Take NY-109 W/Babylon Farmingdale Rd to 1st Ave in North Lindenhurst

5 min (1.8 mi)

9. Merge onto Sunrise Hwy North Service Rd

0.4 mi

10. Turn right to merge onto NY-109 W/Babylon Farmingdale Rd toward Farmingdale

1.2 mi

11. Turn left onto Herzel Blvd

0.2 mi

12. Turn right at the 2nd cross street onto 1st Ave

Destination will be on the left

341 ft

910 NY-109
Lindenhurst, NY 11757

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

1. Emergency Contact Information

Table 1u. Patchogue Emergency Information

Important Phone Numbers		Directions to Hospital
Local Police:	911	See Attached Maps and Directions
Fire Department:	911	
Ambulance:	911	
State Police or County Sheriff:	911	
Brookhaven Memorial Hospital: 101 Hospital Road Patchogue, New York 11772	(631) 654-7100	
Occupational Health Clinic Land, Sea and Air Medical: 910 Route 109 Lindenhurst, NY 11757	(631) 225-3060	
Project Manager: Chris Morris	(631) 759-2967 office (631) 484-9152 cell	
Field Operations Manager: Mike Quinlan	(631) 708-8063 cell	
Corporate Health and Safety Officer: Steve Hawkins	(860) 368-5348 office (860) 916-4167 cell	
Regional Health and Safety Officer: Jeena Sheppard	(856) 608-5663 office (856) 298-7138 cell	
Client Contact: Sarah Aldridge	(516) 545-2568 office (860) 334-0554 cell	
Nearest Telephone Location: On-site cellular		

Patchogue

Site Description:

The Site is owned by National Grid and is located at 234 West Main Street in the Village of Patchogue, Town of Brookhaven, Suffolk County, New York and is identified as District 204 Section 12 Block 9 and Lot 6.4 on the Village of Patchogue Tax Map. The Site is an approximately 3.6-acre area with a maximum length (north-south) of approximately 680 feet and a maximum width (east-west) of 180 feet, and is bounded to the north by West Main Street, beyond which is a property occupied by Briarcliff College and Patchogue Lake; to the east by an unpaved access driveway and two commercial properties, beyond which is the Patchogue River; to the south by a residential area and an overflow pond to the south/southwest; and to the west by a steep slope, beyond which are a residential area and municipal storage yard. The Site has relatively flat topography with a typical elevation of approximately five feet above mean sea level.

Special Site Conditions or Concerns:

- Working near water.

Safety equipment will include: First aid kit, fire extinguisher, eye wash bottles, adequate supply of drinking water and electrolyte fluids, and cell phone.

Table 2c: Activity Hazard Analysis

Activity	Potential Hazard	Control Measures
Carrying Equipment	Heavy lifting, strains/sprains, slips/trips/falls, pinch points	• Use proper lifting techniques as defined in the heavy lifting activity analysis below • Wear the proper type of glove to protect hands against sharp edges and skin/soft tissue injuries • Wear appropriate footwear • Be aware of hard to grip and hold items that may force your hand or wrist into awkward, stressful positions and cause disorders like tendinitis or carpal tunnel syndrome • Take breaks when carrying items frequently and/or for long distances • Do not over reach when picking up or placing items. • Use the buddy system when necessary • When climbing ladders, maintain three points of contact at all times. DO NOT carry equipment up or down ladders unless it is in a secure backpack or similar hands-free shoulder-strap bag or case. Lower or raise larger equipment by crane or rope
Drum Handling	Contaminant Contact • Wear proper PPE during sampling including nitrile gloves and safety glasses. Cuts or Abrasions Heavy Lifting , Slips/Trips/Falls	• Wear proper PPE during sampling including nitrile gloves and safety glasses and face shield as appropriate. • Use proper dollies or drum moving tools. • Use applicable tools to open/close drum lids. • Do not handle drums with bulging sides. • Dispose of gloves after use and wash hands. • Wear work gloves over nitrile gloves. • Use proper lifting techniques. • Ask fellow worker for help. • Keep trafficked areas free from slip/trip/fall hazards. • See SOP HS-003
Groundwater Sampling	Contaminant Exposure, Heavy Lifting, Repetition, Slips/Trips/Falls	• Wear hardhat; high visibility reflective safety vest; steel-toed, steel-shank boots or composite toe and shank; safety glasses and Nitrile/neoprene gloves. • Dispose of gloves after use and wash hands. • User proper lifting techniques. • Take regular breaks and do not work in unusual positions for long periods of time. • Keep trafficked areas free from slip/trip/fall hazards.
Working near Water	Drowning, hypothermia	• While working near water stay inside guard rails and or barriers. • While working out of out of safety zones a personal flotation device (PFD) must be worn at all times and an approved 30-inch ring buoys will be readily available for emergency rescue operations. • Use appropriate fall protection. • Buddy system shall be in use. • See SOP HS-017

Attachment 1

National Grid Reporting Requirements

National Grid Incident Reporting Requirements

All contractors and consultants working on National Grid projects hired either by National Grid or its representative will report incidents involving their personnel or subcontractor personnel to National Grid. Incidents include but are not limited to injuries, illnesses, near misses, motor vehicle incidents, environmental releases, fires, incidents involving the public, and property damage. The person reporting the incident is the Incident Reporter.

The Incident Reporter will notify the Project-Specific National Grid Project Manager (PM) **verbally** within **1 hour** of the incident. All work will be suspended until contact is made with the Project-Specific PM so that National Grid can assess if continued work suspension or if a stand down is necessary. If the National Grid PM cannot be reached, contact the National Grid SIR Regional Safety Lead as noted in the table below.

Name	Region	Phone Numbers	E-Mail
William Ryan	Downstate NY	W- (516) 545-2586 C - (516) 790-1660	William.Ryan@nationalgrid.com
Brian Stearns	Upstate NY	W- (315) 428-5731 C - (315) 461-7892	Brian.Stearns@nationalgrid.com
Elizabeth Greene	MA/RI	W- (781) 907-3656 C- (781) 248-6469	Elizabeth.Greene@nationalgrid.com

A DRAFT written Incident Report and/or email summary must be completed and submitted by the Incident Reporter to the Project-Specific National Grid PM, National Grid SIR Safety Lead, and/or other designated National Grid representative **within 4 hours** of the incident.

The Incident Reporter will provide a FINAL Incident Report within **24 hours** via e-mail to the Project-Specific National Grid PM, National Grid Regional Safety Lead, and/or the person to whom the verbal notification was initially provided.

Figures, photographs and/or sketches should be included within the Incident Report. Photographs of the incident area and/or vehicle (not of the personal injury) should be included. For vehicle incidents and cases of damaged or stolen property, a police report should be filed and a copy provided to the Project-Specific PM. A representative with knowledge of the incident should be available to provide incident information until the investigation is completed by National Grid. In some municipalities police will not be dispatched to a non-injury accident, but every effort needs to be made to try and obtain the report.

All personnel must be made aware that preventing or promptly addressing accidents and injuries takes precedence over completing field work. In addition, if any worker believes that working

conditions pose a risk of harm to on-site personnel or members of the public, work must stop and the situation must be addressed.

Incident Report Information

The following information should be included when reporting the incident to National Grid.

1. Incident Date and time

2. Date/Time National Grid PM was initially notified. Record different times and methods of notification (Call cell, Call office, Left message, e mail, text, etc.).

3. Employee type (regular, temp, contractor, consultant), company, company address, and what position held. Name, DOB, sex, full/part time.

4. Incident Type
    a. Injury/Illness to Employee (NG employee, temporary, consultant, contractor)
    b. Injury/Illness to Contractor
    c. Near Miss
    d. Motor Vehicle
    e. Public Incident
    f. Hazardous Condition
    g. Company property Damage/Equipment Damage/Equipment Failure
    h. Switching/Relay Incident
    i. Environmental

5. Incident location. Address where incident happened, site name/Owner.

6. Description of what happened, number people injured, fatalities, voltage, pressure (if applicable). Type of activity/task being performed.

7. Medical attention received

8. Spills (if applicable) - material, source, quantity, weather conditions, cause, responsible party for cleanup, PCB level, environmental media (land, water, and/or air) impacted. Clean up and Corrective actions.

9. Equipment details (if applicable) - type, number, size, unit, manufacturer

10. Witness Detail (name, address, statement).

11. OSHA severity

12. Name and address of medical care facility/doctor (if treated by a doctor or hospital). Was employee treated overnight? In the emergency room?

13. Nature of injury - part injured. Be specific.

14. Object that caused injury. Be specific.

15. What was employee doing just prior to injury?

16. How could this incident been prevented?

17. List any unsafe acts / unsafe conditions

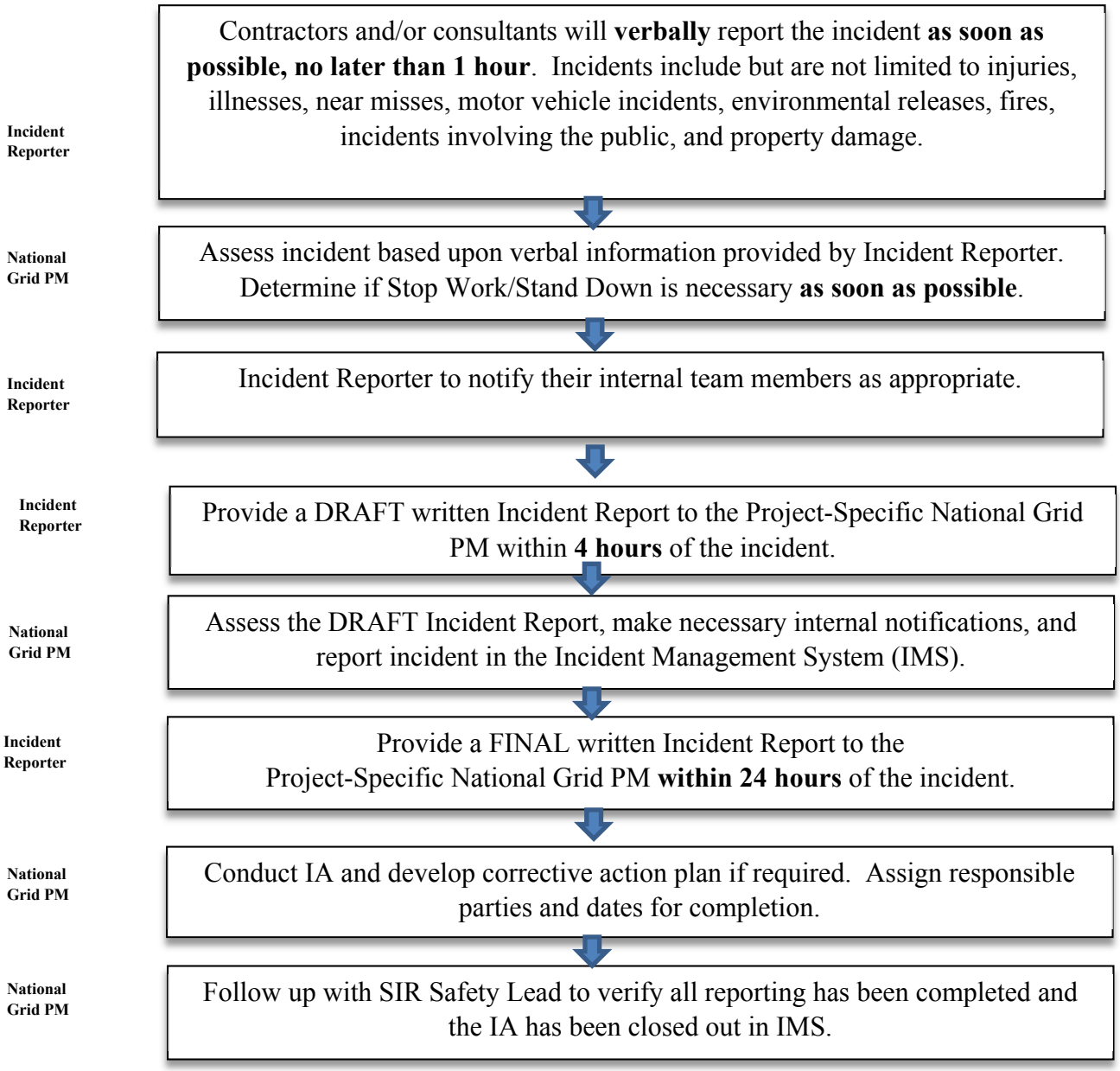
18. Were safety rules, work methods, procedures violated?

19. Was proper protective equipment worn?

20. List any prior accidents with dates that this employee has experienced

21. Lessons Learned

Flow Chart for Accident Reporting



Attachment 2

Effective Management Practices Memo for Recovering NAPL

M E M O R A N D U M

This Effective Management Practices (EMP) assessment memorandum has been prepared to evaluate existing dense non-aqueous phase liquid (DNAPL) tar recovery methods and procedures currently used by GEI at National Grid sites located in Downstate New York region in order to reduce the potential for exposure to tar during recovery operations. This memorandum identifies the existing ongoing recovery operations at six National Grid former MGP sites and evaluates practical options and technologies to reduce the potential for exposure. The results of this EMP assessment will be used to determine whether these existing DNAPL tar recovery operations are adequate as is, or whether improvements or modifications to the procedures or methods/techniques are necessary, and/or whether another technology/method should be tested and implemented. The EMP is structured as follows:

- Existing DNAPL Tar Recovery Operations – presents the existing methods/technologies used and procedures followed for each of the DNAPL tar recovery operations managed by GEI at National Grid sites within the downstate region of New York
- Potential DNAPL Tar Removal Techniques – provides a discussion of the potential recovery techniques that have been developed moving forward, based on the thickness and volume of DNAPL tar to be removed
- Recommendations (for "low-volume and "high-volume" sites)

EXISTING DNAPL TAR RECOVERY OPERATIONS

DNAPL tar recovery operations using various methods are currently managed by GEI at six National Grid sites located in downstate New York. These sites are located in the downstate region including the Hempstead-Intersection former MGP site, Halesite former MGP site, and Sag Harbor former MGP site, located on Long Island, as well as the Clifton former MGP site, Coney Island former MGP site, and Rockaway Park former MGP site, located in the New York City area. Recovery operations currently range from "low-volume" removal using oil-sorbent socks or peristaltic pumps, where limited volumes (typically less than 5-gallons) may be removed per event, to "high-volume" removal using dedicated pumps, where hundreds of gallons may be removed annually. A brief summary of the DNAPL tar recovery operations at each of these sites is provided below.

Hempstead-Intersection Former MGP Site

DNAPL tar is currently recovered from one onsite recovery well. Initial DNAPL recovery occurred between 2007 and the Third Quarter of 2011 when the In-Situ Solidification (ISS) remediation project began. Approximately 745 gallons of DNAPL were recovered during this time and all, but one, of the recovery wells were decommissioned as part of the ISS work.

Recent DNAPL thicknesses in the monitoring wells ranged from zero to 2.5 feet, with less than 3 gallons recovered during each event. Measurable DNAPL is pumped with a peristaltic pump and emptied into a 55-gallon drum during each event. The total volume of NAPL recovered during 2017 was 10.3 gallons.

PPE from AECOM recovery efforts is unknown, however, GEI would utilize Tyvek, nitrile gloves, safety glasses and face shield.

Sag Harbor Former MGP Site

DNAPL tar is currently recovered from one onsite recovery well. 25 recovery and monitoring wells are gauged quarterly for groundwater levels and NAPL, however, in recent events, only one recovery well has a recoverable amount of NAPL.

Recent DNAPL thicknesses in the monitoring wells ranged from zero to one foot with recovery actions only being attempted when DNAPL thickness measures greater than 0.33-feet. Measurable DNAPL is pumped with a peristaltic pump and emptied into a 55-gallon drum during each recovery event. Three recovery events have occurred since 2015. The current total volume of DNAPL recovered from this well is approximately 2.5 gallons.

PPE used includes Tyvek, nitrile gloves, safety glasses and face shield.

Halesite Former MGP Site

DNAPL tar is currently recovered from two onsite recovery wells. DNAPL tar was also previously recovered from two other monitoring wells, but recovery operations in these wells has been terminated due to diminishing DNAPL thicknesses. DNAPL tar recovery was initially conducted at the site between December 2008 and February 2009 at one monitoring well, but was discontinued due to the ongoing remedial activities. Following the completion of remedial activities, DNAPL recovery resumed in September 2009. Recovery methods have included, bailing, purging with a peristaltic pump, and oil-sorbent socks. To date, approximately 50 gallons of DNAPL has been recovered at the site. The majority of the recovered DNAPL tar at the site is removed from one six-inch recovery well with a peristaltic pump.

Recent data indicate that measured DNAPL thicknesses in the recovery wells are typically between one to two feet in one recovery well, and approximately zero to four inches in the other recovery well. DNAPL collection from the recovery wells was initially conducted by bailing and later with oil-sorbent socks; however, due to potential exposure issues that might result from handling DNAPL-coated bailers and oil sorbent socks, these methods were discontinued.

Recovery operations are now conducted using a peristaltic pump. The DNAPL is pumped into a 5-gallon bucket and subsequently emptied into 55-gallon drum.

PPE used includes Tyvek, nitrile gloves, safety glasses and face shield.

Rockaway Park Former MGP Site

DNAPL tar is not currently recovered at Rockaway Park, however, it will likely occur in the future due to the presence of DNAPL found within eleven onsite recovery wells. Recent DNAPL thicknesses in the monitoring wells from gauging events ranged from zero to over six feet. Future recovery actions would have measurable DNAPL pumped with a peristaltic pump or bailed and emptied into a 55-gallon drum during each recovery event.

PPE used would include Tyvek, nitrile gloves, safety glasses and face shield.

Coney Island Former MGP Site

DNAPL tar will soon be recovered from onsite recovery wells and three onsite piezometer wells. As of the most recent gauging event in February 2018, DNAPL is currently present at thicknesses greater than 0.5-feet in three piezometers and two recovery wells at the Site. The presence of NAPL in the piezometers was first noted in the August-September 2017 monitoring event. The recent DNAPL thickness in these wells ranges from approximately one foot to over five feet.

The piezometers at the Site were not installed with sumps to allow for the accumulation of DNAPL. As such, the installation of recovery wells in the area of the piezometers with accumulating DNAPL may be necessary. DNAPL recovery rate testing will be conducted within these piezometers to determine if a sufficient volume of DNAPL is present in the area to facilitate future recovery. Testing will also be performed for the recovery wells with accumulating DNAPL to determine if a routine DNAPL recovery program should be implemented at these wells. The recovery method will involve either bailing or pumping (to be determined based on viscosity) with a peristaltic pump to the lowest extent possible. If it found that these methods are not effective, then a low-volume “down-hole” pump will be utilized.

PPE used would include Tyvek, nitrile gloves, safety glasses and face shield.

Clifton Former MGP Site

DNAPL tar is currently recovered from nine onsite recovery wells. There are 25 passive DNAPL recovery wells at the site for gauging of DNAPL thicknesses, and recovery of DNAPL, if present. As specified in the SMP, the DNAPL recovery wells are gauged on a bi-weekly, monthly, quarterly

or annual basis to check for the presence of DNAPL. Recent data indicates that measured range of DNAPL thicknesses in the recovery wells are typically between zero and seven feet.

Following gauging, DNAPL is removed from the wells with measurable and recoverable thicknesses. In recent recovery events the volume of the NAPL recovered has ranged between four gallons and seventeen gallons per event. From January 2010, through June 2018, a total of 3,385 gallons has been recovered at the site. DNAPL is removed using the AECOM air lift™ (compressed air vacuum), peristaltic pumps or steel bailers as appropriate, based on the rate of accumulation and viscosity of the DNAPL at each recovery well. DNAPL removed from the recovery wells is containerized in 55-gallon drums.

PPE used includes Tyvek, nitrile gloves, safety glasses and face shield.

DNAPL TAR REMOVAL TECHNIQUES

The DNAPL tar removal techniques reviewed vary based on the thickness, viscosity and volume being removed at each of the sites. As such, removal options for "low-volume" sites, where DNAPL thicknesses are typically five feet or less (i.e. Halesite) and "high-volume" sites where DNAPL thicknesses have ranged to up to 10 feet (i.e. Clifton) have been reviewed separately and are presented below. "Pros" and "cons" for each technique, as well as potential method improvements (if applicable) are also presented.

Whether pumping DNAPL at a "low-volume" or "high-volume" site, special attention should be paid to the tightness of any fittings or tubing connections prior to the start of recovery operations. Consideration should be given to the placement of storage drums. If feasible, a 55-gallon drum should be placed at each well where DNAPL is being collected. In cases where this is not feasible, DNAPL should be temporarily discharged into another container (5-gallon bucket or carboy) with a lid and pour spout prior to placement in a 55-gallon drum, located within a dedicated storage area. The pour spout should be utilized when transferring the fluids into the 55-gallon drum.

<u>"Low-Volume Sites"</u>

The removal options reviewed included the use of oil-sorbent socks, removal by peristaltic pump, bailers, inertial pumps, and other pumps (dedicated and non-dedicated).

Oil-Sorbent Sock Method

Although not currently used at any of the sites, DNAPL tar can be removed using passive oil-sorbent socks by lowering a weighted bundle of socks, which are attached to a polypropylene or nylon twine, to the bottom of the well. The socks are removed periodically and placed into a 55-gallon drum for disposal, and then replaced.

- Pros include low cost, ease of installation and removal, effectiveness versus other methods for limited thickness of DNAPL or for highly viscous NAPL.
- Cons include potential exposure to DNAPL during the sock removal process. Removal of the socks by pulling up the twine can be particularly problematic due to the twine becoming coated with DNAPL making it slippery. The twine can slip through the hands and potentially resulting in the splashing of DNAPL. Absorbent pads are to be used to wipe the DNAPL from the twine during removal to reduce the potential for slippage, splashing and spillage.

Recommended Method Improvements

- Use of a mechanical reel to withdraw the DNAPL-laden socks from the wells. This method would reduce the chance of the twine slipping, but would necessitate cleaning of the reel. Reel cleaning would present an additional exposure risk; however, the risk should be less than that of removing the socks manually. The use of a disposable reel would further limit the risk of exposure.
- Use of better gripping gloves.
- Tying knots in the twine (if a reel is not used) to help prevent slippage
- Use of an alternate to the current twine being utilized in order to facilitate easier and more thorough cleaning during removal. Alternates include fishing line (to be used with a reel only), light-weight steel cable or a plastic string or cord.

Bailers

Bailers can also be utilized to remove limited thicknesses of DNAPL tar or high-viscosity DNAPL in monitoring or recovery wells. DNAPL bailing is accomplished by lowering the weighted bailer into the well, removing the bailer and recovered DNAPL, emptying the bailer into a drum or other approved vessel and repeating the process until the DNAPL is removed (to the extent practical).

- Pros include low cost, ease, effectiveness versus other methods for limited thicknesses of DNAPL
- Cons include potential contact with DNAPL during the removal process. Bailers and the twine attached to the bailer can become coated in DNAPL, therefore increasing the chances for contaminant contact.

Bailers are not currently being utilized for DNAPL removal at any of our sites; however, many of the method improvements listed for oil-sorbent socks would also apply to bailing. These recommended method improvements will be utilized if DNAPL bailing is being performed.

Peristaltic Pumps

Removal of DNAPL tar by peristaltic pump is ideal if conditions permit, since dedicated tubing can be used, thereby limiting the chance for DNAPL exposure. Limiting factors include the depth and viscosity of the DNAPL. Setting the pump at a very low setting (at the start of pumping) to allow for DNAPL migration into the tubing may increase efficiency and minimize the volume of groundwater that is removed.

- Pros include low cost, ease and efficiency, limited contaminant contact.
- Cons include pump limitations due to depth (typically peristaltic pumps are limited to approximately 30 feet of head) and NAPL viscosity. In addition, the dedicated tubing can detach from the silicon tubing, which runs through the pump housing, causing splashing. This can be minimized through the use of hose clamps, duct tape, or by placing the pump within a plastic bag during pumping.

Recommended Method Improvements

- The use of smaller diameter tubing.
- Placing the peristaltic pump within a plastic bag or under a bucket during operation to contain any splatter if the silicon and polyethylene tubing become detached.

Inertial Pumps

Currently inertial pumps are not being utilized for DNAPL removal at any of our sites in New York. However, a manual pump and foot valve may be an effective alternative for removal if conditions permit.

- Pros include low cost, ease and efficiency.
- Cons include possible limited effectiveness (at greater depths and lower viscosities and also within larger diameter recovery wells –these systems are typically used within narrow-diameter direct-push equipment), and the potential need to clean the check valve between uses resulting in an exposure risk.

Dedicated or Non-Dedicated "Down-Hole" Pumps

Dedicated or non-dedicated "down-hole" pumps are not currently being utilized for DNAPL removal at any of our "low-volume" sites. However, this method may be utilized at Coney Island if the initial attempts with bailing and the peristaltic pump prove to be ineffective. See "high-volume" sites for a description of these methods.

<u>"High-Volume" Sites</u>

Generally, "down-hole" pumps are used to remove significant quantities of DNAPL tar. The two options for these are dedicated or non-dedicated pumps. The majority of these pumps are air-

driven bladder-type pumps. In either scenario, the discharge tubing will be secured at both the well head and the drum. Float-liquid level indicators will be used to prevent overfilling and spillage.

Dedicated Pumps

The use of dedicated equipment is preferable to manually handling DNAPL-laden equipment if site conditions warrant. Any electrical pumps that may come in contact with DNAPL should be explosion proof, at a minimum, or be intrinsically safe if the fluids being removed have a low or hazardous flash point.

- Pros include minimal contact with DNAPL
- Cons include cost associated with pump purchase for each well, power supply needs (compressor or electric) and cleaning of equipment should the pump experience mechanical difficulties. Many of these pumps are designed with few moving parts to avoid breakdown and limit maintenance.

Potential Method Improvements

- Limiting flow rates to avoid splattering from tubing which may come loose
- Automating the system if warranted by site conditions.

Non-dedicated Pumps

- Pros include cost versus dedicated pumps
- Cons include potential contaminant contact due to decontamination procedures required when moving pump from well to well.

SUMMARY OF RECOMMENDATIONS

Based on the information presented above, the following general recommendations are made to reduce the potential exposure to DNAPL tar:

- The use of dedicated equipment, where feasible, is preferred over non-dedicated equipment if warranted by site conditions.
- Standardization of the PPE policy for DNAPL removal, including nitrile gloves, safety glasses, face shield and Tyvek suits or apron variety with sleeves may be used during warmer weather conditions.
- Placement of DNAPL storage vessels (typically a 55-gallon drum) near the point of generation, if feasible, to avoid the need to transfer the recovered fluid.
- If DNAPL is to be temporarily discharged into another container prior to placement in a 55-gallon drum, the temporary discharge bucket or other container should have a lid with

a pour spout placed on it prior to transport to the drum, and the pour spout should be used during fluid transfer from the container to the drum.
- Clamping discharge tubing at the well head and discharge point (bucket or drum).
- Installation of float-liquid level indicators within drums being used with automated systems.

Recommendations specific to "low-volume" sites include:

- The use of peristaltic pumps, where feasible, over oil-sorbent socks or bailers. Operation of peristaltic pumps at low flow rates may improve recovery efficiency and minimize the recovery of groundwater.
- The use of an inertial pump and foot valve.
- The use of a dedicated pump, if site conditions won't allow the use of a peristaltic pump and if the budget allows for the purchase of the pump and associated equipment.

If dedicated equipment does not prove feasible, a reel (preferably disposable) will be used to remove bailers or oil-sorbent socks. The use of an easier to clean alternate to the nylon or polypropylene twine is also recommended.

Recommendations specific to "high-volume" sites include:

- Limiting discharge flow rates to prevent spillage from discharge tubing/hose.
- System automation (if budget and conditions allow).

Attachment 3

National Grid COVID-19 Procedures

Safety Health Environmental nationalgrid

May 4, 2020

Safety Procedure A-116 for the COVID-19 Health and Safety Plan (HASP)

As part of National Grid's pandemic response, we have established Safety Procedure A-116 for the COVID-19 Health and Safety Plan (HASP). This procedure ensures uniform implementation of the preventative measures that have been put in place to help slow the spread of the COVID-19 virus

The core components of A-116 include:

- Plan Personnel - roles and responsibilities of plan implementation
- COVID-19 Pandemic Response Measures
- COVID-19 Reporting Process

All company field personnel should familiarize themselves with this A-116 HASP and understand their role in implementation of the plan. The preventative measures included in the HASP are the measures that have been implemented over the past few weeks.

Key Health and Safety Plan Implementation Reminders:

- Upon receipt of this A-116 HASP, review as an individual or as part of a field crew's job brief
- Ensure this A-116 HASP is available at the worksite upon request to company personnel or outside agency inspection
- If there are any questions about the A-116, please contact your Supervisor or local Field Safety Representative

A link to A-116. This new Procedure has also been shared with our contractors via ISN.

FORWARD

National Grid's vision is to be a world-class safety organization, with zero injuries every day. A critical component of achieving this vision is the careful development, implementation and maintenance of safety procedures. This guidance document, COVID-19 Health and Safety Plan, describes pandemic response measures, taken by National Grid, to help prevent the spread of COVID-19.

Questions regarding this guidance should be referred to National Grid's Safety Department.

Record of Change

Revision	Date	Description
Initial	04/28/2020	Initial creation

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1.0 SCOPE OF HEALTH & SAFETY PLAN

National Grid has developed this Health & Safety Plan (HASP) to uniformly apply pandemic response measures to help prevent the spread of the COVID-19 virus. National Grid field personnel and crews have been provided this information and communications.

2.0 PROJECT PERSONNEL

2.1 Roles and Responsibilities

National Grid shall be responsible for the safety of all its employees and shall ensure COVID-19 pandemic measures are in place. Key National Grid personnel are as follows:

Incident Command Structure

The National Grid Incident Command Structure (ICS) has been activated within all Business Units of National Grid's US Operations to respond to the COVID-19 pandemic. Members of the ICS review and approve all operational decisions, with the Incident Commander ultimately responsible for these decisions. The Incident Commander relies upon subject matter experts within the ICS, including the Operations Officer, the Safety and Health Officer, to help set standards and guidance for protective measures to be used to limit the spread of the COVID-19 virus. These Officers, in turn, utilize the expertise of other members of the organization within Operations, Safety, and Health, to assess risks associated with the work being performed and provide guidance on the most effective measures to be used by employees to protect themselves, their coworkers, our customers, and members of the public.

Field Supervisor

The Field Supervisor shall have the responsibility for monitoring and enforcing National Grid COVID-19 pandemic measures and shall ensure that all employees have received and reviewed this Health & Safety plan.

- Serve as the appointed supervisor to oversee field personnel and ensure pandemic measures are being followed
- Ensure field personnel have the appropriate pandemic supplies
- Disseminate all new National Grid COVID-19 communications to all field employees
- Where non-compliance is observed, take prompt corrective action; and
- Have the authority to order a safety stop in the event of a serious safety issue.

Crew Leader

The National Grid crew leader shall be in charge of the day-to-day details of the work to be performed. They shall ensure that work is performed in accordance with National Grid COVID-19 pandemic measures. They will:

- Walk the job site at the start of each day to ensure a safe work environment;
- Where non-compliance is observed, take prompt corrective action; and
- Have the authority to order a safety stop in the event of a serious safety issue.
- Perform the daily job safety briefing before commencing work, whenever a visitor arrives to the job site, and if there is a significant change in the work or when an extended break occurs. As part of the COVID-19 pandemic response, the COVID-19 job brief checklist (Appendix A) shall be used in addition to the applicable departmental job brief form.

Employees

National Grid employees are responsible for following all COVID-19 pandemic measures;

- Each employee is responsible for reporting to supervision any symptoms of COVID-19, of any direct contact with an individual confirmed to have COVID-19, or in contact with a person in quarantine.
- Each employee is obligated to call a safety stop when a hazardous condition is observed.
- All lone workers shall conduct a self-assessment utilizing the COVID-19 job brief checklist (Appendix A) and adhere to the guidance outlined in this plan.

National Grid Field Safety Representative

National Grid Field Safety Representatives conduct routine and random crew visits to National Grid job sites. The National Grid Field Safety Department shall act as a resource for National Grid field personnel to effectively implement this COVID-19 Health & Safety Plan and will be available on an as-needed basis for inquiries related to this HASP.

3.0 COVID-19 PANDEMIC RESPONSE MEASURES

3.1 COVID-19 Symptoms

COVID-19 Symptoms may include the following:

- Fever
- Cough

- Shortness of Breath
- Chills
- Repeated shaking with chills
- Muscle Pain
- Headache
- Sore Throat
- New loss of taste or smell

3.2 Hygiene and Social Distancing

- Wash your hands often with soap and water for at least 20 seconds, especially after using the restroom, before eating, and after blowing your nose, coughing, or sneezing. Hand washing is the best way to prevent the spread of viruses.
- If soap and water are not readily available, use an alcohol-based hand sanitizer with at least 60% alcohol. Always wash hands with soap and water if hands are visibly dirty.
- **Proper hand washing/sanitizing products will be provided to all employees**
- Maintain a minimum of 6' social distance from other employees on site while performing work and during routine breaks. When work tasks prevent this, ensure proper face coverings are continued to be worn and proper hygiene
- Avoid touching your eyes, nose, and mouth.
- Cover your cough or sneeze with a tissue, then throw the tissue in the trash.
- Clean and disinfect frequently touched objects and surfaces using a disinfecting cleaning spray or wipe; if not available, use a soap and water solution.
- All cleaning product trash and potentially contaminated PPE will be stored in a trash bag and immediately disposed of at a National Grid facility at the end of each shift. Trash should not accumulate in any National Grid vehicle. Immediately wash hands upon disposing of trash bag.

3.3 COVID-19 PPE and Face Coverings

- Face coverings are a requirement for all National Grid employees. Face coverings must be worn by all employees:
    - When working in public places
    - When working in a customer's premises
    - When social distancing is not able to be maintained with a co-worker, customer or member of the public in a National Grid facility, barn/yard, work location or company vehicle.
- Non-Fire-Retardant/Arc Rated Face Covering– use when there is no potential for a gas ignition or electric arc flash. This can be National Grid supplied or a personal face covering. Fire Retardant Face Covering – must be used when there is potential for a gas ignition or electric arc flash.
- **Additional COVID-19 PPE guidance is provided in the attached Premise**

Entry Guidelines

3.4 COVID-19 Virus Risk Assessment and Adopted Measures

National Grid's prescribed measures (work practices, PPE, hygiene) were selected based upon the risk assessments completed by subject matter experts and reported up through the ICS for approval. They are based upon the Centers for Disease Control & Prevention (CDC) and OSHA guidance, as well as input from Operations, Safety, and Health team members. They are believed to address all risks posed to our workforce, as well as to our customers and members of the public, when jobs are conducted in public places. These measures are reviewed on a continuous basis, for both effectiveness and to ensure the latest guidance is incorporated, with changes made, as necessary, after these reviews.

4.0 COVID-19 REPORTING PROCESS

4.1 COVID-19 Job Brief Checklist

In addition to the applicable departmental job brief form, all crew leaders shall utilize the COVID-19 job brief checklist to facilitate crew discussion regarding symptoms of COVID-19 and allow for discussion to help facilitate the reporting of a COVID-19 incident. All visitors to the job site will be required to have the job brief and COVID-19 checklist reviewed with them by the crew leader prior to entry on the job site.

Remember to maintain social distancing while conducting the job brief

4.2 COVID-19 Incident Reporting

To ensure the safety of all employees and the public, any employee shall immediately contact their Supervisor and National Grid Employee Services if one of the following conditions occur:

- Employee is exhibiting symptoms of COVID-19
- Employee has been in close contact of another individual with COVID-19
- Employee has been in close contact of another individual who is currently being quarantine for a suspected case of COVID-19

  Close contact is defined as being within 6' of a sick/quarantined individual for more than 15 minutes.

Please refer to the COVID-19 Suspected/Confirmed Positive Process guidance document in Appendix A.

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Appendix A – National Grid COVID-19 Communications

A Message from John Bruckner

National Grid US Coronavirus Incident Commander

Updated Guidance on Face Coverings

April 16, 2020

The state of New York and the state of Rhode Island recently issued executive orders requiring all essential employees who are working in public places to wear face coverings when distance from the public or co-workers cannot be maintained. As a result, we are updating our company policy to align safety standards for all employees.

We had previously communicated that wearing a face covering was voluntary based on CDC recommendations. We are now **requiring** National Grid employees to wear face coverings in the situations below. Please note that this applies to both **office** and **field-based** employees, and applies across **all jurisdictions**.

Face coverings must be worn:

- ✓ When working in public places
- ✓ When working in a customer's premises
- ✓ When social distancing is not able to be maintained with a co-worker, customer or member of the public in a National Grid facility, barn/yard, work location or company vehicle.

- This directive is effective at 8:00 pm this evening for all New York employees.
- It is effective starting this Saturday for all Rhode Island and Massachusetts employees.
- If you are working from home, our company guidance remains: If you can work from home, you should.

What qualifies as a face covering?

Employees may use either a company-issued or a personal face covering, depending on preference and availability. These include:

- Disposable masks, which need to be changed daily or if significantly dirty.
- Reusable FR Balaclavas, which need to be laundered daily, according to CDC cleaning guidance.
- Reusable FR neck warmers, which need to be laundered daily, according to CDC cleaning guidance.
  - Please note: Face pieces must be made from Flame Resistant (FR) material if they are worn when working in an energized zone or there is potential for a gas ignition.

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How to get a face covering:

Our procurement and warehouse teams are working directly with teams to ensure a steady supply of face coverings.

It is our intention to provide company-supplied face coverings widely, but in instances where one is not available or preferred, a personal covering may still be used.

Operations teams should work through their normal channels to order face coverings. We will be providing further guidance to office-based colleagues on where they can access face coverings.

CDC guidance on personal face coverings can be found here:

- https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover.html
- https://www.cdc.gov/coronavirus/2019-ncov/downloads/DIY-cloth-face-covering-instructions.pdf

Face coverings should:

- Fit snugly but comfortably against the side of the face
- Be secured with ties or ear loops, if provided
- Include multiple layers of fabric
- Allow for breathing without restriction
- Be removed from behind head or ears to minimize hand contact with face
- Be laundered and machine dried if reusable

Cleaned, dried coverings can be kept in a clean plastic bag until needed for use

It is important to note that face coverings, whether company-issued or personal, are not a substitute for taking measures that are known to be effective in stopping the spread.

Handwashing, and maintaining a social distance of 6 feet apart from others remains the most critical guidance that we can follow.

Sincerely,

John Bruckner

nationalgrid

COVID-19 Job Brief Checklist

Please Distribute

During this trying time it is important that we maintain our same level of focus at work locations conducting hazard assessments and identifying risks prior to the start of each task. Prior to beginning work at every location, when conditions, job focus or crew members change, after each meal period and after any prolonged interruption to the work, a **Job Briefing** shall be held.

The work to be performed shall be discussed and assigned, and the safety aspects of the job shall be reviewed. The National Grid protocol to screen all individuals to determine who may have been exposed to COVID-19 outside of work **must be reviewed** at the start of the workday and Job Briefing.

(Employees working alone shall conduct a self-assessment to determine if they may have been exposed to COVID-19 outside of work or should their condition change during the workday)

The questions are:

- ☐ Are you feeling ill in any way? For instance, do you have any of the following symptoms: A fever? A cough? Shortness of breath? Chills? Repeated shaking with chills? Muscle pain? Headache? Sore throat? New loss of taste or smell?
- ☐ Have you had close contact with a symptomatic person (e.g., fever, cough, and/or shortness of breath, chills, repeated shaking with chills, muscle pain, headache, sore throat, new loss of taste or smell) within the last 14 days?
- ☐ Have you had close contact with a person who was tested with results pending or positive for coronavirus within the last 14 days?
- ☐ Have you recently been out of state for non-work related travel (within the last 14 days)?

*Employees who answer **"YES"** to any of these questions must distance themselves from others, not enter the work area, and immediately contact their supervisor privately for further instruction.*

The employee must also contact the National Grid Employee Services Hotline 1-888-483-2123.

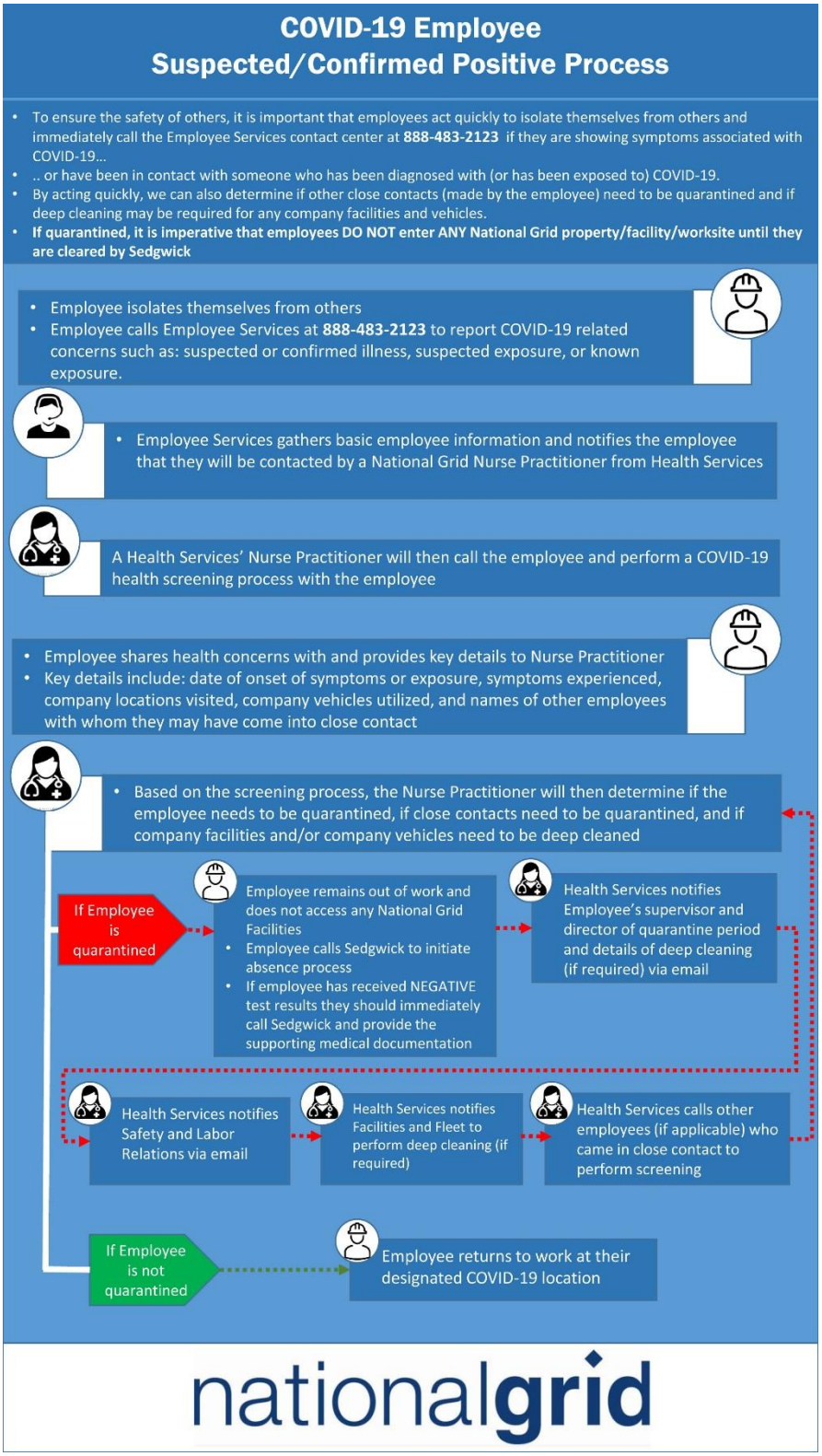
Employees who answer **"NO"** to all of these questions proceed with work activities as planned. on

Please note on the Job Brief that you asked these COVID-19 Screening Questions.

To reduce multiple people handling the job brief during the COVID-19 pandemic crew leaders should handle all documentation and record who is present on site after they have reviewed the job brief with each employee or visitor.

REMINDER - Please be sure to follow CDC recommendations

- Maintain a minimum 6' social distance from other people
- Employees should wear a cloth face covering in areas where 6' social distancing is difficult or impossible
- Avoid touching your eyes, nose, and mouth.
- Clean and disinfect frequently touched objects and surfaces using either a EPA registered disinfectant (Lysol, Clorox, etc.), soap and water, or a bleach and water mixture (1/3rd cup bleach per gallon of water)
- Use the fold of your arm to cover a sneeze or cough
- Wash your hands often with soap and water for at least 20 seconds, especially after going to the bathroom; before eating; and after blowing your nose, coughing, or sneezing.
    - If soap and water are not readily available, use an alcohol-based hand sanitizer with at least 60% alcohol. Always wash hands with soap and water if hands are visibly dirty.



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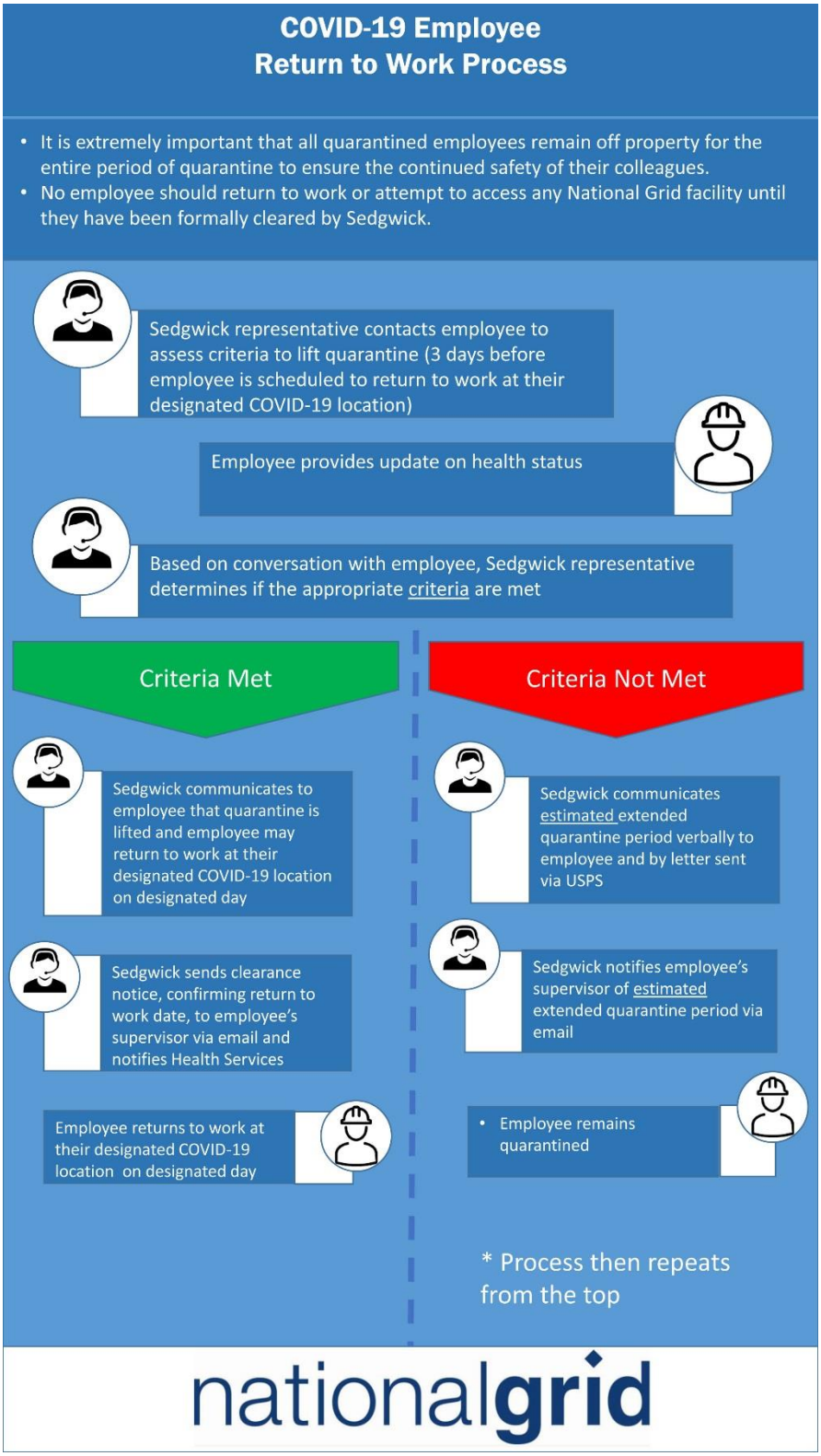

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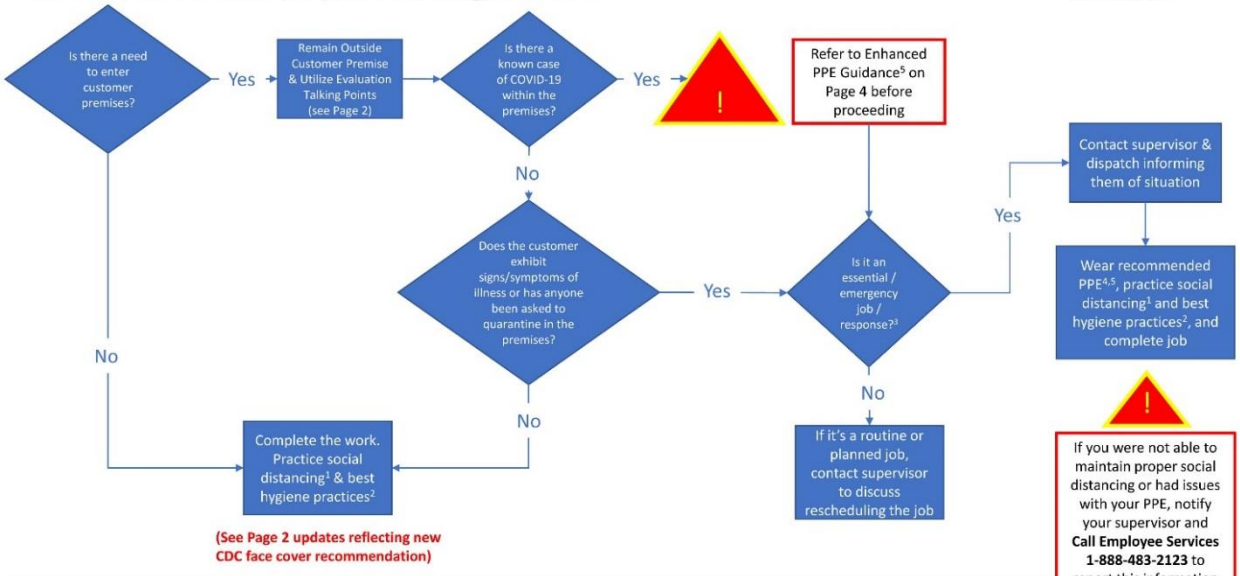
Guidance for Field Employees Entering Premises

Issued 4/7/20



(See Page 2 updates reflecting new CDC face cover recommendation)

See Page 2 for additional information on Talking Points, CDC Recommendations for (1) Social Distancing and (2) Best Hygiene Practices
See Page 3 for National Grid (3) Emergency Work at a Premises and (4) Standard PPE Guidance
See Page 4 for National Grid (5) Enhanced PPE Guidance

1

Issued 4/8/20

Talking Points - Engage Customer

Prior to entry, engage the customer and advise of social distancing practices. Here are some questions and statements.

- Does someone within the premises have a known case of COVID-19? Has someone within the premises tested positive for the COVID-19 virus?

(IF ANSWER IS 'YES' TO EITHER OF THE ABOVE QUESTIONS, REFER TO ENHANCED PPE GUIDANCE ON PAGE 4)

- Do you mind if I follow the social distancing practice today?
- Is anyone currently sick inside the premises?
- If you are feeling sick, would you mind remaining in another room while I am working This is a best practice policy my company is recommending. Can you tell me where your equipment is located?
- I will do my job, keep you updated and tell you when I am done

(1) Social Distancing

- Maintain at least 6 feet distance between yourself and the customer at all times
- Where social distancing measures cannot be maintained, face cover can be worn to help limit the spread of the virus (see National Grid's Face Cover Guidance for details)

(2) Best Hygiene Practices

- Face covering can be worn in public settings where social distancing measures cannot be maintained (see National Grid's Face Cover Guidance for details)
- Use alcohol-based hand sanitizer (at least 60% alcohol), before and after each home visit; OR wash hands using soap and water for 20 seconds

2

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Issued 4/8/20

(3) Emergency Work at a Premises

On arrival, assess the premise/situation in its entirety and consider these questions.

- Is it a multi-unit building?
  - Is the unit where work is required affected?
- What work can be done without interaction/entry?
- Is entry through a side or back door possible to limit exposure?
- Can make safe actions be taken without interaction/entry?
  - Securing Outside Meter/Curb Valve
- Would a hardship be caused by isolating the service?

Note: These questions and considerations are meant to help guide in the decision making process. There may be instances where access to a premise cannot be avoided in order to address immediate public safety concerns. Please reference the Social Distancing and applicable PPE Guidance in all situations.

(4) Standard PPE Guidance for Entering a Premises (No Known COVID-19 cases are present)

- Avoid touching ANYTHING in customer premises other than company equipment and customer equipment related to the job
- Wear disposable latex or nitrile gloves to prevent touching contaminated surfaces
- Latex or nitrile gloves should be donned before entering the home
  - If work gloves are needed to perform the task, remove disposable latex or nitrile gloves and dispose of them. Don work gloves and perform task. Once task is complete remove work gloves and store them. Don a new pair of disposable latex or nitrile gloves to exit the home.
- Remove latex or nitrile gloves and dispose in way that won't create other opportunities for exposure
- Immediately wash / sanitize hands after removing latex or nitrile gloves
- All other PPE normally required for the work being performed should be used

3

Issued 4/8/20

(5) Enhanced PPE Guidance for Entering a Premise (Where a Known COVID-19 Case is Present)

The most effective way to protect the employees from contracting the virus is physical distance; if at all possible, the customer diagnosed with COVID-19 should be asked to move to a separate room before premises entry. When available and practicable, the following PPE items may be used at the premises with a known COVID-19 case present. These PPE items can be used in combination with our Social Distancing and Best Hygiene Practices to limit the spread of the virus.

- N-95 / KN-95 mask (see Page 5 for pictures of typical N-95 / KN-95 masks available)
- Reusable Face Shield
- Disposable Surgical Gloves (nitrile or latex)
- All other PPE required for doing the work (i.e. safety glasses, hard hat, etc.)
- If desired, FR-rated balaclava may be worn to provide additional protection while working

The following steps should be taken while conducting work in the premises:

- Prepare a paper or plastic bag for disposal of used PPE prior to entering the premises.
- Avoid touching ANYTHING in customer premises other than company equipment and customer equipment related to the job.
- Wear disposable latex or nitrile gloves to prevent touching contaminated surfaces.
- Any PPE should be donned before entering the home.
- If a mask is in use, avoid touching your face or adjusting the mask.
- If work gloves are needed to perform the task, remove disposable latex or nitrile gloves and dispose of them. Don work gloves and perform task. Once task is complete remove work gloves and store them. Don a new pair of disposable latex or nitrile gloves to exit the home.

Once work is completed in the home, follow these steps to safely remove the PPE items

- Remove face shield, taking care to avoid touching your face. Clean / disinfect and store properly.
- Remove mask from the back of the head first, taking care to avoid touching your face. Place used mask in a bag and dispose in normal trash.
- If balaclava has been worn, remove covering from back of head, similar to removal of mask.
- Remove latex or nitrile gloves (turn inside out while removing) and place in a bag. Dispose of bag in normal trash.
- Immediately wash / sanitize hands after removing latex or nitrile gloves, following Best Hygiene Practices.

4

Issued 4/8/20

Typical N-95 / KN-95 masks

5

Safeguarding your Vehicle

Now, more than ever, with COVID-19, precautions to safeguard your vehicle when transferring the vehicle to another employee, or when taking your vehicle in for maintenance, is very important.

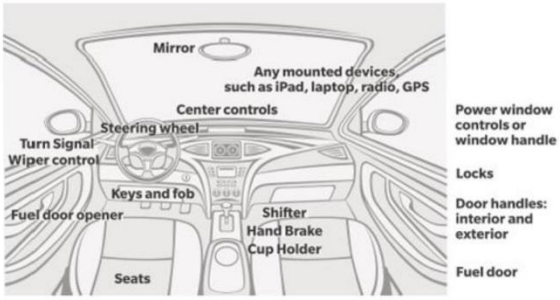
Here are some high-touch areas that should **never** be missed:

• Mirror • Center controls • Keys and fob • Wiper control • Climate control • Audio controls • Hand brake • Seats *(driver/passenger)*/Seatbelts • Fuel door opener • Windows • Headrests • Armrests	• All mounted devices *(any and all electronic devised used - i.e. iPad, laptop, radio, GPS, phone chargers)* • Steering wheel • Headlight • All cabin lighting controls • Shifter • Cup holder • Door handle*(inside and out)*/Window control/locks • Air vent • Sun visors

Use disinfectant wipes, diluted bleach solution, or damp soapy water wipes when cleaning all hard surfaces throughout the vehicle.

To guide your efforts when cleaning the vehicle, think about where droplets would fall when you sneeze or cough (*for example: do you turn your head to the side?) and remember to think about your own personal safety:*

- Be sure to wash your hands for **20 seconds** after completing the cleaning process.
- If you take your vehicle home at night, be sure to lock it to prevent it from being compromised.
- Make sure you have a mask and gloves (when/where appropriate).



Before you leave or enter the vehicle – here's a checklist to keep you safe and your team members safe as well:

Activity to Safeguard	✓
Keys / Fob	
Door Handles (interior/exterior)	
Steering Wheel, Shift Lever, Brake Lever, Wiper Stalk, Turn Signal Stalk	
Air Vents, Console, Dashboard, Cup Holder	
Exterior and Interior Fueling Latch, Cover, Cap	
Seats, Seatbelts, Headrests	
Mirrors, Windows, Window Controls	
Interior Lights	
Sun Visors	
Passenger and Driver Door Armrests, Grab Handles, Seat Adjusters	
All Electronic Devices used while in vehicle (iPads, Navigation Systems, Phone Chargers, Laptops, etc.)	

Additional considerations for crew trucks:

Handles on bin doors	
Equipment controls (bucket / digger)	

**** Please consider any other touch point identified by a crew member but not listed***

Appendix F

Site Management Forms

INSTITUTIONAL AND ENGINEERING CONTROL EVALUATION FORM

I. Site Background Information

A. Site Name and Location:

Site name as it appears on the Environmental Easement*:* _____

Name of the current property owner(s): _____

Site Street Address: _____

Municipality (-ies): _____ County (-ies): _____

Blocks: _____

Lots: _____

Source information obtained from: _____

B. Person responsible for preparing Institutional and Engineering Control Evaluation Form:

Person's Name: _____

Person's Title: _____

Company Name: _____

Relationship to the Site (check as appropriate): Owner _____ Operator_____

Lessee _____ Person Who Conducted the Cleanup _____
Other (describe)_____

Street Address: _____

City: _____ State: _____

Telephone Number: (___) ___-____

Fax Number: (___) ___-____

E-mail Address:_____

C. Case Specific Information (**Complete all that apply**)

- Site Name: _____
- Site Registry Number: _____
- Date of final Remediation Report and/or Certificate of Completion:_____
- Name and program of assigned Project Manager at issuance of Environmental Easement:
  _____

D. Existing Site Conditions

- Describe the physical characteristics of the site (features, topography, drainage, vegetation, access, etc.). If necessary, attach additional sheets.

_____
_____
_____
_____
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_____
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_____

- Describe the current site operations/use. If necessary, attach additional sheets.

_____
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_____

- Describe visual integrity/condition engineering control. If necessary, attach additional sheets.

_____

_____

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_____

_____

_____

II. Protectiveness Evaluation

A. Environmental Easement and Engineering Control Information (Complete below)

- Provide the following information for the recorded Environmental Easement:

  Book Number: _____

  Page Number: _____

  Date the date the Environmental Easement was filed in the office of the county recording officer: _____

- Have any amendments and/or additional filings been recorded that may modify or supersede the Environmental Easement?

Yes ____ No ____

If "Yes", provide an explanation. If necessary, attach additional sheets.

_____

_____

_____

_____

_____

B. Evaluation of Institutional and Engineering Controls

1. Zoning or Land Use Changes (Complete below)

a. Land use at the time the Environmental Easement was filed (check all that apply):

Non-Residential ____ Residential _____ Agricultural _____ Other _____

b. Current land use (check all that apply):

Non-Residential ____ Residential _____ Agricultural _____ Other _____

c. Has there been an actual or pending zoning or land-use change?

Yes ____ No ____

2. Inspections (Complete below)

Have periodic inspections of the site identified any excavation or other disturbance activities that have taken place within the restricted areas?

Yes____No_____

Date(s) of Disturbance: _____

Duration of Disturbance: Years ____ Months ____ Days ____

Date the NYSDEC was notified: _____

Date Work Plan Approved: _____

Description of the disturbance and methods to address the disturbance. If necessary, attach additional sheets.

_____

_____

_____

Name of Contact Person Relative to the Disturbance:

_____

Title: _____

Street Address: _____

City: _____ State: _____ Zip Code: _____

Telephone Number: _____

Email Address: _____

3. Changes to Laws and Regulations (Complete below)

a. Are there any subsequently promulgated or modified environmental laws or regulations, which apply to the site?

Yes ____No ____

b. If "Yes", has the evaluation also determined that the Environmental Easement and engineering control, as applicable, meets the requirements of the new laws and regulations?

Yes____No_____

c. The Environmental Easement and engineering control, as applicable that did not meet the requirements of the new laws and regulations has been addressed in the following manner to bring them into compliance. If necessary, attach additional sheets.

_____

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Appendix G

Request to Import/Reuse Fill Material Form

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Request to Import/Reuse Fill or Soil

This form is based on the information required by DER-10, Section 5.4(e). Use of this form is not a substitute for reading the applicable Technical Guidance document.

SECTION 1 – SITE BACKGROUND

The allowable site use is: Choose an item

Have Ecological Resources been identified? Choose an item

Is this soil originating from the site? Choose an item

How many cubic yards of soil will be imported/reused? Choose an item

If greater than 1000 cubic yards will be imported, enter volume to be imported:

SECTION 2 – MATERIAL OTHER THAN SOIL

Is the material to be imported gravel, rock or stone? Choose an item

Does it contain less than 10%, by weight, material that would pass a size 80 sieve? Choose an item

Is this virgin material from a permitted mine or quarry? Choose an item

Is this material recycled concrete or brick from a DEC registered processing facility? Choose an item

SECTION 3 - SAMPLING

Provide a brief description of the number and type of samples collected in the space below:

Example Text: 5 discrete samples were collected and analyzed for VOCs. 2 composite samples were collected and analyzed for SVOCs, Inorganics & PCBs/Pesticides.

If the material meets requirements of DER-10 section 5.5 (other material), no chemical testing needed.

SECTION 3 CONT'D - SAMPLING

Provide a brief written summary of the sampling results or attach evaluation tables (compare to DER-10, Appendix 5):

Example Text: Arsenic was detected up to 17 ppm in 1 (of 5) samples; the allowable level is 16 ppm.

If Ecological Resources have been identified use the "If Ecological Resources are Present" column in Appendix 5.

SECTION 4 – SOURCE OF FILL

Name of person providing fill and relationship to the source:

Location where fill was obtained:

Identification of any state or local approvals as a fill source:

If no approvals are available, provide a brief history of the use of the property that is the fill source:

Provide a list of supporting documentation included with this request:

The information provided on this form is accurate and complete.

_____ _____

Signature Date

_____

Print Name

_____

Firm

Revised August 2014