Arverne Substation (Former Edgemere Substation)

QUEENS COUNTY

ARVERNE, NEW YORK

SITE MANAGEMENT PLAN

NYSDEC Site Number: V00147

Prepared for:

NATIONAL GRID

175 EAST OLD COUNTRY ROAD

HICKSVILLE, NY 11801

Prepared by:

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Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date
1	11/01/2018	Changes related to: • Removing SMP requirements from an offsite property and the substations gravel driveway following additional remediation; • Updating to the most recent NYSDEC SMP template; and • Request to change the PRR period from annual to once every 3 years.	10/16/2020

DECEMBER 2014

CERTIFICATION STATEMENT

I, MATTHEW J. O'NEIL, 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).

10/16/20

Date

Matthew J. O'Neil, P.E.
GEI Consultants, Inc., P.C.
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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

BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CAMP	Community Air Monitoring Plan
CFR	Code of Federal Regulation
COC	Contaminants of Concern
CPP	Citizen Participation Plan
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
EWP	Excavation Work Plan
ft bgs	feet below ground surface
GEI	GEI Consultants, Inc., P.C.
HASP	Health and Safety Plan
IC	Institutional Control
LILCO	Long Island Lighting Company
LIPA	Long Island Power Authority
µg/L	microgram per liter
MGP	Manufacture Gas Plant
NYCRR	New York Codes, Rules and Regulations
NYS	New York State
NYSAWQS	New York State Ambient Water Quality Standards
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
OM&M	Operation, Maintenance and Monitoring
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PRR	Periodic Review Report
QEP	Qualified Environmental Professional
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RP	Remedial Party and Respondent
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVOC	Semi-volatile Organic Compounds
TAL	Target Analyte List
TCL	Target Compound List
EPA	United States Environmental Protection Agency
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program
VOC	Volatile Organic Compounds

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: V00147 Arverne Substation (Former Edgemere Substation)

Institutional Controls:	1. The property may be used for commercial use;	
	2. Deed Restriction.	
	3. All Engineering Controls (ECs) must be inspected at a frequency and in a manner defined in the SMP. This statement is to be included here if there are ECs per the site's remedial program.	
Engineering Controls:	1. Composite Cover System	
	2. Site Access Controls	
Inspections:		Frequency
1. Composite Cover System		Annually
2. Annual Site Wide Inspection		Annually
Maintenance:		
1. Composite Cover System Maintenance		As needed
Reporting:		
1. Periodic Review Report		Every Three 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 and 4 of this SMP.

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

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 Arverne Substation (Former Edgemere Substation) located in Arverne, New York (hereinafter referred to as the "Site"). See Figure 1. The Site was remediated under the New York State (NYS) Voluntary Cleanup Program (VCP) Site No. R2-0330-98-01 which was administered by New York State Department of Environmental Conservation (NYSDEC).

Long Island Lighting Company (LILCO [a predecessor of National Grid]) (hereinafter "National Grid" or "RP") entered into a Voluntary Cleanup Agreement (VCA) on April 19, 1998 with the NYSDEC to remediate Manufactured Gas Plant (MGP)-related impacts at the Site (the Order). This Order required the RP to investigate and remediate contaminated media at the Site. After successful completion of additional soil remediation, and in conjunction with the termination of the VCP, NYSDEC issued an Assignable Release and Covenant Not to Sue on July 2, 2018.

Figure 1 shows the Site location and Figure 2 depicts the boundaries of this Site and the SMP. The boundaries of the Site are more fully described in the metes and bounds Site description that is part of the Deed Restriction provided in Appendix A. The Deed Restriction is granted by the owner of the Site (the "Grantor") to the NYSDEC and was recorded at the County Clerk on April 16, 2015. The SMP boundary was revised in this SMP to exclude the substations gravel driveway following the June 2018 Shallow Soil Removal (Figure 2). The SMP boundary revision does not affect the Deed Restriction boundary

After completion of the remedial work, some target compounds and target analytes were left in the subsurface at the Site. The remaining impacts are generally located in the deeper soils at the Site and 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 Site remedy to control exposure to target compounds and target analytes detected at concentrations exceeding applicable Standards, Criteria and Guidance (SCGs) in environmental samples collected at the Site (i.e. impacts) to ensure protection of public health and the environment. A Deed Restriction granted to the NYSDEC by the property owners (see Table 1, hereinafter "the Property Owners" and/or "the Grantors"), and recorded with the Queens County Clerk, requires compliance with this SMP and all ECs and ICs placed on the Site. The Deed Restriction is located in Appendix A.

ECs and ICs will be incorporated into this SMP to control exposure to impacts to ensure protection of public health and the environment. The ECs to be established on the Site as part of the remedy include a composite cover system as well as site access controls. ICs consist of compliance with the Deed Restriction which requires compliance with the SMP and all established ECs and ICs for the Site.

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

This SMP was prepared to manage impacts at the Site until the Deed Restriction is extinguished in accordance with Environmental Conservation Law (ECL) Article 71, Title 36. This plan has been approved by the NYSDEC, and compliance with this plan is required by the Grantor of the Deed Restriction and the Grantor's successors and assigns. This SMP 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 Deed Restriction. Failure to properly implement the SMP is a violation of the Deed Restriction;

- Failure to comply with this SMP is a violation of 6 New York Codes, Rules, and Regulations (NYCRR) Part 375 and the VCA (Index #R2-0330-98-01; Site #V00147) 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 National Grid and NYSDEC, and the provisions in the Excavation Work Plan (Appendix B). National Grid is only responsible for costs associated with MGP-related impacts.

- 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 Contaminants of Concern (COCs) to environment, lack of odor control, etc.

Annual inspections of the Site will be conducted to assess compliance with the provisions of the Deed Restriction 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. A list of contacts for persons involved with the Site is provided in Appendix C of this SMP.

This SMP was prepared by GEI Consultants, Inc., P.C. (GEI), 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 Deed Restriction 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.**

This SMP includes the following plan:

1. An IC/EC 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:
    - ICs: Deed Restriction; and
    - ECs: Composite Cover System, Site Access Controls.

The IC/EC Control Plan, which is presented in Section 3 of this SMP, includes the following plans and provisions:

- An Excavation Work Plan (EWP) which details the provisions for management of limited excavations in areas of remaining impacts;
- A Health and Safety Plan (HASP);
- Community Air Monitoring Plans (CAMP);
- 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, limited to annual inspection and periodic certification, 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. Revisions will be necessary upon, but not limited to, the following

occurring: a change in media monitoring requirements, upgrades to or shut-down of a remedial system, post-remedial removal of impacted sediment or soil, or other significant change to the Site conditions. In accordance with the Deed Restriction for the Site, the NYSDEC 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 (RAWP) while smaller scale (*i.e.*, "limited") intrusive activities will comply with the EWP (Appendix B) 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:

- 60-day advance notice of any proposed changes in Site use that are required under the terms of the VCA, 6NYCRR Part 375 and/or ECL.

- 30-day advance notice of any field activity not pursuant to the EWP.

- Notify National Grid as soon as possible of any proposed ground-intrusive activity pursuant to the EWP. Notify NYSDEC at least 15 days prior to the proposed start of activity.

- Once identified, notice will be provided to National Grid and NYSDEC 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.

- Verbal notice will be provided to National Grid and NYSDEC 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. National Grid will provide written confirmation to NYSDEC within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

- Follow-up status reports on actions taken to respond to any damage or defect to the EC requiring ongoing responsive action will be prepared by National Grid 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:

- 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 Voluntary Cleanup Agreement (VCA), and all approved work plans and reports, including this SMP.

- 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.

Table 2 on the following page includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of Site-related contact information is provided in Appendix C.

Table 2: Notifications*

Name	**Contact Information**
Sondra Martinkat	(718) 482-4891 Sondra.martinkat@dec.ny.gov
Jane O'Connell	(718) 482-4599 Jane.oconnell@dec.ny.gov
Sarah Aldridge National Grid Project Manager	516-545-2568 Sarah.Aldridge@nationalgrid.com

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

2. Summary of Previous Investigations and Remedial Actions

2.1 Site Location and Description

The Site is located at 5219 Rockaway Beach Boulevard, Arverne, Queens County, New York and is identified as Block 15891 and Lot 10 on the Edgemere-Queens Tax Map (see Figure 2– Site Layout Map). The Site is an approximately 0.5-acre area and is bounded by Rockaway Beach Boulevard to the north, Rockaway Freeway to the south, a church and Beach 52nd Street to the east, and a one-story commercial building and Beach 54th Street to the west. The boundaries of the Site are more fully described in Appendix A – Deed Restriction. The SMP boundary shown on Figure 2 was revised in this SMP to exclude the substations gravel driveway following the June 2018 Shallow Soil Removal. The owner of the Site parcel at the time of issuance of this SMP is Long Island Power Authority (LIPA).

2.2 Physical Setting

2.2.1 Land Use

The Site consists of the following: an electric substation. The Site is zoned commercial and is currently an operating LIPA substation.

The properties adjoining the Site, and in the neighborhood surrounding the Site, primarily include commercial and residential properties and a church. The properties immediately south of the Site include residential properties; the properties immediately north of the Site include residential properties; the properties immediately east of the Site include commercial properties; and the properties to the west of the Site include commercial properties.

2.2.2 Geology

The Site is located within the Atlantic Coastal Plain geomorphic province. There are approximately 980 feet of unconsolidated deposits overlying bedrock at the former Site. The deposits underneath generally consist of outwash deposits comprised of gravel and sand with lenses of finer materials. Recent deposits consisting of artificial fill, peat, shell bearing mud, silt, clay, wind- and wave-deposited sands, gravels, and shell fragments overlie the outwash deposits.

The Rockaway Park Former MGP site is located approximately 2.5 miles to the southwest from the Arverne Substation. It is suspected that the MGP-related fill used as

fill at the Substation was material from the Rockaway Park Former MGP. Soil boring and monitoring wells installed at the Site were limited to the depth of the impacted fill and underlying soils to a maximum depth of approximately 12 feet below ground surface (ft bgs). Within that depth, soils at the Site consisted of 1 to 3 feet of fill material underlain by sand.

2.2.3 Hydrogeology

There are four major aquifers in the Rockaway peninsula identified as the Jameco, Lloyd, Magothy, and Upper Glacial aquifers. Regional hydrogeology of the Rockaway peninsula is characterized by groundwater flow north towards Jamaica Bay within the northern portions of the Peninsula and south towards the Atlantic Ocean in the southern portions. Regional hydraulic conductivities calculated within the outwash deposits underlying the site area average approximately 270 feet per day for horizontal flow and 27 feet per day for vertical flow. The water table is near or below sea level in the vicinity of the Site. Water table conditions are encountered on the Rockaway peninsula within the outwash deposits.

Four groundwater gauging events were conducted at the Site between 1999 and 2000. The depth to water at the Site varied seasonally from between approximately 2 to 4 ft bgs. Groundwater flow at the Site was generally to the north as shown in Figure 3. During recent construction, groundwater was documented as shallow as 1 ft bgs.

2.3 Site, Investigation and Remedial History

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site. Full titles for each of the reports referenced below are provided in Section 7.0 - References.

2.3.1 Site History

An electrical substation was operated at the Site from approximately 1938 through 1994. When the Substation was retired in 1994, it consisted of a 3,000-kilovolt transformer and a control house. During fall of 1995, an electrical transformer located at the Site was vandalized, resulting in the release of 2,000 gallons of non-hazardous mineral oil within the southwest corner of the Site. Remedial activities were performed at the Site, and approximately 1,200 gallons of the mineral oil was recovered using two 3-foot diameter oil recovery wells. Soil sampling as part of the remedial activities revealed that the Site included various types of fill material, including fill that appears to be from former MGPs.

Immediately east of the Substation is a property currently owned by a church (the Solid Rock Church of Seventh-Day Adventists, Block 15891, Lot 21, the Church Property). LILCO previously owned this property until it was sold in the early 1960s.

In 1998, excavations were performed in the Site and at the adjacent Church Property, and a clean soil cover was installed (see Section 2.3.2 below).

In 2004, the Arverne Substation was constructed at the Site above the composite cover system. In October 2009, construction began for a new substation building on the Site. Nineteen mini-piles were installed, and shallow excavation was performed to construct the building foundation from October to November 2009.

In February and March 2010, shallow excavation was performed by LIPA to connect the mini-piles installed in 2009 to an existing electrical grounding network.

In May through July 2018, shallow excavations were performed by LIPA to remove contaminated soils in the gravel driveway on the eastern portion of the Site and at the adjacent Church Property.

2.3.2 Investigation and Remedial History

Between 1995 and 1998, environmental assessments were performed at the Site in response to the reported mineral oil spill. During these assessments, elevated levels of lead and benzene were detected in soil. Further investigation revealed the elevated benzene levels in soil might be due to the presence of coal tar, which had been deposited on the Site. Additional investigations were conducted to delineate the location of coal tar impacts as well as to delineate and quantify the levels of lead in soil in detail. A summary of the investigations was included in the RAWP prepared by MARCOR Remediation, Inc. in 1998.

As a result of the 1995 to 1998 investigations, potentially hazardous and non-hazardous areas were delineated. Waste profiles were developed for the respective material and plans and specifications were developed by LILCO to remove all site material located above the groundwater. The Site was remediated in accordance with the NYSDEC-approved Work Plan for Site Remediation by MARCOR Remediation, Inc. for LILCO dated May 1998.

The remedial activity included the removal of substation equipment, debris and 3 feet of material (to approximate depth to groundwater at the time of remediation) from the Site and adjacent Church Property. The contaminated material removed consisted primarily of coal ash, clinker, purifier box wastes, tars, brick, sand, and debris from the former substation control house. The impacted material was removed off-site and approximately 3 feet of clean fill was added to act as a clean soil cover. Excavation activities next to structures were limited to ensure structural integrity was maintained. Material removal

commenced approximately 6" from the respective structure, and a slope of 1-foot vertical to 1-foot horizontal was maintained. A demarcation barrier was not installed below the clean soil cover in 1998 during the remediation. The location of the clean soil cover is shown in Figure 4. Groundwater and soil/debris located below the groundwater table were not included in the 1998 remedial activity.

In 2004, the Arverne Substation was constructed at the Site above the clean soil cover installed during the remediation. The foundation elements for the new substation and the 1998 clean soil cover are referred to as the composite cover system which is currently installed at the Site.

In October 2009, construction began for a new substation building on the Site. Work included the installation of additional foundation elements and concrete trenching with the upper three at the Site. These additional subsurface components have been incorporated into the composite cover system as shown in Figure 4.

In 2009, GEI performed additional sampling of soil during the Substation construction to further assess the nature and extent of contamination.

In January and February 2016, during construction work at the current substation, samples were collected from soil below the composite cover system on the Site to determine the presence of lead-impacted soils that exceeded 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (Unrestricted Use SCOs). In December 2016, additional shallow subsurface soil samples were collected from to the west and south of the adjacent Church Property. The NYSDEC-approved Shallow Soil Removal Work Plan was developed to remove the remaining impacts both on the substation property and the adjacent Church Property to a target depth of 5 ft bgs using the analytical data collected from the 2016 sampling.

In May through July 2018, impacted soils were removed from within the gravel driveway of the substation and adjacent Church Property. The impacted material located from 3 to 5 ft bgs was removed off-site and replaced with clean fill. Clean soils from 0 to 3 ft bgs were excavated, stockpiled separately, and reused to reestablish the clean soil cover. The off-Site property and the substation driveway had been remediated to meet Unrestricted Use SCOs. Per the NYSDEC-approved Construction Completion Report recommendation, dated June 2018, the off-site property and the substation driveway were removed from the SMP requirements following the shallow soil removal.

2.3.3 Investigation Results

2.3.3.1 Site-Related Soils

The bulk of the remaining residual MGP impacts are located within subsurface soils beneath the composite cover system below 3 feet. Details on the composite cover system

are discussed in Section 2.3.2. The contaminated material consists primarily of coal ash, clinker, purifier box wastes, tars, brick, sand, and debris remaining from the former substation control house. Soils are also contaminated with transformer mineral oils.

Laboratory analytical testing from 1995 indicates that elevated concentrations of certain volatile organic compounds (VOCs) specifically benzene, ethylbenzene, toluene, and xylene, semivolatile organic compounds (SVOCs) specifically polycyclic aromatic hydrocarbons (PAHs), metals and cyanide were present in areas where residual MGP impacts were encountered. A summary of compounds detected in subsurface soils located below the remedial excavation are provided in Table 3. Remaining soil with concentrations above Unrestricted Use SCOs are shown in Figure 5. Remaining soil with concentrations above Commercial Use SCOs are shown in Figure 5A.

It was suspected that the fill material present on the Substation property might extend to the area behind the adjacent Church. At the request of the NYSDEC, the rear property behind the Church was examined for the presence of fill material. During the site assessments conducted between 1995 and 1998, the soil behind the adjacent Church Property was characterized as both hazardous and non-hazardous material and was delineated accordingly. The material was removed as part of the remediation conducted at the Site.

2.3.3.2 Site-Related Groundwater

Groundwater monitoring was conducted in accordance with the post-remediation groundwater monitoring plan dated August 1998. Four monitoring wells (MW-01 through MW-04) at the Site were sampled for benzene and lead four times from April 1999 to May 2000. The location of the monitoring wells is shown in Figure 3. Benzene and lead were less than the New York State Ambient Water Quality Standards (NYSAWQS) in all samples, except for benzene at MW-3, which was 1.6 microgram per liter (µg/L) on August 10, 1999; however, benzene concentrations at this location were not detected during two subsequent sampling events in June and May of 2000. No further groundwater sampling was required at the Site. Results from the four sampling events are shown in Table 4 and Figure 3.

During recent construction, several attempts were made to locate the monitoring wells using the survey locations and a magnetometer so that the conditions of the wells could be assessed. Three of the monitoring wells, MW-1, MW-2, and MW-3, which were located south of the Site, could not be located. The location of MW-4 has been paved over since 2000 and the well could not be located at the Site.

2.3.3.3 Site-Related Soil Vapor Intrusion

In September 2009, GEI installed and sampled twelve temporary soil vapor monitoring points (ES-SV-01 through ES-SV-12) along the eastern, western, and northern borders of

the site. Those locations were chosen due to the proximity of occupied structures and walkways along these property lines.

On December 4, 2009, National Grid and GEI submitted a Soil Gas Survey Letter Report and Analytical Data Results to the NYSDEC. The report summarized analytical results from the samples taken in September 2009.

The report concluded that the concentrations of VOCs that are common to MGP materials and petroleum products were detected in the soil vapor at the Site. It also concluded that the detections were not of sufficient concentration to pose a risk of soil vapor intrusion to the buildings located on the adjacent properties.

A summary of compounds detected in the soil vapor are included in Table 5 and Figure 6.

2.4 Remaining Impacts

2.4.1 Soil

In general, the remaining MGP and petroleum-related impacts present at the site are limited to concentrations of lead which do not meet the Commercial Use SCOs. These are present below the composite cover system at depths deeper than 3 feet.

Table 3, Figure 5, and Figure 5A summarize the impacts identified in the soil including visual observations and results of all soil samples collected that exceed the Unrestricted Use SCOs and the Commercial Use SCOs at the Site after completion of remedial action.

2.5 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site are as follows:

Groundwater

- Remove the source of ground water contamination.

Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

3. Institutional and Engineering control plan

3.1 General

Since impacts remain in soil samples collected at the Site, ICs and 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.

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 Deed Restriction;
- A description of the controls to be evaluated during each required inspection;
- A description of plans and procedures to be followed for implementation of IC/ECs, such as the EWP (as provided in Appendix B) for the proper handling of impacted material that may be disturbed during small-scale (i.e. limited) 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:
    - An EWP (provided in Appendix B) that details the provisions for management of small-scale (*i.e.*, limited) excavations, in areas of impacts detected in soil and/or groundwater samples, including the proper handling of impacted material that may be disturbed during small-scale 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; and
    - Maintenance of site access controls and Department notification.

3.2 Roles and Responsibilities

A description of the roles and responsibilities of each party (i.e., the Department, the property owner, and National Grid) with respect to this SMP is included as the Matrix of Responsibility (Table 6). A decision tree outlining the steps for on-site intrusive work by the property owners, included as Figure 7.

3.3 Institutional Controls

One ICs, a Deed Restriction, is required to: (1) implement, maintain and monitor EC systems; (2) prevent future exposure to impacts; and, (3) limit the use and development of the Site to commercial uses only. The Deed Restriction requires compliance with this SMP. Restrictions identified in the Deed Restriction may not be discontinued without an amendment to or extinguishment of the Deed Restriction. The IC boundaries are shown in the figures associated with the Deed Restriction package included in Appendix A. Key components of the Deed Restriction are:

- The Site may be used for: Commercial as described in 6 NYCRR Part 475-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 475-1.8(g)(2)(iv) use;
- The EC must be maintained by National Grid and/or Property Owner as specified in this SMP;
- The EC must be inspected at a frequency and in a manner defined in the SMP (see Section 4 and Section 6);
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the New York State Department of Health (NYSDOH) or the Queens 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 6);
- All future intrusive activities that will disturb impacts must be conducted in accordance with this SMP (see Appendix B);
- Maintenance, inspection, and reporting of any physical components of the remedy shall be performed as defined in this SMP (see Section 4 and Section 6); and
- 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 the Deed Restriction.

Components of the Deed Restriction may be modified, added or deleted from this list as warranted by Site-specific conditions with approval with NYSDEC.

The responsibility for the elements of the Deed Restriction is discussed in Table 6 – Matrix of Responsibilities. Table 6 defines the responsibilities for National Grid and the property owner(s).

3.4 Engineering Controls

3.4.1 Composite Cover System

Exposure to remaining impacts at the Site is prevented by a cover system placed over the Site. This cover system is comprised of a minimum of 36 inches of clean soil, gravel, concrete cubs and concrete substation foundation elements. Figure 4 presents the location of the cover system and applicable demarcation layers. The (EWP) provided in Appendix B outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining impacts are disturbed. 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 CAMP prepared for the Site and provided in Appendices D and E.

The composite 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 cover systems purpose is to maintain a barrier between the public and impacts and the inspection will focus on the structural/remedial integrity of the cover system. Monitoring for aesthetics or functionality apart from the remedial purpose is not required by the SMP.

3.4.2 Access Controls

While the active substation is in operation, additional engineering and institutional controls will be in place to prevent access to the Site and limit exposure to remaining contamination for workers within the substation. These controls include the following:

- Security Fence – The Site is enclosed by an 8-foot tall security fence topped with a triple stand of razor wire. Access to the locked gates is restricted to substation operations.

- Site Warning Signs – Signs indicating restricted access and the physical hazards associated with the substation equipment are installed at the Site. The signs include “No Digging” and “Contact PSEG”.

- Hazard Communication Program – Employees accessing the substation to conduct work at the Site will be required to review the hazard communication program documents posted in the control house prior to starting work on the Site. A copy of the SMP will also be maintained in the control house at the Site.

- Utility Mapping System – The Arverne Substation is included in the National Grid Gas Operations Mapping System as well as the LIPA Electrical Service Mapping System. This will alert utility workers to the presence of contamination prior to beginning work at the Site.

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 Figure 7.

3.5.2 Excavation Work Plan

This SMP includes an EWP that is to be used for small-scale (i.e., limited) excavations (Appendix B). NYSDEC will make the determination of small-scale or large-scale, with respect to excavations. 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. 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. 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.

3.6 Maintenance of Site Access Controls

Access to the Site is controlled by security fencing. Control of access to the Site is to be maintained. Responsibility for maintenance of site access controls (e.g., buildings, walls, doors, fences, gates, etc.…) is per the Matrix of Responsibility (Table 6).

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 per the Matrix of Responsibility (Table 6).

3.8 Further Investigation and Possible Remedial Work Plan

Further investigation of the Site will be required should large-scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible. The nature and extent, if any, of impacts in areas where access was previously limited or unavailable, will be investigated pursuant to a plan approved by the Department. 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 plan

4.1 General

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

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:

- Annual inspection and periodic certification.

Reporting requirements are provided in Section 6 of this SMP.

4.2 Site-wide Inspection

Site-wide inspections will be performed by a Qualified Environmental Professional (QEP) at a minimum of once per year. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. 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 Inspection 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;
- 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 Deed Restriction; and
- If Site records are complete and up to date.

Reporting requirements are outlined in Section 7 of this plan.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, the property owner will notify National Grid and NYSDEC 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 determined by the NYSDEC. Written confirmation must be provided to the NYSDEC within 7 days of the event (to the extent possible) that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

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. Reporting Requirements

6.1 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 applicable inspection forms and other records 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 7.

Table 7: Schedule of Inspection Reports

Task/Report	Reporting Frequency*
Inspection Report	Annually
Periodic Review Report	Every Three Years, or as otherwise determined by the Department

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

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

- Date of event or reporting period;
- Name, company, and position of person(s) conducting 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);
- Copies of all field forms completed (e.g., site inspection forms, etc.); and
- Any observations, conclusions, or recommendations.

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

- Date of event;
- Name, company, and position of person(s) conducting maintenance activities;
- Description of maintenance activities performed;
- Any modifications to the composite cover system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and,

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)

6.2 Periodic Review Report

A Periodic Review Report (PRR) will be submitted by National Grid's QEP to the Department beginning 16 months or other agreed upon submittal date based on required operation, maintenance and monitoring (OM&M) activities after the Release and Covenant Not to Sue is issued. After submittal of the initial PRR, the next PRR shall be submitted every third year to the Department or at another frequency as may be required by the Department. In the event that the Site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the Site described in Appendix A - Deed Restriction. 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 PRR. 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 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.

- A Site evaluation, which includes the following:

  - Any new conclusions or observations regarding site impacts based on inspections;

  - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and

  - The overall performance and effectiveness of the remedy.

6.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, National Grid's QEP 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 Deed Restriction;*

- *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 or National Grid's Designated Site Representative.

6.3 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, a Corrective Measures Work Plan will be submitted to the NYSDEC 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.

7. References

GEI Consultants Inc., P.C. *Arverne (Former Edgemere) Substation Site, Index Number R2-0330-09-01. Final Engineering Report*. September 1, 2015.

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MARCOR Remediation, Inc. (1998). *Work Plan for Site Remediation at the Edgemere Substation*. May 1998.

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

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

Tables

Table 1. Site Property Divisions and Owners
Arverne Substation (Former Edgemere Substation)
Arverne, New York

Property Address	5219 Rockaway Beach Boulevard Queens, NY 11691
Owner	Long Island Lighting Company 175 Old Country Road Hicksville, NY 11801
Occupant	Substation Operator - PSEG Long Island
Block and Lot Number	Block 15891 Lot 10
Current Zoning	C8-1

Table 3. Subsurface Soil Analytical Results Summary
Arverne Substation (Former Edgemere Substation)
Arverne, New York

Sample Type				Confirmation Samples Below Composite Cover System										Confirmation Samples of Composite Cover System Materials					
Location Name				LIL-SS-02	LIL-SS-03	LIL-SS-04	LIL-SS-05	LIL-SS-07	LIL-SS-09	LIL-SS-10	LIL-SS-11	LIL-SS-12	LIL-SS-13	SB-1	SB-2	SB-2	SB-3	SB-4	SB-5
Sample Name				LIL-SS-02	LIL-SS-03	LIL-SS-04	LIL-SS-05	LIL-SS-07	LIL-SS-09	LIL-SS-10	LIL-SS-11	LIL-SS-12	LIL-SS-13	SB-1	DUP-01 ARV	SB-2	SB-3	SB-4	SB-5
Start Depth				3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	0.25	0.25	0.25	0.25	0.25	0.25
End Depth				3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.00	3.00	3.00	3.00	3.00	3.00
Sample Date				5/20/1998	5/20/1998	5/21/1998	5/26/1998	5/29/1998	6/10/1998	6/10/1998	6/10/1998	6/10/1998	6/10/1998	9/24/2012	9/24/2012	9/24/2012	9/24/2012	9/24/2012	9/24/2012
Analyte	CAS no.	Unrestricted SCO	Commercial SCO																
BTEX (mg/kg)																			
Benzene	71-43-2	0.06	44	0.00635 U	**0.00229**	0.0078 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.011 UJ	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Toluene	108-88-3	0.7	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Ethylbenzene	100-41-4	1	390	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Total Xylene	1330-20-7	0.26	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Other VOCs (mg/kg)																			
Acetone	67-64-1	0.05	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 UJ	0.012 U	0.011 U	0.012 UJ	**0.042 J**	0.011 UJ
Bromobenzene	108-86-1	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	74-97-5	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	75-27-4	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Bromoform	75-25-2	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Bromomethane	74-83-9	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
2-Butanone (Methyl ethyl ketone)	78-93-3	0.12	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 UJ	0.012 UJ	0.011 UJ	0.012 UJ	0.012 UJ	0.011 UJ
n-Butylbenzene	104-51-8	12	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	98-06-6	5.9	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	135-98-8	11	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	75-15-0	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Carbon tetrachloride	56-23-5	0.76	22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Chlorobenzene	108-90-7	1.1	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Chloroethane	75-00-3	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 UJ	0.012 UJ	0.011 UJ	0.012 UJ	0.012 UJ	0.011 UJ
Chloroform	67-66-3	0.37	350	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Chloromethane	74-87-3	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 UJ	0.012 UJ	0.011 UJ	0.012 UJ	0.012 UJ	0.011 UJ
2-Chlorotoluene (o-Chlorotoluene)	95-49-8	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorotoluene (p-Chlorotoluene)	106-43-4	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	96-12-8	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	124-48-1	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
1,2-Dibromoethane (EDB)	106-93-4	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	74-95-3	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	95-50-1	1.1	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	541-73-1	2.4	280	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	1.8	130	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (Freon 12)	75-71-8	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	75-34-3	0.27	240	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 UJ	0.012 UJ	0.011 UJ	0.012 UJ	0.012 UJ	0.011 UJ
1,2-Dichloroethane	107-06-2	0.02	30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Total 1,2-Dichloroethene	540-59-0	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
1,1-Dichloroethene	75-35-4	0.33	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 UJ	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
1,2-Dichloropropane	78-87-5	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
1,3-Dichloropropane	142-28-9	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2-Dichloropropane	594-20-7	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloropropene	563-58-6	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	10061-01-5	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
trans-1,3-Dichloropropene	10061-02-6	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Hexachlorobutadiene	87-68-3	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	591-78-6	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 UJ	0.012 UJ	0.011 UJ	0.012 UJ	0.012 UJ	0.011 UJ
Isopropyl benzene	98-82-8	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	99-87-6	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (MTBE)	1634-04-4	0.93	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
4-Methyl-2-pentanone (MIBK)	108-10-1	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 UJ	0.012 UJ	0.011 UJ	0.012 UJ	0.012 UJ	0.011 UJ
Methylene chloride	75-09-2	0.05	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Naphthalene	91-20-3	12	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	103-65-1	3.9	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100-42-5	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
1,1,1,2-Tetrachloroethane	630-20-6	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	79-34-5	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Tetrachloroethene (PCE)	127-18-4	1.3	150	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
1,2,3-Trichlorobenzene	87-61-6	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	120-82-1	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	71-55-6	0.68	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
1,1,2-Trichloroethane	79-00-5	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Trichloroethene (TCE)	79-01-6	0.47	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 UJ	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U
Trichlorofluoromethane (Freon 11)	75-69-4	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	96-18-4	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	95-63-6	3.6	190	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	108-67-8	8.4	190	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl acetate	108-05-4	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	75-01-4	0.02	13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U

Table 3. Subsurface Soil Analytical Results Summary
Arverne Substation (Former Edgemere Substation)
Arverne, New York

Sample Type				Confirmation Samples Below Composite Cover System										Confirmation Samples of Composite Cover System Materials					
Location Name				LIL-SS-02	LIL-SS-03	LIL-SS-04	LIL-SS-05	LIL-SS-07	LIL-SS-09	LIL-SS-10	LIL-SS-11	LIL-SS-12	LIL-SS-13	SB-1	SB-2	SB-2	SB-3	SB-4	SB-5
Sample Name				LIL-SS-02	LIL-SS-03	LIL-SS-04	LIL-SS-05	LIL-SS-07	LIL-SS-09	LIL-SS-10	LIL-SS-11	LIL-SS-12	LIL-SS-13	SB-1	DUP-01 ARV	SB-2	SB-3	SB-4	SB-5
Start Depth				3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	0.25	0.25	0.25	0.25	0.25	0.25
End Depth				3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.00	3.00	3.00	3.00	3.00	3.00
Sample Date				5/20/1998	5/20/1998	5/21/1998	5/26/1998	5/29/1998	6/10/1998	6/10/1998	6/10/1998	6/10/1998	6/10/1998	9/24/2012	9/24/2012	9/24/2012	9/24/2012	9/24/2012	9/24/2012
Analyte	CAS no.	Unrestricted SCO	Commercial SCO																
Non-carcinogenic PAHs (mg/kg)																			
Acenaphthene	83-32-9	20	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Acenaphthylene	208-96-8	100	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	**0.23 J**	**0.41**	0.4 U	0.39 U	0.37 U
Anthracene	120-12-7	100	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	**0.36 J**	0.4 U	0.39 U	0.37 U
Benzo[g,h,i]perylene	191-24-2	100	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	**0.11 J**	**0.21 J**	0.4 U	0.39 U	0.37 U
Fluoranthene	206-44-0	100	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.13 J**	**0.36 J**	**1.3 J**	**0.11 J**	**0.12 J**	0.37 U
Fluorene	86-73-7	30	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	**0.33 J**	0.4 U	0.39 U	0.37 U
2-Methylnaphthalene	91-57-6	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	**0.26 J**	0.4 U	0.39 U	0.37 U
Naphthalene	91-20-3	12	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	**0.28 J**	0.4 U	0.39 U	0.37 U
Phenanthrene	85-01-8	100	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	**0.23 J**	**1.7 J**	0.4 U	**0.18 J**	0.37 U
Pyrene	129-00-0	100	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.17 J**	**0.58 J**	**1.8 J**	**0.12 J**	**0.15 J**	0.37 U
Carcinogenic PAHs (mg/kg)																			
Benz[a]anthracene	56-55-3	1	5.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.083 J**	**0.23 J**	**0.7**	0.4 U	0.39 U	0.37 U
Benzo[a]pyrene	50-32-8	1	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	**0.2 J**	**0.52**	0.4 U	0.39 U	0.37 U
Benzo[b]fluoranthene	205-99-2	1	5.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.091 J**	**0.27 J**	**0.61**	0.4 U	0.39 U	0.37 U
Benzo[k]fluoranthene	207-08-9	0.8	56	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	**0.12 J**	**0.3 J**	0.4 U	0.39 U	0.37 U
Chrysene	218-01-9	1	56	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.089 J**	**0.27 J**	**0.77**	0.4 U	0.39 U	0.37 U
Dibenz[a,h]anthracene	53-70-3	0.33	0.56	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Indeno[1,2,3-cd]pyrene	193-39-5	0.5	5.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	**0.097 J**	**0.19 J**	0.4 U	0.39 U	0.37 U
Other SVOCs (mg/kg)																			
Benzyl alcohol	100-51-6	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(chloroisopropyl)ether	108-60-1	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Bis(2-chloroethyl)ether	111-44-4	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Bis(2-chloroethoxy)methane	111-91-1	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Bis(2-ethylhexyl)phthalate	117-81-7	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	**0.094 J**	0.39 U	0.37 U
4-Bromophenyl phenyl ether	101-55-3	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Butyl benzyl phthalate	85-68-7	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Carbazole	86-74-8	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
4-Chloro-3-methylphenol	59-50-7	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
4-Chloroaniline	106-47-8	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
2-Chloronaphthalene	91-58-7	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
2-Chlorophenol	95-57-8	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
4-Chlorophenyl phenyl ether	7005-72-3	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Dibenzofuran	132-64-9	7	350	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
1,2-Dichlorobenzene	95-50-1	1.1	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
1,3-Dichlorobenzene	541-73-1	2.4	280	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
1,4-Dichlorobenzene	106-46-7	1.8	130	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
3,3-Dichlorobenzidine	91-94-1	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
2,4-Dichlorophenol	120-83-2	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Diethyl phthalate	84-66-2	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Dimethyl phthalate	131-11-3	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
2,4-Dimethylphenol	105-67-9	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Di-n-butyl phthalate	84-74-2	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
4,6-Dinitro-2-methylphenol	534-52-1	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.93 U	0.98 U	0.94 U	1 U	0.98 U	0.93 U
2,4-Dinitrophenol	51-28-5	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.93 U	0.98 U	0.94 U	1 U	0.98 U	0.93 U
2,4-Dinitrotoluene	121-14-2	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
2,6-Dinitrotoluene	606-20-2	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Di-n-octyl phthalate	117-84-0	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Hexachlorobenzene	118-74-1	0.33	6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Hexachlorobutadiene	87-68-3	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Hexachlorocyclopentadiene	77-47-4	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 UJ	0.39 UJ	0.37 UJ	0.4 UJ	0.39 UJ	0.37 UJ
Hexachloroethane	67-72-1	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Isophorone	78-59-1	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
2-Methylphenol (o-Cresol)	95-48-7	0.33	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
3,4-Methylphenol (m,p-Cresol)	108394/106445	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol (p-Cresol)	106-44-5	0.33	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
2-Nitroaniline	88-74-4	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.93 UJ	0.98 UJ	0.94 UJ	1 UJ	0.98 UJ	0.93 UJ
3-Nitroaniline	99-09-2	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.93 U	0.98 U	0.94 U	1 U	0.98 U	0.93 U
4-Nitroaniline	100-01-6	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.93 U	0.98 U	0.94 U	1 U	0.98 U	0.93 U
Nitrobenzene	98-95-3	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
2-Nitrophenol	88-75-5	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
4-Nitrophenol	100-02-7	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.93 U	0.98 U	0.94 U	1 U	0.98 U	0.93 U
N-Nitrosodi-n-propylamine	621-64-7	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
N-Nitrosodiphenylamine	86-30-6	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
Pentachlorophenol	87-86-5	0.8	6.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.93 U	0.98 U	0.94 U	1 U	0.98 U	0.93 U
Phenol	108-95-2	0.33	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
1,2,4-Trichlorobenzene	120-82-1	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U
2,4,5-Trichlorophenol	95-95-4	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.93 U	0.98 U	0.94 U	1 U	0.98 U	0.93 U
2,4,6-Trichlorophenol	88-06-2	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37 U	0.39 U	0.37 U	0.4 U	0.39 U	0.37 U

Table 3. Subsurface Soil Analytical Results Summary
Arverne Substation (Former Edgemere Substation)
Arverne, New York

Sample Type				Confirmation Samples Below Composite Cover System										Confirmation Samples of Composite Cover System Materials					
Location Name				LIL-SS-02	LIL-SS-03	LIL-SS-04	LIL-SS-05	LIL-SS-07	LIL-SS-09	LIL-SS-10	LIL-SS-11	LIL-SS-12	LIL-SS-13	SB-1	SB-2	SB-2	SB-3	SB-4	SB-5
Sample Name				LIL-SS-02	LIL-SS-03	LIL-SS-04	LIL-SS-05	LIL-SS-07	LIL-SS-09	LIL-SS-10	LIL-SS-11	LIL-SS-12	LIL-SS-13	SB-1	DUP-01 ARV	SB-2	SB-3	SB-4	SB-5
Start Depth				3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	0.25	0.25	0.25	0.25	0.25	0.25
End Depth				3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.00	3.00	3.00	3.00	3.00	3.00
Sample Date				5/20/1998	5/20/1998	5/21/1998	5/26/1998	5/29/1998	6/10/1998	6/10/1998	6/10/1998	6/10/1998	6/10/1998	9/24/2012	9/24/2012	9/24/2012	9/24/2012	9/24/2012	9/24/2012
Analyte	CAS no.	Unrestricted SCO	Commercial SCO																
Metals (mg/kg)																			
Arsenic	7440-38-2	13	16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	7440-39-3	350	400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	7440-43-9	2.5	9.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	63	1000	**457**	**129**	**1110**	**6.95**	**50.8**	**20**	**273**	**82.4**	**254**	**250**	**42.2**	**102**	**76.4**	**32.1**	**36.8**	**3.2**
Mercury	7439-97-6	0.18	2.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	3.9	1500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	7440-22-4	2	1500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanides (mg/kg)																			
Cyanide Reactivity	REAC-CN	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other																			
Corrosivity (pH) (mm/yr)	CORROS	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Corrosivity (pH) (s.u.)	CORROS (PH)	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Flash Point (deg f)	FP	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)	MOIST	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**11.6**	**15.4**	**11.8**	**16.9**	**15.9**	**11.1**
pH (s.u.)	pH	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfide Reactivity (mg/kg)	REAC-HS	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (%)	TOC	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3. Subsurface Soil Analytical Results Summary
Arverne Substation (Former Edgemere Substation)
Arverne, New York

Sample Type				Backfill Samples of Composite Cover System				Confirmation Samples															
Location Name				Sand Sample	LIL-FS-02	Soil Sample	Top Soil	LIL-SB-23	LIL-SB-24	LIL-SB-25	LIL-SB-26	SB-101	SB-101	SB-101	SB-102	SB-102	SB-103	SB-103	SB-104	SB-104	SB-104	SB-105	SB-105	SB-105
Sample Name				Sand Sample	LIL-FS-02	Soil Sample	Top Soil	LIL-SB-23 (3-5')	LIL-SB-24 (3-5')	LIL-SB-25 (3-5')	LIL-SB-26 (3-5')	SB-101(5-6)	SB-10X	SB-101(6-7)	SB-102(5-6)	SB-102(6-7)	SB-103(5-6)	SB-103(6-7)	SB-104(3-5)	SB-104(5-6)	SB-104(6-7)	SB-105(3-5)	SB-105(5-6)	SB-105(6-7)
Start Depth				0.25	0.25	0.25	0.25	3	3	3	3	5	5	6	5	6	5	6	3	5	6	3	5	6
End Depth				3.00	3.00	3.00	3.00	5	5	5	5	6	6	7	6	7	6	7	5	6	7	5	6	7
Sample Date				5/11/1998	4/27/1998	7/7/1998	6/2/1998	12/12/2016	12/12/2016	12/12/2016	12/12/2016	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017
Analyte	CAS no.	Unrestricted SCO	Commercial SCO																					
BTEX (mg/kg)																								
Benzene	71-43-2	0.06	44	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	108-88-3	0.7	500	**0.3**	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	100-41-4	1	390	**0.007**	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylene	1330-20-7	0.26	500	NA	NA	NA	0.015 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other VOCs (mg/kg)																								
Acetone	67-64-1	0.05	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	108-86-1	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	74-97-5	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	75-27-4	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	75-25-2	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	74-83-9	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone)	78-93-3	0.12	500	NA	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	104-51-8	12	500	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	98-06-6	5.9	500	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	135-98-8	11	500	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	75-15-0	NE	NE	NA	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	56-23-5	0.76	22	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	108-90-7	1.1	500	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	75-00-3	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	67-66-3	0.37	350	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	74-87-3	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorotoluene (o-Chlorotoluene)	95-49-8	NE	NE	NA	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorotoluene (p-Chlorotoluene)	106-43-4	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	96-12-8	NE	NE	**0.001**	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	124-48-1	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	106-93-4	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	74-95-3	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	95-50-1	1.1	500	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	541-73-1	2.4	280	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	1.8	130	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (Freon 12)	75-71-8	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	75-34-3	0.27	240	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	107-06-2	0.02	30	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total 1,2-Dichloroethene	540-59-0	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	75-35-4	0.33	500	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	78-87-5	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichloropropane	142-28-9	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2-Dichloropropane	594-20-7	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloropropene	563-58-6	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	10061-01-5	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	10061-02-6	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	87-68-3	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	591-78-6	NE	NE	NA	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	98-82-8	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	99-87-6	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether (MTBE)	1634-04-4	0.93	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	108-10-1	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	75-09-2	0.05	500	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	91-20-3	12	500	**0.018**	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	103-65-1	3.9	500	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100-42-5	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	630-20-6	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	79-34-5	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene (PCE)	127-18-4	1.3	150	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	87-61-6	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	120-82-1	NE	NE	**0.007**	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	71-55-6	0.68	500	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	79-00-5	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene (TCE)	79-01-6	0.47	200	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (Freon 11)	75-69-4	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	96-18-4	NE	NE	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	95-63-6	3.6	190	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	108-67-8	8.4	190	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl acetate	108-05-4	NE	NE	NA	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	75-01-4	0.02	13	0.005 U	NA	NA	0.005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3. Subsurface Soil Analytical Results Summary
Arverne Substation (Former Edgemere Substation)
Arverne, New York

Sample Type				Backfill Samples of Composite Cover System				Confirmation Samples															
Location Name				Sand Sample	LIL-FS-02	Soil Sample	Top Soil	LIL-SB-23	LIL-SB-24	LIL-SB-25	LIL-SB-26	SB-101	SB-101	SB-101	SB-102	SB-102	SB-103	SB-103	SB-104	SB-104	SB-104	SB-105	SB-105	SB-105
Sample Name				Sand Sample	LIL-FS-02	Soil Sample	Top Soil	LIL-SB-23 (3-5')	LIL-SB-24 (3-5')	LIL-SB-25 (3-5')	LIL-SB-26 (3-5')	SB-101(5-6)	SB-10X	SB-101(6-7)	SB-102(5-6)	SB-102(6-7)	SB-103(5-6)	SB-103(6-7)	SB-104(3-5)	SB-104(5-6)	SB-104(6-7)	SB-105(3-5)	SB-105(5-6)	SB-105(6-7)
Start Depth				0.25	0.25	0.25	0.25	3	3	3	3	5	5	6	5	6	5	6	3	5	6	3	5	6
End Depth				3.00	3.00	3.00	3.00	5	5	5	5	6	6	7	6	7	6	7	5	6	7	5	6	7
Sample Date				5/11/1998	4/27/1998	7/7/1998	6/2/1998	12/12/2016	12/12/2016	12/12/2016	12/12/2016	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017
Analyte	CAS no.	Unrestricted SCO	Commercial SCO																					
Non-carcinogenic PAHs (mg/kg)																								
Acenaphthene	83-32-9	20	500	0.04 U	0.35 U	NA	0.01 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	208-96-8	100	500	0.04 U	0.35 U	NA	0.04 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	100	500	0.04 U	0.35 U	NA	0.04 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[g,h,i]perylene	191-24-2	100	500	0.1 U	0.35 U	NA	0.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	206-44-0	100	500	0.04 U	0.35 U	NA	**0.141**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	86-73-7	30	500	0.04 U	0.35 U	NA	0.04 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	91-57-6	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	91-20-3	12	500	0.04 U	0.35 U	NA	0.04 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	100	500	0.04 U	0.35 U	NA	**0.061**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	129-00-0	100	500	0.04 U	0.35 U	NA	**0.211**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carcinogenic PAHs (mg/kg)																								
Benz[a]anthracene	56-55-3	1	5.6	0.04 U	0.35 U	NA	**0.067**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[a]pyrene	50-32-8	1	1	0.04 U	0.35 U	0.04 U	**0.077**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[b]fluoranthene	205-99-2	1	5.6	0.15 U	0.35 U	NA	0.15 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[k]fluoranthene	207-08-9	0.8	56	0.1 U	0.35 U	NA	0.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	218-01-9	1	56	0.1 U	0.35 U	NA	0.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz[a,h]anthracene	53-70-3	0.33	0.56	0.04 U	0.35 U	NA	0.04 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene	193-39-5	0.5	5.6	0.04 U	0.35 U	NA	0.04 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other SVOCs (mg/kg)																								
Benzyl alcohol	100-51-6	NE	NE	0.666 U	NA	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(chloroisopropyl)ether	108-60-1	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroethyl)ether	111-44-4	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	111-91-1	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	117-81-7	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	101-55-3	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	85-68-7	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	86-74-8	NE	NE	NA	0.35 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	59-50-7	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	106-47-8	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	91-58-7	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	95-57-8	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	7005-72-3	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	132-64-9	7	350	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	95-50-1	1.1	500	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	541-73-1	2.4	280	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	1.8	130	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3-Dichlorobenzidine	91-94-1	NE	NE	0.666 U	1.7 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	120-83-2	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	84-66-2	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	131-11-3	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	84-74-2	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	534-52-1	NE	NE	0.666 U	1.7 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	51-28-5	NE	NE	1.332 U	1.7 U	NA	1.332 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	121-14-2	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	606-20-2	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	117-84-0	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	118-74-1	0.33	6	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	87-68-3	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	77-47-4	NE	NE	1 U	1.7 U	NA	1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	67-72-1	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	78-59-1	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol (o-Cresol)	95-48-7	0.33	500	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4-Methylphenol (m,p-Cresol)	108394/106445	NE	NE	NA	0.35 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol (p-Cresol)	106-44-5	0.33	500	0.666 U	NA	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	88-74-4	NE	NE	0.666 U	1.7 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	99-09-2	NE	NE	0.666 U	1.7 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	100-01-6	NE	NE	0.666 U	1.7 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	98-95-3	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	88-75-5	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	100-02-7	NE	NE	0.666 U	1.7 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	621-64-7	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	86-30-6	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	87-86-5	0.8	6.7	0.666 U	1.7 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	108-95-2	0.33	500	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	120-82-1	NE	NE	0.1 U	0.35 U	NA	0.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	95-95-4	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	88-06-2	NE	NE	0.666 U	0.35 U	NA	0.666 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3. Subsurface Soil Analytical Results Summary
Arverne Substation (Former Edgemere Substation)
Arverne, New York

Sample Type				Backfill Samples of Composite Cover System				Confirmation Samples															
Location Name				Sand Sample	LIL-FS-02	Soil Sample	Top Soil	LIL-SB-23	LIL-SB-24	LIL-SB-25	LIL-SB-26	SB-101	SB-101	SB-101	SB-102	SB-102	SB-103	SB-103	SB-104	SB-104	SB-104	SB-105	SB-105	SB-105
Sample Name				Sand Sample	LIL-FS-02	Soil Sample	Top Soil	LIL-SB-23 (3-5')	LIL-SB-24 (3-5')	LIL-SB-25 (3-5')	LIL-SB-26 (3-5')	SB-101(5-6)	SB-10X	SB-101(6-7)	SB-102(5-6)	SB-102(6-7)	SB-103(5-6)	SB-103(6-7)	SB-104(3-5)	SB-104(5-6)	SB-104(6-7)	SB-105(3-5)	SB-105(5-6)	SB-105(6-7)
Start Depth				0.25	0.25	0.25	0.25	3	3	3	3	5	5	6	5	6	5	6	3	5	6	3	5	6
End Depth				3.00	3.00	3.00	3.00	5	5	5	5	6	6	7	6	7	6	7	5	6	7	5	6	7
Sample Date				5/11/1998	4/27/1998	7/7/1998	6/2/1998	12/12/2016	12/12/2016	12/12/2016	12/12/2016	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017	8/14/2017
Analyte	CAS no.	Unrestricted SCO	Commercial SCO																					
Metals (mg/kg)																								
Arsenic	7440-38-2	13	16	**1.17**	1.1 U	0.5 U	**8.54**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	7440-39-3	350	400	**7.81**	21.1 U	NA	**32.7**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	7440-43-9	2.5	9.3	**0.39**	0.53 U	NA	0.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	NE	NE	**2.34**	**1.5**	NA	0.3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	63	1000	**21.9**	**0.69**	NA	**4.56**	**32 J**	**24 J**	**40.9 J**	**29.6 J**	**6.3**	**10.9**	**42.9**	**8.2**	**81.3**	**10.6**	**2.1 J**	**6.1**	**7.3**	**13.1**	**16.2**	**6.5**	**6.6**
Mercury	7439-97-6	0.18	2.8	0.05 U	0.11 U	NA	0.05 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	3.9	1500	0.5 U	0.53 U	NA	0.3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	7440-22-4	2	1500	0.5 U	1.1 U	NA	0.3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanides (mg/kg)																								
Cyanide Reactivity	REAC-CN	NE	NE	0.1 U	NA	NA	0.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other																								
Corrosivity (pH) (mm/yr)	CORROS	NE	NE	0 U	NA	NA	0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Corrosivity (pH) (s.u.)	CORROS (PH)	NE	NE	**7.97**	NA	NA	**7.97**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Flash Point (deg f)	FP	NE	NE	**200**	NA	NA	**200**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)	MOIST	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH (s.u.)	pH	NE	NE	NA	NA	NA	**6.12**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfide Reactivity (mg/kg)	REAC-HS	NE	NE	0.01 U	NA	NA	2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (%)	TOC	NE	NE	NA	NA	NA	**3.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3. Subsurface Soil Analytical Results Summary
Arverne Substation (Former Edgemere Substation)
Arverne, New York

Notes:

Historic Data for this sampling events have not been validated. Qualifiers are Lab Qualifiers.

mg/kg - milligrams/kilogram or parts per million (ppm)
S.U. - Standard Units
BTEX - benzene, toluene, ethylbenzene, and xylenes
VOCs - volatile organic compounds
PAHs - polycyclic aromatic hydrocarbons
SVOCs - semivolatile organic compounds

6 NYCRR -New York State Register and Official Compilation of Codes, Rules and Regulations of the State of New York
Comparison of detected results are performed against the following NYCRR, Chapter IV, Part 375-6 Soil Cleanup Objectives (SCO)s: Unrestricted Use, Commercial Use

* 500 ppm total PAH SCO for non-residential sites (Commercial or Industrial), per NYSDEC CP-51 / Soil Cleanup Guidance, Section V(H).

NE - not established

NA - not analyzed

Bromoform

Bolding indicates a detected concentration

Gray shading and bolding indicates that the detected result value exceeds the Unrestricted SCO

Yellow shading and bolding indicates that the detected result value exceeds the Commercial SCO

Data Qualifiers:

J - estimated value

U - indicates not detected at or above the reporting limit shown.

Table 4. Groundwater Analytical Results Summary
Arverne Substation (Former Edgemere Substation)
Arverne, New York

Sample Location: Sample Date:	NYS AWQS	MW-1 4/22/1999	MW-1 8/10/1999	MW-1 2/7/2000	MW-1 5/24/2000	MW-2 4/22/1999	MW-2 8/10/1999	MW-2 2/7/2000	MW-2 5/24/2000
VOCs (ug/L)									
Benzene	1	**0.2**	**0.2**	**0.7**	0.2 U	**0.2**	**0.2**	0.2 U	0.2 U
Metals (ug/L)									
Lead	25	130 U	**6**	5 U	5 U	130 U	**10**	5 U	5 U

Sample Location: Sample Date:	NYS AWQS	MW-3 4/22/1999	MW-3 8/10/1999	MW-3 2/7/2000	MW-3 5/24/2000	MW-4 4/22/1999	MW-4 8/10/1999	MW-4 2/7/2000	MW-4 5/24/2000
VOCs (ug/L)									
Benzene	1	**0.2**	**1.6**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Metals (ug/L)									
Lead	25	130 U	4 U	5 U	5 U	130 U	**4**	5 U	5 U

Notes:

µg/L - micrograms/Liter or parts per billion (ppb)
VOCs - volatile organic compounds
NYS AWQS - New York State Ambient Water Quality Standards for GA groundwater

Bolding indicates a detected concentration
Gray shading and bolding indicates that the detected result value exceeds established NYS AWQS
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis

Table 5. Soil Vapor Analytical Results Summary
Arverne Substation (Former Edgemere Substation)
Arverne, New York

Sample Name: **Sample Date:**	NYSDOH Background Outdoor Air Concentrations 95th Percentile Range[1]	ES-SV-01 9/8/2009	ES-SV-02 9/8/2009	ES-SV-03 9/8/2009	ES-SV-04 9/8/2009	ES-SV-05 9/8/2009	ES-SV-06 9/8/2009	ES-SV-07 9/8/2009	ES-SV-08 9/8/2009	ES-SV-09 9/8/2009	ES-SV-10 9/8/2009	ES-SV-11 9/8/2009	Duplicate of: ES-SV-11 9/8/2009	ES-SV-12 9/8/2009	ES-AA-01 9/8/2009	ES-AA-02 9/8/2009	ES-AA-03 9/8/2009
BTEX (ug/m^3)																	
Benzene	5.8	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.83 U	0.64 U	0.70 U	0.64 U	0.89 U	**1.5**	**0.99**
Toluene	21	**1.3**	**0.45 J**	**0.53 J**	**0.75**	**0.49 J**	**0.45 J**	**0.45 J**	**0.68 J**	**0.45 J**	**0.75**	**0.41 J**	**0.53 J**	**0.68 J**	**2.0**	**2.9**	**2.0**
Ethylbenzene	1.9	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	**0.30 J**	0.87 U	0.87 U	**0.22 J**	**0.39 J**	**0.52 J**	**0.39 J**
Xylene, m,p-	3.1	**0.69 J**	1.7 U	1.7 U	**0.56 J**	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	**0.65 J**	1.7 U	1.7 U	**0.52 J**	**0.82 J**	**1.4 J**	**0.87 J**
Xylene, o-	2.5	**0.30 J**	0.87 U	0.87 U	**0.26 J**	0.87 U	0.87 U	0.87 U	**0.22 J**	0.87 U	**0.39 J**	0.87 U	0.87 U	**0.26 J**	**0.35 J**	**0.52 J**	**0.35 J**
Other VOCs (ug/m^3)																	
Acetaldehyde	NE	**12 J**	4.5 U	5.0 U	7.0 U	6.7 U	7.7 U	7.8 U	6.3 U	7.2 U	4.5 UJ	**10 J**	**12 J**	4.5 UJ	**17**	**16**	**290**
Acetone	58	8.6 UJ	4.1 UJ	3.7 UJ	5.5 UJ	4.6 UJ	5.2 UJ	5.0 UJ	5.7 UJ	4.1 UJ	2.4 UJ	6.4 UJ	8.4 UJ	7.5 UJ	9.1 UJ	11 UJ	**33 J**
Acrolein (propenal)	NE	**0.85 J**	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**0.50 J**	**0.53 J**	1.2 U	1.2 U	1.2 U	**2.5**
Allyl chloride	NE	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U
Benzothiophene	NE	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ
Bromodichloromethane	NE	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Bromoform	NE	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Bromomethane	0.9	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U
Butadiene, 1,3-	NE	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Butane	NE	**0.50**	0.48 U	**0.55**	0.48 U	**0.24 J**	0.48 U	0.48 U	**1.3**	**3.6**	**77**	**4.6**	**5.0**	**11**	**0.74**	**2.1**	**2.0**
Butanone, 2-	17	**1.6**	**1.1**	**0.85**	**1.3**	**0.91**	**1.2**	**1.1**	**1.2**	**0.68**	**1.3**	**1.2 J**	**1.8 J**	**1.7**	**1.4**	**1.5**	**8.4**
Carbon disulfide	NE	**0.47 J**	**0.44 J**	**0.28 J**	**0.25 J**	**0.44 J**	**0.62**	**0.28 J**	**1.5**	**15**	**0.68**	**31**	**33**	**2.2**	0.62 U	0.62 U	0.62 U
Carbon tetrachloride	1	1.3 U	1.3 U	1.3 U	**0.31 J**	**0.50 J**	**0.44 J**	1.3 U	**0.38 J**	**0.31 J**	**0.44 J**	**0.57 J**	**0.50 J**	**0.69 J**	**0.57 J**	**0.44 J**	**0.63 J**
Chlorobenzene	0.25	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U
Chloroethane	0.4	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U
Chloroform	0.5	**9.3**	**3.8**	**3.6**	**2.0**	**1.5**	**1.1**	**4.7**	**3.3**	**3.4**	**1.4**	**0.63 J**	**0.68 J**	**0.88 J**	0.98 U	**0.29 J**	0.98 U
Chloromethane	4.6	**0.31 J**	0.41 U	**0.23 J**	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	**0.21 J**	0.41 U	**0.35 J**	**0.37 J**	**0.12 J**	**0.93**	**1.0**	**0.87**
Chlorotoluene,2-	NE	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cryofluorane	1.3	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Cyclohexane	3	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	**0.34 J**	**0.28 J**
Decane, n-	3.6	**6.7**	**6.9**	**5.8**	**10**	**4.4**	**5.8**	**6.2**	**7.6**	**5.0**	**11**	**4.5**	**5.0**	**8.5**	1.2 U	1.2 U	1.2 U
Dibromochloromethane	NE	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dibromoethane,1,2-	0.25	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Dichlorobenzene,1,2-	0.9	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Dichlorobenzene,1,3-	0.7	1.2 U	**0.36 J**	**0.42 J**	**1.1 J**	**0.60 J**	**0.96 J**	**0.72 J**	1.2 U	1.2 U	**0.42 J**	1.2 U	1.2 U	**0.42 J**	1.2 U	1.2 U	1.2 U
Dichlorobenzene,1,4-	0.8	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Dichlorodifluoromethane	11	**2.7**	**2.4**	**2.4**	**2.4**	**2.4**	**2.5**	**2.3**	**2.3**	**2.2**	**2.2**	**2.3**	**2.4**	**2.3**	**2.4**	**2.5**	**2.7**
Dichloroethane,1,1-	0.25	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	**3.5**	**1.3**	0.81 U	**0.28 J**	**0.32 J**	**0.32 J**	0.81 U	0.81 U	0.81 U
Dichloroethane,1,2-	0.25	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U
Dichloroethene, cis-1,2-	0.25	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
Dichloroethene,1,1-	0.25	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
Dichloropropane,1,2-	0.25	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U
Dichloropropene, cis-1,3	0.25	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U
Dichloropropene, trans-1,3	0.25	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U
Dioxane,1,4-	NE	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	**0.25 J**	0.72 U	**0.40 J**	0.72 U	0.72 U
Dodecane, n-	7.6	**6.9**	**8.3**	**8.6**	**13**	**6.4**	**9.2**	**10**	**5.2**	**4.6**	**4.2**	**5.4 J**	**8.6 J**	**7.9**	1.4 U	1.4 U	1.4 U

Table 5. Soil Vapor Analytical Results Summary
Arverne Substation (Former Edgemere Substation)
Arverne, New York

Sample Name: **Sample Date:**	NYSDOH Background Outdoor Air Concentrations 95th Percentile Range[1]	ES-SV-01 9/8/2009	ES-SV-02 9/8/2009	ES-SV-03 9/8/2009	ES-SV-04 9/8/2009	ES-SV-05 9/8/2009	ES-SV-06 9/8/2009	ES-SV-07 9/8/2009	ES-SV-08 9/8/2009	ES-SV-09 9/8/2009	ES-SV-10 9/8/2009	ES-SV-11 9/8/2009	Duplicate of: ES-SV-11 9/8/2009	ES-SV-12 9/8/2009	ES-AA-01 9/8/2009	ES-AA-02 9/8/2009	ES-AA-03 9/8/2009
Ethanol	220	**7.3**	**5.4**	**4.7**	**11**	**5.1**	**7.0**	**5.9**	**5.6**	3.2 U	**7.9**	**3.6**	**3.6**	**6.6**	**6.2**	**11**	**23**
Ethylthiophene, 2-	NE	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U
Ethyltoluene, p-	NE	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U
Heptane, n-	5.1	**0.29 J**	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	**0.57 J**	**0.57 J**	**0.53 J**
Hexachlorobutadiene	7	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Hexane, n-	3.6	**0.53 J**	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	**0.25 J**	**0.46 J**	**0.39 J**	**0.21 J**	**0.28 J**	**0.25 J**	**0.56 J**	**1.3**	**0.88**
Hexanone,2-	NE	**0.82**	0.82 U	**0.78 J**	**1.5**	**0.90**	**0.90**	**0.90**	**1.2**	**0.65 J**	0.82 U	0.82 U	**0.70 J**	**0.78 J**	0.82 U	0.82 U	0.82 U
Indan	NE	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U
Indene	NE	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U
Methyl tert-butyl ether	5.9	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U
Methyl-2-pentanone,4-	2.9	**0.82**	**0.65 J**	0.82 U	**0.98**	**0.53 J**	**0.61 J**	**0.65 J**	**0.82**	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
Methylene chloride	2.9	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	0.82 U	1.7 U	1.7 U	**0.76 J**	**0.59 J**	**0.69 J**
Methylnaphthalene,1-	NE	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**0.29 J**	1.2 U	1.2 U	1.2 U	1.2 U	0.82 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Methylnaphthalene,2-	NE	1.2 UJ	**0.29 J**	**0.29 J**	**0.41 J**	1.2 U	**0.35 J**	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	0.82 U	**0.46 J**	1.2 UJ	1.2 UJ	1.2 U	1.2 UJ
Methylthiophene, 2-	NE	0.80 U	0.80 U	0.80 U	0.80 U	0.80 UJ	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.82 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U
Methylthiophene, 3-	NE	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.82 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U
Naphthalene	10	**0.37 J**	**0.37 J**	**0.31 J**	**0.42 J**	**0.26 J**	**0.42 J**	1.0 U	1.0 U	1.0 U	1.0 U	0.82 U	**0.37 J**	**0.26 J**	1.0 U	1.0 UJ	1.0 U
Nonane	1.2	**0.42 J**	**0.37 J**	**0.42 J**	**1.0 J**	**0.31 J**	**0.42 J**	1.0 U	**0.37 J**	**0.31 J**	1.0 U	0.82 U	**0.26 J**	**0.37 J**	1.0 U	**0.31 J**	1.0 U
Octane, n-	2.1	**3.4**	**3.7**	**2.9**	**6.5**	**2.5**	**2.5**	**2.7**	**8.1**	**4.2**	**8.0**	0.82 U	**2.9**	**6.1**	0.93 U	0.93 U	0.93 U
Pentane	NE	**1.6**	**0.29 J**	0.59 U	**0.38 J**	0.59 U	0.59 U	0.59 U	**0.44 J**	**1.8**	**3.5**	0.82 U	**1.2**	**1.2**	**0.88**	**2.5**	**1.9**
Propanol, 2-	NE	1.8 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**4.9**	**4.1**	1.2 U	2.5 U	0.82 U	1.2 UJ	1.2 U	1.7 U	**2.6**	**3.6**
Styrene	0.6	**0.30 J**	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	**0.26 J**	0.82 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U
t-Butyl alcohol	NE	**1.1**	**1.8**	**0.30 J**	**0.73**	**0.48 J**	**0.55 J**	**0.67**	**0.45 J**	**0.67**	**0.73**	0.82 U	**0.61**	**0.61**	0.61 U	0.61 U	**0.27 J**
Tetrachloroethane,1,1,2,2-	0.25	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	0.82 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Tetrachloroethene	1.6	**1.9**	**1.8**	**1.5**	**1.2 J**	**1.4**	**2.1**	**2.8**	**2.0**	**1.7**	**1.8**	0.82 U	**3.3**	**3.3**	**0.47 J**	**0.54 J**	**0.54 J**
Tetramethylbenzene, 1,2,4,5-	NE	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	0.82 U	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ
Thiophene	NE	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.82 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U
Trans-1,2-dichloroethene	NE	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.82 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
Trichloro-1,2,2-trifluoroethane, 1,1,2-	3.6	**0.69 J**	**0.77 J**	**0.77 J**	**0.61 J**	**0.54 J**	**0.61 J**	**0.69 J**	**0.61 J**	**0.61 J**	**0.54 J**	0.82 U	**0.54 J**	**0.61 J**	**0.77 J**	**0.69 J**	**0.69 J**
Trichlorobenzene, 1,2,4-	4.8	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	0.82 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Trichloroethane, 1,1,1-	0.7	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	**0.27 J**	1.1 U	**3.2**	**0.55 J**	1.1 U	0.82 U	**0.38 J**	**0.60 J**	1.1 U	1.1 U	1.1 U
Trichloroethane, 1,1,2-	0.25	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	0.82 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Trichloroethene	0.5	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	**0.32 J**	0.82 U	**1.4**	**1.2**	1.1 U	1.1 U	1.1 U
Trichlorofluoromethane	6.1	**1.8**	**1.8**	**1.6**	**1.5**	**1.5**	**1.6**	**1.6**	**1.7**	**1.4**	**1.4**	0.82 U	**1.4**	**1.5**	**1.5**	**1.5**	**1.6**
Trimethylbenzene, 1,2,4-	2.5	**0.44 J**	**0.25 J**	**0.34 J**	**0.39 J**	0.98 U	**0.29 J**	**0.25 J**	**0.25 J**	0.98 U	**0.49 J**	0.82 U	**0.34 J**	**0.29 J**	**0.29 J**	**0.44 J**	**0.25 J**
Trimethylbenzene, 1,3,5-	1	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.82 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U
Trimethylbenzene,1,2,3-	0.6	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.82 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U
Trimethylpentane, 2,2,4-	2	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.82 U	0.93 U	0.93 U	**0.93**	**1.7**	**1.1**
Undecane, n-	2.3	**0.96 J**	**0.64 J**	**0.89 J**	**1.2 J**	**0.70 J**	**0.83 J**	**0.89 J**	**0.89 J**	1.3 U	1.3 U	0.82 U	**1.5**	**0.83 J**	1.3 U	1.3 U	1.3 U
Vinyl bromide	NE	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.82 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U
Vinyl chloride	0.25	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.82 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U
Other (%)																	
Helium	NE	**0.03**	0.0201 U	**0.256**	**0.104**	**0.057**	**0.063**	**0.102**	**0.03**	**0.054**	**0.048**	**0.029**	**0.029**	**0.211**	NA	NA	NA

Table 5. Soil Vapor Analytical Results Summary
Arverne Substation (Former Edgemere Substation)
Arverne, New York

NOTES:
BTEX (ug/m^3)
BTEX - benzene, toluene, ethylbenzene, and xylenes
VOCs - volatile organic compounds
NYSDOH - New York State Department of Health

[1] Source: NYSDOH, October 2006. Summary of Indoor and Outdoor Levels of Volatile Organic Compounds from Fuel Oil Heated Homes reported in various locations within sampled homes in NYS, 1997-2003. Background values for naphthalene are from the NYSDOH 1997 Control Home Database presented in Table C3 of the NYSDOH 2006 Guidance.
Other VOCs (ug/m^3)
NE - not established
NA - not analyzed

Bolding indicates a detected concentration
Validation Qualifiers:
J - estimated value
U - indicates not detected at or above the reporting limit shown.
UJ - not detected at or above the reporting limit shown and the reporting limit is estimated

Table 6. Matrix of Responsibility by Property Owner, National Grid, and Governing Agency
Arverne Substation (Former Edgemere Substation)
Arverne, New York

Task	NYSDEC	National Grid	Property Owner	Responsibility		
				NYSDEC	National Grid	Property Owner
Access Agreement (AA)	✓	✓	✓	If access is not granted to National Grid by the property owner, NYSDEC to intervene, if necessary.	AA will be executed between the Property Owner and National Grid for Annual Inspections, or as otherwise required. Reference to the SMP to be included in the text of the AA. National Grid will request NYSDEC intervention on their behalf, if necessary.	AA will be executed between the Property Owner and National Grid for Annual Inspections, or as otherwise required. Access to the Site will be provided to National Grid and NYSDEC.
Annual Report	✓	✓	✓	Review and Comment.	If required by the SMP, National Grid will prepare the annual report.	If access is required for the annual inspection, grant access to the property for inspection.
Community Air Monitoring Plan (CAMP)	✓	✓	✓	Review and Comment.	National Grid's environmental professional consultants will follow Site-specific CAMP procedures during intrusive work in MGP impacted areas that require remediation or in areas where investigation for MGP impacts are required.	Owner's contractors and consultants will abide by direction given by National Grid's environmental consultant based on Community Air Monitoring results.
Corrective Measures Work Plan	✓	✓		Review, Comment, and Approve.	Prepare the Corrective Measures Work Plan and update when required.	
Engineering Controls (EC) - Cover System		✓	✓		Inspect ECs during annual inspection and when required by NYSDEC. Notify NYSDEC of known damage.	Maintenance and repair of the existing building foundation. Notify National Grid of damage.
Observed Damage or Defect to the Foundation, Structures, or EC	✓	✓	✓	Review, Comment, and Approve.	National Grid's contracted qualified environmental professional conducts an inspection within 5 days of notification. National Grid provides NYSDEC with follow-up status reports for ongoing responsive action within 45 days.	Once identified, notice to National Grid and NYSDEC within 48-hours identifying damage and mitigation actions taken.
Emergency Response due to EC Failure caused by Natural Disaster	✓	✓	✓	Review, Comment, and Approve.	National Grid's contracted qualified environmental professional conducts an inspection within 5 days of event. Written confirmation to NYSDEC within 7 days of event that summarizes event and actions taken. National Grid provides NYSDEC with follow-up status reports for ongoing responsive action within 45 days.	Verbal notice to National Grid and NYSDEC as soon as possible but at least by noon the following day.
Field Activity not Pursuant to the EWP	✓	✓	✓	Review and Comment.	Review and Comment.	30-day advance notice to National Grid and NYSDEC.
Limited Intrusive Work (Small Scale)* performed under the Excavation Work Plan (EWP)	✓	✓	✓	Review and Comment.	National Grid to review and decide if oversight is required. Following development, National Grid to update SMP and submit to NYSDEC.	Property Owner has to provide at a minimum 60-day notice to National Grid and NYSDEC and 30-day notice prior to work starting. All ground intrusive activities have to follow the SMP.
Future Property Development (Large Scale)*	✓	✓	✓	Review and Comment. Review results of any further investigation and determine if remediation is required.	National Grid to review and decide if oversight is required. Following development, National Grid to update SMP and submit to NYSDEC.	Property Owner has to provide at a minimum 60-days notice to National Grid and NYSDEC and 30-days notice prior to work starting. Property Owner has to provide at a minimum 18-months notice to National Grid and NYSDEC of property redevelopment or demolition of structures. All ground intrusive activities have to follow the SMP.
Future Site Subdivision			✓			Property owner notifies NYSDEC and National Grid of the subdivision.

Table 6. Matrix of Responsibility by Property Owner, National Grid, and Governing Agency
Arverne Substation (Former Edgemere Substation)
Arverne, New York

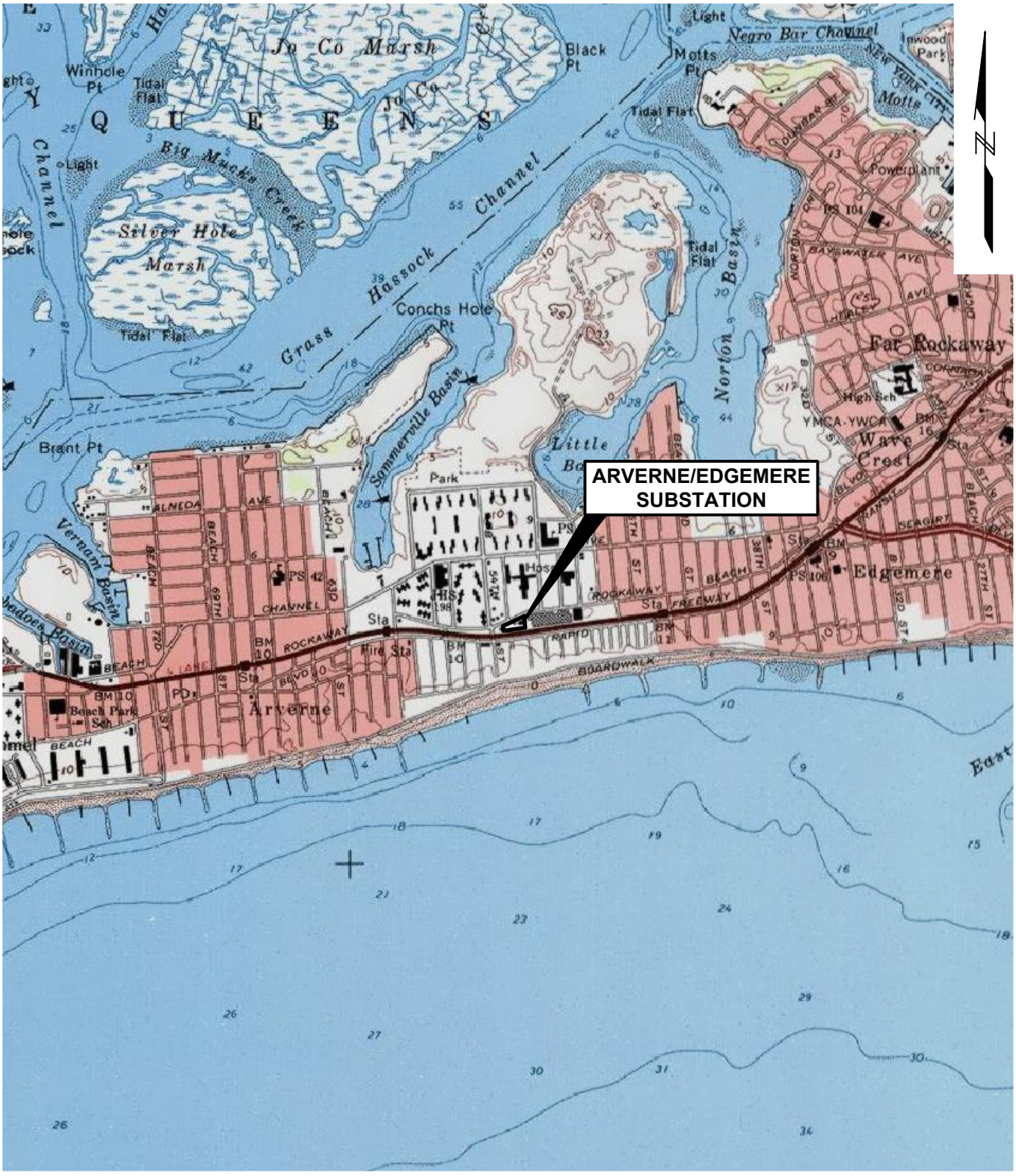
Task	NYSDEC	National Grid	Property Owner	Responsibility		
				NYSDEC	National Grid	Property Owner
Groundwater Use and Fluids Management*		✓	✓		National Grid's contracted qualified environmental professional will containerize and coordinate off-site disposal of liquids generated from its groundwater sampling such as purge water, development water, and decontamination fluids.	Property owner is restricted from use of groundwater as a source of potable water or process water. Property Owner is responsible for fluids management during excavation in accordance with the EWP. Discharge of water generated during large-scale construction activities will be performed according to a Remedial Plan. Discharge of water generated during small-scale (i.e. limited excavations) construction activities will be performed according to SMP requirements.
HASP	✓	✓	✓	Review and Comment.	Develop a Site-specific HASP to be included in the (I)SMP.	Direct consultants and contractors to develop a Site-specific HASP for any subsurface work.
Inspections	✓	✓	✓	Review and Comment.	National Grid will complete inspections once per year and after severe weather that may affect ECs and monitoring. A Site Management Form will be completed and provided to NYSDEC.	Property Owner will provide access.
Institutional Control (IC) - Deed Restriction	✓	✓	✓	The Deed Restriction will be executed between the Property Owner and the NYSDEC.	National Grid will prepare the Deed Restriction.	The Deed Restriction will be executed between the Property Owner and the NYSDEC.
Metes and Bounds Survey		✓	✓		National Grid will perform a Metes and Bounds (or similar) Survey to include in the SMP.	Property Owner will provide access.
Operation and Maintenance (O&M) Plan	✓	✓		Review, Comment, and Approve.	Prepare the O&M Plan and update when required.	
O&M of ECs - Cover System		✓	✓		Operation and routine and non-routine maintenance of ECs.	Maintenance and repair of cover system. Notify National Grid of damage.
Property Use Change (currently Restricted Use Commercial)	✓	✓	✓	Review and Comment.	National Grid to review and confer with NYSDEC if (I)SMP revision and/or additional ICs are required. Following use change, National Grid to update (I)SMP and submit to NYSDEC, if required.	Provide at a minimum 60 days notice to National Grid and NYSDEC.
Property Ownership Change			✓		Notification receipt confirmation to Property Owner in 15 days (business).	Provide at a minimum 60 days notice to National Grid and NYSDEC.
Remedial Site Optimization Report	✓	✓		Review and Comment.	Prepare the Remedial Site Optimization Report.	
Reporting	✓	✓	✓	Review and Comment.	National Grid's contracted qualified environmental professional will prepare and provide reports to NYSDEC as follows: - Groundwater sampling annually; - Soil Vapor Intrusion Report, as needed; - Severe Conditions Inspection Report annually; and - Periodic Review Report 16 months after (I)SMP is issued and annually (within 30 days of certification period) or as requested by NYSDEC.	Provide certification in writing that ICs remain in place and are complied with annually and when requested by National Grid or NYSDEC.
Record Of Decision (ROD)	✓			NYSDEC Submits ROD.		

Table 6. Matrix of Responsibility by Property Owner, National Grid, and Governing Agency
Arverne Substation (Former Edgemere Substation)
Arverne, New York

Task	NYSDEC	National Grid	Property Owner	Responsibility		
				NYSDEC	National Grid	Property Owner
Security			✓			Property Owner is responsible for site security.
Site Management Plan (SMP)	✓	✓	✓	Review and Approve SMP and revisions. Append revisions to SMP.	Prepare the SMP and update when required.	Implement the SMP for any ground intrusive work that will disturb the cover system.

Notes:
* - The property owner is required to comply with the (I)SMP including all notifications to National Grid and provisions of the Excavation Work Plan. National Grid is only responsible for costs associated with MGP-related impacts.
Nothing on this page shall supersede the provisions of an Environmental Easement, Consent Order, Consent Decree, agreement, or other legally binding document that affects rights and obligations relating to the Site.

Figures



SOURCE:
Map created with TOPO! ® ©2001 National Geographic (www.nationalgeographic.com/topo)

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SCALE, FEET

SITE MANAGEMENT PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
ARVERNE, NEW YORK

nationalgrid

GEI Consultants

SITE LOCATION PLAN

Project 093140-1-1107 | October 2018 | Figure 1

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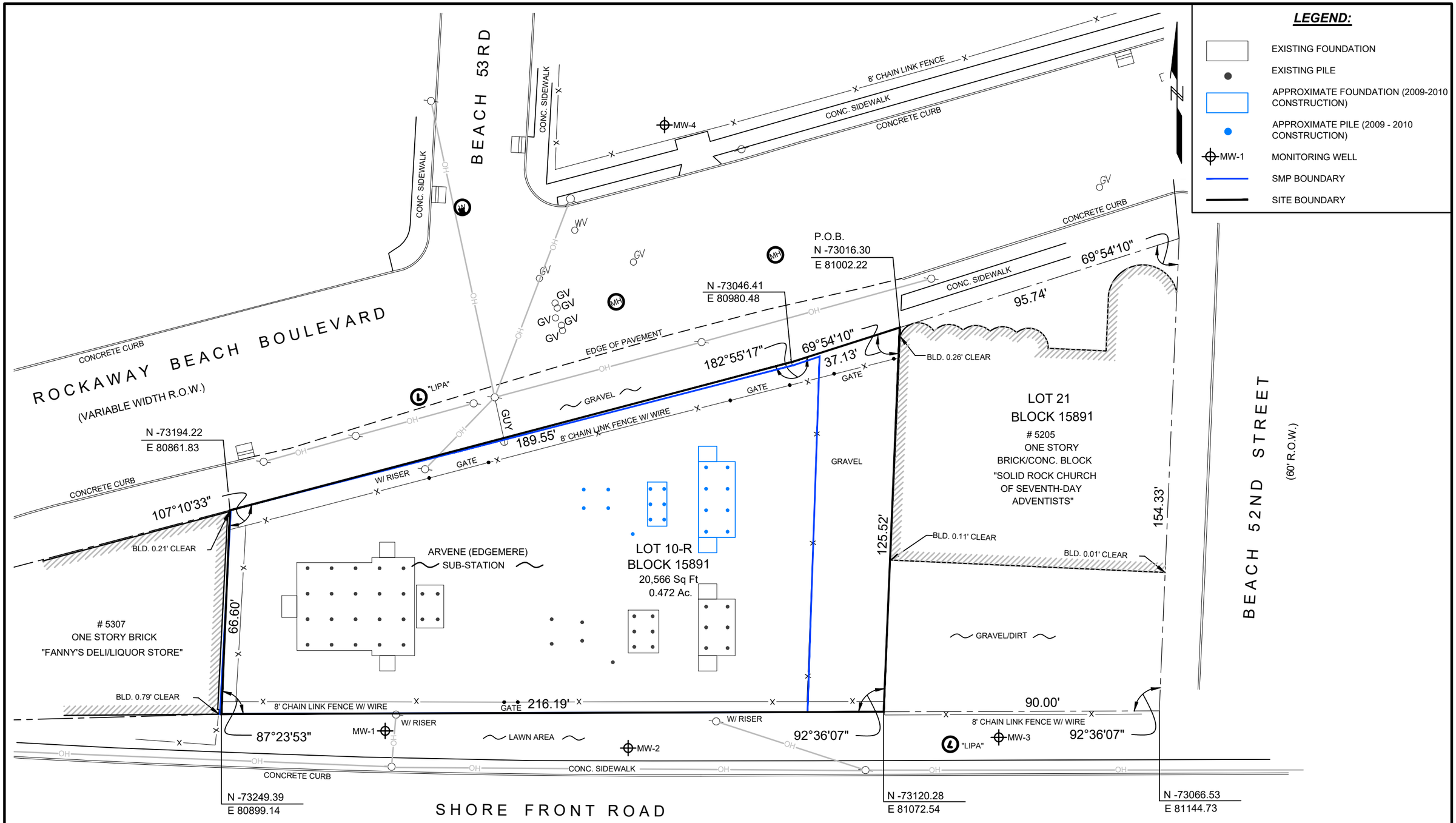

SOURCE:

1. PLAN BASED ON MAP PREPARED BY KS ENGINEERS, P.C. TITLED "BOUNDARY SURVEY - AREVERNE (EDGEMERE) SUBSTATION" DATED 04/11/12.
2. PLAN BASED ON A CERTAIN MAP ENTITLED "PLAN PREPARED FOR MARKET SPAN CORPORATION EDGEMERE SUBSTATION, QUEENS NEW YORK, SOIL AND FILL MATERIAL REMOVALS, SITE PLAN" PREPARED BY GEI CONSULTANTS INC. PLATE 1 AND 2, DATED SEPTEMBER 1998.

SITE MANAGEMENT PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
ARVERNE, NEW YORK

nationalgrid

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Project 093140-1-1107

SITE LAYOUT MAP

October 2018 Figure 2

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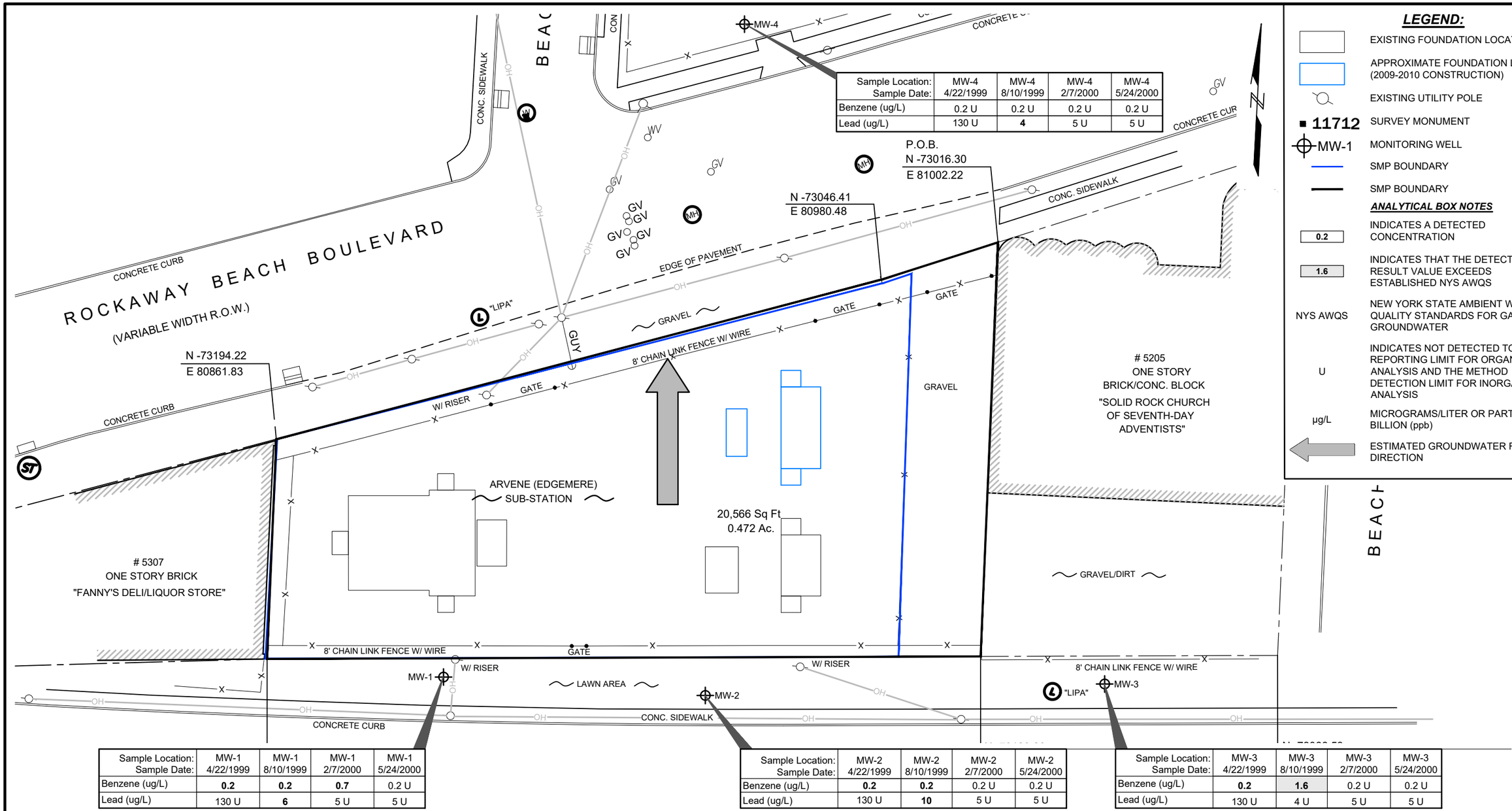

Sample Location: / Sample Date:	MW-4 4/22/1999	MW-4 8/10/1999	MW-4 2/7/2000	MW-4 5/24/2000
Benzene (ug/L)	0.2 U	0.2 U	0.2 U	0.2 U
Lead (ug/L)	130 U	**4**	5 U	5 U

Sample Location: / Sample Date:	MW-1 4/22/1999	MW-1 8/10/1999	MW-1 2/7/2000	MW-1 5/24/2000
Benzene (ug/L)	**0.2**	**0.2**	**0.7**	0.2 U
Lead (ug/L)	130 U	**6**	5 U	5 U

Sample Location: / Sample Date:	MW-2 4/22/1999	MW-2 8/10/1999	MW-2 2/7/2000	MW-2 5/24/2000
Benzene (ug/L)	**0.2**	**0.2**	0.2 U	0.2 U
Lead (ug/L)	130 U	**10**	5 U	5 U

Sample Location: / Sample Date:	MW-3 4/22/1999	MW-3 8/10/1999	MW-3 2/7/2000	MW-3 5/24/2000
Benzene (ug/L)	**0.2**	**1.6**	0.2 U	0.2 U
Lead (ug/L)	130 U	4 U	5 U	5 U

LEGEND:

- EXISTING FOUNDATION LOCATION
- APPROXIMATE FOUNDATION LOCATION (2009-2010 CONSTRUCTION)
- EXISTING UTILITY POLE
- 11712 — SURVEY MONUMENT
- MW-1 — MONITORING WELL
- SMP BOUNDARY
- SMP BOUNDARY

ANALYTICAL BOX NOTES

- 0.2 — INDICATES A DETECTED CONCENTRATION
- 1.6 — INDICATES THAT THE DETECTED RESULT VALUE EXCEEDS ESTABLISHED NYS AWQS
- NYS AWQS — NEW YORK STATE AMBIENT WATER QUALITY STANDARDS FOR GA GROUNDWATER
- U — INDICATES NOT DETECTED TO THE REPORTING LIMIT FOR ORGANIC ANALYSIS AND THE METHOD DETECTION LIMIT FOR INORGANIC ANALYSIS
- µg/L — MICROGRAMS/LITER OR PARTS PER BILLION (ppb)
- ESTIMATED GROUNDWATER FLOW DIRECTION

SOURCE:

1. PLAN BASED ON MAP PREPARED BY KS ENGINEERS, P.C. TITLED "BOUNDARY SURVEY - AREVERNE (EDGEMERE) SUBSTATION" DATED 04/11/12.
2. PLAN BASED ON A CERTAIN MAP ENTITLED "PLAN PREPARED FOR MARKET SPAN CORPORATION EDGEMERE SUBSTATION, QUEENS NEW YORK, SOIL AND FILL MATERIAL REMOVALS, SITE PLAN" PREPARED BY GEI CONSULTANTS INC. PLATE 1 AND 2, DATED SEPTEMBER 1998.

0 30 60

SCALE, FEET

SITE MANAGEMENT PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
ARVERNE, NEW YORK

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Project 093140-1-1107

ANALYTICAL RESULTS - GROUNDWATER

October 2018 Figure 3

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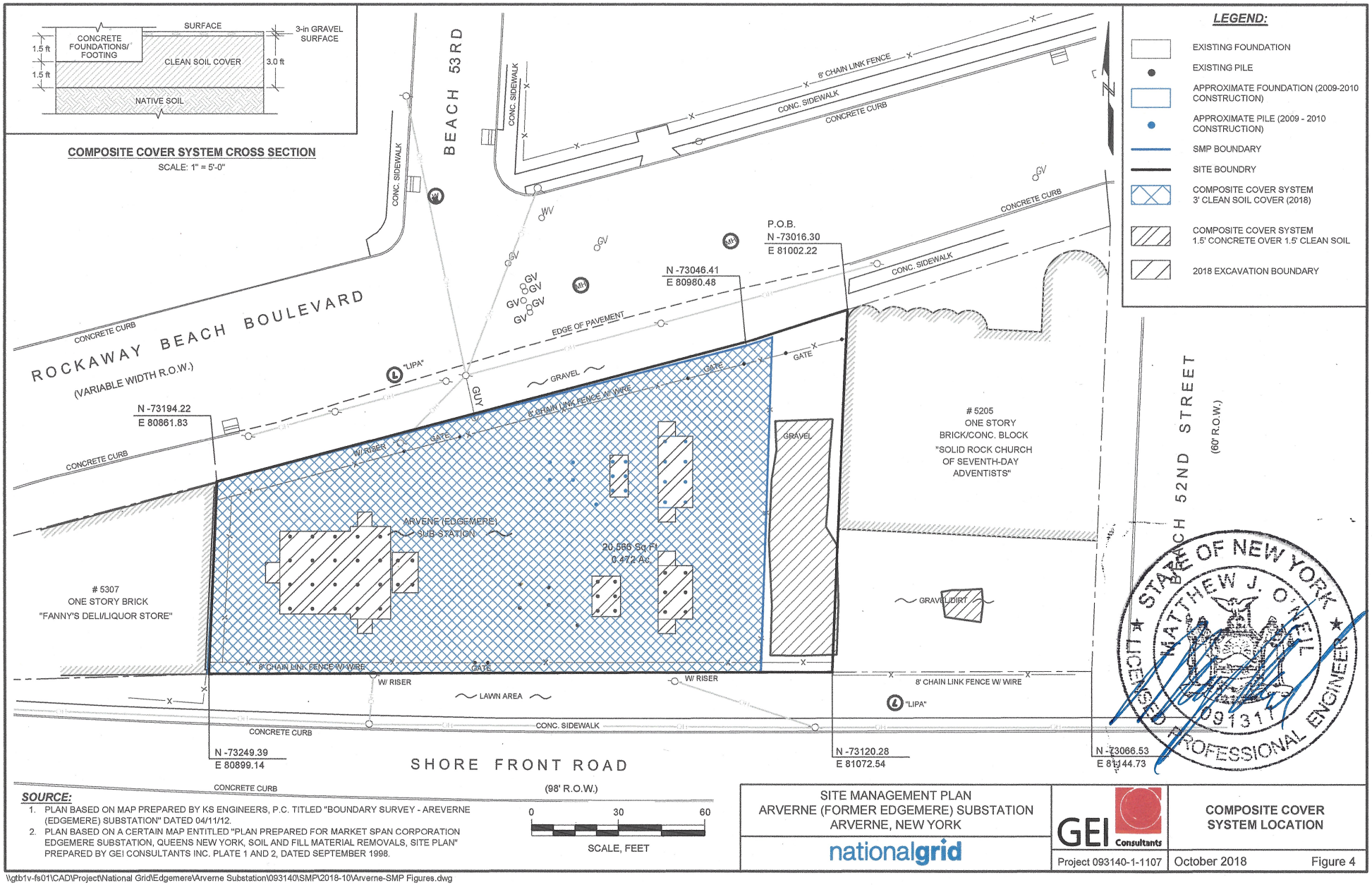

SOURCE:

1. PLAN BASED ON MAP PREPARED BY KS ENGINEERS, P.C. TITLED "BOUNDARY SURVEY - AREVERNE (EDGEMERE) SUBSTATION" DATED 04/11/12.
2. PLAN BASED ON A CERTAIN MAP ENTITLED "PLAN PREPARED FOR MARKET SPAN CORPORATION EDGEMERE SUBSTATION, QUEENS NEW YORK, SOIL AND FILL MATERIAL REMOVALS, SITE PLAN" PREPARED BY GEI CONSULTANTS INC. PLATE 1 AND 2, DATED SEPTEMBER 1998.

SITE MANAGEMENT PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
ARVERNE, NEW YORK

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Project 093140-1-1107 | October 2018 | Figure 4

COMPOSITE COVER SYSTEM LOCATION

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NOTES:

1. GRAY HIGHLIGHT INDICATES ANALYTE EXCEEDS THE UNRESTRICTED USE SOIL CLEANUP OBJECTIVES (SCOs).
2. YELLOW HIGHLIGHT INDICATES ANALYTE EXCEEDS THE COMMERCIAL SCOs.
3. SB -102 WAS RESAMPLED ON 1/10/2018 TO CONFIRM THE CONCENTRATION OF LEAD DETECTED IN AUGUST 2017. THE NEW SAMPLE MET THE UNRESTRICTED USE SCO'S. AS A RESULT, THE EXCAVATION DEPTH WAS REDUCED TO 5 FEET BGS WITH NYSDEC APPROVAL.

LEGEND:

- EXISTING FOUNDATION
- APPROXIMATE FOUNDATION (2009-2010 CONSTRUCTION)
- EXISTING UTILITY POLE
- 11712 SURVEY MONUMENT
- LIL-SS-7 CONFIRMATION SOIL SAMPLE
- SB-1 SOIL BORING
- 2017 CONFIRMATION SOIL BORING
- EXISTING FENCE
- PROPERTY LINE
- 2018 EXCAVATION AREA
- SMP BOUNDARY
- SITE BOUNDARY
- ND NOT DETECTED

Sample Name:	SB-3
Sample Depth:	(0-3 ft bgs)
Sample Date:	9/24/2012
Total VOCs (mg/kg)	ND
Total SVOCs (mg/kg)	**0.324**
Lead (mg/kg)	**32.1**

Sample Name:	LIL-SS-02
Sample Date:	5/20/1998
Benzene (mg/kg)	ND
Lead (mg/kg)	**457**

Sample Name:	SB-5
Sample Depth:	(0-3 ft bgs)
Sample Date:	9/24/2012
Total VOCs (mg/kg)	ND
Total SVOCs (mg/kg)	ND
Lead (mg/kg)	**3.2**

Sample Name:	SB-102	SB-102	SB-102R
Sample Depth:	(5-6 ft bgs)	(6-7 ft bgs)	(6-7 ft bgs)
Sample Date:	8/14/2017	8/14/2017	1/10/2018
Lead (mg/kg)	**8.2**	**81.3**	**10.4**
TCLP Lead (mg/L)	**0.281**	**0.04 J**	**NA**

Sample Name:	LIL-SS-09
Sample Date:	6/10/1998
Benzene (mg/kg)	ND
Lead (mg/kg)	**20**

Sample Name:	SB-1
Sample Depth:	(0-3 ft bgs)
Sample Date:	9/24/2012
Total VOCs (mg/kg)	ND
Total SVOCs (mg/kg)	**0.563**
Lead (mg/kg)	**42.2**

P.O.B.
N -73016.30
E 81002.22

N -73046.41
E 80980.48

ROCKAWAY BEACH BOULEVARD
(VARIABLE WIDTH R.O.W.)

CONCRETE CURB
CONCRETE CUR
CONC. SIDEWALK
EDGE OF PAVEMENT
GRAVEL
8' CHAIN LINK FENCE W/ WIRE
GATE
W/ RISER
LIPA"
GUY
OH
GV

Sample Name:	LIL-SB-26
Sample Depth:	(3-5 ft bgs)
Sample Date:	12/12/2016
Lead (mg/kg)	**29.6**
TCLP Lead (mg/L)	**0.169**

Sample Name:	LIL-SS-10
Sample Date:	6/10/1998
Benzene (mg/kg)	ND
Lead (mg/kg)	**273**

N -73194.22
E 80861.83

5205
ONE STORY
BRICK/CONC. BLOCK
"SOLID ROCK CHURCH OF SEVENTH-DAY ADVENTISTS"

Sample Name:	LIL-SB-24
Sample Depth:	(3-5 ft bgs)
Sample Date:	12/12/2016
Lead (mg/kg)	**24.0**
TCLP Lead (mg/L)	**0.1**

Sample Name:	LIL-SS-07
Sample Date:	5/29/1998
Benzene (mg/kg)	ND
Lead (mg/kg)	**50.8**

BEACH 52ND

Sample Name:	LIL-SS-12
Sample Date:	6/10/1998
Benzene (mg/kg)	ND
Lead (mg/kg)	**254**

5307
ONE STORY BRICK
"FANNY'S DELI/LIQUOR STORE"

ARVENE (EDGEMERE) SUB-STATION

20,566 Sq Ft
0.472 Ac.

SB-1 SB-2 SB-3 SB-4 SB-5 SB-23 SB-24 SB-25 SB-26 SB-101 SB-102 SB-103 SB-104 SB-105

LIL-SS-2 (5/18/98)
LIL-SS-3 (5/20/98)
LIL-SS-4 (5/2/98)
LIL-SS-5 (5/26/98)
LIL-SS-7 (5/29/98)
LIL-SS-8 (5/6/98)
LIL-SS-9 (6/9/98)
LIL-SS-10 (6/10/98)
LIL-SS-11 (6/10/98)
LIL-SS-12 (6/10/98)
LIL-SS-13 (6/11/98)
SB-102-SS-1 (5/6/98)

GRAVEL
LAWN AREA
CONC. SIDEWALK

Sample Name:	SB-105	SB-105	SB-105
Sample Depth:	(3-5 ft bgs)	(5-6 ft bgs)	(6-7 ft bgs)
Sample Date:	8/14/2017	8/14/2017	8/14/2017
Lead (mg/kg)	**16.2**	**6.5**	**6.6**
TCLP Lead (mg/L)	**0.232**	**0.116**	**0.0703**

Sample Name:	SB-103	SB-103
Sample Depth:	(5-6 ft bgs)	(6-7 ft bgs)
Sample Date:	8/14/2017	8/14/2017
Lead (mg/kg)	**10.6**	**2.1 J**
TCLP Lead (mg/L)	**0.0263 J**	**0.34**

Sample Name:	LIL-SS-13
Sample Date:	6/10/1998
Benzene (mg/kg)	ND
Lead (mg/kg)	**250**

Sample Name:	LIL-SS-11
Sample Date:	6/10/1998
Benzene (mg/kg)	ND
Lead (mg/kg)	**82.4**

Sample Name:	LIL-SS-03
Sample Date:	5/20/1998
Benzene (mg/kg)	**0.00229**
Lead (mg/kg)	**129**

Sample Name:	LIL-SS-05
Sample Date:	5/26/1998
Benzene (mg/kg)	ND
Lead (mg/kg)	**6.95**

Sample Name:	LIL-SB-25
Sample Depth:	(3-5 ft bgs)
Sample Date:	12/12/2016
Lead (mg/kg)	**40.9**
TCLP Lead (mg/L)	**0.14**

Sample Name:	SB-104	SB-104	SB-104
Sample Depth:	(3-5 ft bgs)	(5-6 ft bgs)	(6-7 ft bgs)
Sample Date:	8/14/2017	8/14/2017	8/14/2017
Lead (mg/kg)	**6.1**	**7.3**	**13.1**
TCLP Lead (mg/L)	**0.0359 J**	**0.141**	**0.0649**

Sample Name:	SB-2	SB-2
Sample Depth:	(0-3 ft bgs)	(0-3 ft bgs)
Sample Date:	9/24/2012	9/24/2012
Total VOCs (mg/kg)	ND	ND
Total SVOCs (mg/kg)	**6.73**	**2.697**
Lead (mg/kg)	**76.4**	**102**

Sample Name:	LIL-SS-04
Sample Date:	5/21/1998
Benzene (mg/kg)	ND
Lead (mg/kg)	**1110**

Sample Name:	SB-4
Sample Depth:	(0-3 ft bgs)
Sample Date:	9/24/2012
Total VOCs (mg/kg)	**0.042**
Total SVOCs (mg/kg)	**0.45**
Lead (mg/kg)	**36.8**

Sample Name:	SB-101	SB-101
Sample Depth:	(5-6 ft bgs)	(6-7 ft bgs)
Sample Date:	8/14/2017	8/14/2017
Lead (mg/kg)	**6.3**	**42.9**
TCLP Lead (mg/L)	**0.102**	**0.149**

Sample Name:	LIL-SB-23
Sample Depth:	(3-5 ft bgs)
Sample Date:	12/12/2016
Lead (mg/kg)	**32.0**
TCLP Lead (mg/L)	**0.06**

SOURCE:

1. PLAN BASED ON MAP PREPARED BY KS ENGINEERS, P.C. TITLED "BOUNDARY SURVEY - AREVERNE (EDGEMERE) SUBSTATION" DATED 04/11/12.
2. PLAN BASED ON A CERTAIN MAP ENTITLED "PLAN PREPARED FOR MARKET SPAN CORPORATION EDGEMERE SUBSTATION, QUEENS NEW YORK, SOIL AND FILL MATERIAL REMOVALS, SITE PLAN" PREPARED BY GEI CONSULTANTS INC. PLATE 1 AND 2, DATED SEPTEMBER 1998.

0 30 60
SCALE, FEET

SITE MANAGEMENT PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
ARVERNE, NEW YORK

nationalgrid

GEI Consultants

Project 093140-1-1107

EXTENT OF REMAINING CONTAMINATION IN SOIL ABOVE UNRESTRICTED USE SCOs

October 2018 Figure 5

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NOTE:
1. YELLOW HIGHLIGHT INDICATES ANALYTE EXCEEDS THE COMMERCIAL SOIL CLEANUP OBJECTIVES (SCOs).

LEGEND:

- EXISTING FOUNDATION
- APPROXIMATE FOUNDATION (2009-2010 CONSTRUCTION)
- EXISTING UTILITY POLE
- 11712 SURVEY MONUMENT
- LIL-SS-7 CONFIRMATION SOIL SAMPLE
- SB-1 SOIL BORING
- 2017 CONFIRMATION SOIL BORING
- EXISTING FENCE
- PROPERTY LINE
- 2018 EXCAVATION AREA
- SMP BOUNDARY
- SITE BOUNDARY
- ND NOT DETECTED

ROCKAWAY BEACH BOULEVARD
(VARIABLE WIDTH R.O.W.)
CONCRETE CURB
CONC. SIDEWALK
EDGE OF PAVEMENT
"LIPA"
GUY
GRAVEL
8' CHAIN LINK FENCE W/ WIRE
GATE
W/ RISER
P.O.B.
N -73016.30
E 81002.22
N -73046.41
E 80980.48
N -73194.22
E 80861.83
LIL-SS-9 (6/9/98)
LIL-SS-2 (5/18/98)
LIL-SS-12 (6/10/98)
LIL-SS-10 (6/10/98)
LIL-SS-11 (6/10/98)
LIL-SS-3 (5/20/98)
LIL-SS-4 (5/2/98)
LIL-SS-5 (5/26/98)
LIL-SS-7 (5/29/98)
LIL-SS-13 (6/11/98)
SB-1
SB-2
SB-3
SB-4
SB-5
SB-101
SB-102
SB-103
SB-104
SB-105
SB-23
SB-24
SB-25
SB-26
ARVENE (EDGEMERE) SUB-STATION
20,566 Sq Ft
0.472 Ac.
5205
ONE STORY
BRICK/CONC. BLOCK
"SOLID ROCK CHURCH OF SEVENTH-DAY ADVENTISTS"
5307
ONE STORY BRICK
"FANNY'S DELI/LIQUOR STORE"
LAWN AREA
BEACH 52ND
N -73249.39
N -73120.28
N -73066.53

Sample Name:	LIL-SS-04
Sample Date:	5/21/1998
Benzene (mg/kg)	ND
Lead (mg/kg)	**1110**

SOURCE:
1. PLAN BASED ON MAP PREPARED BY KS ENGINEERS, P.C. TITLED "BOUNDARY SURVEY - AREVERNE (EDGEMERE) SUBSTATION" DATED 04/11/12.
2. PLAN BASED ON A CERTAIN MAP ENTITLED "PLAN PREPARED FOR MARKET SPAN CORPORATION EDGEMERE SUBSTATION, QUEENS NEW YORK, SOIL AND FILL MATERIAL REMOVALS, SITE PLAN" PREPARED BY GEI CONSULTANTS INC. PLATE 1 AND 2, DATED SEPTEMBER 1998.

0 30 60
SCALE, FEET

SITE MANAGEMENT PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
ARVERNE, NEW YORK

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EXTENT OF REMAINING CONTAMINATION IN SOIL ABOVE COMMERCIAL USE SCOs

Project 093140-1-1107 | October 2018 | Figure 5A

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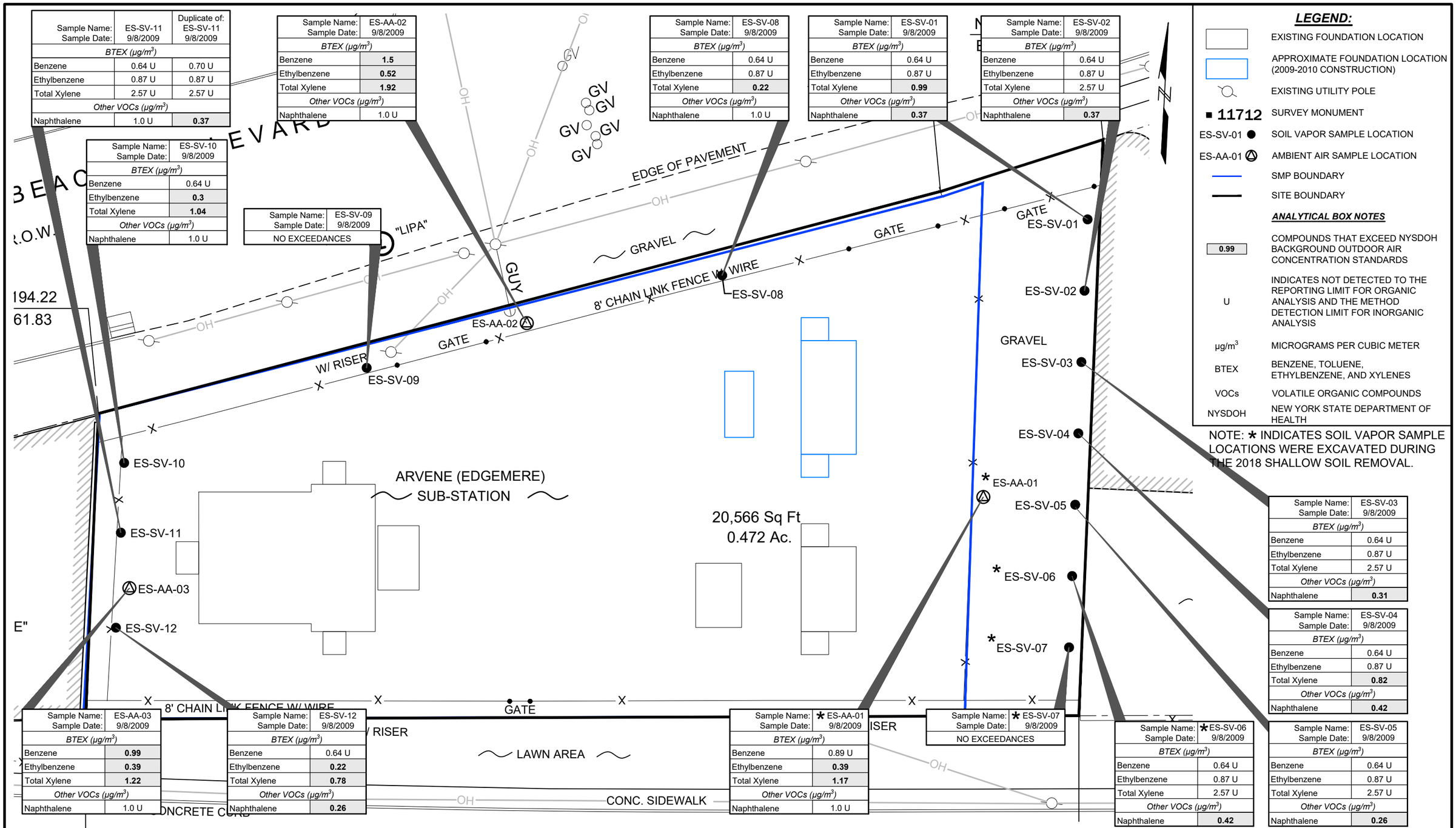

Sample Name:	ES-SV-11	Duplicate of: ES-SV-11
Sample Date:	9/8/2009	9/8/2009
BTEX (µg/m³)		
Benzene	0.64 U	0.70 U
Ethylbenzene	0.87 U	0.87 U
Total Xylene	2.57 U	2.57 U
Other VOCs (µg/m³)		
Naphthalene	1.0 U	**0.37**

Sample Name:	ES-AA-02
Sample Date:	9/8/2009
BTEX (µg/m³)	
Benzene	**1.5**
Ethylbenzene	**0.52**
Total Xylene	**1.92**
Other VOCs (µg/m³)	
Naphthalene	1.0 U

Sample Name:	ES-SV-08
Sample Date:	9/8/2009
BTEX (µg/m³)	
Benzene	0.64 U
Ethylbenzene	0.87 U
Total Xylene	**0.22**
Other VOCs (µg/m³)	
Naphthalene	1.0 U

Sample Name:	ES-SV-01
Sample Date:	9/8/2009
BTEX (µg/m³)	
Benzene	0.64 U
Ethylbenzene	0.87 U
Total Xylene	**0.99**
Other VOCs (µg/m³)	
Naphthalene	**0.37**

Sample Name:	ES-SV-02
Sample Date:	9/8/2009
BTEX (µg/m³)	
Benzene	0.64 U
Ethylbenzene	0.87 U
Total Xylene	2.57 U
Other VOCs (µg/m³)	
Naphthalene	**0.37**

Sample Name:	ES-SV-10
Sample Date:	9/8/2009
BTEX (µg/m³)	
Benzene	0.64 U
Ethylbenzene	**0.3**
Total Xylene	**1.04**
Other VOCs (µg/m³)	
Naphthalene	1.0 U

Sample Name:	ES-SV-09
Sample Date:	9/8/2009
NO EXCEEDANCES	

LEGEND:

- EXISTING FOUNDATION LOCATION
- APPROXIMATE FOUNDATION LOCATION (2009-2010 CONSTRUCTION)
- EXISTING UTILITY POLE
- ■ 11712 SURVEY MONUMENT
- ES-SV-01 ● SOIL VAPOR SAMPLE LOCATION
- ES-AA-01 △ AMBIENT AIR SAMPLE LOCATION
- SMP BOUNDARY
- SITE BOUNDARY

ANALYTICAL BOX NOTES

- **0.99** COMPOUNDS THAT EXCEED NYSDOH BACKGROUND OUTDOOR AIR CONCENTRATION STANDARDS
- U INDICATES NOT DETECTED TO THE REPORTING LIMIT FOR ORGANIC ANALYSIS AND THE METHOD DETECTION LIMIT FOR INORGANIC ANALYSIS
- µg/m³ MICROGRAMS PER CUBIC METER
- BTEX BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES
- VOCs VOLATILE ORGANIC COMPOUNDS
- NYSDOH NEW YORK STATE DEPARTMENT OF HEALTH

NOTE: * INDICATES SOIL VAPOR SAMPLE LOCATIONS WERE EXCAVATED DURING THE 2018 SHALLOW SOIL REMOVAL.

Sample Name:	ES-SV-03
Sample Date:	9/8/2009
BTEX (µg/m³)	
Benzene	0.64 U
Ethylbenzene	0.87 U
Total Xylene	2.57 U
Other VOCs (µg/m³)	
Naphthalene	**0.31**

Sample Name:	ES-SV-04
Sample Date:	9/8/2009
BTEX (µg/m³)	
Benzene	0.64 U
Ethylbenzene	0.87 U
Total Xylene	**0.82**
Other VOCs (µg/m³)	
Naphthalene	**0.42**

Sample Name:	ES-SV-05
Sample Date:	9/8/2009
BTEX (µg/m³)	
Benzene	0.64 U
Ethylbenzene	0.87 U
Total Xylene	2.57 U
Other VOCs (µg/m³)	
Naphthalene	**0.26**

Sample Name:	*ES-SV-06
Sample Date:	9/8/2009
BTEX (µg/m³)	
Benzene	0.64 U
Ethylbenzene	0.87 U
Total Xylene	2.57 U
Other VOCs (µg/m³)	
Naphthalene	**0.42**

Sample Name:	*ES-SV-07
Sample Date:	9/8/2009
NO EXCEEDANCES	

Sample Name:	ES-AA-01
Sample Date:	9/8/2009
BTEX (µg/m³)	
Benzene	0.89 U
Ethylbenzene	**0.39**
Total Xylene	**1.17**
Other VOCs (µg/m³)	
Naphthalene	1.0 U

Sample Name:	ES-SV-12
Sample Date:	9/8/2009
BTEX (µg/m³)	
Benzene	0.64 U
Ethylbenzene	**0.22**
Total Xylene	**0.78**
Other VOCs (µg/m³)	
Naphthalene	**0.26**

Sample Name:	ES-AA-03
Sample Date:	9/8/2009
BTEX (µg/m³)	
Benzene	**0.99**
Ethylbenzene	**0.39**
Total Xylene	**1.22**
Other VOCs (µg/m³)	
Naphthalene	1.0 U

SOURCE: N -73249.39

1. PLAN BASED ON MAP PREPARED BY KS ENGINEERS, P.C. TITLED "BOUNDARY SURVEY - AREVERNE (EDGEMERE) SUBSTATION" DATED 04/11/12.
2. PLAN BASED ON A CERTAIN MAP ENTITLED "PLAN PREPARED FOR MARKET SPAN CORPORATION EDGEMERE SUBSTATION, QUEENS NEW YORK, SOIL AND FILL MATERIAL REMOVALS, SITE PLAN" PREPARED BY GEI CONSULTANTS INC. PLATE 1 AND 2, DATED SEPTEMBER 1998.

0 20 40
SCALE, FEET

SITE MANAGEMENT PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
ARVERNE, NEW YORK

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ANALYTICAL RESULTS - SOIL VAPOR

Project 093140-1-1107 | October 2018 | Figure 6

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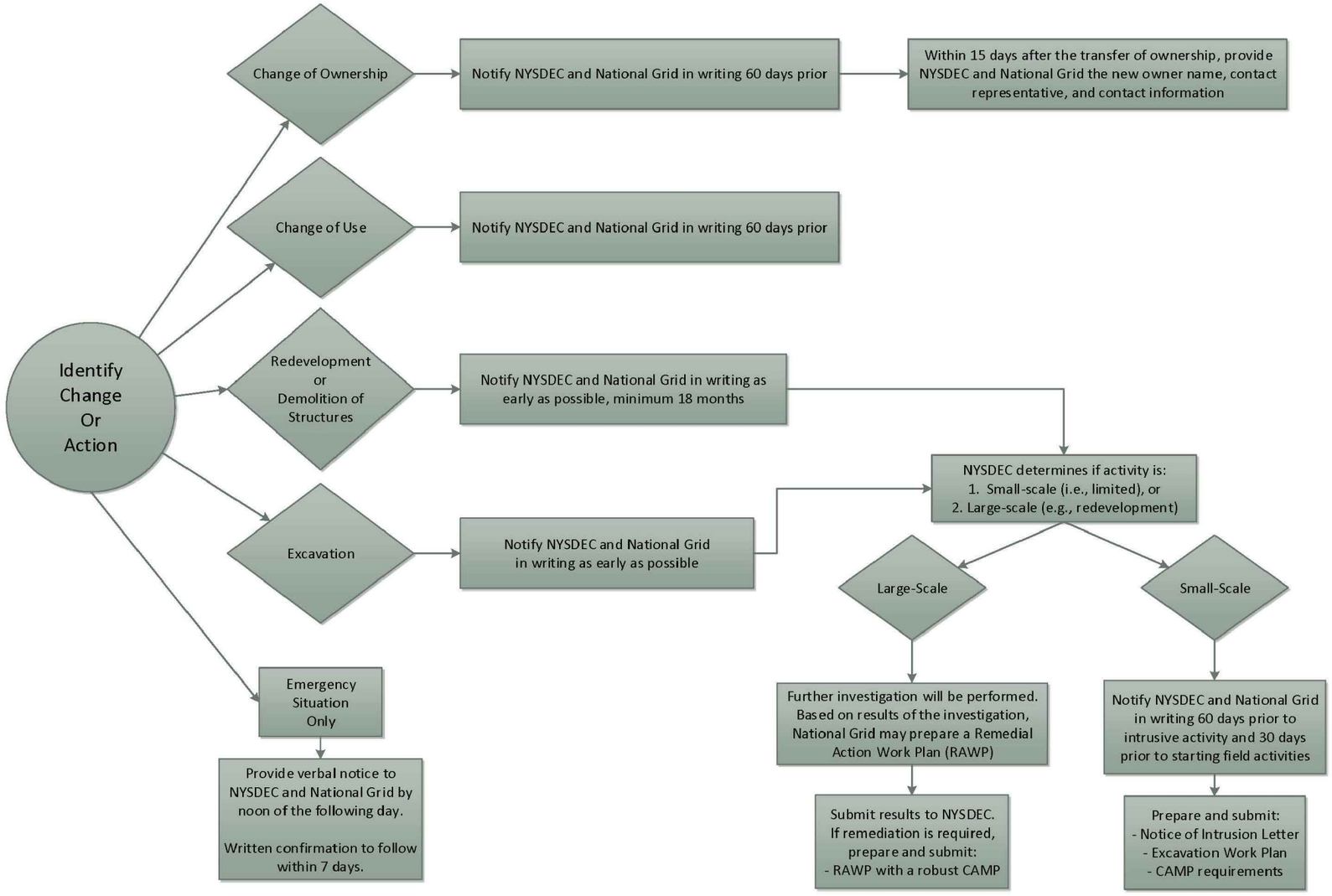
Site Name
Site City, New York
(Interim) Site Management Plan



SITE MANAGEMENT PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
ARVERNE, NEW YORK

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DECISION TREE FOR INTRUSIVE ACTIVITIES ON-SITE

Project 093140-1-1107 | October 2018 | Figure 7

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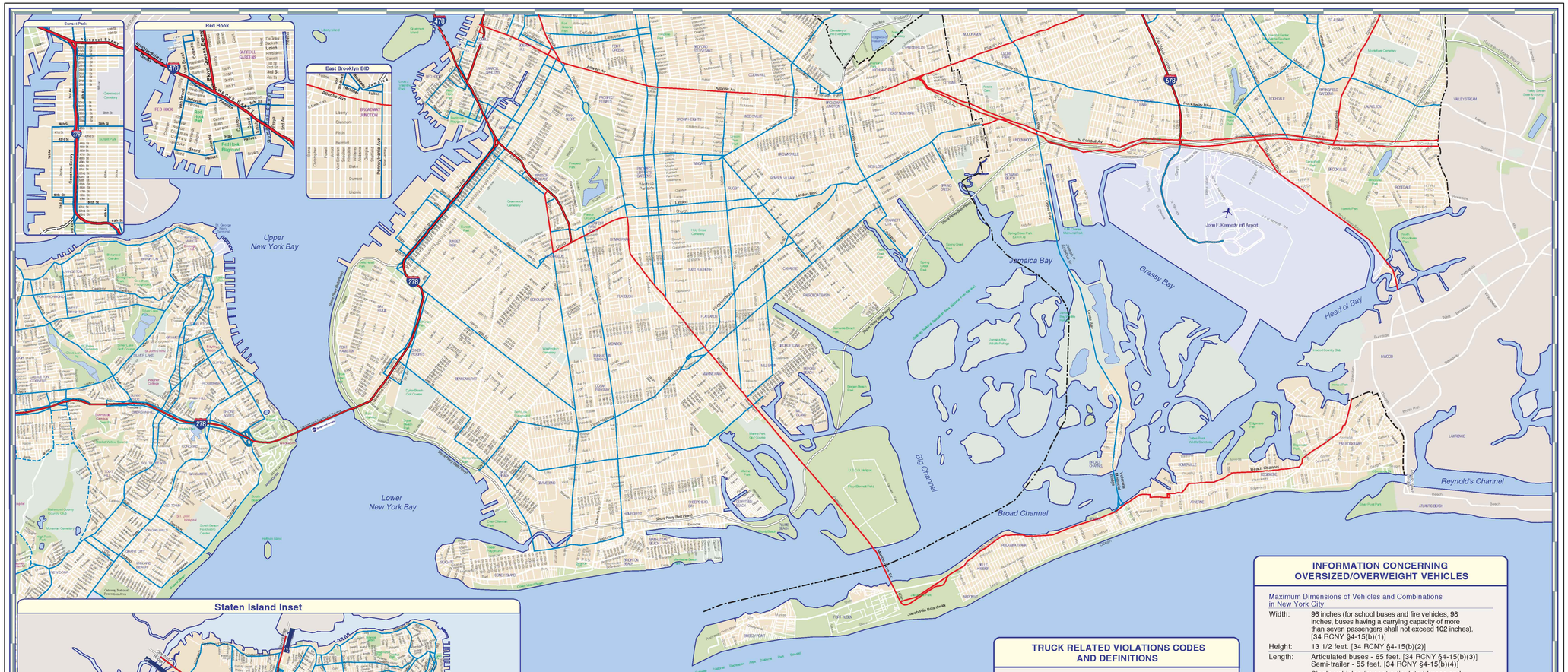


INFORMATION CONCERNING OVERSIZED/OVERWEIGHT VEHICLES

Maximum Dimensions of Vehicles and Combinations in New York City

Width: 96 inches (for school buses and fire vehicles, 98 inches, buses having a carrying capacity of more than seven passengers shall not exceed 102 inches). [34 RCNY §4-15(b)(1)]

Height: 13 1/2 feet. [34 RCNY §4-15(b)(2)]

Length: Articulated buses - 65 feet. [34 RCNY §4-15(b)(3)]
Semi-trailer - 55 feet. [34 RCNY §4-15(b)(4)]
Single vehicles (except articulated buses and semi-trailers) - 35 feet. [34 RCNY §4-15(b)(3)]

On I-95 between I-287 and I-295, on I-295 between I-295 and I-495, and on I-495 between I-95 and the Nassau-Queens county line, a semi-trailer over 48 feet (but not over 53 feet) may be operated if the distance between the kingpin of the semi-trailer and the centerline of the rear axle or rear axle group does not exceed 43 feet, and if the semi-trailer is equipped with a rear-end protective device of substantial construction consisting of a continuous lateral beam extending to within 4 inches of the lateral extremities of the semi-trailer and located not more than 22 inches from the surface as measured with the vehicle empty and on a level surface. [NY Vehicle and Traffic Law §385(3)(e)]

In double bottom operation, a semi-trailer or trailer may not exceed 28 1/2 feet. [NY Vehicle and Traffic Law §385(3)(b)]

Combination of Vehicles - 55 feet except that on qualifying highways and access highways there is no limit on length. [34 RCNY §4-15(b)(4), NY Vehicle and Traffic Law §385(4)(b)(1)]

NOTE: The provisions of Section 4-15 shall not apply to any vehicle authorized by the Federal Surface Transportation Assistance Act of 1982, as amended, when such vehicle is operating pursuant to the provisions of such Act.

Permissible Gross Weight of Vehicles And Combinations With Pneumatic Tires

Weight per inch width of tire on one wheel - 800 pounds. [34 RCNY §4-15(b)(6)]

Weight on any one wheel - 11,200 pounds. [34 RCNY §4-15(b)(7)]

Weight on any one axle - 22,400 pounds. [34 RCNY §4-15(b)(8)]

Weight on any two consecutive axles less than 10 feet apart - 36,000 pounds. [34 RCNY §4-15(b)(9)]

Weight on any three axles (34,000 lb. Plus 1,000 lb. Per foot and major fraction of a foot between first and last axles, (center to center). However, total weight should not exceed 73,280 lb. [34 RCNY §4-15(b)(10)]

Weight And Height Restrictions On Bridges, Viaducts And Other Structures

No vehicle or combination of vehicles may be operated over, on or through any bridge, viaduct or other structures on any highway if the weight of such vehicle or combination of vehicles and load is greater than the posted capacity of the structure or exceeds the height of the posted clearance as shown by an official sign or other marking or device. [34 RCNY §4-15(b)(13)]

TRUCK RELATED VIOLATIONS CODES AND DEFINITIONS

Off-Truck Route Violations

New York City Truck Routes are designated in Section 4-13 of the New York City Traffic Rules

Queens	4-13(b)	Brooklyn	4-13(e)
Staten Island	4-13(c)	Bronx	4-13(f)
Manhattan	4-13(d)		

Truck Route Definitions

TRUCK

Pursuant to 34 RCNY §4-13, a truck is defined as any vehicle or combination of vehicles designed for the transportation of property, which has either of the following characteristics: two axles, six tires; or three or more axles.

LOCAL TRUCK ROUTE

Trucks with an origin or destination for the purpose of delivery, loading or servicing within the respective Borough, shall only operate on designated local routes, except that an operator may operate on a non-designated street for the purpose of arriving at his/her destination. This shall be accomplished by leaving a designated truck route at the intersection that is nearest to their destination, proceeding by the most direct route, and then returning to the nearest designated truck route by the most direct route. If the operator has additional destinations in the same general area, he/she may proceed by the most direct route to his/her next destination without returning to a designated truck route, provided that the operator's next destination does not require that he/she cross a designated truck route.

THROUGH TRUCK ROUTE

Trucks having neither an origin nor a destination within the respective borough shall restrict the operation of such vehicles to those street segments designated as Through Truck Routes.

LIMITED LOCAL TRUCK ROUTE

Some of the roadways in Staten Island are designated as Limited Local Truck Routes. These roadways serve as Local Truck Routes but are limited to trucks with two axles and six tires.

INFORMATION FOR OVERWEIGHT/OVERDIMENSIONAL PERMITS

Each of the transportation providers in New York City has special requirements regarding the movement of Oversized or Overweight Vehicles over their facilities. These include the New York City Department of Transportation, the MTA Bridges and Tunnels, and the Port Authority of New York and New Jersey.

Within New York City Overdimensional Permits are issued by:

DOT-Bridges Truck Unit
2 Rector Street,
New York NY 10006
Tel: (212) 341-3726

IMPORTANT ADVISORY

Please be advised that commercial vehicles cannot travel on most Parkways.

All trucks must travel on designated Local and Through Truck Routes to the intersection nearest their destination. All posted restrictions must be obeyed.

* Truck restrictions vary by facility. For more information, refer to the Resource section of this map or call 311 ((212) NEW-YORK from outside New York City).

LEGEND

- Local Truck Routes
- Limited Local Truck Routes
- Through Truck Routes
- Through Truck Routes on Expressway
- Expressways
- Principal Streets
- Transportation Facility Operator*
- Parks
- Open Space or Cemeteries
- Airports and Industrial Uses
- Interstate Route

0 1/2 1 MILES
0 1 2 KILOMETERS

Second printing: Summer 2007

This map is to be used for reference purposes only. Please refer to the New York City Traffic Rules for the most current traffic regulations governing truck routes as well as permissible truck weights and dimensions. Information on this map is subject to change without notice. Always observe all posted restrictions as limitations may apply to designated truck routes.

See a mistake? Please help us make the next edition of this map more accurate. Inform the New York City Department of Transportation about any inaccuracies or omissions you may notice by emailing truckroute@dot.nyc.gov or writing to: Truck Route Map, 40 Worth Street, Suite 1105, New York, NY 10013.

Layout & Design by Emily Stedman Studio

0 4000 8000
SCALE, FEET

SITE MANAGEMENT PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
ARVERNE, NEW YORK

nationalgrid

PROJECT 093140-1-1107

GEI Consultants
455 WINDING BROOK DRIVE
SUITE 201
GLASTONBURY, CONNECTICUT 06033

TRUCK TRANSPORT ROUTE

October 2018 Figure 8

\\gtb1v-fs01\CAD\Project\National Grid\Edgemere\Arverne Substation\093140\SMP\2018-10\Arverne-SMP Figures.dwg

Appendix A

Deed Restriction

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER

This page is part of the instrument. The City Register will rely on the information provided by you on this page for purposes of indexing this instrument. The information on this page will control for indexing purposes in the event of any conflict with the rest of the document.

2015040800271001001EF359

RECORDING AND ENDORSEMENT COVER PAGE **PAGE 1 OF 11**

Document ID: 2015040800271001 Document Date: 02-13-2013 Preparation Date: 04-08-2015
Document Type: SUNDRY MISCELLANEOUS
Document Page Count: 10

PRESENTER:
ALL STATE ABSTRACT CORP-86930-"PICK UP REDVISION"
AS AGENT FOR:COURTESY RECORDING
52 BROADWAY, SUITE 4
GREENLAWN, NY 11740
631-261-7111

RETURN TO:
HISCOCK & BARCLAY
ONE PARK PLACE-300 SOUTH STATE STREET
SYRACUSE, NY 13202

PROPERTY DATA

Borough	Block	Lot	Unit	Address
QUEENS	15891	10	Entire Lot	N/A ROCKAWAY BEACH BLVD

Property Type: OTHER

CROSS REFERENCE DATA

CRFN_____ *or* DocumentID_____ *or* _____ Year____ Reel____ Page____ *or* File Number_____

PARTIES

PARTY 1:
LONG ISLAND LIGHTING COMPANY
333 EARLE OVINGTON BOULEVARD
UNIONDALE, NY 11553

FEES AND TAXES

Mortgage :		
Mortgage Amount:	$	0.00
Taxable Mortgage Amount:	$	0.00
Exemption:		
TAXES: County (Basic):	$	0.00
City (Additional):	$	0.00
Spec (Additional):	$	0.00
TASF:	$	0.00
MTA:	$	0.00
NYCTA:	$	0.00
Additional MRT:	$	0.00
TOTAL:	$	0.00
Recording Fee:	$	87.00
Affidavit Fee:	$	0.00

Filing Fee:	$	0.00
NYC Real Property Transfer Tax:	$	0.00
NYS Real Estate Transfer Tax:	$	0.00

RECORDED OR FILED IN THE OFFICE OF THE CITY REGISTER OF THE CITY OF NEW YORK
Recorded/Filed 04-16-2015 13:09
City Register File No.(CRFN): **2015000127975**

City Register Official Signature

DECLARATION of COVENANTS and RESTRICTIONS

THIS DECLARATION ("Declaration"), is made the 13th day of February 2013, by Long Island Lighting Company d/b/a LIPA, a New York corporation and wholly-owned subsidiary of the Long Island Power Authority, which is a corporate municipal instrumentality and political subdivision of the State of New York, with principal offices at 333 Earle Ovington Boulevard, Uniondale, Nassau County, New York 11553; and

WHEREAS, Long Island Lighting Company d/b/a LIPA is the owner (the "Owner") of a parcel of real property located on the south side of Rockaway Beach Boulevard and west of Beach 52nd Street, Edgemere, Queens County Tax Records, Section 61, Block 15891, Lot 10 (known as the Arverne (Edgemere) Substation), being more particularly described in Exhibit "A" entitled, "Boundary Survey – Arverne (Edgemere) Substation, Queens County, New York", prepared by KS Engineers, P.C., dated April 11, 2012, attached to this Declaration and made a part hereof, and hereinafter referred to as the "Property;" and

WHEREAS, the Property is the subject of a certain Voluntary Cleanup Agreement, Index # R2-0330-98-01, dated April 19, 1998, executed by Edward J. Youngling, Senior Vice President, Long Island Lighting Company, as part of the New York State Department of Environmental Conservation's ("Department" in the singular) Voluntary Cleanup Program; 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 was completed in August 1998, and such remedy requires that the Property be subject to restrictive covenants; and

WHEREAS, the Department approved a Site Management Plan ("SMP"), which addresses the implementation of institutional and engineering controls required at the Property; and

NOW, THEREFORE, Long Island Lighting Company d/b/a LIPA, for itself and its successors and/or assigns, covenants that:

First, the Property subject to this Declaration is as shown on Exhibit "A" 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 SMP, dated December 1, 2014, 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 Exhibit "B" 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 commercial or industrial utility purposes 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.

Long Island Lighting Company d/b/a LIPA

Michael Taunton

Name: MICHAEL J. TAUNTON

Title: CHIEF OPERATING OFFICER
CHIEF FINANCIAL OFFICER

::ODMA\PCDOCS\DOCS\315008\1

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

On the 13th day of February in the year 2013 before me, the undersigned, personally appeared Michael J. Taunton, 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

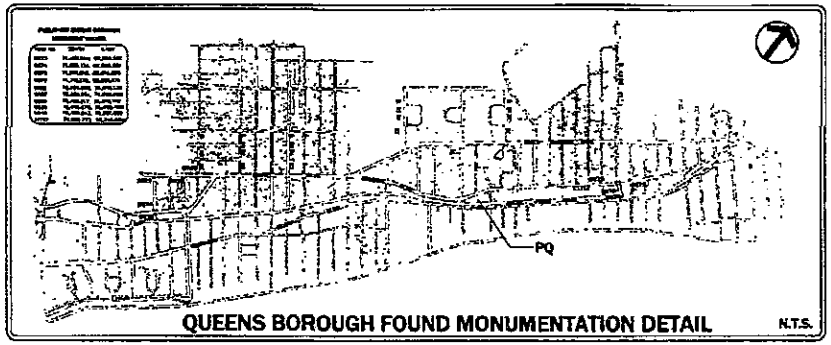
Notary Stamp & Expiration Date:

MICHELE A. PINCUS
Notary Public State of New York
No. 02P14990215
Qualified in Suffolk County
Commission Expires December 30, 2013

SEAL

Exhibit "A"

("Boundary Survey – Arverne (Edgemere) Substation, Queens County, New York", prepared by KS Engineers, P.C., dated April 11, 2012, revised September 24, 2013)



QUEENS BOROUGH FOUND MONUMENTATION DETAIL N.T.S.

LEGAL DESCRIPTION PER THIS SURVEY

BEGINNING AT A POINT OF INTERSECTION WITH THE SOUTHERLY BOUNDARY OF ROCKAWAY BEACH BOULEVARD (VARIABLE WIDTH R.O.W.) AND THE COMMON LOT LINE OF LOT 10-R AND LOT 21, BLOCK 15891, HAVING A QUEENS BOROUGH HORIZONTAL DATUM COORDINATE VALUE OF NORTH 72091.33, EAST 95602.37, SAID POINT BEING ON THE SOUTHEASTERLY OF THE INTERSECTION OF THE WESTERLY BOUNDARY OF BEACH 84th STREET (60' R.O.W.) AND THE BOUNDARY BOUNDARY OF ROCKAWAY BEACH BOULEVARD, RUNNING;

1. SOUTHWESTERLY, ALONG THE SOUTHERLY BOUNDARY OF ROCKAWAY BEACH BOULEVARD 37.12' TO AN ANGLE POINT, THENCE;
2. CONTINUING SOUTHWESTERLY ALONG SAID SOUTHERLY BOUNDARY, HAVING AN INTERIOR ANGLE OF 180°23'17" AND A DISTANCE OF 188.35' TO A POINT OF INTERSECTION WITH THE COMMON LOT LINE OF LOT 3 AND LOT 10-R, BLOCK 15891, THENCE;
3. SOUTHEASTERLY, LEAVING SAID BOUNDARY ALONG THE COMMON LOT LINE OF LOT 3 AND LOT 10-R, BLOCK 15891, HAVING AN INTERIOR ANGLE OF 107° 16'32" AND A DISTANCE OF 98.84', TO A POINT IN THE NORTHERLY BOUNDARY OF SHORE FRONT ROAD (66' R.O.W.), THENCE;
4. NORTHEASTERLY, ALONG THE NORTHERLY BOUNDARY OF SHORE FRONT ROAD, HAVING AN INTERIOR ANGLE OF 89° 53'53", AND A DISTANCE OF 274.13', TO A POINT OF INTERSECTION WITH SAID NORTHERLY BOUNDARY AND THE COMMON LOT LINE OF LOT 21 AND LOT 10-R, BLOCK 15891, THENCE;
5. NORTHWESTERLY, ALONG THE COMMON LOT LINE OF LOT 21 AND LOT 10-R, BLOCK 15891, HAVING AN INTERIOR ANGLE OF 92°34'07" AND A DISTANCE 123.62', TO THE POINT OR PLACE OF BEGINNING

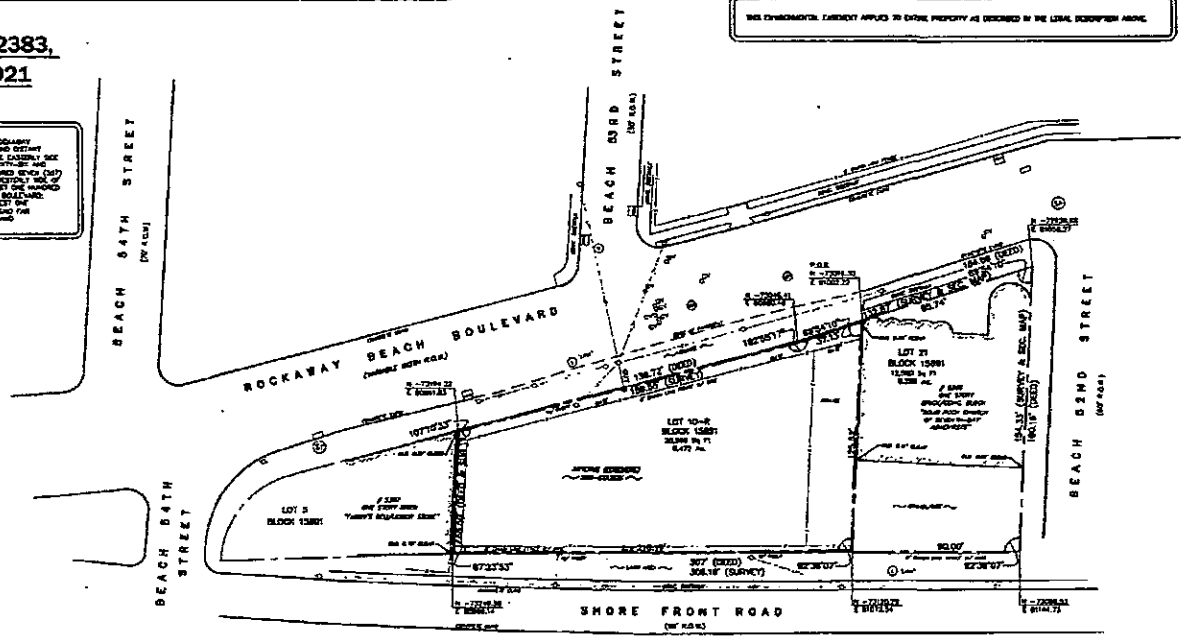
CONTAINING 20,366 SQ. FT. OR 0.472 ACRES

DEED RESTRICTION DESCRIPTION NYSDEC SITE ID V00147:

THIS ENVIRONMENTAL EASEMENT APPLIES TO ENTIRE PROPERTY AS DESCRIBED IN THE LEGAL DESCRIPTION ABOVE.

LEGAL DESCRIPTION PER LIBER 2383, PAGE 302, RECORDED 3/17/1921 DESCRIBING LOTS 10-R & 21

BEGINNING AT A POINT ON THE SOUTHERLY SIDE OF ROCKAWAY BOULEVARD, AS NOW LAID OUT AND KNOWN AS THE ROCKAWAY BOULEVARD, WHERE THE SAME IS INTERSECTED BY A LINE DRAWN PARALLEL TO STORM AVENUE, AND DISTANT THEREON NINETY-NINE AND FIFTY ONE-HUNDREDTHS (199.50') FEET EASTERLY FROM THE EASTERLY SIDE OF STORM AVENUE, AT RIGHT ANGLES THERETO, RUNNING THENCE SOUTHERLY ALONG SAID LINE SIXTY-SIX AND SIXTY-ONE HUNDREDTHS (66.60) FEET TO THE LONG ISLAND RAILROAD; THENCE EASTERLY ALONG SAID RAILROAD, TWO HUNDRED SEVEN (207) FEET TO A PROPOSED STREET KNOWN AS BEACH 83RD STREET; THENCE NORTHERLY, ALONG THE WESTERLY SIDE OF THE SAID PROPOSED STREET, KNOWN AS BEACH 83RD STREET, NORTH 0 DEGREES 38 MINUTES, WEST ONE HUNDRED SIXTY AND 30 HUNDREDTHS (160.30) FEET TO THE SOUTHERLY SIDE OF THE ROCKAWAY BOULEVARD; THENCE ALONG SAID THE ROCKAWAY BOULEVARD, SOUTH 89 DEGREES 38 MINUTES 10 SECONDS WEST ONE HUNDRED EIGHTY-FOUR AND SIXTY-NINE ONE-HUNDREDTHS (184.69) FEET, THENCE STILL ALONG SAID THE ROCKAWAY BOULEVARD, 79 DEGREES, 52 MINUTES 50 SECONDS WEST ONE HUNDRED EIGHTY-ONE AND SEVENTY-TWO ONE-HUNDREDTHS (181.72) FEET TO THE POINT OR PLACE OF BEGINNING.



LEGEND

MAP REFERENCES:

1. A CERTAIN MAP ENTITLED: "CITY OF NEW YORK, BOROUGH OF QUEENS, OFFICE OF THE PRESIDENT, TOPOGRAPHIC BUREAU, MAP SHOWING STREET SYSTEM FOR THE TERRITORY HEREINAFTER AS PARTIAL SECTION 37A, OF THE FINAL MAPS OF THE BOROUGH OF QUEENS", DATED APRIL 27, 1932
2. A CERTAIN MAP ENTITLED: "CITY OF NEW YORK, BOROUGH OF QUEENS, OFFICE OF THE PRESIDENT, TOPOGRAPHIC BUREAU, MAP SHOWING STREET SYSTEM FOR THE TERRITORY HEREINAFTER AS SECTION 37A, OF THE FINAL MAPS OF THE BOROUGH OF QUEENS", DATED APRIL 06, 1933
3. A CERTAIN MAP ENTITLED: "CITY OF NEW YORK, BOROUGH OF QUEENS, OFFICE OF THE PRESIDENT, TOPOGRAPHIC BUREAU, MAP SHOWING STREET SYSTEM FOR THE TERRITORY HEREINAFTER AS SECTION 32A, OF THE FINAL MAPS OF THE BOROUGH OF QUEENS", DATED JULY 13, 1935
4. A CERTAIN MAP ENTITLED: "ALTERATION MAP No. 9474, DRAWING No. A-3, SHEET No. 4 OF 17", DATED APRIL 16, 2009, OBTAINED AT THE TOPOGRAPHIC BUREAU OF QUEENS.
5. A CERTAIN MAP ENTITLED: "PLAN PREPARED FOR MARKET SPAN CORPORATION, CENTRE SUBSTATION, QUEENS NEW YORK, SCE AND T&D, ARVERNE, REMOVABLE SUBSTATION", PREPARED BY: GD CONSULTANTS AND PLAN'S 1 AND 2, DATED SEPT. 1988

SURVEY REFERENCES:

1. LIBER 2383, PAGE 302, RECORDED 3/17/1921
2. LIBER 2383, PAGE 303, RECORDED 3/17/1921

NOTES:

1. HORIZONTAL DATUM QUEENS BOROUGH DATUM ESTABLISHED BY GLOBAL POSITIONING SYSTEM METHODOLOGY
2. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND IS SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD OF WHICH AN ACCURATE TITLE REPORT MAY DISCLOSE
3. SOME DATA LOCATIONS ARE APPROXIMATE AND TAKEN FROM REFERENCE No. 1 ABOVE.

THE ENGINEERING AND INSTITUTIONAL CONTROLS FOR THIS EASEMENT ARE SET FORTH IN THE SITE MANAGEMENT PLAN (SMP). A COPY OF 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 dec.ny.gov/chemical/site.html

GRAPHIC SCALE

CERTIFIED TO: NEW YORK STATE – DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DESIGNED BY: | DRAWN BY: LV | CHECKED BY:

ROBERT GUY RYAN
REGISTERED LAND SURVEYOR
N.Y. LICENSE NO. 49729

NO.	REVISIONS	DATE
1		6/24/19

BOUNDARY SURVEY
ARVERNE (EDGEMERE) SUBSTATION
QUEENS COUNTY, NEW YORK

KSE
KLEINFELDER SCIENCE, P.C.

SCALE	DATE	PROJECT NO.	SHEET NO.
1"=30'	4/11/19		1 OF 1

GEI Consultants

Geotechnical
Environmental and
Water Resources
Engineering

Site Management Plan

Arverne Substation (Former Edgemere Substation)
Rockaway Beach Boulevard and 53rd Street
Arverne, New York
AOC Index No. R2-0330-98-01
Site No. V00147

Submitted to:
National Grid
175 East Old Country Road
Hicksville, NY 11801

Submitted by:
GEI Consultants, Inc., P.C.
400 Unicorn Park Drive
Woburn MA 01801
(781) 721-4000

110 Walt Whitman Road, Suite 204
Huntington Station, NY 11746
(631) 760-9300

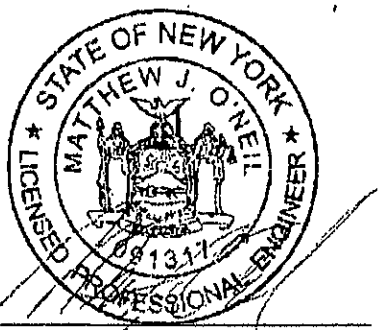
December 1, 2014
Project 093140

Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date

Professional Engineer Certification

I, Matthew J. O'Neil, 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).



12/1/14
Date

Matthew J. O'Neil
GEI Consultants, Inc. P.C.
New York State Professional Engineer
License Number 091317

SEAL

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.

Table of Contents

Tables

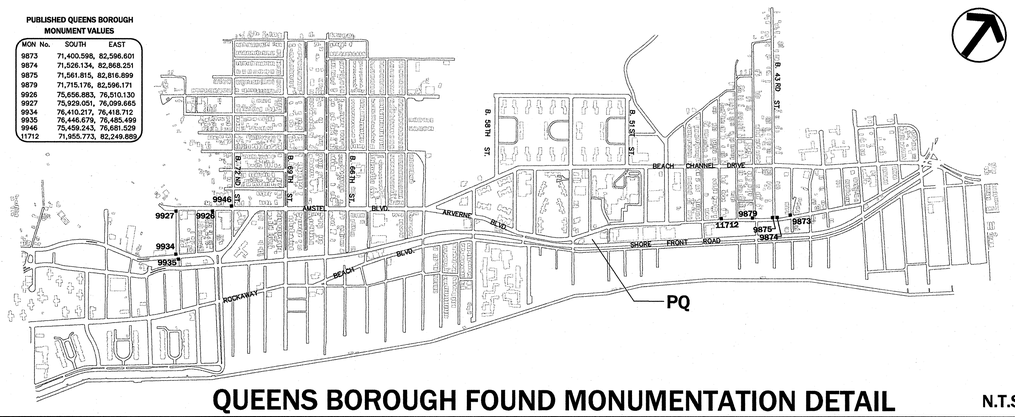
Figures

Appendices

MTF/MZ/amm H:\WPROC\Project\NationalGrid\Edgemere\Site Management Plan\SMP-2014\FINAL\SMP.V00147.2014-12-01.Arverne.docx

PUBLISHED QUEENS BOROUGH MONUMENT VALUES

MON No.	SOUTH	EAST
9873	71,400.598,	82,596.601
9874	71,526.134,	82,868.251
9875	71,561.815,	82,816.899
9879	71,715.176,	82,596.171
9926	75,656.883,	76,510.130
9927	75,929.051,	76,099.665
9934	76,410.217,	76,418.712
9935	76,446.679,	76,485.499
9946	75,459.243,	76,681.529
11712	71,955.773,	82,249.889



QUEENS BOROUGH FOUND MONUMENTATION DETAIL

N.T.S.

LEGAL DESCRIPTION PER LIBER 2383, PAGE 302, RECORDED 3/17/1921 DESCRIBING LOTS 10-R & 21

BEGINNING AT A POINT ON THE SOUTHERLY SIDE OF ARVENE BOULEVARD, ALSO KNOWN AS FAR ROCKAWAY BOULEVARD, WHERE THE SAME IS INTERSECTED BY A LINE DRAWN PARALLEL TO STORM AVENUE, AND DISTANT FOURTEEN HUNDRED SIXTY–NINE AND FIFTY ONE–HUNDREDTHS (1469.50) FEET EASTERLY FROM THE EASTERLY SIDE OF STORM AVENUE, AT RIGHT ANGLES THERETO: RUNNING THENCE SOUTHERLY ALONG SAID LINE SIXTY–SIX AND SIXTY–ONE HUNDREDTHS (66.60) FEET TO THE LAND OF THE LONG ISLAND RAILROAD, THREE HUNDRED SEVEN (307) FEET TO A PROPOSED STREET KNOWN AS BEACH 53rd STREET; THENCE NORTHERLY, ALONG THE WESTERLY SIDE OF THE SAID PROPOSED STREET, KNOWN AS BEACH 53rd STREET, NORTH 0 DEGREES 30 MINUTES, WEST ONE HUNDRED SIXTY AND SIXTEEN ONE–HUNDREDTHS (160.16) FEET TO THE SOUTHERLY SIDE OF FAR ROCKAWAY BOULEVARD; THENCE ALONG SAID FAR ROCKAWAY BOULEVARD, SOUTH 69 DEGREES 38 MINUTES 10 SECONDS WEST ONE HUNDRED EIGHTY–FOUR AND SIXTY–NINE ONE–HUNDREDTHS (184.69) FEET; THENCE STILL ALONG SAID FAR ROCKAWAY BOULEVARD, 70 DEGREES, 52 MINUTES 10 SECONDS WEST ONE HUNDRED THIRTY–NINE AND SEVENTY–TWO ONE–HUNDREDTHS (139.72) FEET TO THE **POINT OR PLACE OR BEGINNING.**

LEGAL DESCRIPTION PER THIS SURVEY

BEGINNING AT A POINT OF INTERSECTION WITH THE SOUTHERLY SIDELINE OF ROCKAWAY BEACH BOULEVARD (VARIABLE WIDTH R.O.W.) AND THE COMMON LOT LINE OF LOT 10–R AND LOT 21, BLOCK 15891, HAVING A QUEENS BOROUGH HORIZONTAL DATUM COORDINATE VALUE OF SOUTH 73016.30, EAST 81002.22, SAID POINT BEING 95.74' SOUTHWESTERLY OF THE INTERSECTION OF THE WESTERLY SIDELINE OF BEACH 52nd STREET (60' R.O.W.) AND THE SOUTHERLY SIDELINE OF ROCKAWAY BEACH BOULEVARD, THENCE;

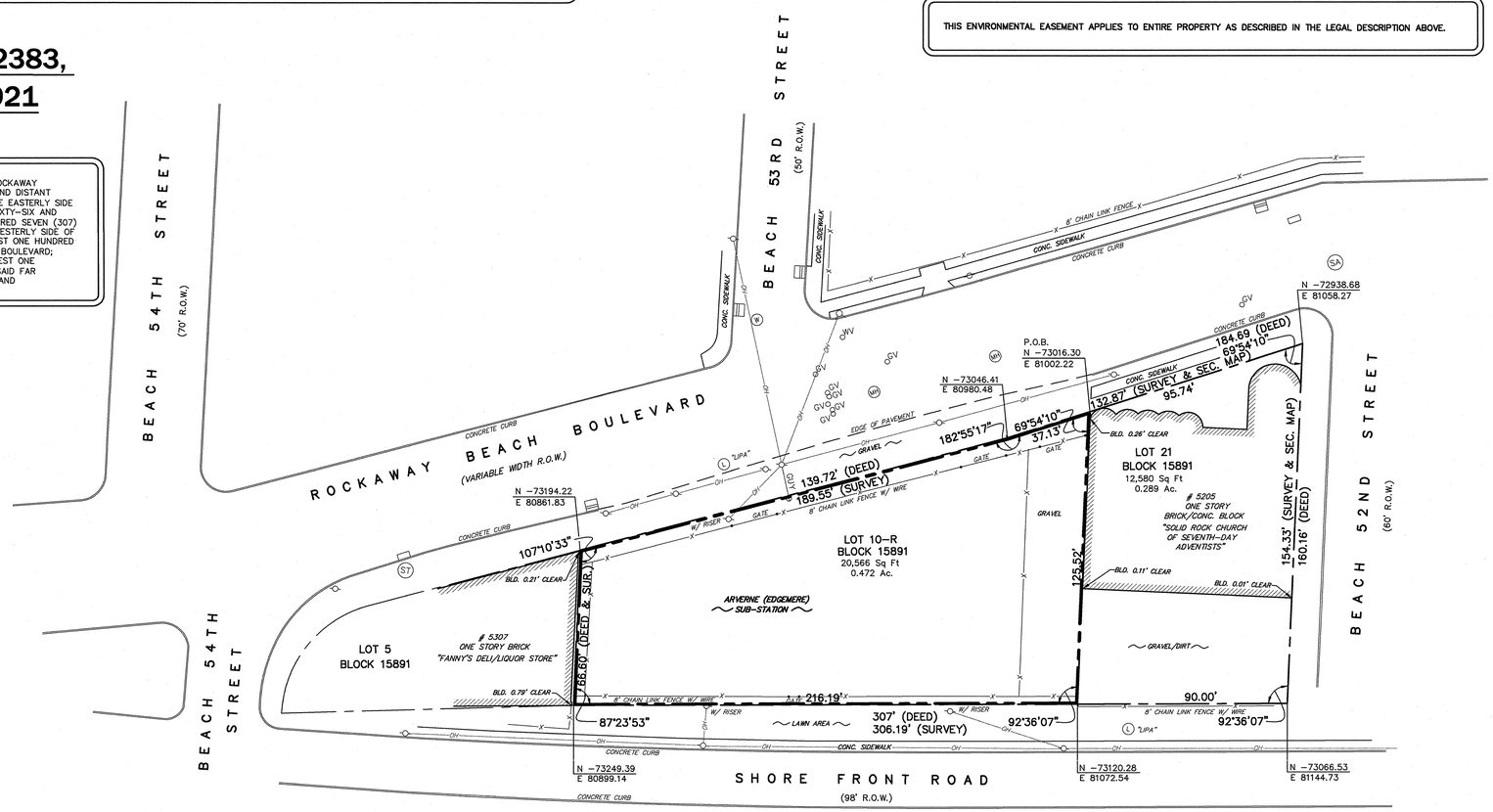
1. SOUTHWESTERLY, ALONG THE SOUTHERLY SIDELINE OF ROCKAWAY BEACH BOULEVARD 37.13' TO AN ANGLE POINT, THENCE;
2. CONTINUING SOUTHWESTERLY ALONG SAID SOUTHERLY SIDELINE, HAVING AN INTERIOR ANGLE OF 182°55'17" AND A DISTANCE OF 189.55' TO A POINT OF INTERSECTION WITH THE COMMON LOT LINE OF LOT 5 AND LOT 10–R, BLOCK 15891, THENCE;
3. SOUTHEASTERLY, LEAVING SAID SIDELINE ALONG THE COMMON LOT LINE OF LOT 5 AND LOT 10–R, BLOCK 15891, HAVING AN INTERIOR ANGLE OF 107° 10'33" AND A DISTANCE OF 66.60', TO A POINT IN THE NORTHERLY SIDELINE OF SHORE FRONT ROAD (98' R.O.W.), THENCE;
4. NORTHEASTERLY, ALONG THE NORTHERLY SIDELINE OF SHORE FRONT ROAD, HAVING AN INTERIOR ANGLE OF 87° 23'53" AND A DISTANCE OF 216.19', TO A POINT OF INTERSECTION WITH SAID NORTHERLY SIDELINE AND THE COMMON LOT LINE OF LOT 21 AND LOT 10–R, BLOCK 15891, THENCE;
5. NORTHWESTERLY, ALONG THE COMMON LOT LINE OF LOT 21 AND LOT 10–R, BLOCK 15891, HAVING AN INTERIOR ANGLE OF 92°36'07" AND A DISTANCE 125.52', TO THE **POINT OR PLACE OF BEGINNING.**

CONTAINING 20,566 SQ. FT. OR 0.472 ACRES

QUEENS BOROUGH DATUM

DEED RESTRICTION DESCRIPTION NYSDEC SITE ID V00147:

THIS ENVIRONMENTAL EASEMENT APPLIES TO ENTIRE PROPERTY AS DESCRIBED IN THE LEGAL DESCRIPTION ABOVE.



LEGEND

- UTILITY POLE
- GV GAS VALVE
- WV WATER VALVE
- W WATER MANHOLE
- L LIPA MANHOLE
- MH UNKNOWN MANHOLE
- INLET
- OH OVERHEAD WIRES
- APPROXIMATE LIMITS OF ENGINEERING CONTROL–CLEAN SOIL COVER

MAP REFERENCES:

1. A CERTAIN MAP ENTITLED: "CITY OF NEW YORK, BOROUGH OF QUEENS, OFFICE OF THE PRESIDENTS, TOPOGRAPHIC BUREAU, MAP SHOWING STREET SYSTEM FOR THE TERRITORY DESIGNATED AS PARTIAL SECTION 219, OF THE FINAL MAPS OF THE BOROUGH OF QUEENS", DATED APRIL 27, 1922
2. A CERTAIN MAP ENTITLED: "CITY OF NEW YORK, BOROUGH OF QUEENS, OFFICE OF THE PRESIDENTS, TOPOGRAPHIC BUREAU, MAP SHOWING STREET SYSTEM FOR THE TERRITORY DESIGNATED AS SECTION 228, OF THE FINAL MAPS OF THE BOROUGH OF QUEENS", DATED APRIL 06, 1925
3. A CERTAIN MAP ENTITLED: "CITY OF NEW YORK, BOROUGH OF QUEENS, OFFICE OF THE PRESIDENTS, TOPOGRAPHIC BUREAU, MAP SHOWING STREET SYSTEM FOR THE TERRITORY DESIGNATED AS SECTION 228, OF THE FINAL MAPS OF THE BOROUGH OF QUEENS", DATED JULY 15, 1925
4. A CERTAIN MAP ENTITLED: "ALTERATION MAP No. 9474, DRAWING No. A–3, SHEET No. 4 OF 11", DATED APRIL 19, 2004, OBTAINED AT THE TOPOGRAPHIC BOUROUGH OF QUEENS.
5. A CERTAIN MAP ENTITLED: "PLAN PREPARED FOR MARKET SPAN CORPORATION, EDMERE SUBSTATION, QUEENS NEW YORK, SOIL AND FILL MATERIAL REMOVALS, SITE PLAN", PREPARED BY GEI CONSULTANTS INC. PLATE 1 AND 2, DATED SEPT. 1998

DEED REFERENCE:

1. LIBER 7424, PAGE 462, RECORDED 1/18/1962.
2. LIBER 2383, PAGE 302, RECORDED 3/17/1921.

NOTES:

1. HORIZONTAL DATUM QUEENS BOROUGH DATUM ESTABLISHED BY GLOBAL POSITIONING SYSTEM METHODOLOGY
2. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND IS SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD IN WHICH AN ACCURATE TITLE REPORT MAY DISCLOSE.
3. SOIL DATA LOCATIONS ARE APPROXIMATE AND TAKEN FROM REFERENCE No. 5 ABOVE.

THE ENGINEERING AND INSTITUTIONAL CONTROLS FOR THIS EASEMENT ARE SET FORTH IN THE SITE MANAGEMENT PLAN (SMP). A COPY OF 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

30 0 15 30 60 120

GRAPHIC SCALE

CERTIFIED TO: NEW YORK STATE – DEPARTMENT OF ENVIRONMENTAL CONSERVATION

STATE OF NEW YORK · ROBERT A. RYAN · 049728-1 · PROFESSIONAL LAND SURVEYOR

ROBERT A. RYAN
PROFESSIONAL LAND SURVEYOR
N.Y. LICENSE NO. 49728

DESIGNED BY:	DRAWN BY:	CHECKED BY:
	LV	

REVISIONS	
1	9/24/13

BOUNDARY SURVEY

ARVERNE (EDGEMERE) SUBSTATION

QUEENS COUNTY, NEW YORK

KSE
KS ENGINEERS, P.C.

Engineers • Surveyors • Construction Managers
494 Broad Street, Newark, N.J. 07102
Phone: (973) 623-2999, Fax: (973) 623-2988

SCALE:	DATE:	PROJECT NO.:	SHEET NO.:
1"=30'	4/11/12	1261	1 OF 1

Appendix B

Excavation Work Plan (EWP)

APPENDIX B – EXCAVATION WORK PLAN (EWP)

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 owner and tenants, consultants, and contractors are required to comply with this EWP. National Grid is only responsible for costs associated with Manufactured Gas Plant MGP-related impacts. MGP-impacted areas are identified in Figure 5 and Figure 5A, note that these areas may not encompass the entire property or all tax parcels.

B-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, based on the data available, the property owner or their representative will notify the New York State Department of Environmental Conservation (NYSDEC) and National Grid in writing. Table B1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of Site-related contact information is provided in Appendix C.

Table B1: Notifications*

Sondra Martinkat	(718) 482-4891 Sondra.martinkat@dec.ny.gov
Jane O'Connell	(718) 482-4599 Jane.oconnell@dec.ny.gov
Sarah Aldridge National Grid Project Manager	(516) 545-2568 Sarah.Aldridge@nationalgrid.com

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

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 letter. This notification will include:

[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.

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for Site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of impacted soil to be excavated and any work that may impact the EC;

- Whether proposed activities will require dewatering, proposed containment of dewatering liquids and planned disposal options for dewatering liquids;

- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly 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 health and safety plan (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 all required chemical testing results.

B-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed by a qualified environmental professional (QEP) or person under their supervision during all limited excavations into known or potentially-impacted material. 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 Sections 6 and 7 of this Appendix.

B-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.

B-4 MATERIALS EXCAVATION AND LOAD-OUT

A QEP or person under their supervision 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(s) 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.

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 Truck wash 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.

B-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 the New York State Code of Rules and Regulations (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 are included in Figure 8. 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.

B-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 in accordance with all local, State (including 6 NYCRR Part 360) 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. Unregulated off-site management of materials from this Site will not occur without formal NYSDEC approval.

Regulated soils will be stockpiled and transported to a National Grid-approved facility. Off-site disposal locations for excavated soils will be identified in the pre-excavation notification prepared by the owner and provided to National Grid for review and 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: 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, at minimum, as a Municipal Solid Waste per 6 NYCRR Part 360-1.2. Material that does not meet Unrestricted Use Soil Cleanup Objectives (SCOs) is prohibited from being taken to a New York State recycling facility (6 NYCRR Part 360-16 Registration Facility).

B-7 MATERIALS REUSE ON-SITE

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

Material that meets the Commercial 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 volatile organic compounds (VOCs) via U.S. Environmental Protection Agency (EPA) Method 8260
- Total semivolatile organic compounds (SVOCs) via EPA Method 8270C
- Polychlorinated biphenyls (PCBs) via EPA Method 8082/8082A/8080
- Total cyanide via EPA Method 9010/9014
- Total Metals (Resource Conservation and Recovery Act [RCRA]+Cu, Ni, Zn, Va, Cn HexChrome) via EPA Method 6010B and 6010
- Total Mercury via EPA Method 7471.

The QEP will ensure that procedures defined for materials reuse in this EWP are followed and that unacceptable material 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.

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.

B-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 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.

B-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in kind. The existing cover system is comprised of a minimum of 36 inches of clean soil, gravel, concrete curbs and concrete substation foundation elements. 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 an updated Site Management Plan (SMP).

B-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the Site will be approved by National Grid's QEP 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 by the owner and submitted to the NYSDEC project manager by National Grid allowing a minimum of 5 business days for review. This 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, or 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 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are the Commercial Use SCOs listed in Table 375-6.8(a) of 6 NYCRR Part 375. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not

be imported onto the Site without prior approval by NYSDEC. Solid waste will not be imported onto the Site.

Samples will be collected from imported fill in accordance with the analytical sampling requirements of Division of Environmental Remediation (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 and SVOCs in accordance with the analytes for the [Restricted Residential, Residential, Commercial Use SCOs listed in Table 375-6.8(a)] 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 B-3).

B-11 STORMWATER POLLUTION PREVENTION

For excavations less than 1 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.

B-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 subsurface excavations, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

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 in a manner and timeframe that does not interfere with the property owner's(s') construction schedule, to the extent reasonably feasible. National Grid 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 (Target Analyte List (TAL) metals; Target Compound List (TCL) volatiles and semi-volatiles, pesticides and PCBs, and free cyanide). In the event that future sampling results provide a sufficient justification to limit the list of analytes, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

B-13 COMMUNITY AIR MONITORING PLAN (CAMP)

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. Locations of MGP-impacted material are shown in Figure 5. 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.

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

B-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 and National Grid will be notified by National Grid, Property Owner or their representative 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.

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.

B-15 DUST CONTROL PLAN

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 through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.

- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.

- Gravel will be used on roadways to provide a clean and dust-free road surface.

- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

In the event that complaints are received for dust, the contractor will take the appropriate response actions for dust suppression.

B-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 C

List of Site Contacts

Name	Phone	Email Address
Sarah Aldridge, National Grid Project Manger	(516) 545-2568	Sarah.Aldridge@nationalgrid.com
Matt O'Neil, GEI Project Manger	(401) 533-5152	moneil@geiconsultants.com
Sondra Martinkat, NYSDEC Site Manager	(718) 482-4891	sondra.martinkat@dec.ny.gov
Stephanie Selmer, NYSDOH Site Manager	(518) 402-7880	beei@health.state.ny.us
Jane O'Connell, NYSDEC	(718) 482-4599	jane.oconnell@dec.ny.gov

Appendix D

Health and Safety Plan

GEI Consultants

Geotechnical
Environmental and
Water Resources
Engineering

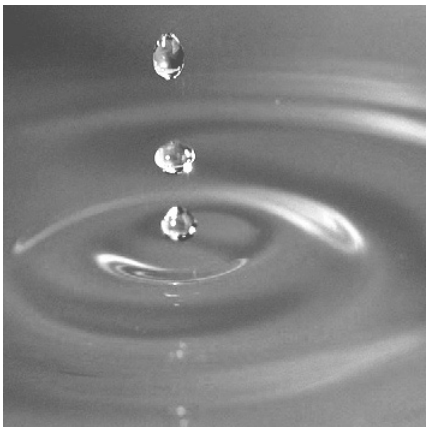
Health and Safety Plan

Arverne (Former Edgemere) Substation Site

Town of Arverne
Queens County, Long Island, NY
NYSDEC Consent Index No. D2-001-98-04

Submitted by:
GEI Consultants, Inc. P.C.
455 Winding Brook Drive, Suite 201
Glastonbury, CT 06033
860-368-5300

June 2012
093140-1-1103



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Appendices

RECORD OF CHANGE		
Revision	**Date**	**Description**
0	**July 2005**	**First Iteration of HASP**
1	**January 2010**	**Updated based upon site activity**
2	**January 2012**	**Changed document to a GEI format. Site-specific information increased. Updated based upon site activity.**
3	**June 2012**	**Updated document based on Hospital Closure and comments from National Grid**

Health and Safety Plan

1. Background Information

1.1 General

Engineer GEI Consultants, Inc. (GEI)
455 Winding Brook Drive, Suite 201
Glastonbury, CT 06033

Project Name Arverne (former Edgemere) Substation Site
Arverne, 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 Arverne (Former Edgemere) Substation Site located in Arverne, Queens County, New York. The site is currently owned by the Long Island Power Authority (LIPA) and there is an active electrical substation on the property.

Reading of and adherence to the HASP is required of all on site GEI personnel. Subcontractors for this project will be required to develop their own HASP for protection of their employees, but at a minimum they must adhere to applicable requirements set forth in this HASP. GEI will verify that its subcontractor's HASP includes National Grid's 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 for HAZCOM purposes, depending on the nature of their presence on site during activities conducted by GEI.

The plan identifies measures to minimize accidents and injuries, which may result from project activities, emergencies, or during adverse weather conditions. Activities performed under this HASP will comply with applicable parts of OSHA Regulations, primarily 29 Code of Federal Regulations (CFR) Parts 1910 and 1926, and National Grid policies and procedures.

1.2 Project Description

Activities conducted at the Arverne (Former Edgemere) Substation Site are periodic in nature and are conducted on an as-needed basis.

These activities primarily include:

- Soil management services (if LIPA is conducting subsurface activities)
- Community air monitoring
- Groundwater, subsurface soil and soil vapor sampling
- Annual Certification

1.3 Site Description

An electrical substation occupied the property until it was retired in 1994. Soil sampling revealed that the site included various types of fill material including fill from a former manufactured gas plant. In the fall of 1995, an electrical transformer located at the site was vandalized, resulting in the release of 2,000 gallons of non-hazardous mineral oil within the southwest corner of the site. Approximately 1,200 gallons of the mineral oil was recovered using two 3-foot-diameter oil recovery wells. Only trace amounts of mineral oil were detected in the wells in the months preceding the 1998 MARCOR Remediation, Inc. (MARCOR) remediation project.

Environmental assessments were performed by LILCO and areas of the site were discovered to contain elevated levels of lead and benzene. Further investigation revealed the elevated benzene levels might be due to the presence of coal tar, which had been deposited on the site. Further investigation was conducted to delineate the location of coal tar impacts as well as to delineate and quantify the levels of lead in detail. As a result of this detailed investigation, potentially hazardous and non-hazardous areas were delineated. Waste profiles were developed for the respective material, and plans and specifications were developed by KeySpan (National Grid) to remove all site material located above the groundwater.

The site was remediated in 1998 under a Voluntary Agreement between the Long Island Lighting Company (LILCO) and the New York State Department of Environmental Conservation (NYSDEC). The remedial activity included the removal of equipment, debris and 3 feet of material (to approximate depth to groundwater at the time of remediation) from the site. The contaminated material removed consisted primarily of coal ash, clinker, purifier box wastes, tars, brick, sand, and debris from the former substation control house. The impacted material was removed off site and approximately 3 feet of clean fill was added. The 3-foot-thick layer of fill will be known as the "composite soil cover." It is assumed that underneath the buildings/foundations, the composite soil cover is 1.5 feet thick. Groundwater and soil/debris located below the groundwater table were not included in the remedial activity. The new Arverne Substation was constructed at the site in 2004.

The site is approximately one-half acre in size and is bounded by Rockaway Beach Boulevard to the north, Rockaway Freeway to the south, Solid Rock Seventh Day Adventist

Church (the "Church") and Beach 52nd Street to the east, and a one story commercial building and Beach 54th Street to the west. An active LIPA electric substation is located on the western-third of the site. The remaining eastern two-thirds of the property is undeveloped land.

The property located immediately east of the Substation is currently owned by the Church. KeySpan (National Grid) owned this property until it was sold in the early 1960s. It was suspected fill material present on the Substation property might extend to the area behind the Church. At the request of the NYSDEC the rear property behind the Church was examined for the presence of fill material. The soil behind the Church property was characterized as both hazardous and non-hazardous material, and was appropriately delineated. Excavation occurred on the Church property and Substation property. Areas of lead impacts were removed, including a lead hot spot located on the Church property.

In October 2009, construction began for a new substation expansion on the site. GEI was on site implementing the Soil and Groundwater Management Plan. This work was completed in three phases. During Phase 1 from October to November 2009, nineteen mini piles were installed and shallow excavation was performed to build the foundation. Phases 2 and 3 were completed in February and March 2010, respectively. During Phase 2, shallow excavation was performed by LIPA to connect the piles installed in 2009 to an existing electrical grounding network. During Phase 3, trenches were excavated to run cables connecting the new equipment to the distribution system. GEI was on site to conduct community air monitoring as well as sampling of the excavated soils during all three phases.

1.4 Hazard/Risk Analysis

1.4.1 Physical Hazards

Physical hazards associated with heavy equipment operations may be present if intrusive activities are conducted on site. These activities would require the use of heavy equipment such as a backhoe, vacuum excavator, or drill rig, which is associated with but not limited to the following hazards:

- Bodily injuries
- Slipping, tripping or falling
- Heavy lifting
- Electrical hazards associated with substation

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.

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

- Prior to initiation of any excavation activity (or ground intrusive activity, such as drilling), the location of underground installations will be determined. The New York State one-call center (811) will be contacted by the Contractor/Subcontractor a minimum of 72 hours prior to excavation activities. GEI will complete the Utility Clearance procedures checklist included in **Appendix D**. 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 shall be determined by means that are safe to workers, i.e., hand dig, test pits, etc., and in compliance with LIPA General Operating Procedures (see section 1.4.10).
- All excavation areas will be inspected daily by the 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 shall be placed at least 5 feet from the edge of the excavation.
- All excavation operations will cease immediately during hazardous weather conditions such as high winds, heavy rain, lightning and heavy snow.

1.4.2 Fire and Explosion

No smoking is permitted on-site and in areas containing hazards that may contribute to a fire. Fire extinguishers should be located on all heavy equipment on site and in company vehicles as well. All fires should be reported to 911 emergency services.

1.4.3 Cold Stress

During periods of cold weather, workers 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 B – Cold Stress Guidelines.

1.4.4 Heat Stress

A heat stress prevention program will be implemented when ambient temperatures exceed 70ºF. The procedures to be followed regarding avoiding heat stress are provided in Appendix C – Heat Stress Guidelines.

1.4.5 Noise

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

1.4.6 Hand and Power Tools

In order to complete the various tasks for the project, personnel will use hand and power tools. All tools used within the active substation must be approved for use by LIPA. 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 at all times when using hand, and power tools and Ground Fault Indicator (GFI)-equipped circuits will be used for all power tools.

1.4.7 Slips, Trips, and Falls

Working in and around the site will pose slip, trip and fall hazards due to slippery 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 wear and will employ good work practice and housekeeping procedures to minimize the potential for slips, trips, and falls.

1.4.8 Manual Lifting

Manual lifting of objects and equipment may be required. Failure to follow proper lifting technique can result in back injuries and strains. Site workers should use 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.

1.4.9 Projectile Objects and Overhead Dangers

Overhead dangers, including but not limited to falling debris and equipment, can occur while operating drill rigs or other heavy equipment. Site workers will be instructed to 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 personal protective equipment (PPE) will be worn at all times during these types of activities including steel-toed boots, safety vests and hard hats.

1.4.10 Electrical Hazards

The most serious physical hazard on site is the electrical hazards present in the LIPA electrical substation. The substation proper is enclosed by a perimeter fence and a locked gate. When GEI employees need access to the work area within the substation they will be escorted by a LIPA representative. Electrical transmission lines at the substation carry 13 kilovolts of electricity, while distribution lines carry 13 and 4 kilovolts.

Electrical hazards are typically the most serious physical hazards associated with working on or near an electric substation. All activities at the Arverne (Former Edgemere) Substation Site are conducted inside of the substation perimeter and measures to mitigate exposure to overhead and subsurface electrical transmission and distribution lines should be adhered to at all times due to the overhead and underground utilities. These measures include:

General Requirements

- A LIPA representative or designate must perform oversight during activities within the substation.
- Conduct work under the supervision of a LIPA Health and Safety representative as required.
- When working within the perimeter of the substation, or while conducting intrusive work inside or outside the substation, Electrical Hazard (EH)-rated footwear, a hardhat, rubber gloves, and flame resistant clothing that meet NFPA 70E standards is to be worn. See Section 13 for information regarding PPE.
- Rubber gloves and flame resistant clothing are required if hand digging in a substation in/or around energized conductors.
- Use insulated lineman's gloves (NFPA 70E) when handling equipment that may come into contact with underground utilities.

- Avoid working within the perimeter of the LIPA substation in conditions of high humidity or rain or thunderstorms.
- Stop work immediately and vacate the work area in the event lightning is observed.
- Avoid carrying tools/equipment above waist height if overhead electric hazards exist.

Utility Protection Requirements

- Existing underground transmission/distribution lines and utilities must be marked out by LIPA survey/mark out personnel prior to any intrusive work. Markouts must be checked every 10 days and updated as necessary.
- LIPA will also markout the safe off-set distance, as determined by LIPA, for electrical facilities, substation equipment and utility poles prior to intrusive work.
- If necessary, additional markouts may be performed by a private utility locating service.
- Contact DigNet of New York City and Long Island at (811) at least 72 hours prior to any invasive activities for mark out of underground public utilities.
- Complete utility clearance documentation included in Appendix D.
- Obtain the most recent as-built drawings of the transmission/distribution line layout from National Grid.
- The qualified environmental professional on site must receive and maintain copies of all one call numbers, tickets, utilities plates, private utility location information and test pit logs.
- All monitoring well or soil boring locations will be hand cleared to a minimum depth of 5 feet below ground surface. Additional hand clearing deeper than 5 feet will be determined by LIPA.
- All hand clearing will be performed using fiberglass non-conductive tools or vacuum extraction methods and/or air knife.

Vehicle and Equipment Grounding Requirements

- All equipment involved in intrusive activities will be grounded using a LIPA-approved grounding wire, which must be a minimum of 100 ft. long and have an ampacity equal to or greater than 4 AWG copper wire, and be constructed in accordance with LIPA specifications **(Appendix H)**.
- The grounding wire will be connected to a known grounding point at the substation, or to a temporary ground rod if a known grounding point is located too far from the work area.
- All equipment requiring grounding will be equipped with a LIPA-approved ground connection welded to the vehicle frame in a paint-free area of metal-to-metal contact only.
- All heavy equipment operating in conditions where the overhead or underground electrical voltage exceeds 33kV must be double grounded.

Working Restrictions for Overhead Electrical Utilities

- Minimum setbacks, as directed by LIPA, for all boom and trucks operating in the vicinity of energized overhead lines will be maintained at all times.
- Personnel working within close proximity of energized conductors without any mechanical means will maintain the minimum physical clearance distance of 5 feet.
- National Grid and LIPA must be consulted to ensure overhead electrical lines are de-energized prior to work beneath them within the Minimum Approach Distance (MAD).
- Trucks will not be loaded or emptied/dumped under the overhead electrical lines, unless approved by National Grid/LIPA.
- Truck covers will not be opened under the overhead electrical lines.

*Requirements for utility clearance, vehicle and equipment grounding and working restrictions for overhead electrical utilities can be found in the Site Management Plan (SMP), Appendix C: Excavation Work Plan.

Site personnel will assume that all electrical equipment at surface, subsurface, and overhead locations is energized, until the equipment has been designated as de-energized by a LIPA representative. LIPA representatives will be responsible for de-energizing and lock out/tag out of all electrical equipment. If the equipment cannot be de-energized, work will stop and the Field Representative (FR) and/or SSO will consult with the GEI Project Manager (PM) and CHSO. All GEI employees will use proper PPE when working within the active substation including EH-rated safety boots, a hardhat, rubber gloves, and flame resistant clothing that meet NFPA 70E standards. GEI will notify National Grid prior to working adjacent to this equipment, and will verify that the equipment is energized or de-energized.

All power lines, which have been indicated by National Grid to be de-energized must be locked out by a LIPA representative, such that the lines cannot be energized when personnel are working near them. The lines shall not be unlocked and re-energized until GEI notifies National Grid that they have completed work in the area and that all personnel are clear of the area. National Grid representatives will provide GEI personnel with site-specific lockout/tagout documentation prior to on-site activities.

If power lines cannot be de-energized, the SSO will consult with National Grid and the CHSO to discuss how to proceed. Work tasks will only commence after determination that a safe working distance can be maintained and all personnel working in the area have been informed of the limitation. All work performed within the substation boundaries requires the use of task-specific PPE, as described in Section 13.

The subcontractor should verify that all electric, gas, water, steam, sewer, and other utility service lines are located and marked before any intrusive work is started. GEI must verify that the subcontractor has completed a utility mark out checklist prior to intrusive work in

accordance with the SMP. In each case, any utility company that is involved should be notified in advance by the subcontractor according to markout procedures, and its approval or services, if necessary, shall be obtained.

The potential hazards for this project are listed in the following Activity Hazard Analysis and Site Hazards sections.

Activity Hazard Analysis

Activity: Groundwater Monitoring and Soil Vapor Monitoring, Community Air Monitoring, Soil Sampling, Soil Management Services and Oversight (As-Needed Activity)		
Task	**Potential Hazard**	**Control Measure**
Groundwater, Subsurface Soil and Soil Vapor Sampling, Community Air Monitoring, Soil Management Services, and Oversight	Traffic	Follow traffic safety guidelines in **Appendix F**.
	Contaminant contact	Wear proper PPE during sampling including nitrile gloves and safety glasses. Dispose of gloves after use and wash hands.
	Insect Bites	Use insect repellant. Avoid areas where insects may be prevalent.
	Slips, Trips and Falls	Keep trafficked areas free of slip/trip/fall hazards.
	Electrical Substation Interior	Wear proper PPE when working within the substation. Follow National Grid, LIPA and Occupational Safety and Health Administration (OSHA) guidelines for working distance to equipment.
	Heavy Lifting-Strains and Sprains	Use proper lifting techniques. Ask fellow worker for help.
	Poisonous Plants	Avoid heavily wooded areas. Staff should be able to identify common poisonous plants.
	Wild Animals	Avoid contact with wild animals.
	Noise	Wear hearing protection.
	Heavy Equipment Proximity (Pinch-points, crushing, non-secure equipment)	Maintain awareness of location of equipment. Subcontractor use of a spotter for equipment operation.
	Cuts or abrasions (handling drums)	Wear work gloves over nitrile gloves.

1.5 Evaluation of Potential Chemical Hazards

The characteristics of compounds at the site are discussed below for information purposes. Adherence to the safety and health guidelines in this HASP should reduce the potential for exposure to the compounds discussed below. Table 1-1 presents chemical data regarding potential exposure and monitoring for the chemical types listed below. Chemicals defined as "present" or "not present" at the site were determined based upon post-remediation data that reflects the current state of contaminants monitored at the site.

1.5.1 Volatile Organic Compounds (VOCs)

Benzene, a common VOC found at sites where manufactured gas plant (MGP) related contaminants have been found, is present in soil and groundwater. At high concentrations, this compound generally has 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 benzene.

1.5.2 Coal Tar and Coal Tar Products

Coal tar products, which are semi-volatile organic compounds (SVOCs), typically 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 are present at the Site within impacted soil and groundwater.

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 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. Details for monitoring potential chemical hazards can be found in Section 2.

1.5.3 Heavy Metals

The site contains elevated levels of lead.

Ingestion and inhalation are the most common routes of exposure to lead. Acute effects of lead exposure can be loss of appetite, nausea, vomiting, fatigue, weakness, moodiness, headaches, and joint/muscle aches. Ingestion may cause a metallic taste. Chronic exposure can lead to damage in the nervous, urinary, reproductive, and blood-forming systems.

As with VOCs, the primary route of exposure of metals such as lead, is through inhalation of dust particles when soil is disturbed and becomes airborne.

1.5.4 Asbestos-Containing Materials

The site does not currently contain asbestos containing materials (ACM).

1.5.5 Polychlorinated Biphenyls

Polychlorinated Biphenyls (PCBs) have not been identified on site.

1.5.6 Cyanide

Cyanide compounds are common by-products of manufactured gas production and can be found in historic fill material generated from MGP sites. Cyanide compounds have not been identified on-site. Hydrogen cyanide is toxic because it is a chemical asphyxiant. It replaces the oxygen in the blood and, thereby, suffocates the cells. Ferrocyanides are not considered toxic because the hydrogen cyanide ion is bound 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 ferrocyanide molecule. Therefore, hydrogen cyanide is not a concern at the site. However, it is National Grid policy to monitor for hydrogen cyanide in the work zone during earth-disturbing activities at sites where MGP-related contaminants have been found.

1.5.7 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.

1.5.8 Evaluation of Organic Vapor Exposure

During intrusive activities, the requirement for air monitoring reduces the risk of overexposure by indicating when action levels have been exceeded and when personal PPE must be upgraded or changed. Action levels for VOCs and associated contingency plans for the work zone are discussed within Section 2. Air monitoring will be conducted during intrusive activities such as drilling.

Exposure to organic vapors shall be evaluated and/or controlled by:

- Monitoring air concentrations for organic vapors in the breathing zone with a photo-ionization detector (PID).
- 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 or other 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.

Specific chemical hazards information from the Material Safety Data Sheet (MSDS) and Occupational Health Guidelines are summarized in Table 1-1. MSDS for decontamination chemicals, calibration gases, sample preservation chemicals, or other chemicals that may be used on-site, are kept in a separate MSDS binder on-site.

Table 1-1
Chemical Data

Compound	CAS #	American Conference of Industrial Hygienists (ACGIH) threshold limit value (TLV)	OSHA personal exposure limit (PEL)	Route of Exposure	Symptoms of Exposure	Target Organs	Physical Data
Benzene	71-43-2	0.5 ppm (Skin)	1 parts per million (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, known human carcinogen	Eyes, skin, CNS, bone marrow, blood	Flashpoint (FP): 12° F LEL: 1.2% UEL: 7.8% VP: 75 mm
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
Hydrogen sulfide	7783-06-4	10 ppm TWA, 15 ppm STEL	20 ppm continuous, 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
Lead	7439-92-1	0.050 mg/m^3	0.05 mg/m^3 A.L. 0.03 mg/m^3	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 LEL: NA UEL: NA VP: 0 mm

Abbreviations	
C = ceiling limit, not to be exceeded	LEL = Lower explosive limit
CNS = Central Nervous System	mm = millimeter
CVS = Cardiovascular System	ppm = parts per million
eV = electron volt	Skin = significant route of exposure
FP = Flash point	STEL = Short-term exposure limit (15 minutes)
IP = Ionization Potential	TWA = Time-weighted average (8 hours)
GI = Gastro-intestinal	UEL = Upper explosive limit
mg/m^3= milligrams per cubic meter	VP = vapor pressure approximately 68°F in mm Hg (mercury)

1.6 Biological Hazards

During the course of the project, there is a potential for workers to come into contact with biological hazards such as animals, insects and plants. Workers will be instructed in hazard recognition, health hazards, and control measures during site-specific training.

1.6.1 Animals

During the conduct of site operations, wild animals such as stray dogs or cats, raccoons, rats and mice may be encountered. Workers shall use discretion and avoid all contact with wild 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.

1.6.2 Insects

Insects, including bees, wasps, hornets, spiders, and ticks, may be present at the site making the chance of a bite possible. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life threatening condition. Any individuals who have been bitten or stung by an insect should notify the SSO. The following is a list of preventive measures:

- Apply insect repellent prior to performing any field work and as often as needed throughout the work shift;
- Wear proper protective clothing (work boots, socks and light colored pants);
- When walking in wooded areas, avoid contact with bushes, tall grass, or brush as much as possible; and
- Field personnel who may have insect allergies should have bee sting allergy medication on site and should provide this information to the SSO prior to commencing work.

1.6.2.1 Tick Borne Illnesses

Lyme disease is caused by infection from a deer tick that carries a spirochete. During the painless tick bite, the spirochete may be transmitted into the bloodstream that could lead to the worker contracting Lyme disease.

Lyme disease may cause a variety of medical conditions including arthritis, which can be treated successfully if the symptoms are recognized early and medical attention is received. Treatment with antibodies has been successful in preventing more serious symptoms from developing. Early signs may include a flu-like illness, an expanding skin rash and joint pain. If left untreated, Lyme disease can cause serious nerve or heart problems, as well as a disabling type of arthritis.

Symptoms can include a stiff neck, chills, fever, sore throat, headache, fatigue and joint pain. This flu-like illness is out of season, commonly happening between May and October when ticks are most active. A large expanding skin rash may develop around the area of the bite. More than one rash may occur. The rash may feel hot to the touch and may be painful. Rashes vary in size, shape, and color, but often look like a red ring with a clear center. The outer edges expand in size. It's easy to miss the rash and the connection between the rash and a tick bite. The rash develops from 3 days to as long as a month after the tick bite. Almost one third of those with Lyme disease never get the rash.

Joint or muscle pain may be an early sign of Lyme disease. These aches and pains may be easy to confuse with the pain that comes with other types of arthritis. However, unlike many other types of arthritis, this pain seems to move or travel from joint to joint.

Lyme disease can affect the nervous system. Symptoms include stiff neck, severe headache, and fatigue usually linked to meningitis. Symptoms may also include pain and drooping of the muscles on the face, called Bell's Palsy. Lyme disease may also mimic symptoms of multiple sclerosis or other types of paralysis.

The disease can also cause serious but reversible heart problems, such as irregular heartbeat. Finally, Lyme disease can result in a disabling, chronic type of arthritis that most often affects the knees. Treatment is more difficult and less successful in later stages. Often, the effects of Lyme disease may be confused with other medical problems.

It is recommended that personnel check themselves when in areas that could harbor deer ticks, wear light color clothing and visually check themselves and their buddy when coming from wooded or vegetated areas. If a tick is found biting an individual, the PM should be contacted immediately. The tick can be removed by pulling gently at the head with tweezers. The affected area should then be disinfected with an antiseptic wipe. The employee will be offered

the option for medical treatment by a physician, which typically involves prophylactic antibiotics. If personnel feel sick or have signs similar to those above, they should notify the PM immediately.

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.

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).

In New York State, most cases of ehrlichiosis have been reported on Long Island and in the Hudson Valley. 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.

Rocky Mountain spotted fever (RMSF) is a tick-borne disease caused by a rickettsia (a microbe that differs somewhat from bacteria and virus). Fewer than 50 cases are reported annually in New York State. 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. Most of the cases in New York State have occurred on Long Island. RMSF is characterized by a sudden onset of moderate to high fever (which can last for 2 or 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.

*(Information on Ehrlichiosis, Babesiosis, and Rocky Mountain Spotted Fever was derived from the New York State Department of Health).

1.6.3 Plants

The potential for contact with poisonous plants exists when performing field work in undeveloped, wooded or overgrown areas. The majority of the site is covered with blue stone;

however, to the south between the site and the rail road tracks is overgrown. Poison ivy, sumac, and oak may be present on site. 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 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 oak can be present as a sparingly branched shrub. Poison oak is similar to poison ivy in that it has the same leaflet configuration, however, the leaves have slightly deeper notches. Prophylactic application of Tecnu may prevent the occurrence of exposure symptoms. Post exposure over the counter products are available and should be identified at the local pharmacist. Susceptible individuals should be identified to the PM.

Contact with poison ivy, sumac, or oak may lead to a skin rash, characterized by reddened, itchy, blistering skin which needs first aid treatment. If a field worker believes they 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.

1.7 Personal Safety

Field activities have the potential to take site workers 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:

- http://www.nyc.gov/html/nypd/html/crime_prevention/crime_statistics.shtml

2011 crime statistics from this website report that the 100th precinct, which encompasses Arverne, New York, recorded all crimes below the New York City total (see below).

Type of Crime	Arverne & Vicinity	New York City Total*
Murder	1	515
Rape	5	1421
Robbery	86	19,714
Felony Assault	130	18,477
Burglary	138	18,716
Grand Larceny	145	38,501

*New York City Total includes values from Arverne & Vicinity
To protect yourself, take the following precautions:

- Use the buddy system (teams of a minimum of two persons present);

- Let the 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.

Site workers must not knowingly enter into a situation where there is the potential for physical and violent behaviors to occur. If site workers 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 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 and site worker safety will be confirmed by the on-site personnel at the start of each working day.

2. Air Monitoring

Air monitoring shall 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, dense non-aqueous phase liquid (DNAPL) recovery wells, oxygen injection wells, and soil vapor points.

GEI may conduct perimeter air monitoring, and work zone monitoring for on-site workers during intrusive activities only. Activities requiring air monitoring will be conducted in accordance with the site management plan or other 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 FR will immediately implement site action(s) according to Table 2-1 below and notify the PM.

GEI will provide the following equipment for health and safety monitoring of on-site personnel:

- PID with 10.6 eV lamp or equivalent
- Dust Meter
- Combustible Gas Indicator (CGI): LEL/Oxygen (O2)/hydrogen sulfide (H2S)/hydrogen cyanide (HCN) meter
- Sound Level Meter if deemed necessary by the PM and CHSO, type to be appropriate to the activities performed.

All air monitoring equipment will be calibrated and maintained in accordance with manufacturer's requirements. All calibrations will be recorded in the project notes daily or on a daily calibration form.

Organic vapor concentrations will be measured using the PID during intrusive activities. During intrusive operations, organic vapor concentrations shall 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 FR will interpret monitoring results using professional judgment and according to the alert and action limits set forth in the site management plan or other approved 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 CGI meter shall be used to monitor for combustible gases and oxygen content during intrusive activities. The CGI will also be equipped with an H_2S sensor 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.

Guidelines have been established by the National Institute for Occupational Safety and Health (NIOSH) concerning the action levels for work in a potentially explosive environment. These guidelines are as follows: 10-percent of the lower explosive limit (% LEL) - Limit all activities to those which do not generate sparks and 20% LEL - cease all activities in order to allow time for the combustible gases to vent.

Perimeter and work zone air monitoring will be conducted during intrusive activities such as monitoring well installation and abandonment, recovery well installation and abandonment, soil borings and groundwater probes. Table 2-1 provides a summary of real time air monitoring action levels and contingency plans for work zone activities.

TABLE 2-1
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.
PID	Work Zone	0 – 50 ppm	If benzene is not detected, no respiratory protection is required.
		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 SSO & CHSO.
Oxygen meter	Work Zone	< 20.7%	Stop work; withdraw from work area; ventilate area, notify SSO & CHSO.
		> 21.1%	Stop work; withdraw from work area; notify SSO & CHSO.
H_2S meter	Work Zone	<5 ppm	No respiratory protection is required.
		>5 ppm	Stop work, cover excavation, withdraw from work area, institute engineering controls, notify SSO & CHSO
HCN meter	Work Zone	<1.0 ppm	Continue monitoring with real time meter (multi-gas detector with HCN and H_2S sensors), and continue work if reading is less than 2ppm.
		HCN Conc.= <2.0 ppm	Run CMS Drager tube and confirm concentration is less than 2.0 ppm, notify SSO and CHSO. Run CMS tube for sulfur dioxide, hydrogen sulfide (if sensor is not on multi-gas detector), and phosphine chip for potential interferences. Continue to monitor with real time meter.
		>2.0 ppm	Stop work, and move (with continuous HCN monitoring meter) at least 25 ppm upwind of the excavation until continuous meter reads less than 1 ppm. Notify SSO & 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.
CGI	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 SSO & 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.

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.
- Minimize GEI employees' work exposure to potential physical, chemical, and biological hazards.

4. Key Project Personnel/Responsibilities and Lines of Authority

GEI Personnel		
Errol Kitt	Long Island MGP Program Manager	Office: 631-759-2964 Cell: 631-513-7191
Matt O'Neil	Project Manager (PM)	Office: 401-533-5152 Cell: 860-608-9725
Michael Zukauskas	Engineer of Record	Office: 973-873-7113 Cell: 908-458-3230
Various Staff – Activity Dependent	Field Representative Site Safety Officer	
Steve Hawkins	Regional Health and Safety Officer (RHSO)	Office: 860-368-5348 Cell: 860-916-4167
Robin DeHate	Corporate Health and Safety Officer (CHSO)	Office: 813-774-6564 Cell: 813-323-6220

Lines of Authority will be as follows:

On site – GEI will have responsibility for safety of its employees during the work performed at the site. GEI's FR will have a cell phone available to contact the appropriate local authorities, in the event of an emergency. The FR will be available for communication with the SSO and PM and with the National Grid representative. The FR and/or SSO may change due to the nature of work being conducted on site.

4.1 Project Manager

Responsibilities of the PM or his designee includes the following:

- Verifies implementation of the HASP
- Conducts periodic inspections and documents these in the field book or appropriate location
- Participates in incident investigations
- Verifies the HASP has all of the required approvals before any site work is conducted
- Verifies that the National Grid site manager is informed of project changes, which require modifications of the HASP
- Has overall responsibility for project health and safety
- Acts as the primary point of contact with National Grid for site-related activities and coordination with non-project related site operations
- Overseeing of performance of project tasks as outlined in the scope of work
- Plans field work using appropriate safe procedures and equipment

- Verifies and documents current training and medical monitoring clearance for GEI project staff
- Verifies that the subcontractor has a site-specific HASP which complies with National Grid's site specific requirements.

4.2 Corporate Health and Safety Officer

The CHSO is a qualified health and safety professional with experience in hazardous waste site remediation activities. Responsibilities of the CHSO or her designee include the following:

- Provides support for the development and approval of the HASP
- Serves as the primary contact to review health and safety matters that may arise
- Approves revised or new safety protocols for field operations
- Coordinates revisions of this HASP with field personnel
- Coordinates upgrading or downgrading of PPE with the site manager
- Leads the investigation of all accidents/incidents
- Provides the necessary training of GEI field crews in accordance with OSHA regulations and provides proof of training to the SSO prior to GEI personnel entering the site.

4.3 Site Safety Officer

Responsibilities of the SSO include the following:

- Verify that the HASP is implemented and that all health and safety activities identified in the HASP are conducted and/or implemented
- Verify that field work is scheduled with adequate personnel and equipment resources to complete the job safely and enforces site health and safety rules
- Verify that adequate communications between field crews and emergency response personnel is maintained during emergency situations
- Verify that field site personnel are adequately trained and qualified to work at the site and that proper PPE is utilized by field teams
- Investigate and report all accidents/incidents to the CHSO and PM
- Stop work if necessary
- Identifies operational changes which require modifications to the HASP and ensures that the procedure modifications are implemented and documented through changes to the HASP, with CHSO and National Grid approval
- Determines upgrades or downgrades of PPE based on site conditions and/or real-time monitoring results with CHSO and National Grid approval
- Reports any health and safety related issues to the CHSO and provides summaries of field operations and progress related to health and safety events, as necessary.

4.4 Field Representative

The FR is responsible for carrying out the OM&M field work on a monthly, quarterly, or as-needed basis. Responsibilities of the FR include:

- Conducts routine safety inspection of the work area
- Documenting occurrences of unsafe activity and what actions were taken to rectify the situation
- Reports any unsafe or potentially hazardous conditions to the SSO and PM
- Maintains familiarity of the information, instructions, and emergency response actions contained in the HASP
- Complies with rules, regulations and procedures set forth in the HASP
- Prevents admittance to work site by unauthorized personnel
- Inspects all tools and equipment, including PPE, prior to use and documents inspection on the daily safety meeting form
- Ensures that monitoring instruments are calibrated
- Stops work if necessary.

5. Subcontractors

GEI subcontracts with various companies to conduct various work on site on an as-needed basis. Contact information for these subcontractors will be available when such work is being conducted.

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 and must adhere to applicable requirements set forth in this HASP. GEI will verify that its subcontractor's HASP includes National Grid's site-specific requirements as outlined in this HASP.

6. Emergency Contact List

<table>
<tr><th colspan="3">EMERGENCY INFORMATION</th></tr>
<tr><td colspan="2">Important Phone Numbers</td><td>Directions to:
St. Joseph's Episcopal Hospital
327 Beach 19th Street
Far Rockaway, New York 11691</td></tr>
<tr><td>Police</td><td>911</td><td rowspan="4">Head southwest on Rockaway Beach Blvd. 243 feet. Turn left onto Beach 54th Street, go 95 feet and then turn left onto Rockaway Freeway. Continue for 1 mile and turn right onto Seagirt Blvd. Go 0.7 miles and turn left onto Beach 19th Street. Go 0.2 miles to hospital (on left).
Refer to Appendix A for Hospital Route Map.</td></tr>
<tr><td>Fire Department</td><td>911</td></tr>
<tr><td>Ambulance</td><td>911</td></tr>
<tr><td>Local Hospital
Peninsula Hospital Center</td><td>781-734-2000</td></tr>
<tr><td>Project Manager
Matt O'Neil</td><td>(860) 608-9725 cell
(401)533-5152</td><td>DigNet of New York City and Long Island 811</td></tr>
<tr><td>Occupational Health Provider
Land, Sea & Air</td><td>631-225-3060</td><td>Chemtrec 1-800-424-9300</td></tr>
<tr><td>NYSDEC Spill Hotline</td><td>(518) 457-7362</td><td>Poison Control Center 1-800-222-1222</td></tr>
<tr><td>Corporate H&S Officer – Robin DeHate
Regional H&S Officer – Steve Hawkins</td><td>(813) 323-6220 cell
(813) 774-6564 office
(860) 916-4167 cell
(860) 368-5348 office</td><td>Client Contact
Ted Leissing (516) 545-2563 office
(917) 734-3244 cell
Sarah Aldridge (516) 545-2568 office
(860) 334-0554 cell</td></tr>
<tr><td colspan="3">Nearest Telephone Location: Onsite cellular</td></tr>
</table>

7. Training Program

7.1 HAZWOPER Training

In accordance with 29 CFR 1910.120, hazardous waste site workers shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste operations and emergency response (HAZWOPER). At a minimum, the training shall have consisted of instruction in the topics outlined in the standard and can include applicable sections of 29 CFR 1926. Personnel who have not met the requirements

for initial training shall not be allowed to work in any site activities in which they may be exposed to hazards (chemical or physical). Proof of training shall be submitted to the CHSO or representative prior to the start of field activities.

7.2 Annual 8-Hour Refresher Training

Annual 8-hour refresher training will be required of all 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 shall be submitted to the CHSO or her representative prior to the start of field activities.

7.3 Site Supervisory 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 CHSO or representative will ensure all 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 associated with site tasks and activities conducted within the active sub-station, and emergency services at the site and will highlight all provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity. Personnel that have not received site-specific training will not be allowed on-site. All GEI personnel working on site will have current First Aid and CPR training.

7.5 On-site Safety Briefings

Other on-site GEI personnel will be given health and safety briefings by the FR to assist GEI personnel in safely conducting work activities. The briefings will 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. The meetings will also be an opportunity to periodically update the

workers on monitoring results. These safety briefings will be documented in the GEI field book or on the daily safety briefing form.

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. Robin DeHate is GEI's CHSO and is responsible for the administration and coordination of medical evaluations conducted for GEI's employees at all branch office locations. Comprehensive examinations are given to all GEI field personnel participating in hazardous waste operations on an annual or biennial basis (as determined to be appropriate by the CHSO). The medical results of the examinations aid in determining the overall fitness of employees participating in field activities.

Under the CHSO's supervision, all 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 all levels of respiratory protection, in particular.

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.

All GEI subcontractor personnel that will enter any active waste handling or other potentially impacted 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 shall be submitted to the CHSO or their representative prior to the start of field activities.

9. Site Control Measures

During intrusive activities, site zones are intended to control the potential spread of contamination and to assure that only authorized individuals are permitted into potentially hazardous areas. Barricade tape and cones will be used to designate work zone areas. Decontamination will be conducted as outlined in Section 12. If any heavily contaminated soils are encountered during intrusive work, separate wash areas for heavy equipment and personal PPE will be established.

10. Incident Reporting

GEI will report incidents involving GEI personnel or subcontractor personnel, such as lost time injuries, injuries requiring medical attention, near miss incidents, fires, fatalities, accidents involving the public, and property damage. The report shall be made to the GEI PM verbally within 2 hours of the incident. The PM will immediately inform the CHSO and the Director of Human Resources and a Project-Specific National Grid Representative for the incident. An Incident Report Form (see Appendix E) will be completed and submitted to the CHSO and the Director of Human Resources and the Project-Specific National Grid Representative within 24 hours.

11. Medical Support

In case of minor injuries, on-site care shall be administered with the site first aid kit. Staff may also go to the nearest occupational health clinic (Land, Sea and Air Medical Review Specialists) located at 910 Route 109 in North Lindenhurst, New York. Directions to Land, Sea and Air can be found in Appendix A.

For serious injuries, call 911 and request emergency medical assistance. Seriously injured persons should not be moved, unless they are in immediate danger.

Section 5 and Appendix A contains detailed emergency information, including directions to the nearest hospital, and a list of emergency services and their telephone numbers. GEI field personnel will carry a cellular telephone.

12. Decontamination Procedures

12.1 Personnel Decontamination Station

As needed, a personnel decontamination station where workers can drop equipment and remove PPE will be set up at the decontamination pad by the Contractor when intrusive activities are conducted at the site. 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 portable sink where they will wash themselves wherever they have potentially been exposed to any contaminants (e.g., hands, face, etc.).

Contaminated PPE (gloves, suits, etc.) will be decontaminated and stored for reuse or placed in plastic bags (or other appropriate container) and disposed of in an approved facility. Decontamination wastewater and used cleaning fluids will be collected and disposed of in accordance with all applicable state and federal regulations.

12.2 Decontamination Equipment Requirements

If heavily contaminated soils are encountered during intrusive work, the following equipment, as needed, will be in sufficient supply to implement decontamination procedures for GEI's equipment.

- Buckets
- Alconox™ detergent concentrate
- Hand pump sprayers
- Long handle soft bristle brushes
- Large sponges
- Cleaning wipes for respirators
- Bench or stool(s)
- Methanol
- Liquid detergent and paper towels
- Plastic trash bags

13. Personal Protective Equipment

PPE required for each level of protection is as follows.

Safety Equipment	Level A	Level B	Level C	Level D
Work clothing compliant with NFPA 70E as appropriate for work being performed and materials handled				•
Hard hats with splash shields or safety glasses			•	•
EH-rated steel-toe or carbon fiber boots with overboots as appropriate for work being performed and materials handled			•	•
Chemical-resistant gloves			•	•
Reflective, non-mesh vest			•	•
Full-face respirators with HEPA cartridges as approved by the CHSO			•	
Tyvek® splash-resistant suit			•	
Chemical-resistant clothing		•		
Long Pants	•	•	•	•
Pressure-demand, full-face SCBA or pressure-demand supplied air respirator with escape SCBA	•	•		
Inner and outer chemical-resistant gloves	•	•		
Chemical-resistant safety boots or shoes	•	•		
Two-way radio	•	•		
Hard hat	•	•	•	•
Fully encapsulating chemical-resistant suit	•			

PPE requirements for field activities are as follows.

Activity	Level of Protection	Backup Protection
Groundwater and soil vapor monitoring, and soil sampling	D	C
Intrusive activities (i.e., drilling, trenching)	D	C

PPE can include hardhats, safety glasses or face shields, steel toe/steel shank boots, hearing protection, nitrile gloves, and leather gloves as necessary. When working within the substation, or when conducting intrusive work on site, PPE will include EH-rated boots, hardhats, safety glasses, face shields, hearing protection, nitrile gloves, rubber gloves and/or insulated lineman gloves, and fire-resistant clothing.

OSHA Requirements for PPE

All PPE used during the course of this field investigation must meet the following OSHA standards:

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
Clothing	29 CFR 1910.269 (l)(6)(iii)	ASTM 1506-1994

CRF = Code of Federal Regulations
ANSI = American National Standards Institute
ASTM = American Society For Testing and Materials

Any on-site 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 any 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
- IDLH concentrations
- If contaminant levels exceed designated use concentrations

For most work conducted at the site, Level D PPE will include NFPA 70E rated clothing, hard hats, safety glasses with side shields, and steel toe or carbon fiber EH rated safety boots. When work is conducted in areas where contaminant saturated soil is anticipated, workers shall wear, at a minimum, modified Level D PPE, which can include Tyvec® coveralls and safety boots with overboots. The use of respirators is not anticipated.

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 work zone and this HASP will be revised with oversight of the CHSO. GEI personnel will not reenter the exclusion zone until conditions allow.

All GEI personnel accessing an energized electrical substation owned by LIPA will adhere to the following personal protective equipment requirements:

Personnel working within the LIPA substation property, or conducting intrusive work on-site, will wear fire-resistant clothing as outlined in OSHA standards: "Apparel which meets the flame resistant clothing requirements of ASTM F1506-1994, is acceptable under all 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.

14. Supplemental Contingency Plan Procedures

14.1 Hazard Communication Plan

GEI personnel have received hazard communication training as part of their 40-hour HAZWOPER training. All hazardous materials used on the site will be properly labeled, stored, and handled. MSDS will be available to on-site staff.

14.2 Fire

In the event of a fire, all personnel will evacuate the area. GEI's field representative will contact the local fire department and report the fire. Notification of evacuation will be made to the GEI PM and the CHSO. The field representative will account for GEI personnel and subcontractor personnel and report their status to the PM.

14.3 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 mph, heavy rains or snow squalls, thunderstorms, hurricanes, and lightning storms. If severe weather is approaching, the decision to evacuate GEI personnel and subcontractor personnel from the site is the responsibility of GEI's field representative. In accordance with LIPA procedures, all personnel must exit the substation in the event of a lightning storm. Notification of evacuation will be made to the GEI project manager, the CHSO, and the National Grid PM. The field representative will account for GEI personnel and subcontractor personnel and report their status to the PM.

14.4 Spills or Material Release

If a hazardous waste spill or material release, the SSO or their representative will immediately assess the magnitude and potential seriousness of the spill or release based on the following:

- MSDS, if applicable, 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
- 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 ensure implementation of the necessary remedial action. If the release is beyond the capabilities of the site personnel, all personnel will be evacuated from the immediate area and the local fire department will be contacted. The SSO will notify the PM and the CHSO and the National Grid PM.

14.5 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.

Health and Safety Plan Sign-Off

All GEI personnel conducting site activities must read this Health and Safety Plan, be familiar with its requirements, and agree to its implementation.

All other personnel on site for regulatory, observational and other activities not directly associated with remedial activities must read this Health and Safety Plan for hazard communication purposes.

Once the Health and Safety Plan has been read, complete this sign-off sheet, and return it to the Project Manager.

Site Name:
Arverne Substation (Former Edgemere Substation) Site

Activity:
- Groundwater Monitoring
- Soil Vapor Monitoring
- Excavation and Trenching
- Soil Management and Sampling
- Oversight

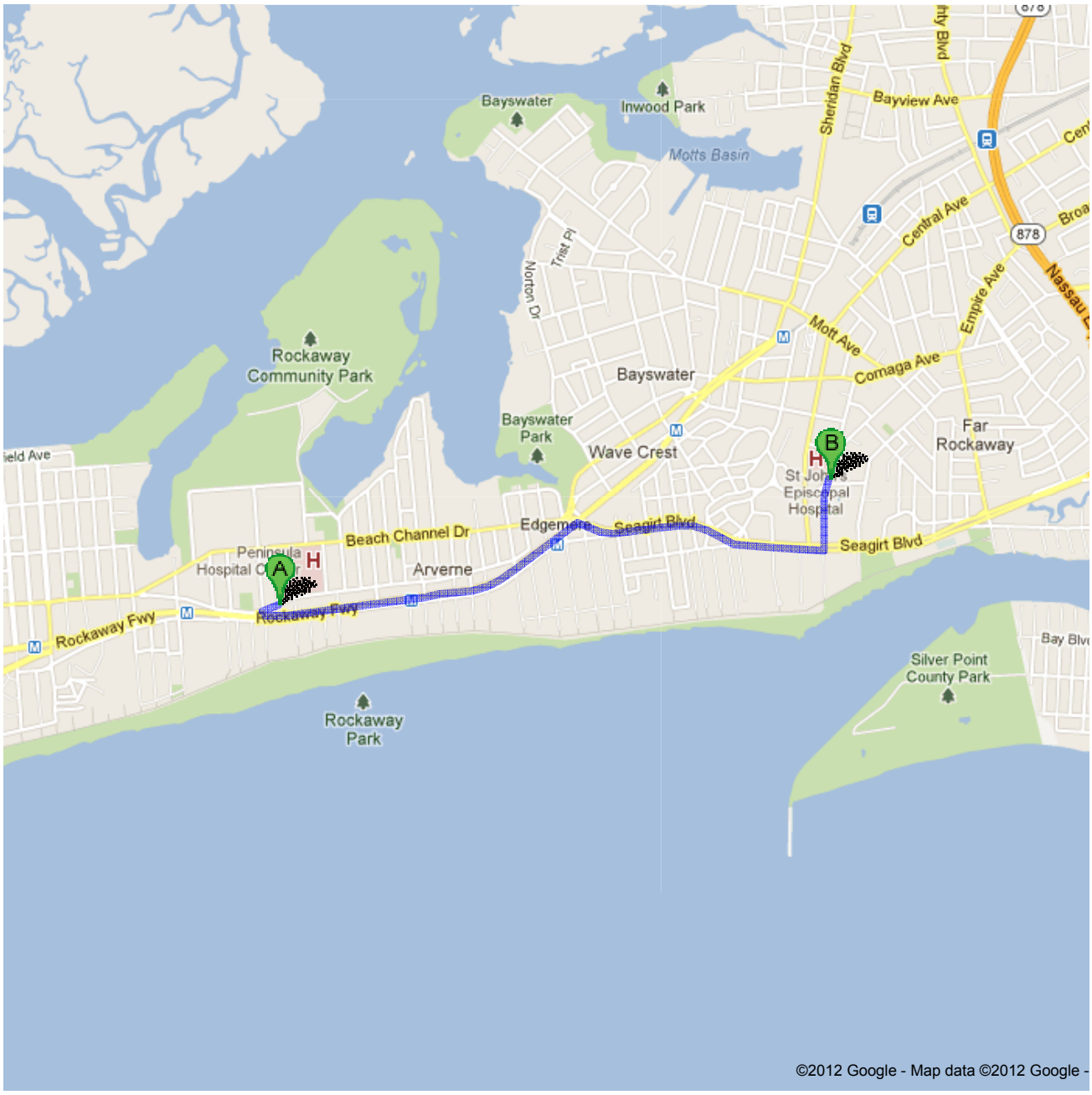
GEI Project No: 093140

Name	Signature	Date	Company	Check if HAZCOM only

APPENDIX A

SITE-SPECIFIC INFORMATION

Directions to 327 Beach 19th St, Queens, NY 11691
2.0 mi – about **6 mins**



Rockaway Beach Blvd

	1. Head **southwest** on **Rockaway Beach Blvd** toward **Beach 54th St**	go 243 ft total 243 ft
	2. Take the 1st left onto **Beach 54th St**	go 95 ft total 338 ft
	3. Take the 1st left onto **Rockaway Fwy** About 2 mins	go 1.0 mi total 1.0 mi
	4. Turn right onto **Seagirt Blvd** About 2 mins	go 0.7 mi total 1.8 mi
	5. Turn left onto **Beach 19th St** Destination will be on the left About 1 min	go 0.2 mi total 2.0 mi

327 Beach 19th St, Queens, 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.

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

APPENDIX B

COLD STRESS GUIDELINES

Cold Stress Guidelines

	Symptoms	What to do
Mild Hypothermia	▪ Body Temp 98-90°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 of blankets ▪ Cover the head ▪ Drink warm (not hot) sugary drink
Moderate Hypothermia	▪ Body temp 90-86°F ▪ Shivering stops ▪ Unable to walk or stand ▪ Confused 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 86-78°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 sugary drink

APPENDIX C

HEAT 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, 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 Dry Skin. Sweating has stopped. Mental confusion, dizziness, nausea, severe headache, collapse, delirium, 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.

Footnotes:

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 five days.

APPENDIX D

UTILITY CLEARANCE FORMS AND PROCEDURES

Utility Clearance Documentation

Client: _____

Project: _____

Site: _____

Drilling Location ID: _____

Driller: _____

GEI PM: _____

GEI Field Team Leader: _____

Utility Drawings Reviewed: _____

Provided By: _____

Reviewed By: _____

One Call Utility Clearance Call Date: _____

Utility Clearance Received back from (list utilities): _____

Completed By (Company): _____ Date: _____

GEI Staff Responsible for Oversight: _____

Metal Detector Survey (yes/no): _____

Drilling Location Cleared by: _____

Contractor: _____ Date: _____

GEI Staff Responsible for Oversight: _____

Physical Test Pit Clearance Required (yes/no): _____

Contractor: _____ Date: _____

GEI Staff Responsible for Oversight: _____

Hand Clearing Performed: _____ Date: _____

Contractor: _____

GEI Staff Responsible for Oversight: _____

Notes: _____

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 exist, they are approved by the client signature below.

Client Signature (Optional): _____ Date: _____

GEI, Inc. Representative: _____ Date: _____

APPENDIX E

INCIDENT REPORTING

INCIDENT REPORT FORM

Report No. _____

Site: _____ Project No. _____

Location: _____

Date of Report: _____ Preparer's Name: _____

Name and Address of Injured: _____

Date of Birth: _____ Date of Hire: _____ Title/Classification: _____

Division/Department: _____ Date of Accident _____ Time: _____

Accident Category: ___ Motor Vehicle ___ Property Damage ___ Fire

___ Chemical Exposure ___ Near Miss ___ Other

For vehicles involved in a motor vehicle incident, please fill out the following information:

MAKE: MODEL: VIN:_____PLATE NO.:_____ ___STATE:_____

MAKE: MODEL: VIN:_____PLATE NO.:_____ ___STATE:_____

MAKE: MODEL: VIN:_____PLATE NO.:_____ ___STATE:_____

MAKE: MODEL: VIN:_____PLATE NO.:_____ ___STATE:_____

Please attach photographs of the area the vehicle incident occurred in and of any damage to vehicles involved.

Severity of Injury or Illness: ____ Non-disabling ___ Disabling

____ Medical Treatment ___ Fatality

Amount of Damage: $_____ Property Damaged: _____

Estimated Number of Days Away from Job: _____

Nature of Injury or Illness: _____

CLASSIFICATION OF INJURY:

____ Fractures	____ Heat Burns	____ Cold Exposure
____ Dislocations	____ Chemical Burns	____ Frostbite
____ Sprains	____ Radiation Burns	____ Heat Stroke
____ Abrasions	____ Bruises	____ Heat Exhaustion
____ Lacerations	____ Blisters	____ Concussion
____ Punctures	____ Toxic Respiratory Exposure	____ Faint/Dizziness
____ Bites	____ Toxic Ingestions	____ Toxic Respiratory
____ Toxic Ingestions	____ Dermal Allergy	

Part of Body Affected: _____

Degree of Disability: _____

Date Medical Care Was Received: _____

Where Medical Care Was Received: _____

Address (if off-site): _____

ACCIDENT LOCATION:

Please provide a sketch of the accident location, vehicles involved, and any details as to how the accident occurred in the space below.

Causative agent most directly related to accident (object substance, material, machinery, equipment conditions):

_____

_____

Was weather a factor? _____

Unsafe mechanical/physical/environmental condition at time of accident (be specific):

_____

Unsafe act by injured and/or others contributing to the accident (be specific, must be answered):

Personal factors (improper attitude, lack of knowledge or skill, slow reaction, fatigue):

Level of personal protection equipment required in Site Safety Plan: _____

Modifications: _____

Was injured using required equipment? _____

If not, how did actual equipment use differ from plan? _____

What can be done to prevent a recurrence of this type of accident (modification of machine; mechanical guards; correct environment training):

Detailed narrative description (how did accident occur, why; objects, equipment, tools used, circumstance assigned duties) (be specific):

(Use separate sheet as required)

Witnesses to accident _____

Signature of Preparer _____

Signature of Site Leader _____

APPENDIX F

TRAFFIC CONTROL

Utility Work Zone Traffic Control Field Guide Book

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The power of action.℠

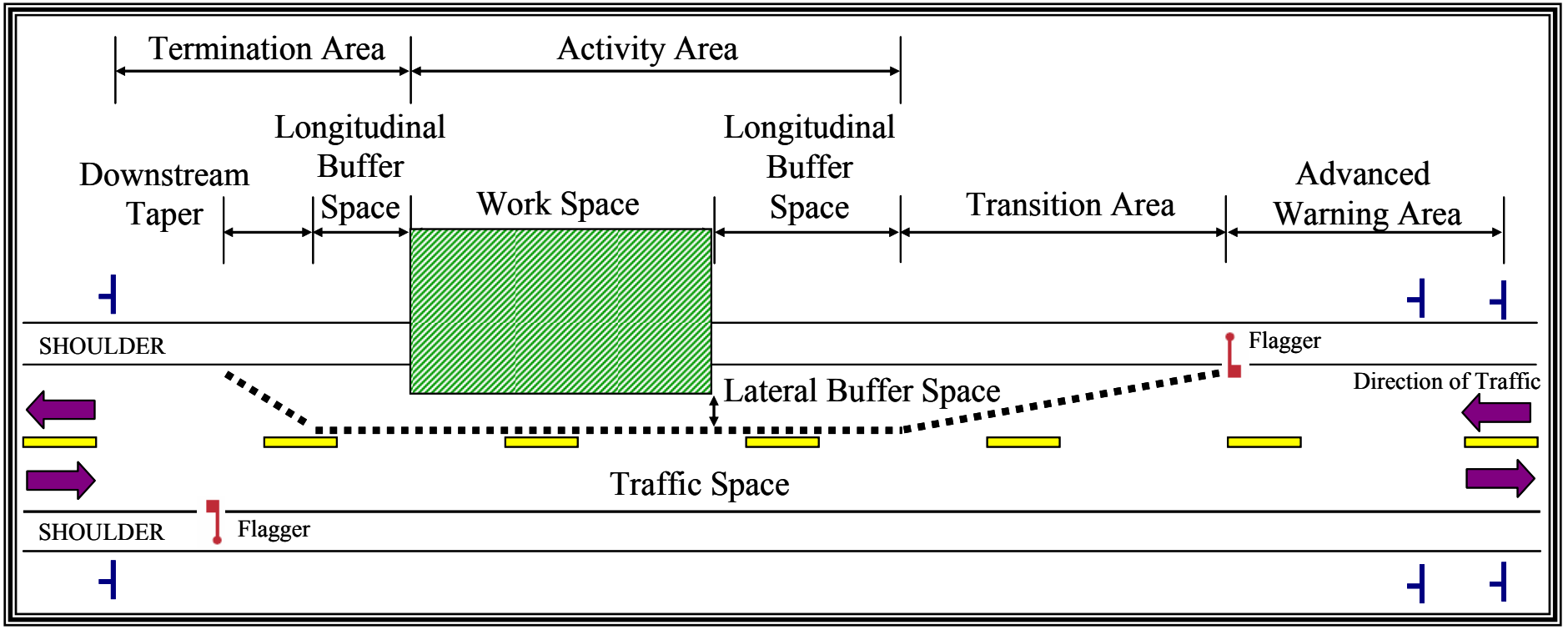
June 2009

- The Work Zone Traffic Control Plans in this guidebook meet the minimum requirements of the federal Manual of Uniform Traffic Control and Devices (MUTCD).

- State and local requirements must be considered when developing specific Work Zone Traffic Control Plans.

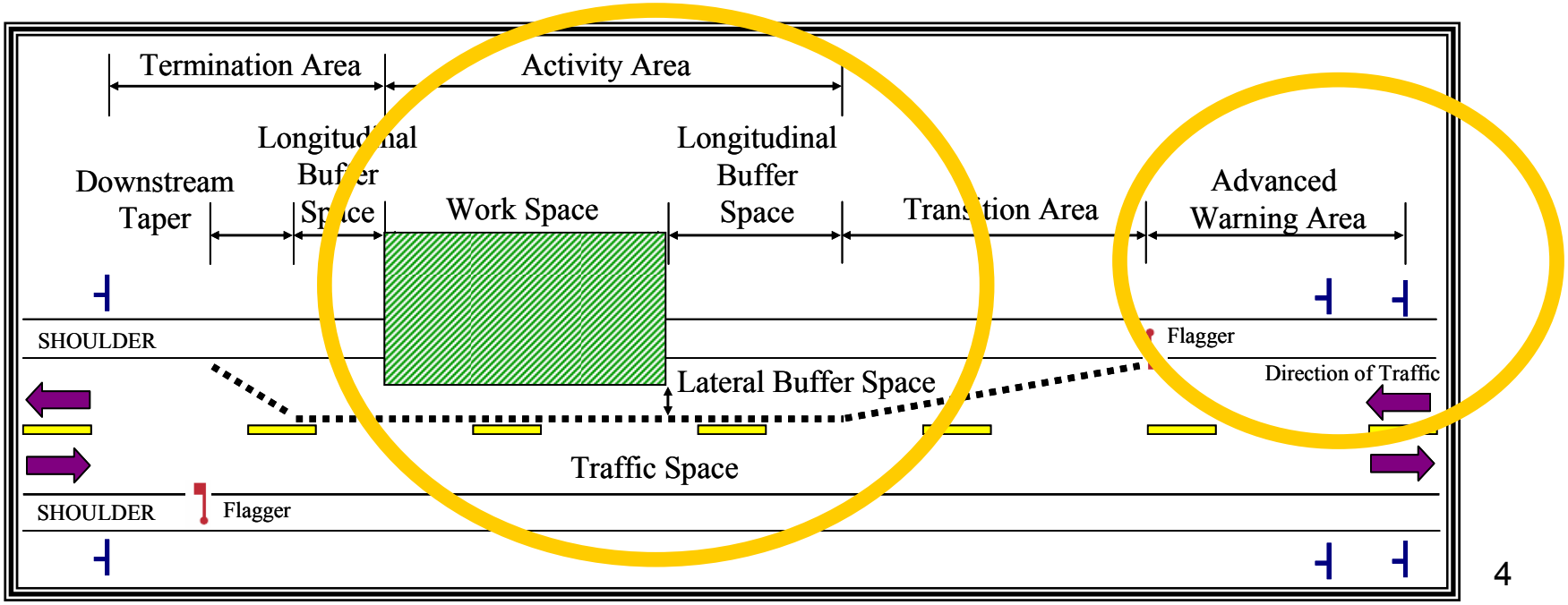
- The Work Zone Traffic Control Plans were developed for the United States Department of Transportation, Federal Highway Administration through a grant to Wayne State University and Bradley University. (August 2008)

Utility Work Zone Temporary Traffic Control Components



Temporary Traffic Control Components

- Activity Area **– work space, traffic space, and buffer space.**
- Advanced Warning Area **– used to provide warning to motorists of an upcoming utility activity.**

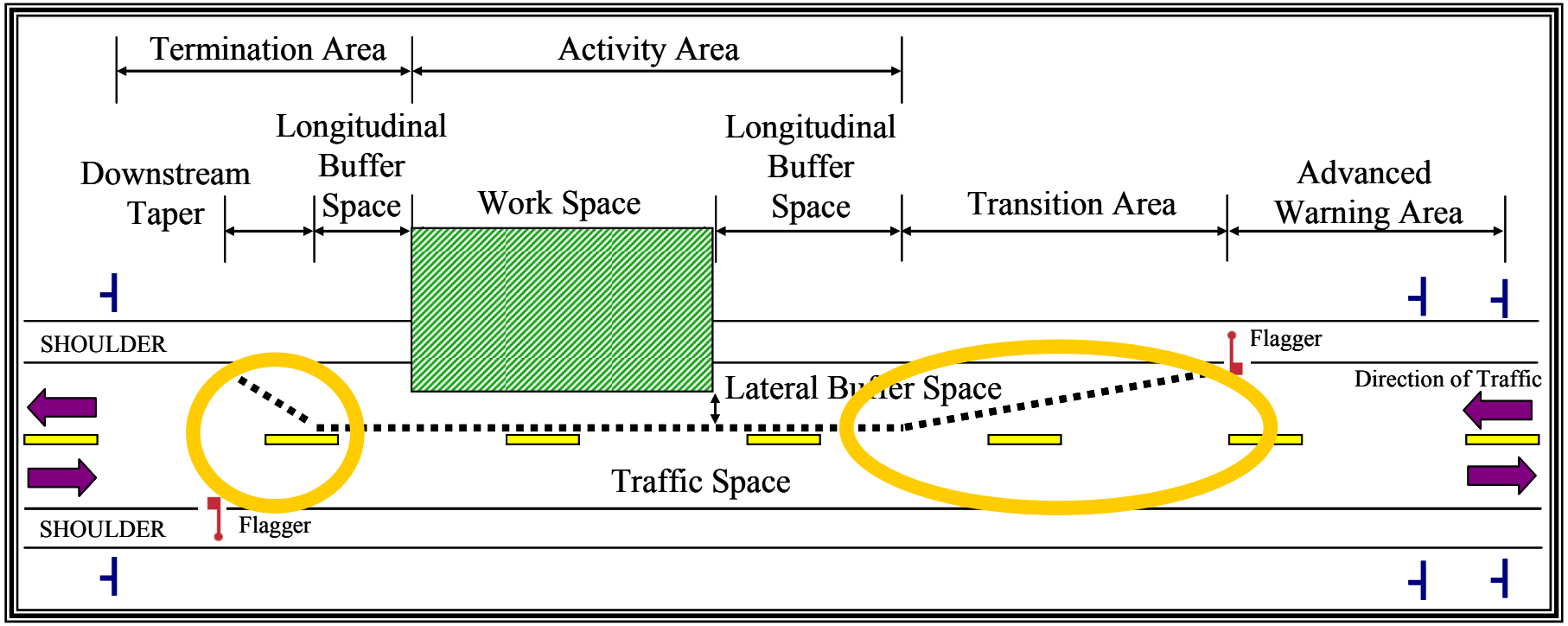


Distance Between Traffic Signs

Road Type	A (Distance Between Signs)
Urban (Low speed)< 45mph	30 m (100 ft)
Urban (High speed) ≥ 45 mph	100 m (350 ft)
Rural	150 m (500 ft)

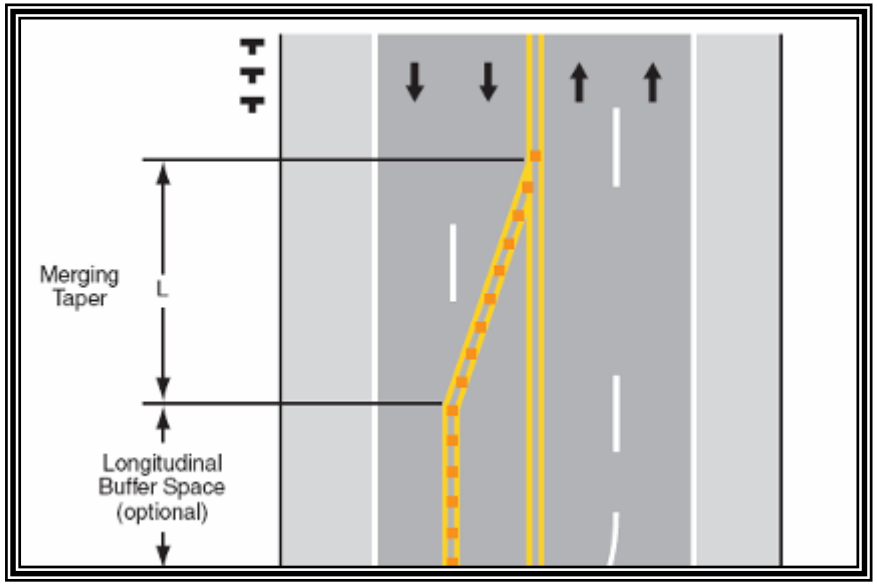
Temporary Traffic Control Components

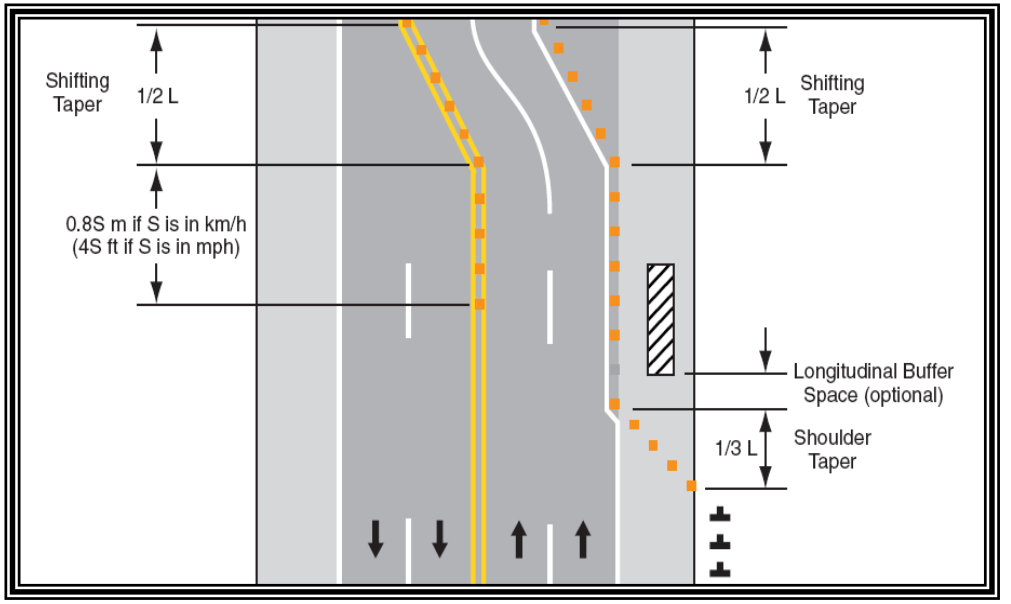
- Tapers – **gradual transition to direct traffic from normal paths to designated path, must be free of workers, vehicles, equipment, etc.**



Different Types of Tapers

Type of Taper	Taper Length (L)*
Merging Taper	at least L
Shifting Taper	at least 0.5L
Shoulder Taper	at least 0.33L
One-Lane, Two-Way Traffic Taper	30 m (100 ft) maximum
Downstream Taper	30 m (100 ft) per lane





Source: MUTCD Figure 6C-2 and Table 6C-3

Formulas for Calculating Taper Lengths

Speed Limit (S)	Taper Length (L) Meters
60 km/h or less	$L = \frac{WS^2}{155}$
70 km/h or more	$L = \frac{WS}{1.6}$

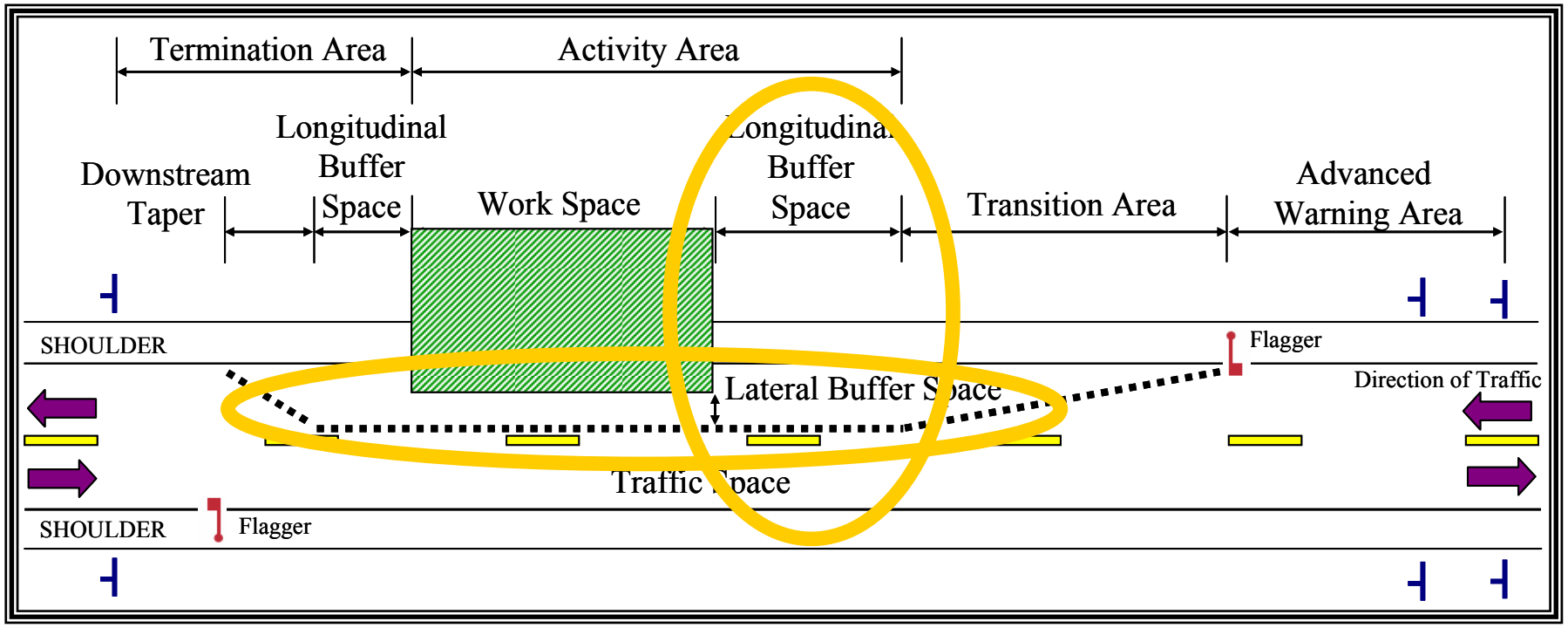
Speed Limit (S)	Taper Length (L) Feet
40 mph or less	$L = \frac{WS^2}{60}$
45 mph or more	L = WS

Where: L = taper length in meters (feet)
W = width of offset in meters (feet)
S = posted speed limit, or off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in km/h (mph)

Source: MUTCD Table 6C-4

Temporary Traffic Control Components

- Buffer Space (Optional) **– lateral and/or longitudinal area that separates traffic from work space, must be free of workers, vehicles, equipment, etc.**

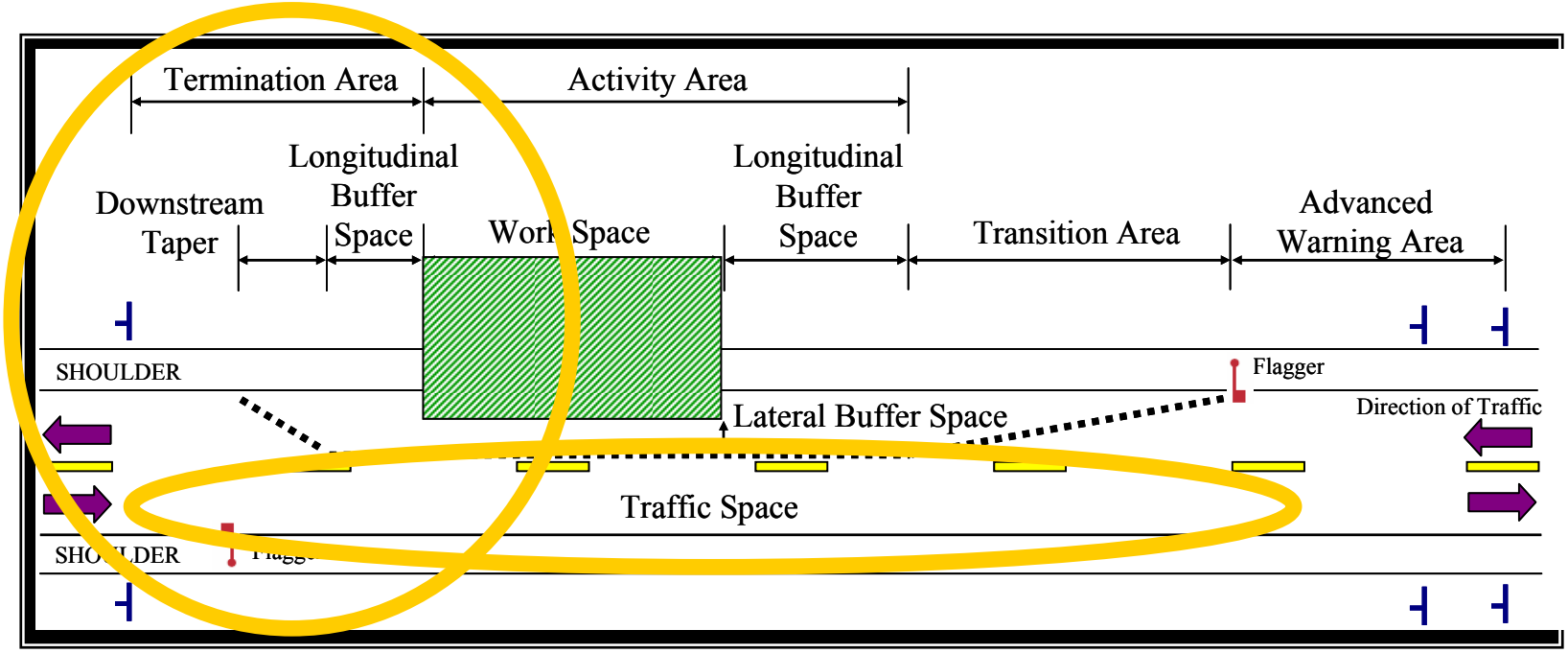


Why Use a Buffer Space?

- Improves worker safety
- Required in some jurisdictions
- May alleviate the need for more complex Traffic Control measures
- Provides additional space between work zone and motorists
- Easy to accommodate into Work Zone plan

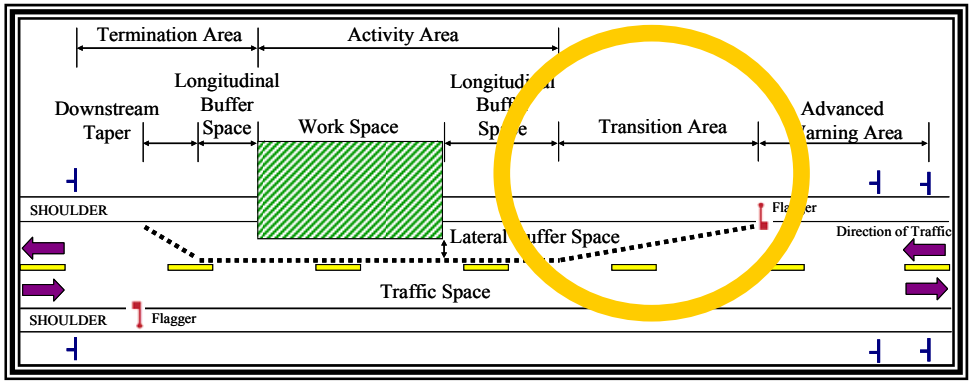
Temporary Traffic Control Components

- Termination Area – **area used to return to normal path**
- Traffic Space – **portion of highway in which road users are routed through the activity area**

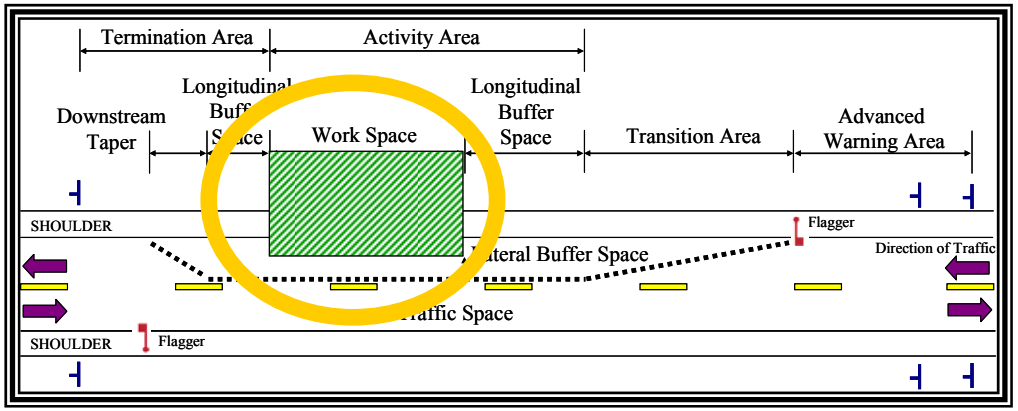


Temporary Traffic Control Components

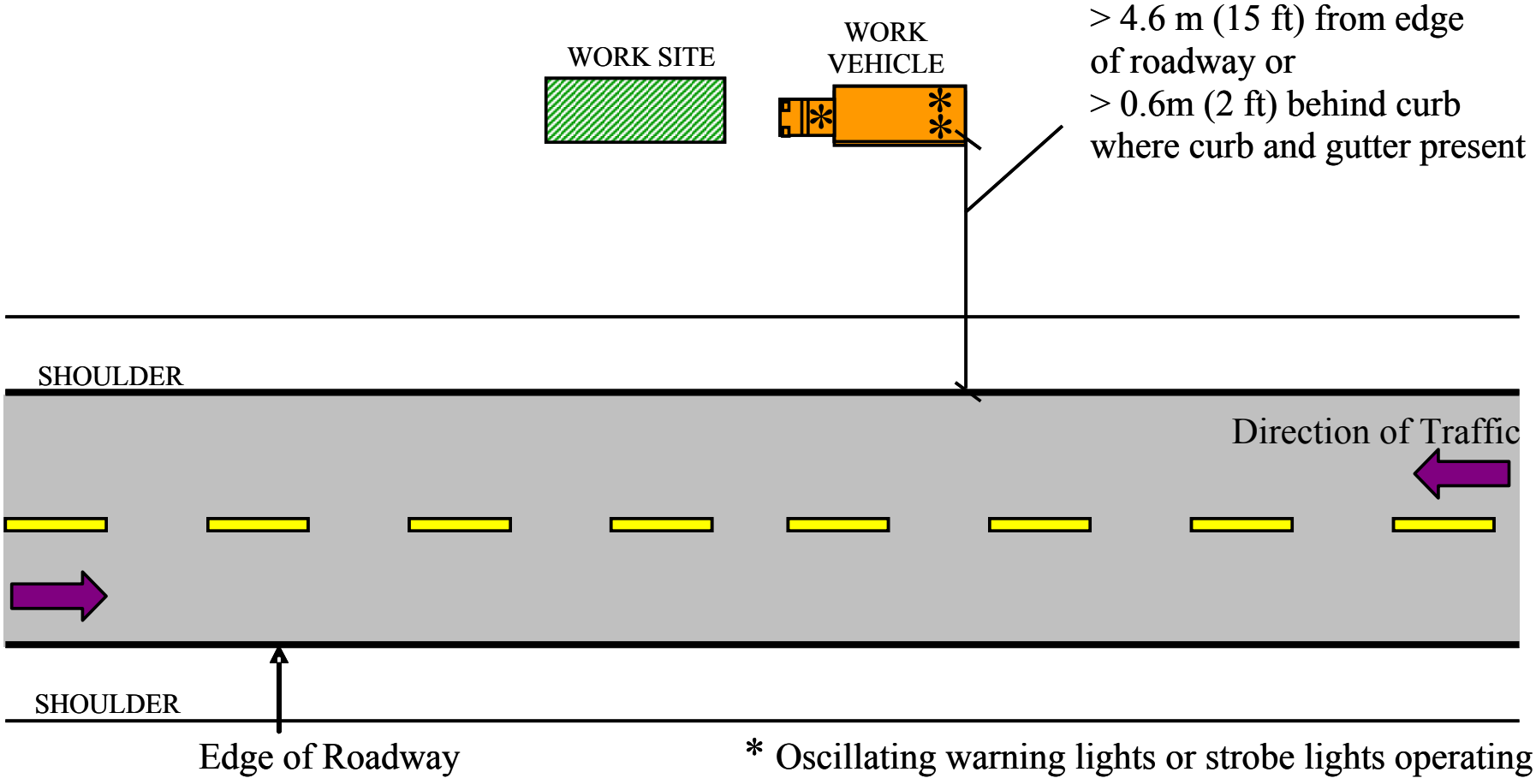
- Transition Area – **area utilized to move motorists from their normal path**



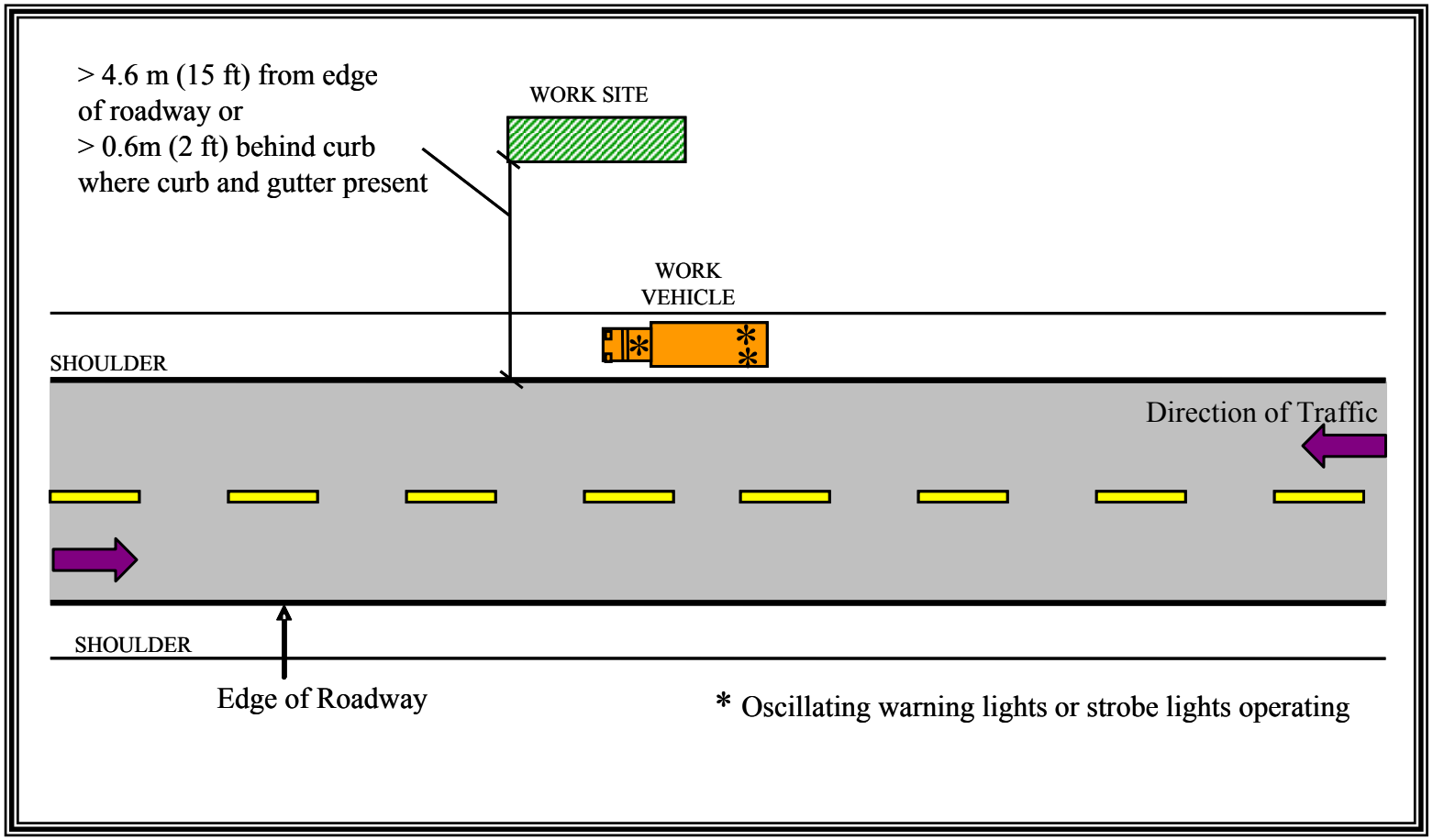
- Work Space – **portion closed to road users – occupied by utility workers, equipment and vehicles.**



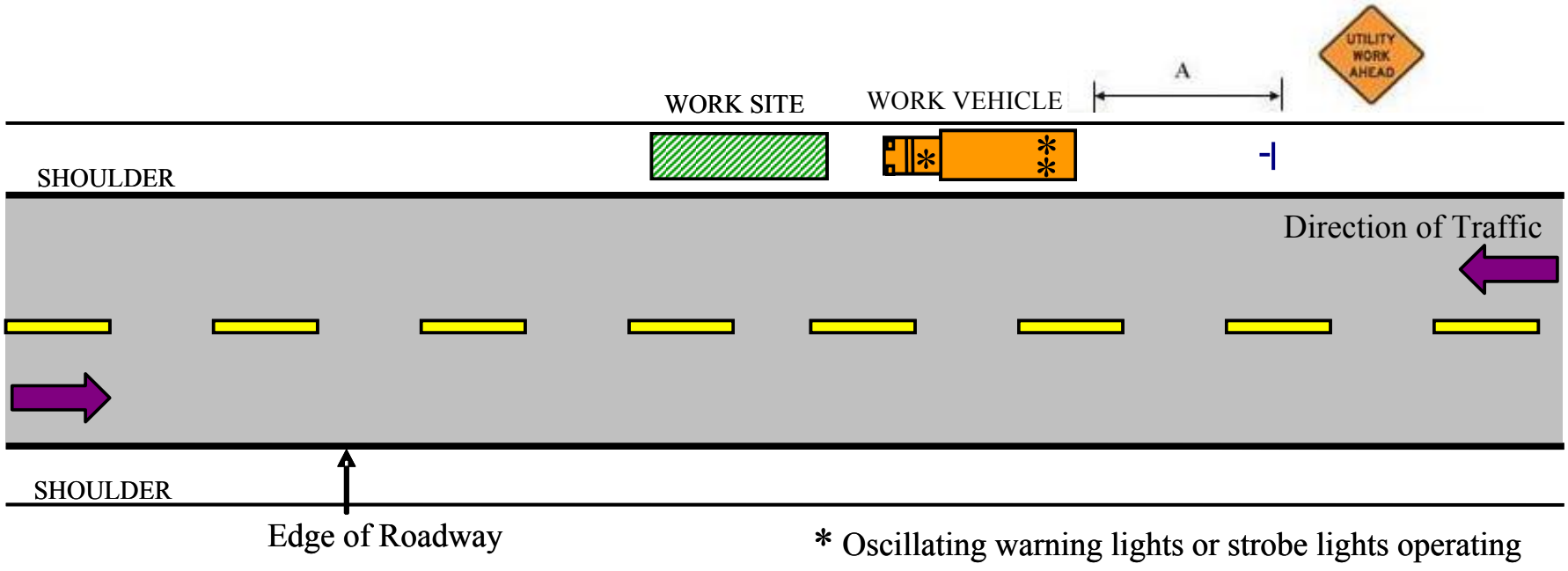
Utility Work Beyond Shoulder



Utility Work Beyond Shoulder with Work Vehicle(s) Parked on Shoulder



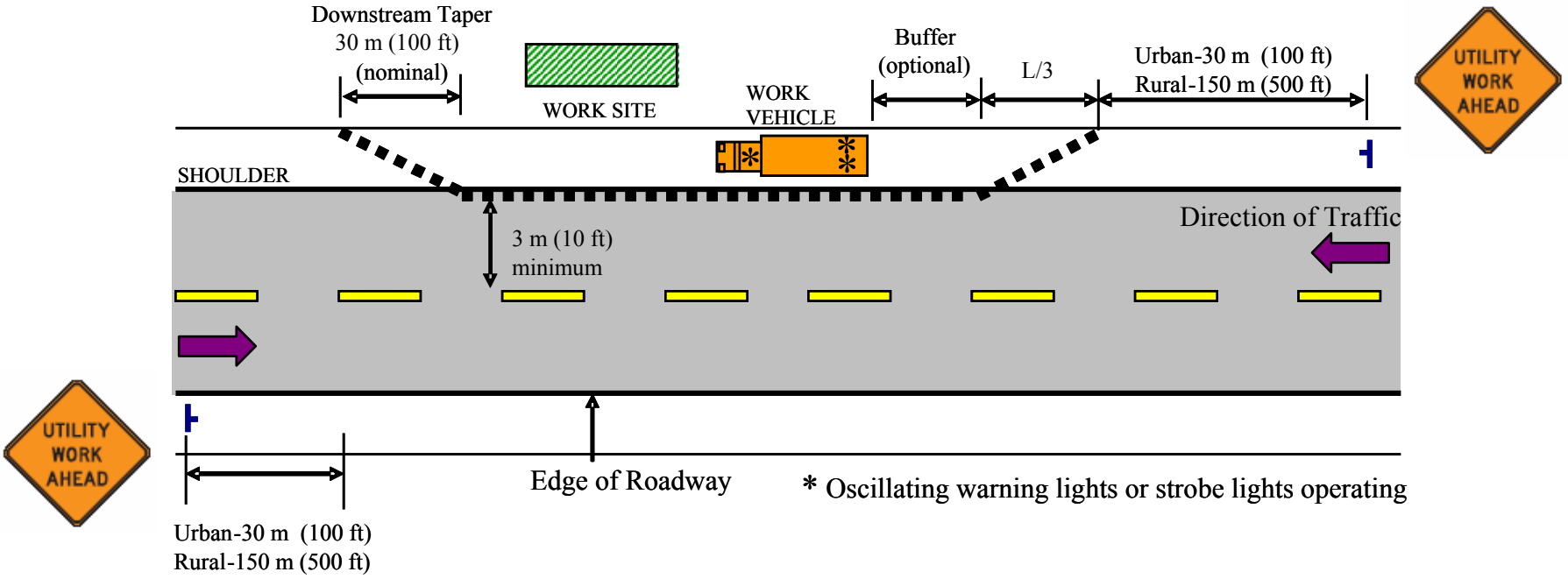
Utility Work on Shoulder
(Low Traffic Volume and Low Speed)



TCP-C

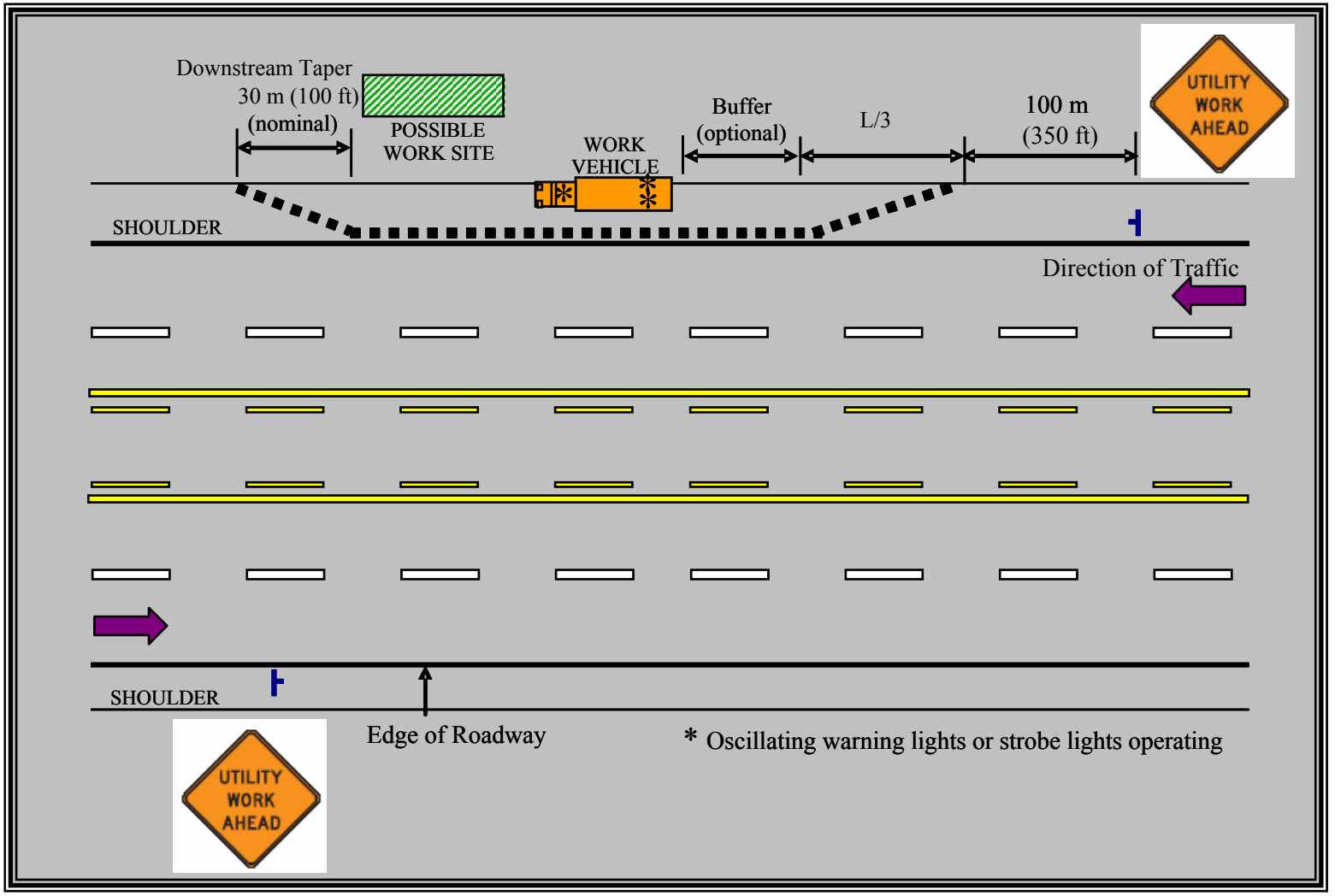
Utility Work Beyond Shoulder with Work Vehicle Parked on Shoulder

(High Traffic Volume and/or High Speed)



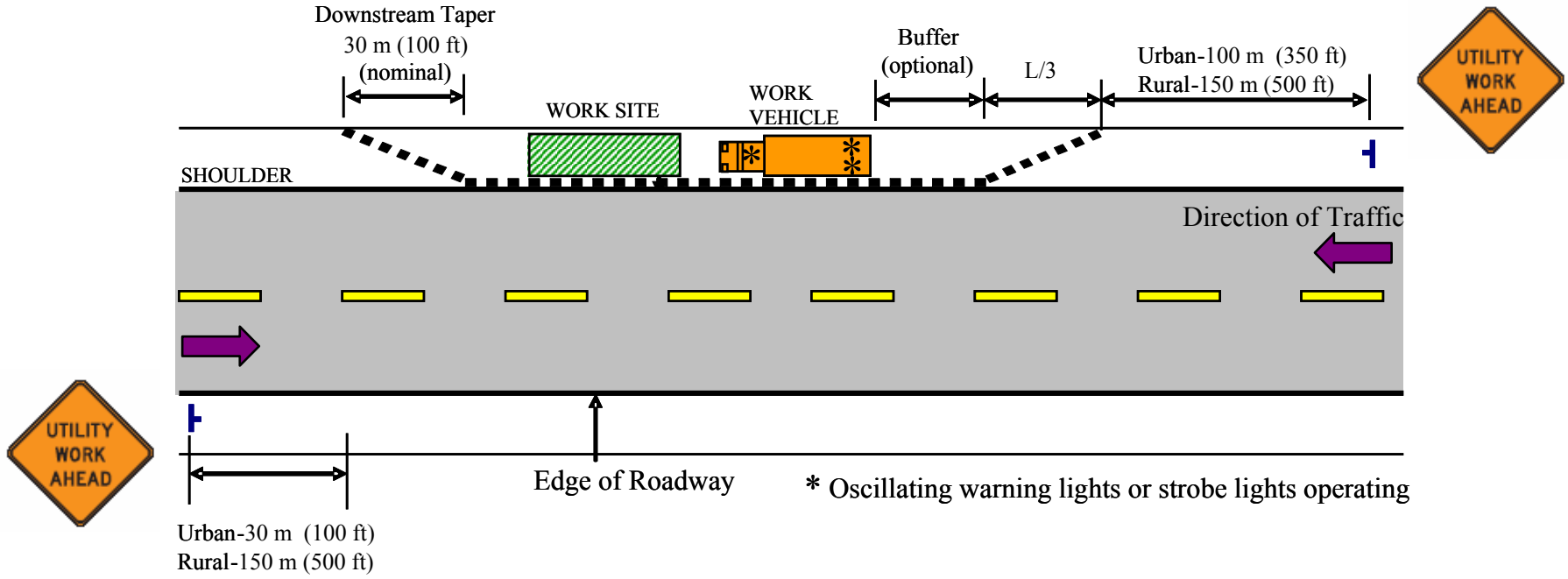
Utility Work Beyond Shoulder with Work Vehicle(s) Parked on Shoulder

(High Traffic Volume and/or High Speed)



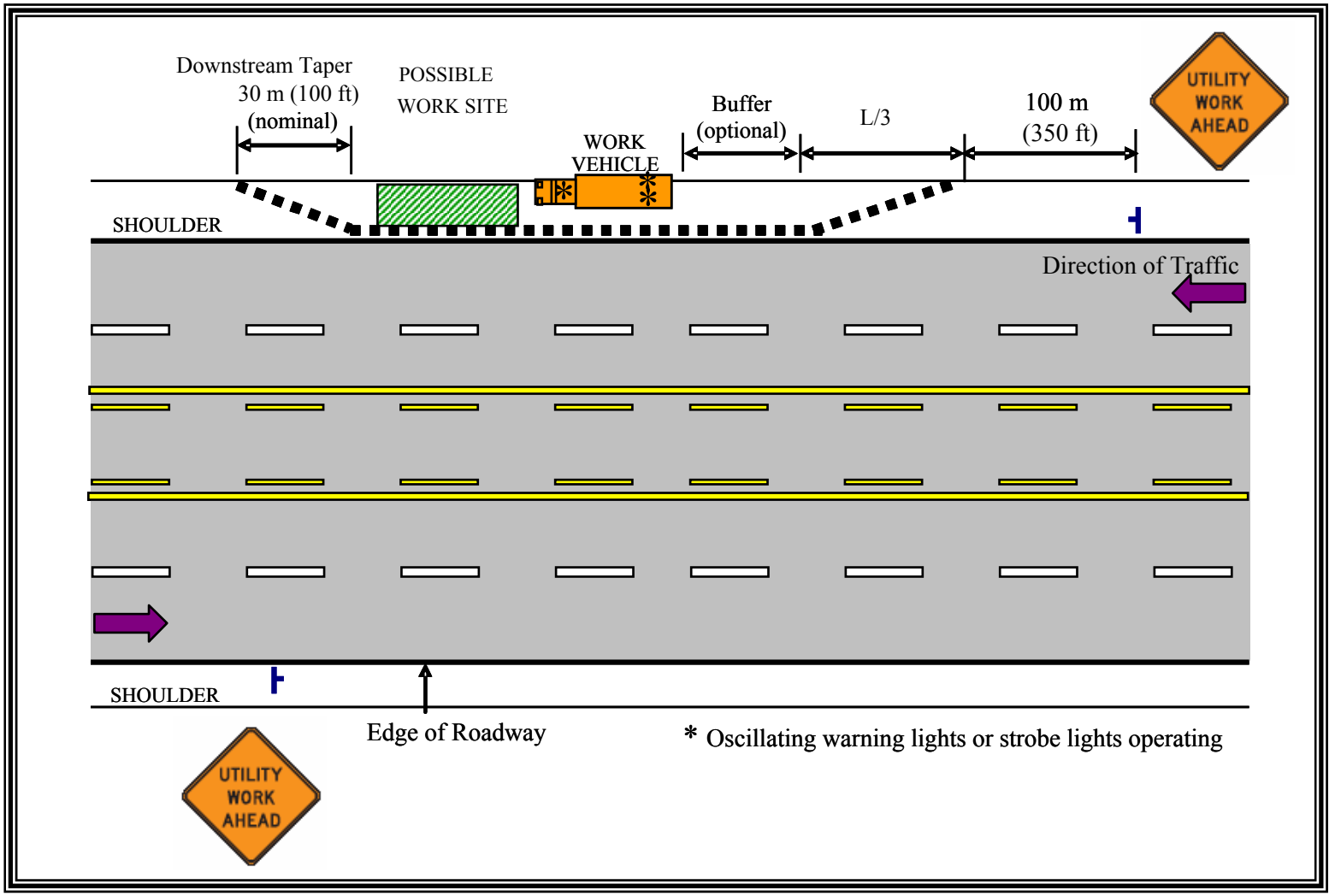
Utility Work on Shoulder with no Encroachment on Roadway

(High Traffic Volume and High Speed)



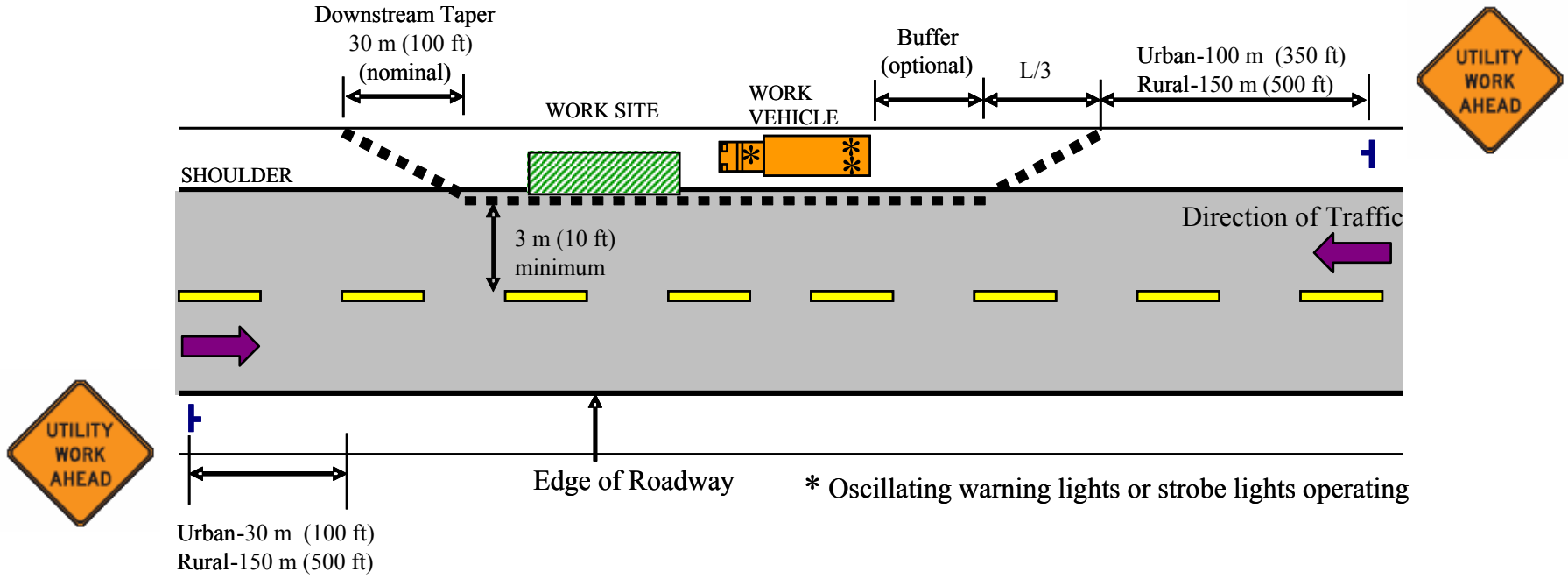
Utility Work on Shoulder with No Encroachment on Roadway

(High Traffic Volume and/or High Speed)



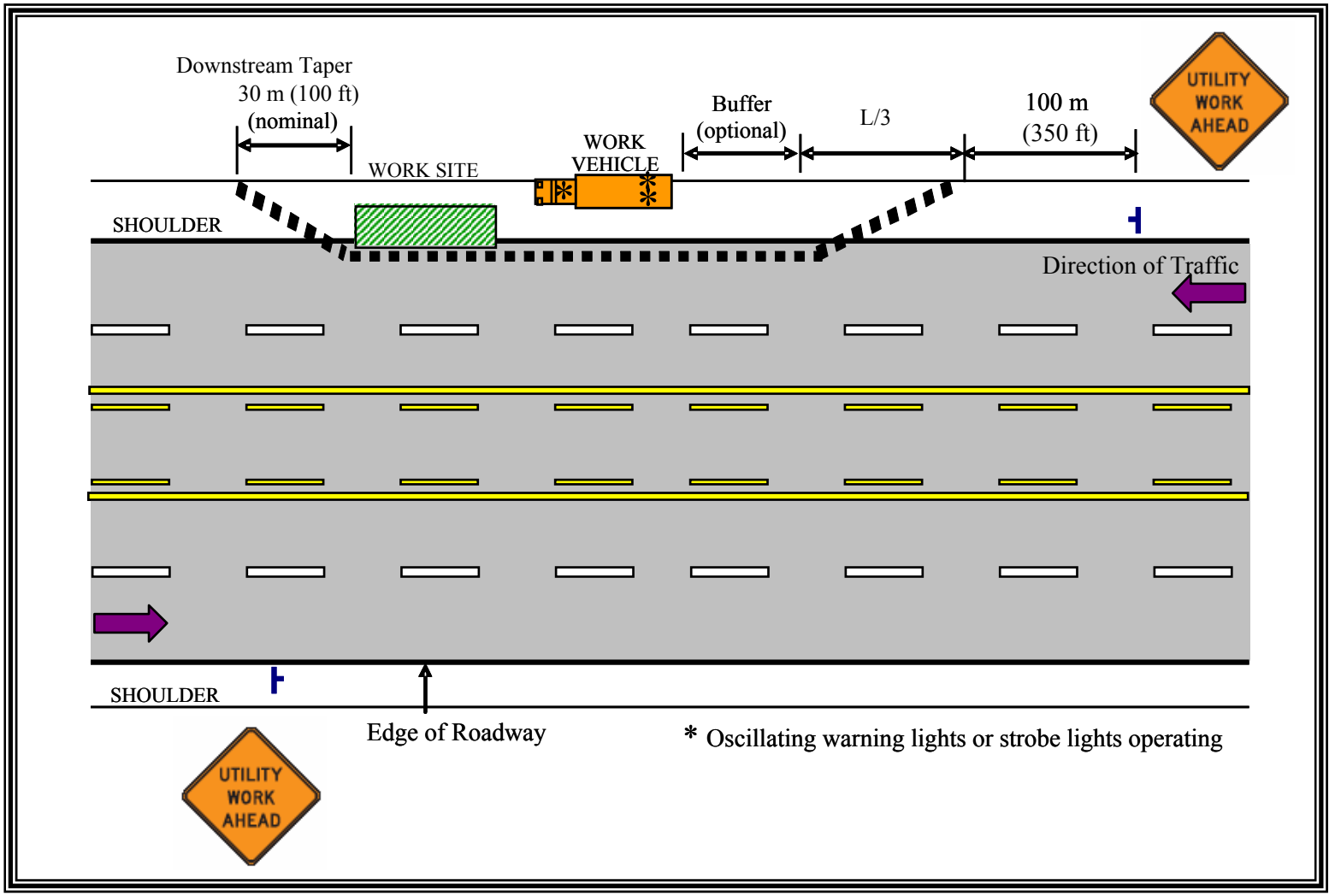
Utility Work on Shoulder with Minor Encroachment

(High Traffic Volume and High Speed)



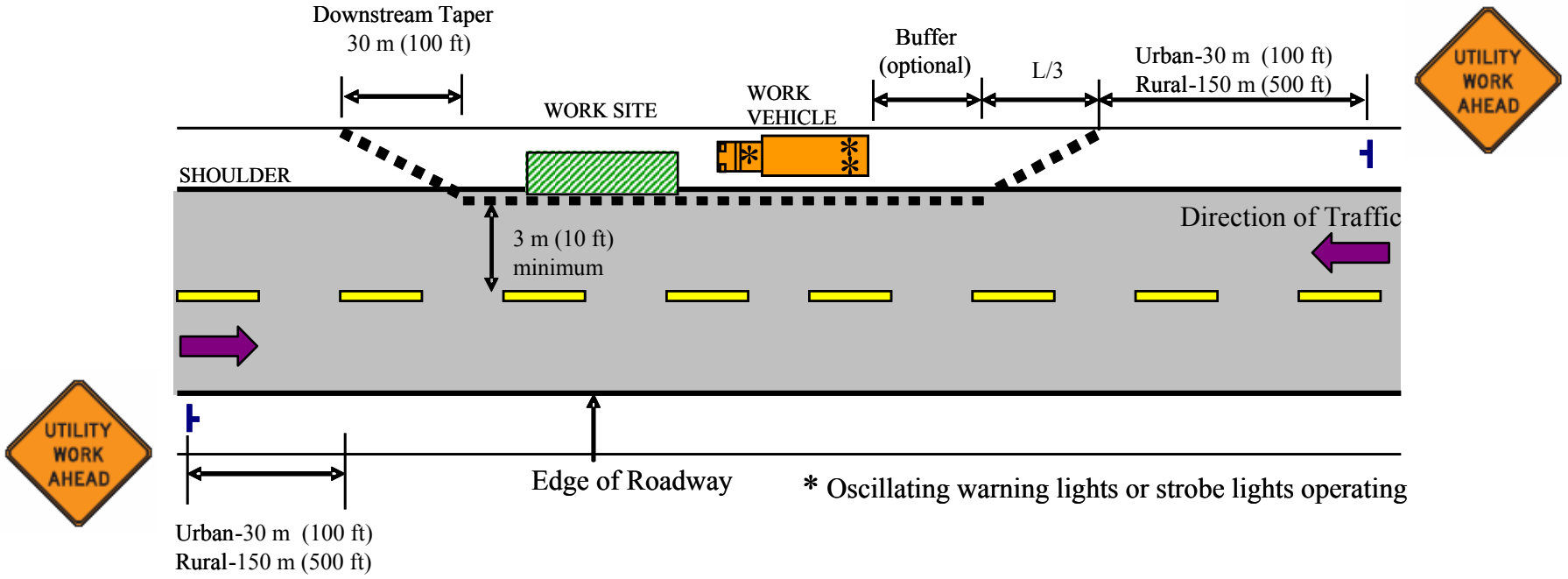
Utility Work on Shoulder with Minor Encroachment on Roadway

(High Traffic Volume and/or High Speed)



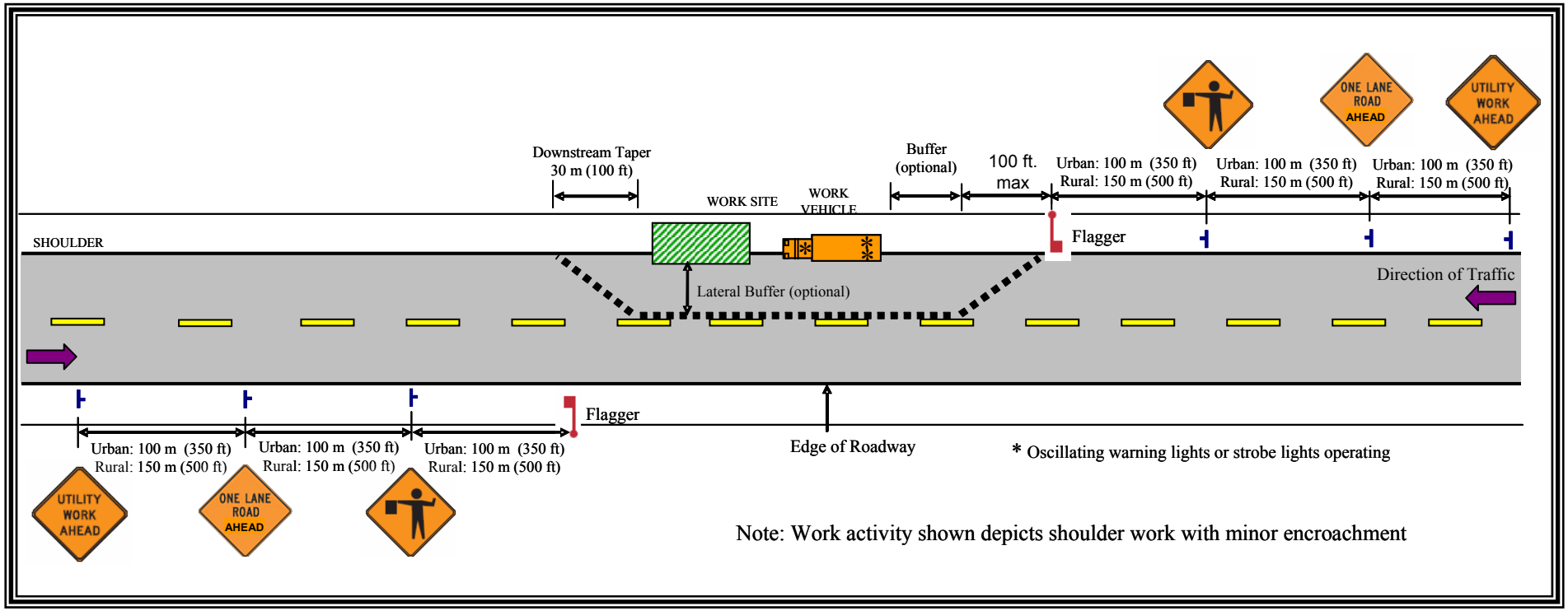
Utility Work on Shoulder with Minor Encroachment

(Low Traffic Volume and Low Speed)

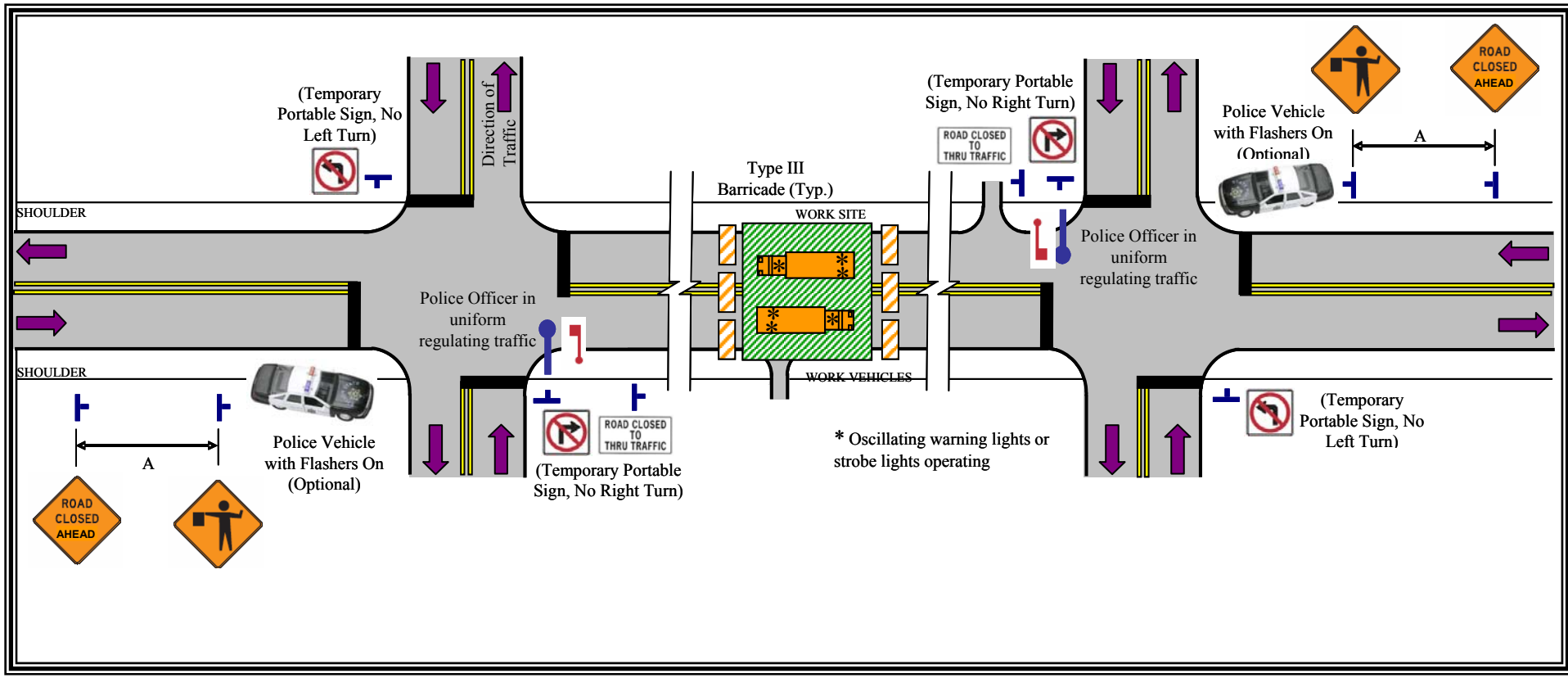


Utility Work on Shoulder with Minor Encroachment or Lane Closure on Two-Lane Road

(High Traffic Volume and/or High Speed)



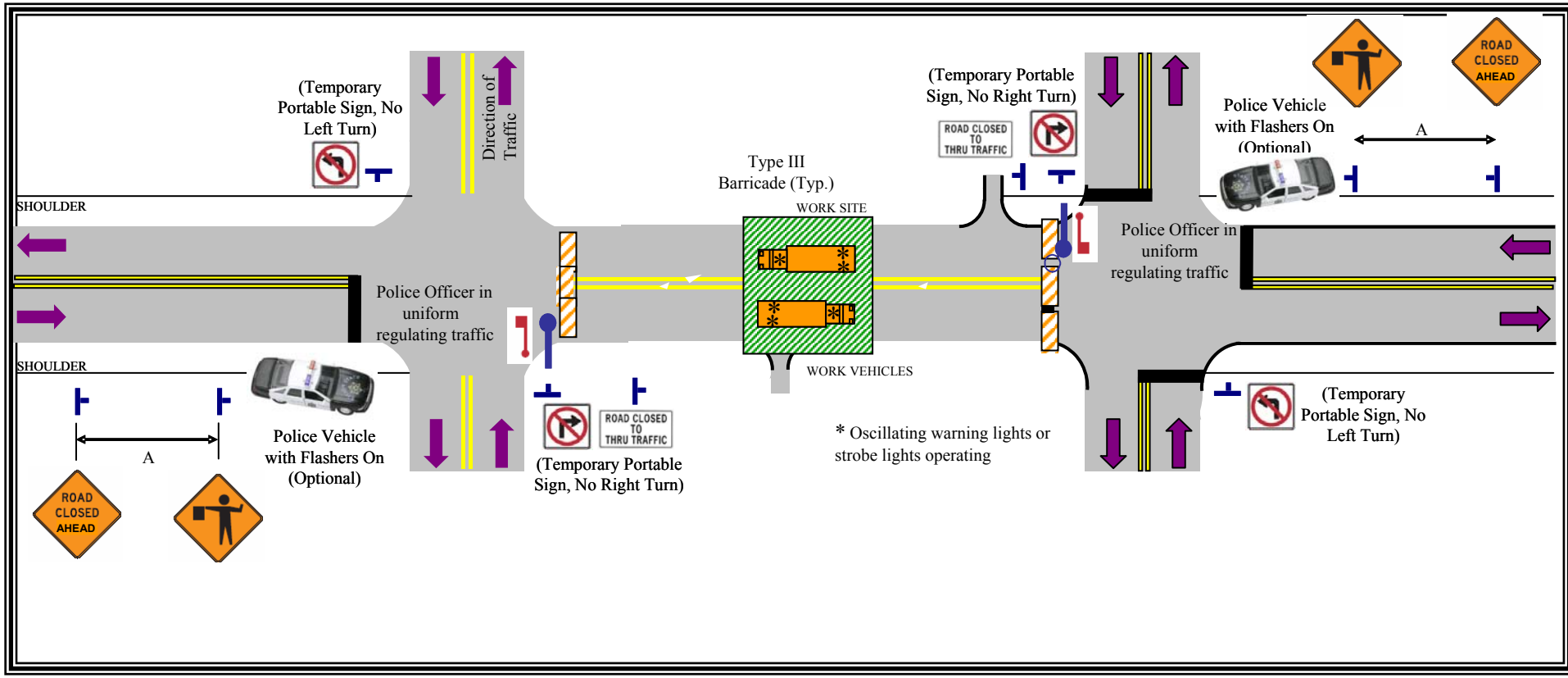
Temporary Road Closure
Mid Block



1. Planned Closure less than 20 minutes – Flagger or Police Vehicle Required
2. More than 20 minutes – Type III Barricades and appropriate traffic control signs shall be used – Use Flaggers where deemed appropriate.
3. White Road Closed Signs may have different wording such as Road Closed, Local Traffic Only

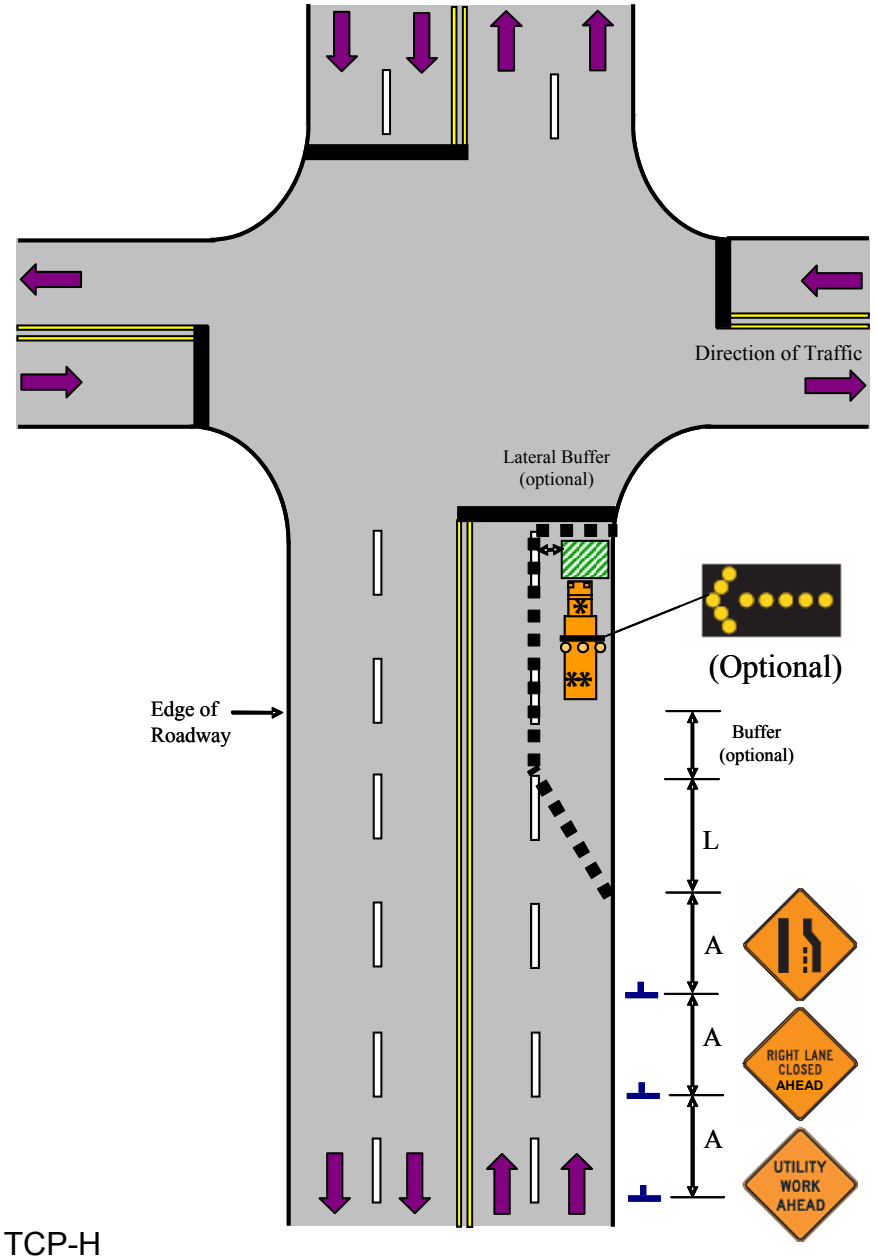
TCP-F

Temporary Road Closure
Full Block Closure



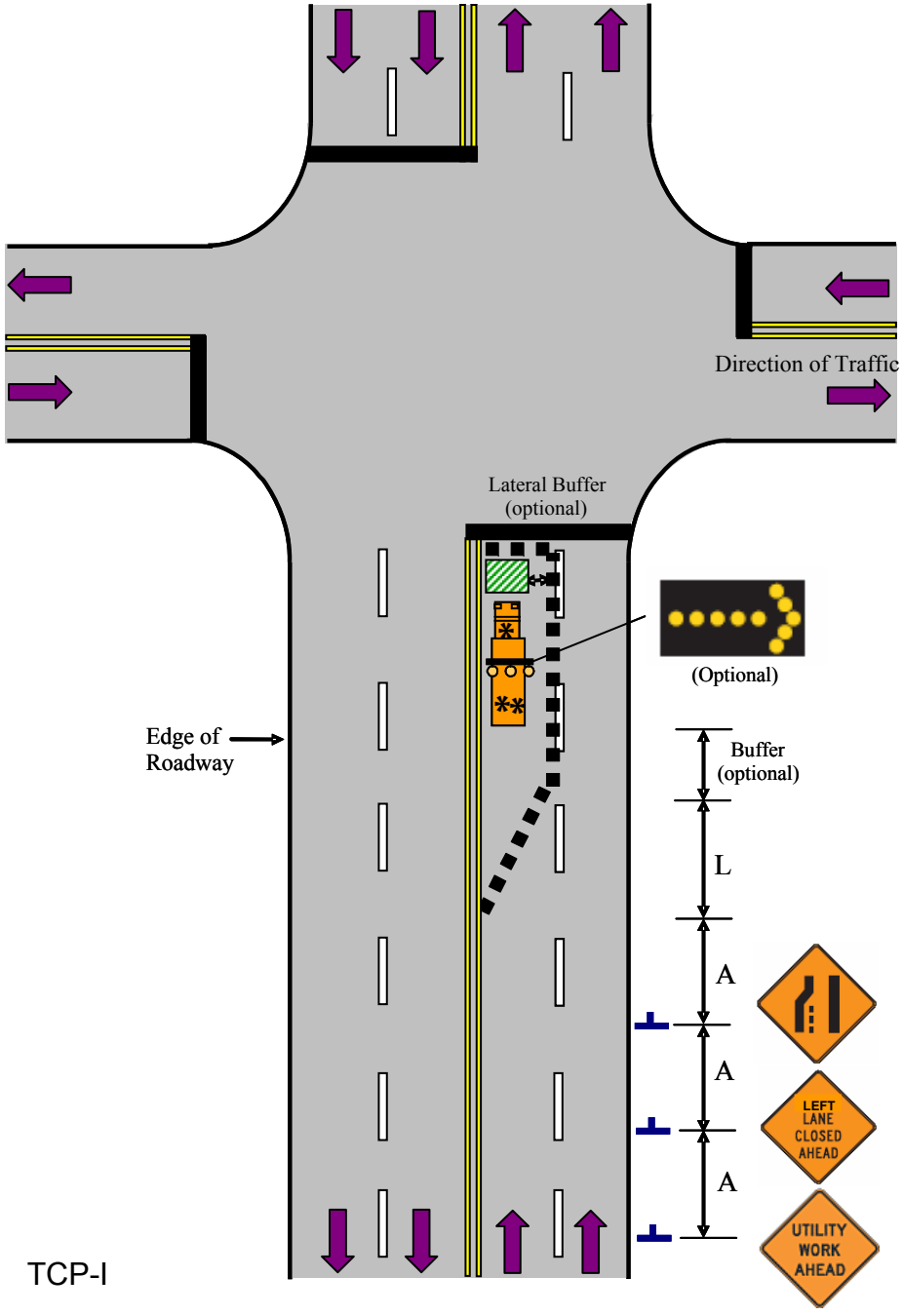
1. Planned Closure less than 20 minutes – Flagger or Police Vehicle Required
2. More than 20 minutes – Type III Barricades and appropriate traffic control signs shall be used – Use Flaggers where deemed appropriate.
3. White Road Closed Signs may have different wording such as Road Closed, Local Traffic Only

Right Lane Closure on Near Side of Intersection

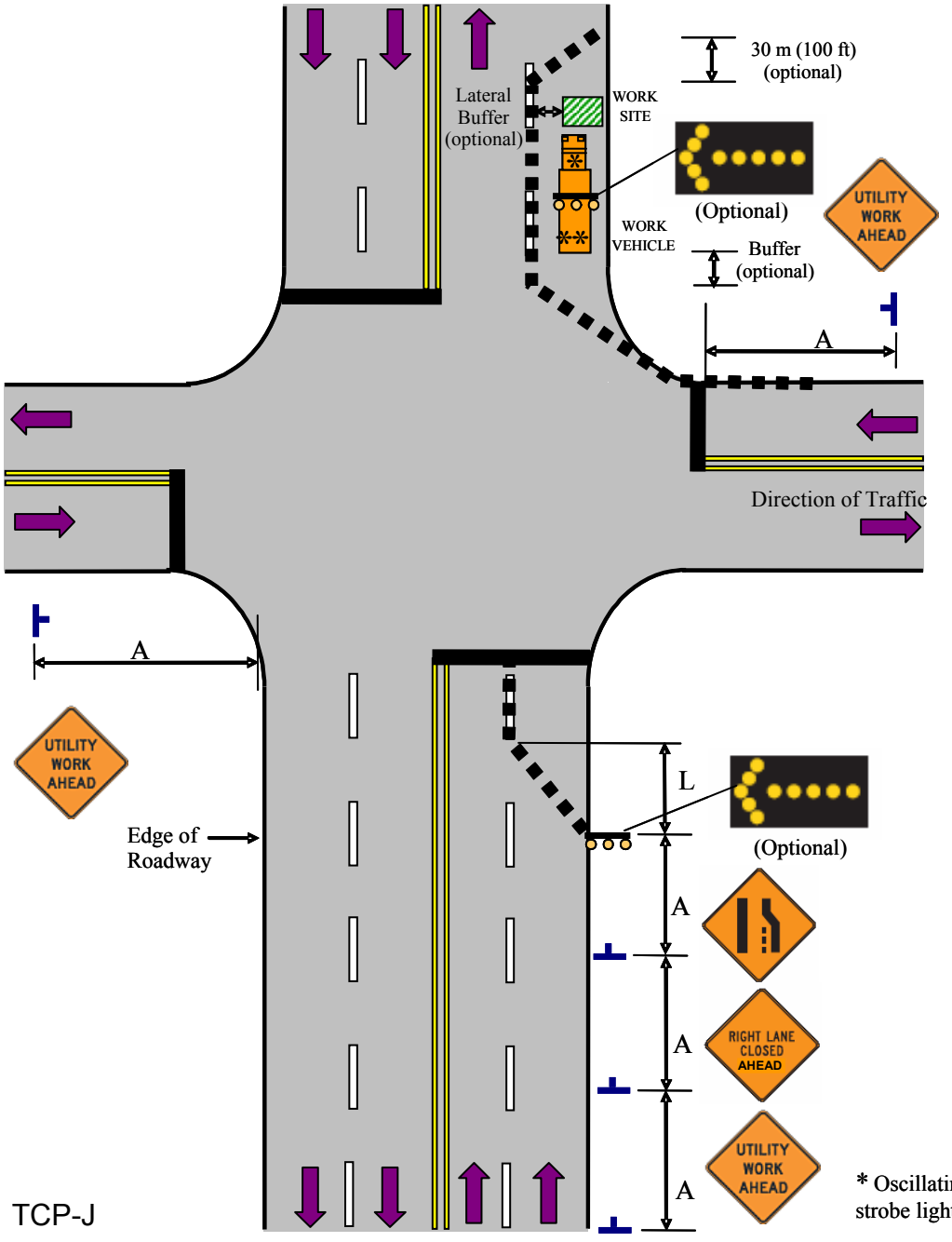


TCP-H

Left Lane Closure on Near Side of Intersection

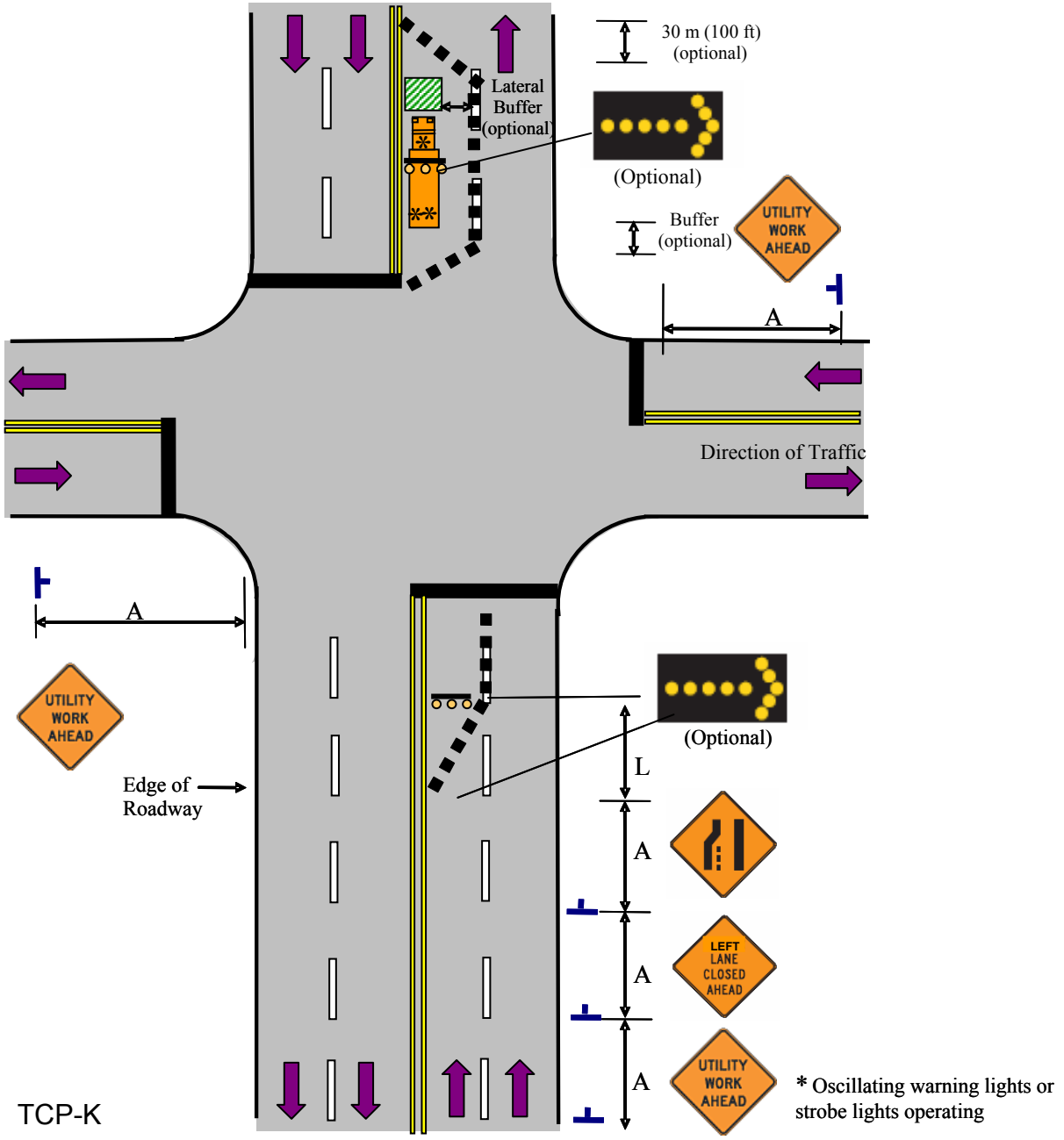


TCP-I

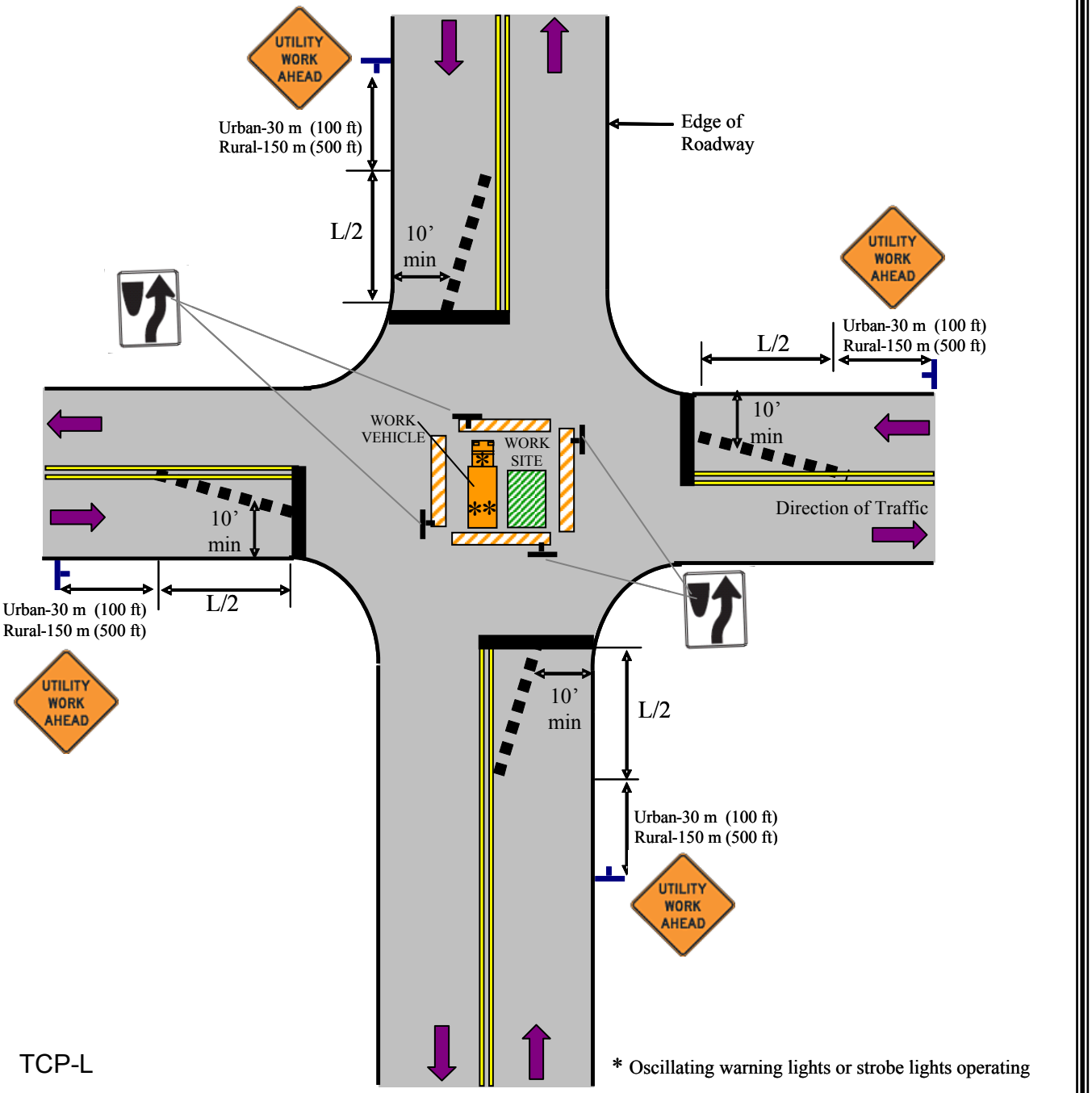


TCP-J

Right Lane Closure on Far Side of Intersection

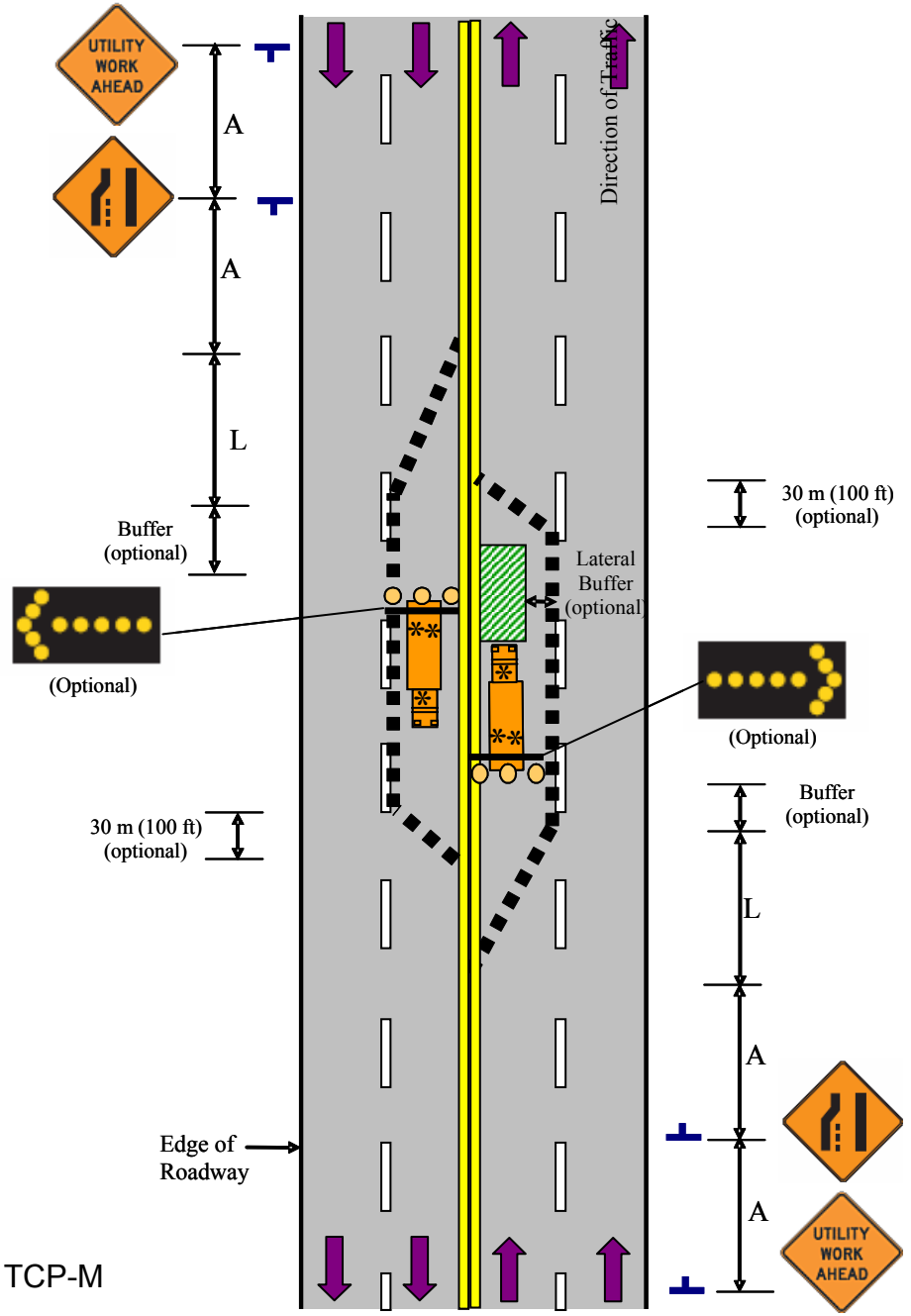


Left Lane Closure on Far Side of Intersection



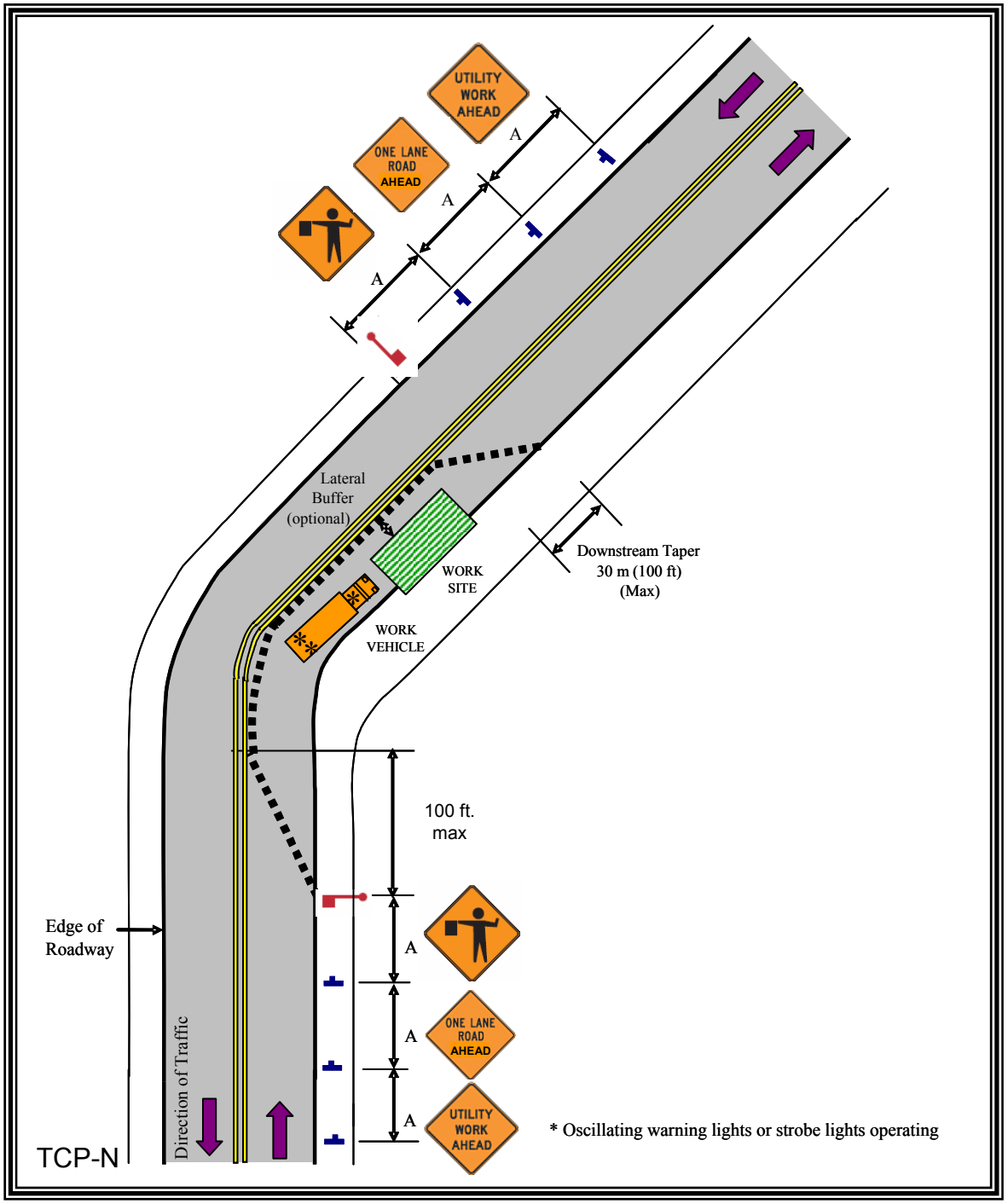
Closure in Center of Intersection

Center Lane Closure on a Multi-Lane Road

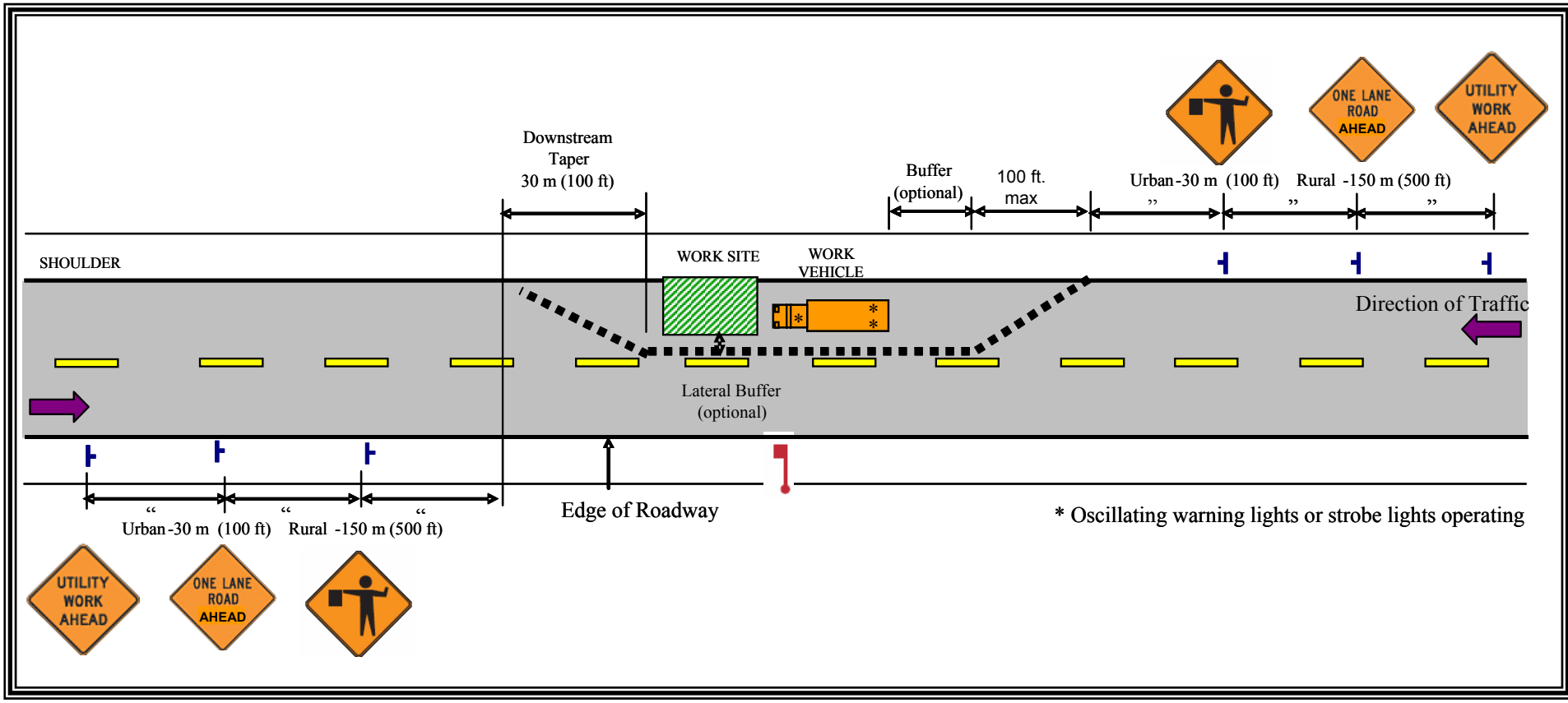


TCP-M

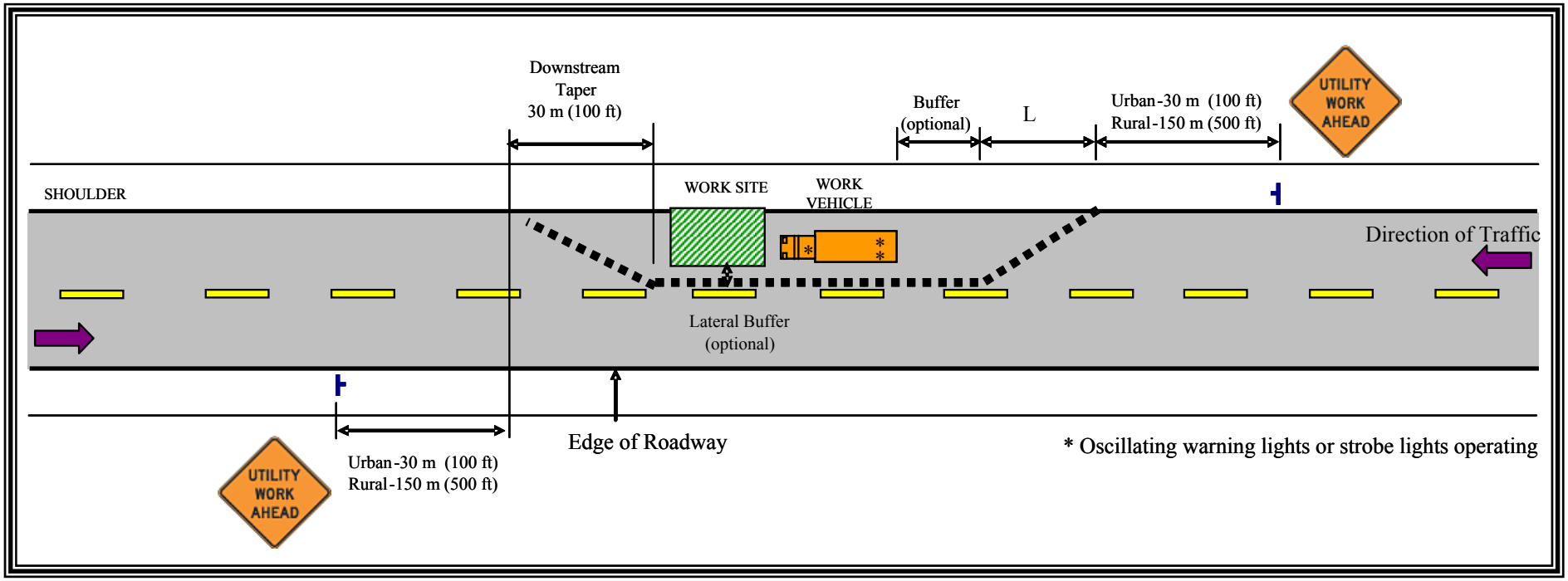
Lane Closure On Two-Lane Road (Restricted Visibility)



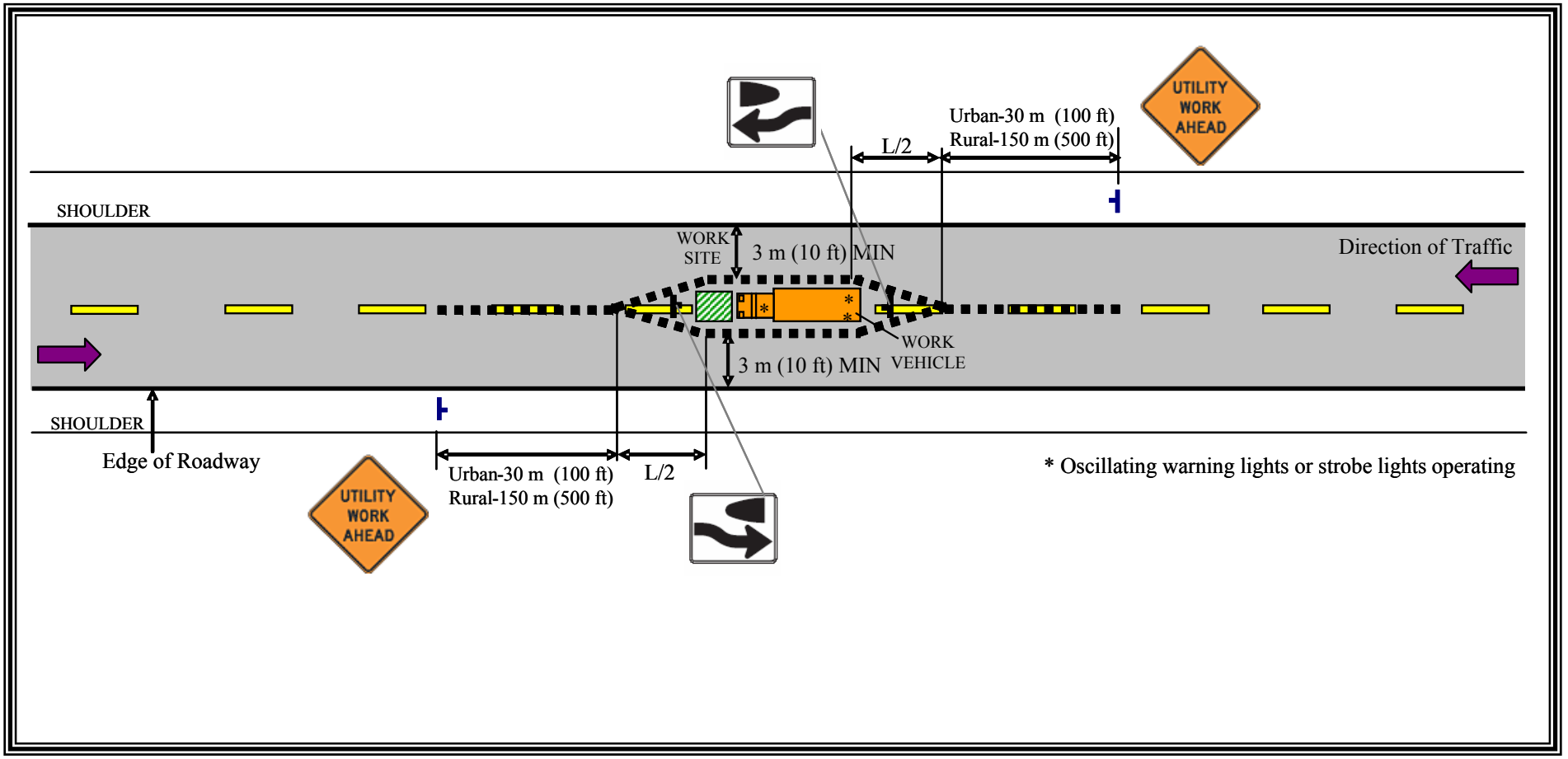
Lane Closure on Two-Lane Road with Unrestricted Visibility
(Low Traffic Volume, Low Speed where Traffic cannot self-regulate without the use of Flaggers)



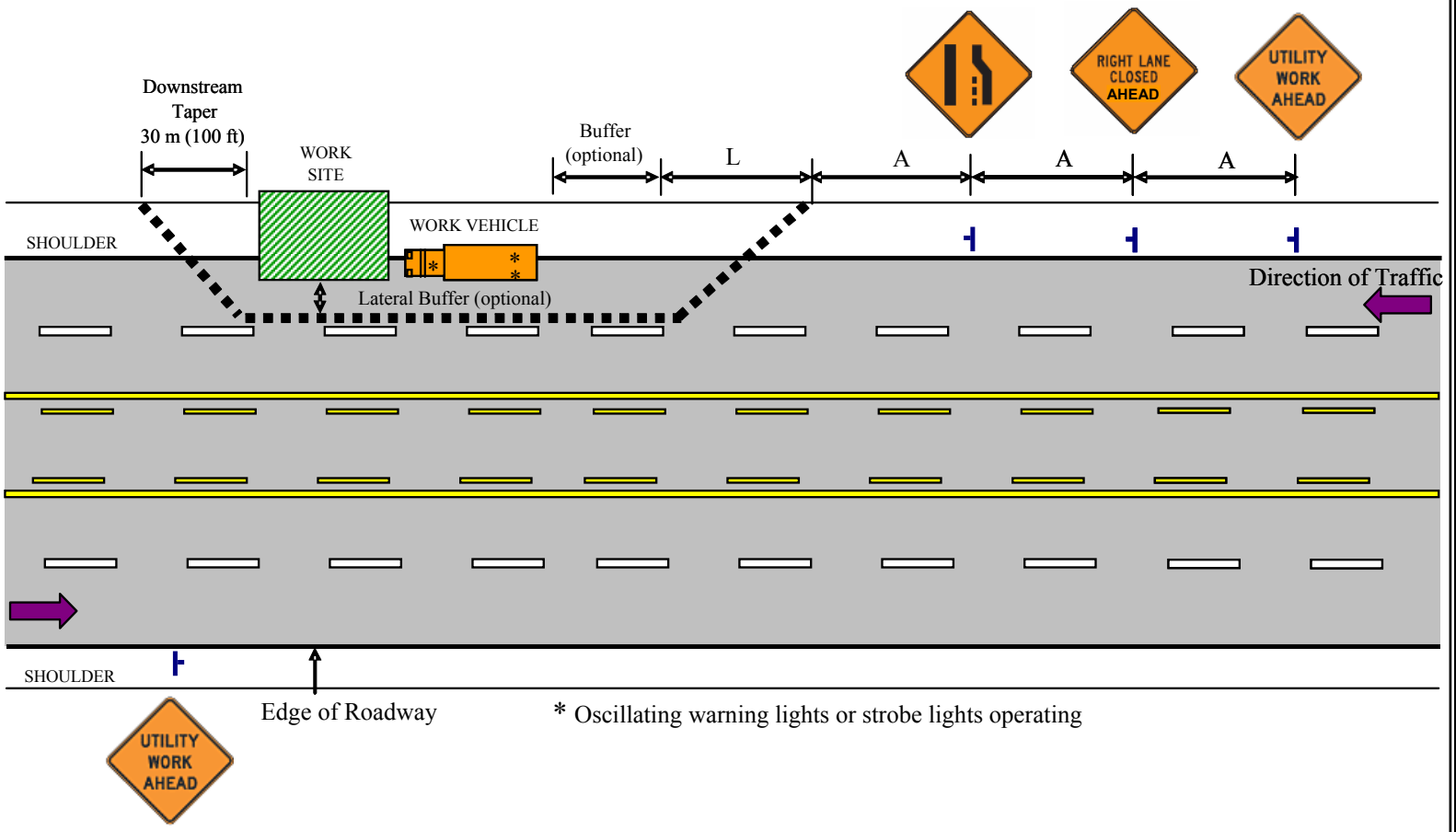
Lane Closure on Two-Lane Road with Unrestricted Visibility
(Low Traffic Volume, Low Speed where Traffic can self-regulate without the use of Flaggers)



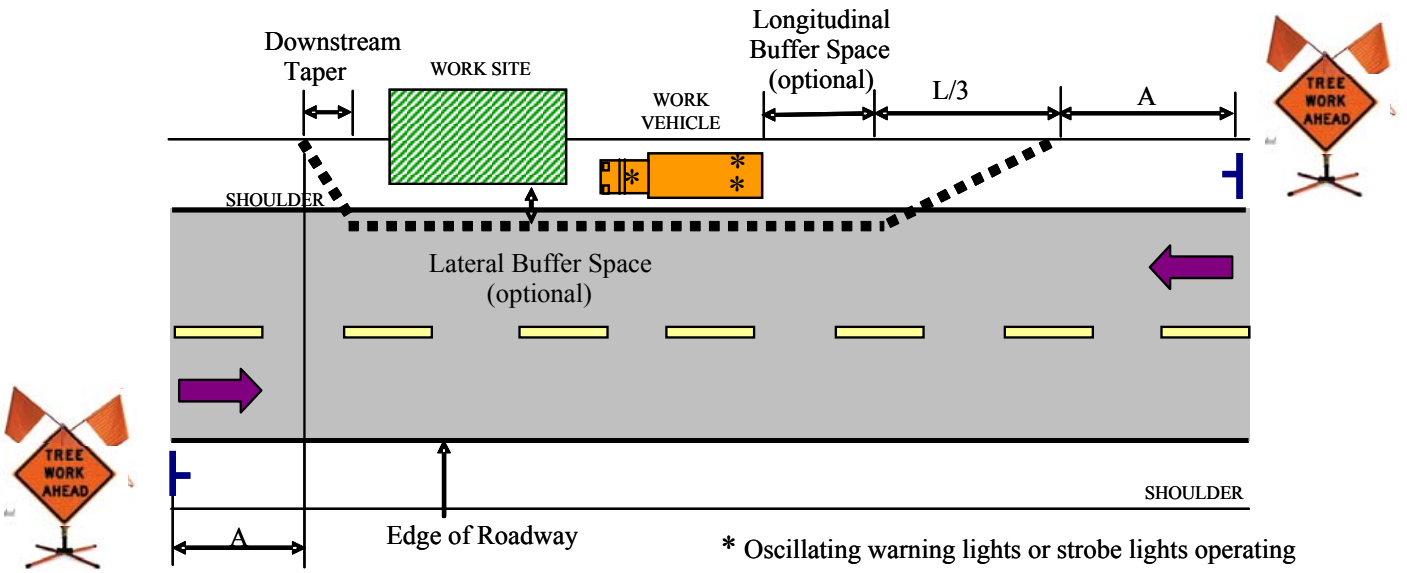
Utility Work in Center of Road
(Low Traffic Volumes)



Outside Lane Closure on Multi-Lane Road

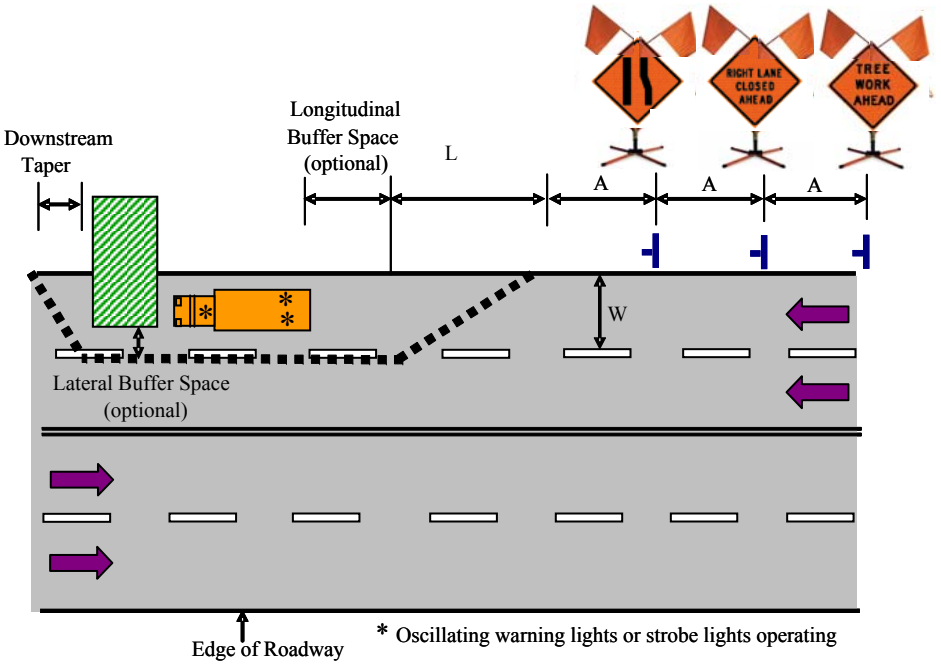


Tree Cutting/Trimming Shoulder Closure on a Two-Lane Road



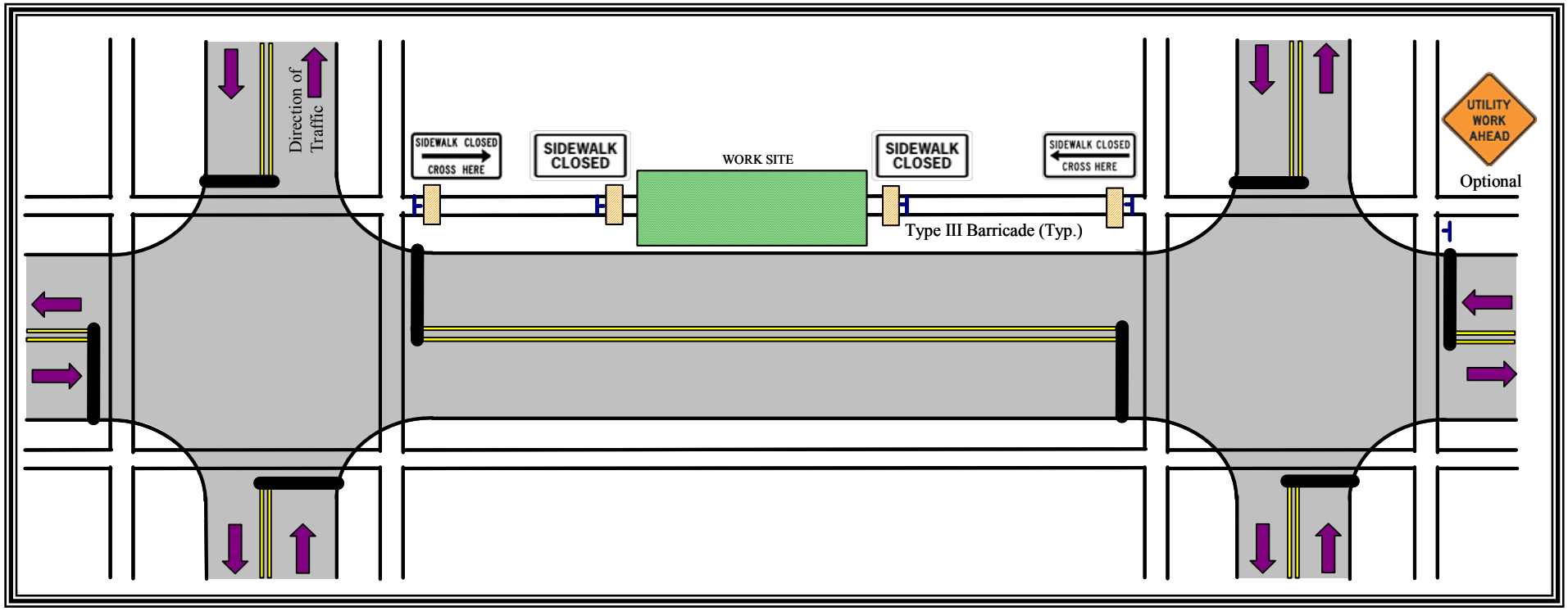
Note: Road Work Ahead, Utility Work Ahead, Worker Symbol sign may be substituted for Tree Work Ahead Sign

Tree Cutting/Trimming Lane Closure on a Multi-Lane Road



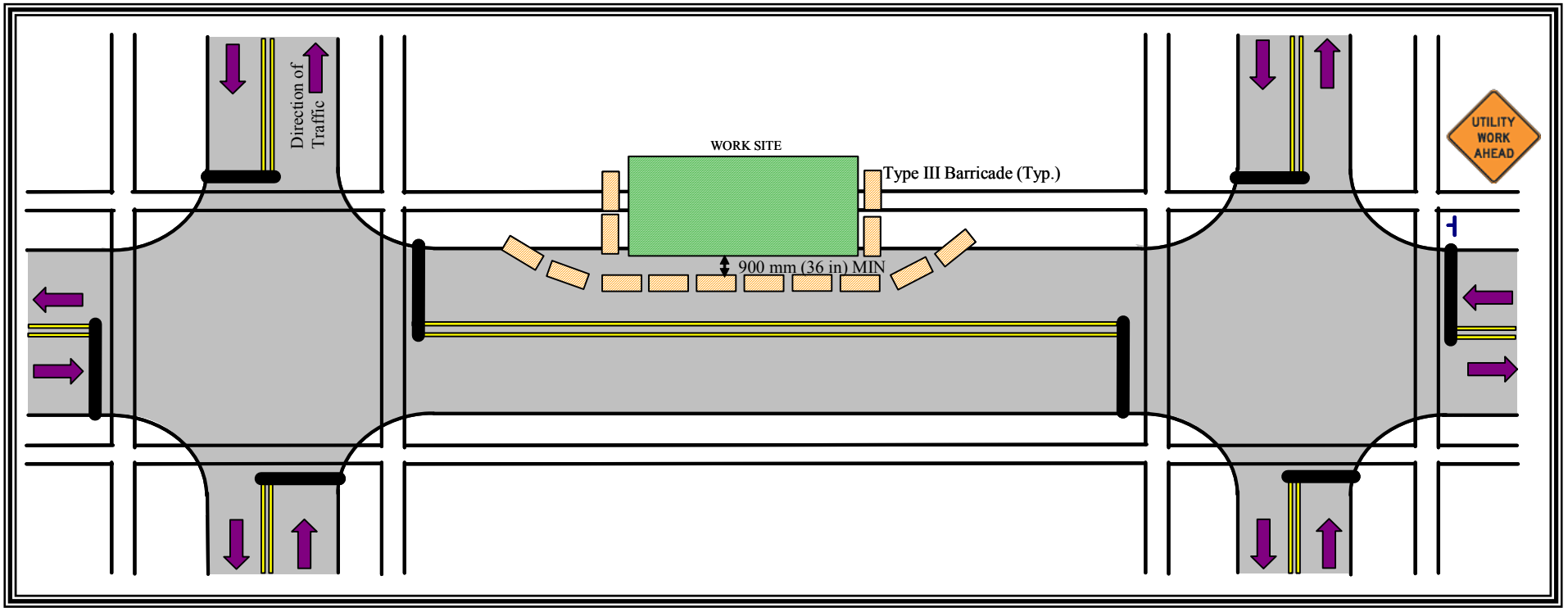
Note: Road Work Ahead, Utility Work Ahead, Worker Symbol sign may be substituted for Tree Work Ahead Sign

Sidewalk Detour for Pedestrians



Note: Sidewalk Closed signs are representative of several wording and direction options available

Sidewalk Diversion for Pedestrians



FOREWORD

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 document, **Work Zone Traffic Control**, provides the minimum standards and specifications for work zone traffic control associated with the utility maintenance, repair and construction on or near roadways or on construction sites.

The procedure is designed to promote uniform and consistent application of these basic principals here at National Grid.

By following this guidelines set forth in Work Zone Traffic Control personnel can reduce their risk of injury and comply with applicable laws and regulations.

Questions regarding this procedure should be referred to National Grid's Safety Department.

Record Of Change

Date of Review/ Revision:

Revision	Date	Description
1	06/01/09	Response to audit item

1.0 INTRODUCTION

1.1 Purpose

This procedure will provide the minimum standards and specifications for work zone traffic control associated with the utility maintenance, repair and construction on or near roadways or on construction sites. The procedure is designed to promote uniform and consistent application of these basic principals.

The purpose of traffic control devices and reasons for their use is to help ensure roadway safety by providing for the orderly and predictable movement of all traffic and provide safety to both the public and employees.

1.2 Applicability

Equally as important as the safety of road users traveling through temporary traffic work zones is the safety of workers. This procedure applies to National Grid employees whose work exposes them to the risks of moving roadway traffic or construction equipment or interfere with the orderly flow of traffic. This includes maintenance or construction work performed within the highway boundary or on construction sites, either public or private.

Minimum standards of application are prescribed for typical situations. A number of typical scenarios are illustrated in the Utility Work Zone Traffic Control Field Guide, showing proper application of these standards and principles.

1.3 Reviews and Revisions

This procedure shall be reviewed periodically and revised as required. Revisions of this procedure should be made as a result of regulatory changes, management review, change in safety management guidance, or company policies. The dates of reviews and revisions will appear on the front of the page of the procedure titled “Record of Change”.

The Safety Programs and Regulatory Compliance Group shall have primary responsibility for maintaining this document, soliciting comment from stakeholders, and revising as necessary. The requirements of this procedure or any future revision thereof, shall be effective the date of its issue unless otherwise noted.

1.4 Documentation

Documentation related to this procedure and subsequent reviews and revisions will be maintained in the Safety Department. This procedure will be accessible to field operations both in paper and electronic formats. The paper versions of the procedure will not be document controlled. The official, current version of this procedure and all other procedures prepared under this guidance will be on the National Grid internal intranet website.

1.5 Quality Assurance and Audit

Internal self-assessment and quality assurance activities are performed at several levels. Local management is responsible for complying with this procedure and with associated work

methods that may be developed. The Safety Department shall be responsible for reviewing and revising this procedure based on feedback from these stakeholders.

The use of this procedure is subject to audit and it is anticipated that the Company' Legal Department and/or Internal Audit will periodically review its implementation.

2.0 RESPONSIBILITIES

2.1 Line of Business (LOB)

- Ensure that all employees are trained in Work Zone Traffic Control
- Monitor compliance with this procedure and note conditions where application of this procedure does not provide adequate worker protection.

2.2 Safety Department

- Provide on-going technical assistance to LOB as requested

2.3 Learning and Development

- Develop Work Zone Traffic Control training for LOB's.
- Conduct training for all workers exposed to the risks of moving roadway traffic or construction equipment.
- Conduct refresher training as needed to address needs and changes in regulatory requirements.
- Maintain training records in training database

2.4 Employees

- Adhere to the requirements of this procedure
- Attend all required training
- Request additional information when necessary

3.0 APPLICATION

It is not possible to prescribe detailed standards of the application for all situations that may conceivably arise. Therefore, typical illustrations are presented in the *Utility Work Zone Traffic Control Field Guide* for the most common situations with the understanding that additional protection may be required where special complexities and hazards prevail. Although each situation must be dealt with individually, conformity with the provisions established herein is required. The protection described for each situation shall be based on the **speed and volume of traffic, duration of work, and exposure to hazards**.

These standards are basically applicable to both rural and urban situations. High speed highways and streets require more thorough treatment than the minimum requirements, whereas low speed may be treated satisfactorily with a minimum of devices.

3.1 Standardization

3.1.1 All traffic control devices used on maintenance and construction projects shall conform to the applicable specifications of this manual.

3.1.2 Signs shall be kept in proper position, clean and legible at all times. Damaged, defaced or dirty signs shall be cleaned, repaired or replaced.

3.1.3 Barricades and signs supports shall be neatly constructed and shall not appear makeshift. They shall be repaired, cleaned or replaced as needed to keep up their appearance.

4.0 FUNDAMENTAL PRINCIPLES OF WORKZONE TRAFFIC CONTROL

4.1 Plan for Safety

Workers should plan ahead for the safety of the motorist, pedestrian and worker.

4.2 Keep it Moving

Normal traffic movement should be disrupted as little as possible.

4.3 Communicate

Motorists and pedestrians should be warned, informed and guided in a clear and positive manner while approaching and traveling through the work zone.

4.4 Plan for the Worst

Workers should plan for the possibility of errant vehicles leaving the roadway and impacting the work zone.

4.5 Train

Each person whose actions affect temporary traffic control zone safety should receive training appropriate to the job decisions each is required to make. Only those who are trained in safe traffic control practices and have a basic understanding of the principles and National Grid's procedures should supervise the selection, placement and maintenance of traffic control devices in work zones.

5.0 THE WORK AREA MUST BE PLANNED

Traffic congestion makes it necessary to plan protection for our work areas. Planned protection is necessary to avoid vehicle and pedestrian traffic hazards for the safety of the public and our own employees.

The vital nature of our services makes it necessary to provide them with a minimum of interruption. We must gain access, to our facilities and equipment, as repair and maintenance is required, providing a work area that is safe for all concerned.

It is National Grid's goal to maintain good relations with the general public. Employees in the field can create public goodwill by the way they conduct themselves and the way they arrange and maintain the traffic work zone.

You can help to maintain a reputation as a good neighbor by making it your standard work practice to use these principles of work zone traffic control.

5.1 Planning Considerations

5.1.1 Maintain street work areas for only as long as is absolutely necessary to quickly and safely move in, do the job, and move out, minimizing obstructions to traffic and exposure to accidents.

5.1.2 Plan according to the work area and duration of work.

5.1.3 Consider the character of the area around the work zone.

5.1.4 Install and securely anchor approved bridging over excavations where pedestrian and vehicular traffic must be maintained during the job.

5.1.5 Take special care to provide suitable boundary definitions and/or barricades to make pedestrians and drivers of vehicles aware of work area boundaries.

5.1.6 Plan in advance for:

- Speed of traffic
- Volume of traffic
- Any changes in the above which may occur during the work operation
- Duration of work
- Traffic approaches
- Pedestrian traffic
- Work vehicle movements above work zone

5.1.7 Maintain the smallest work area consistent with safe operations being guided by the following limitations:

a. Width of work area. The width of a work area, generally, should not exceed the width of one traffic lane. The job should be worked in steps; or in congested areas with unusual traffic conditions, notify appropriate police agency and/or DOT officials.

b. Length of work area. Whenever possible, place tools, equipment, vehicle, or other suitable barriers between the working point and oncoming traffic. Additional area required for essential equipment may be obtained by increasing the work area in the direction of the flow of traffic.

5.1.8 Day or night, warning lights on vehicles and barricades should be operating before moving out into traffic lanes.

5.1.9 Planned consideration should be given for a flagger when the work area extends into traffic lanes. The flagger shall be equipped with a stop and slow paddle and Class 2 or higher high visibility/reflective outer clothing. Channelization is preferred to flagging operations, when two-way traffic can be maintained.

5.1.10 Determine in advance the need for specific traffic control devices including additional special equipment which may be necessary. Consider who will install, maintain and remove the devices. For proper procedure concerning installation and removal of these devices, refer to Section 7.0.

5.1.11 Plan where work material and equipment will be stored.

5.1.12 Consideration should be given to preparation of an emergency traffic plan for unexpected incidents which cause complete closure of a roadway.

5.1.13 Refer to the Typical Control Plan diagrams (TCP's) in the Utility Work Zone Traffic Control Field Guide and select the setup which most closely meets your requirements, adapting it where necessary to meet local conditions.

5.1.14 For night operations or work areas left with traffic restrictions at night, illumination may be required in addition to flashing and steady lights on warning and guide devices.

6.0 SELECTING THE TYPICAL APPLICATION

Selecting the most appropriate typical application for a temporary traffic control zone requires knowledge and understanding of that zone. Three factors are used to characterize the typical applications: speed and volume (roadway type), duration of work and exposure to hazards.

Work duration is a major factor in determining the number or types of devices used in temporary traffic control zones. The five categories of work duration and their time at a location are as follows:

6.1 Duration of Work

6.1.1 Long-Term Stationary

Work that occupies a location more than three days.

At long-term stationary temporary traffic control zones, there is ample time to install and realize benefits from the full range of traffic control procedures and devices that are available for use. Generally, larger channelizing devices are used, as they have more retro- reflective material and offer better nighttime visibility. The larger devices are also less likely to be displaced or tipped over-an important consideration during those periods when the work crew is not present. Furthermore, as long-term operations extend into nighttime, retro-reflective and/or illuminated devices are required.

6.1.2 Intermediate-Term Stationary

Work that occupies a work location for more than one daylight period up to three days, or nighttime lasting more than one hour.

Typically, the work zone is occupied by excavations, materials, and/or equipment at times when workers are not present. At least one advance warning sign should face each direction of traffic approaching a long duration stationary work area. When such an area uses a portion of the roadway, channelizing devices should be used. For long duration work areas, larger signs and more conspicuous channelizing devices are usually warranted to control traffic. Conditions normally require attention by the person responsible for traffic control during work of long duration. Warning, delineation and channelization devices should be effective under varying conditions of light and weather. Devices should be kept current and flagger signs should be covered or turned from view when the flagger is not on duty.

6.1.3 Short-Term Stationary

Work that occupies a work location for more than 1 hour, within a single daylight period.

Most utility operations are short-term stationary work. The work crew is present to maintain and monitor the temporary traffic control zone. The use of a flagger is an option depending on road speed and volume. Lighting and/or retro-reflective devices should be chosen to accommodate varying seasonal, climatic, and visibility situations.

This would be work of a type that at the conclusion of the work day or emergency period, the area is returned to its original state in regard to traffic restrictions. It includes operations such as overhead utility repair, and work on underground utilities at manholes. At least one advance warning sign shall face each direction of traffic approaching the work area. When such an area occupies a portion of the roadway, channelizing devices should be used. As the size of a work area that occupies a travel lane increase, the number of traffic control devices should be increased. For short duration stationary work areas, portable signs, consistent with the need for advance warning and adequate notice, supplemented with cones and barricades are generally sufficient to control traffic.

6.1.4 Short Duration

Work that occupies a location up to one hour.

During short duration work, there are hazards involved for the crew in setting up and taking down the traffic controls. Also, since the work time is short, the time during which motorists are affected is significantly increased as the traffic control is expanded. Considering these factors, it is generally held that simplified control procedures may be warranted for short duration work. Such shortcomings may be offset by the use of other, more dominant devices such as special lighting units on work vehicles, such as arrow displays and flashing beacon lights.

It includes operations such as tree-trimming, overhead utility repairs and work at underground utilities at manholes lasting more than 15 minutes at one location.

6.1.5 Mobile Work

Work that moves intermittently or continuously.

Mobile operations often involve frequent short stops, each as much as 15 minutes long, for activities such as removal of debris from the roadway, operating a power distribution switch, changing a street light lamp, operating a gas valve, gas leak detection operations, surveying, inspections and other utility operations that are similar to stationary operations. Warning signs, flashing beacon lights, flags, and/or channelizing devices should be used. Each worker shall be highly visible to approaching traffic.

Mobile operations also include work activities in which workers and equipment move along the road without stopping, usually at slow speeds. The advance warning area moves with the work area. Traffic should be directed to pass safely. For some continuously moving operations-where volumes are light and visibility is good, a well marked and well signed vehicle may suffice. If volumes and/or speeds are higher, a shadow or backup vehicle equipped as a sign truck, preferable supplied with a flashing arrow display, should follow the work vehicle. Where feasible, warning signs should be placed along the roadway and moved periodically as the work progresses. In addition, vehicles may be equipped with such devices as flags, flashing vehicle lights, truck-mounted attenuators, and appropriate signs. These devices may be required individually or in various combinations, including all of them, as determined necessary.

Safety should not be compromised by using fewer devices simply because the operation will frequently change its location. Portable devices should be used. Flaggers may be used, but caution must be exercised so they are not exposed to unnecessary hazards. The control devices should be moved periodically to keep them near the work area. If mobile operations are in effect on a high-speed travel lane of a multilane divided highway, flashing arrow displays should be used.

6.2 Location of Work

The choice of traffic control needed for a temporary traffic control zone depends upon where the work is located. As a general rule, the closer the work is to traffic, the more control devices are needed.

6.2.1 Outside of the shoulder edge

Devices may not be needed if work is confined to an area 15 or more feet from the edge of the shoulder. Consideration should be given to roadway characteristics, roadway geometrics, and vehicle speed.

A general warning sign shall used if workers and equipment are within 15 feet or less of an uncurbed roadway or 2 feet or less of a curbed roadway.

6.2.2 On or near the shoulder edge

The shoulder should be signed as if work were on the road itself, since it is part of the driver's recovery area. Advance warning signs are needed. Channelizing devices are used to close

the shoulder, direct traffic, and keep the work space visible to the motorist. Portable barriers may be needed to prevent encroachment of errant vehicles into the work space and to protect workers.

6.2.3 On the median of a divided highway

Work in the median may require traffic control for both directions of traffic, through the use of advance warning signs and channelization devices. If the median is narrow, with a significant chance for vehicle intrusion into long-term work sites and/or crossover accidents, portable barriers should be used.

6.2.4 On the traveled way

Work on the traveled way demands optimum protection for workers and maximum advance warning for drivers. Advance warning must provide a general message that work is taking place, information about specific hazards, and actions the driver must take to drive through the temporary traffic control zone.

6.3 Roadway Type

Roadway type is also a primary factor in the use of temporary traffic control zone traffic control devices.

6.3.1 Rural two lane roadways

Characterized by relatively low volumes and high speeds.

6.3.2 Urban arterial roads

Often have lower speeds, but they may require significant controls because of higher traffic volumes and closer spacing of such design features as intersections.

6.3.3 Other urban streets

Characterized with light traffic volumes will generally require fewer more closely spaced devices.

6.3.4 Rural or urban multilane divided and undivided highways

6.3.5 Intersections

6.3.6 Freeways

Major arterials and freeways need the highest type of traffic control, primarily because of high speeds and often high volumes of traffic.

7.0 SIGNS

7.1 Location of Signs

7.1.1 Signs shall be placed where they convey their messages effectively and placement must therefore be accommodated to highway characteristics. Signs shall be so placed that the driver will have adequate time for response.

7.1.2 As a general rule signs shall be located on the right side of the roadway. Where special emphasis is deemed necessary, dual installations may be made which consist of duplicate signs opposite each other on the left and right sides of the roadway. Within a construction or maintenance zone, however, it is often necessary and/or desirable to place signs on portable supports placed within the roadway itself. It is also permissible to mount appropriate signs on barricades.

7.1.3 All signs should be mounted at approximately right angles to the direction of, and facing, traffic which they are to serve. Signs mounted on barricades, or temporary supports may be at lower heights but the bottom of the sign shall be not less than one foot above the pavement elevation. However, higher mounting heights are desirable.

7.2 Regulatory Signs

Regulatory signs (for example, speed limit reductions) impose legal compulsions or restrictions on motorists. Therefore, their use must be officially authorized by the agency having responsible jurisdiction.

7.3 Warning Signs

Warning signs are the most important type of signs used in connection with the maintenance and construction operations. Motorists, properly alerted to the physical conditions ahead, should be able to adjust the operation of their vehicles to safely negotiate the maintenance, construction or detour zone.

Warning signs are normally placed in advance of the condition for which they are intended. The advance posting distance for these signs will vary with the approach speed of traffic, the type of maintenance or construction activity, the roadway conditions, and the number and type of signs and other devices used.

Visibility of each sign should be examined with respect to grade, alignment, road curvature and other possible obstructions on the approach to the sign.

For maximum mobility and safety on certain types of maintenance operations, a large sign may be effectively mounted on a vehicle stationed in advance of the work or moving along with it. This may be the working vehicle itself, as in the case of gas leak mobile and street light work, or a vehicle provided expressly for this purpose. These mobile sign displays may be mounted on a trailer, may be provided with self-contained electric power units for flashing beacons and lights, or may be mounted on a regular maintenance vehicle.

7.4 Guide Signs

Guide signs are used to direct traffic through and around maintenance and construction operations where temporary route changes are necessitated by highway closures and detours.

8.0 BARRIERS AND CHANNELIZATION

8.1 Function

Barriers and channelizing devices, when properly used, are often essential to properly control and direct the movement of traffic through or around maintenance and construction projects.

- 8.1.1These devices are used to mark a limited channel of traffic or to close off sections of highways.
- The work vehicles themselves may be used to protect the work area, particularly in low speed urban districts.
- Consideration should always be given to the need for lighting devices at night.

8.2 Channelization

A very important element, within the system of traffic control devices commonly used in construction or maintenance areas (where a reduction in pavement width is involved), is the taper that is provided for channelization.

8.3 Barricades

Barricades are used to physically block off all or part of a roadway.

- If barricades extend across a roadway and shoulder as a fence, availability of access for maintenance or construction forces must be considered.
- Roadways should be narrowed gradually. This gradual narrowing may be accomplished by means of the barricades themselves or by placing cones, drums, or vertical panels in advance of the barricades. An alternate method is to install the barricades at intervals with each successive barricade extending further into the roadway. At night, consideration should be given to the use of delineators or steady-burning lighting devices to indicate the path to be followed and/or of obstructions within the roadway.
- Barricades may also be used to confine traffic to certain lanes or paths of travel for certain distances. These may be placed longitudinally or transversely to the path of travel. Cones, drums, or vertical panels may be used longitudinally or diagonally.

8.4 Auxiliary Devices

When used to require a change in direction or reduction in the number of lanes available, the change should be made gradually.

8.4.1 Cones

a. Cones shall be predominantly orange in color and may be supplemented with warning flags.

b. Cones should be kept clean and bright for maximum target value.

c. For night time use, they shall be reflectorized or equipped with lighting devices for maximum visibility.

8.4.2 Drums

Drums are less portable than cones but provide greater emphasis. They may be used to surround a work area. Drums shall not be placed in the roadway without advance warning signs.

8.4.3 Warning Lights

Warning lights are used to illuminate and emphasize the existence of obstructions and hazards at night. They may be used as necessary as a supplement to reflectorized signs, barricades and other channelizing devices. Warning lights used in series to supplement channelizing devices should be steady-burning, except that the first two lights in series may flash.

Warning lights consist of steady-burning lights, flashing lights and flashing arrow boards.

a. Steady burning lights include all single-unit, steady-burning, low-intensity lamps which emit yellow light.

b. Flashing yellow lights. They are used for advance warning or for marking a severe or unexpected obstruction or hazard in or near the roadway.

c. Flashing arrow boards. A portable unit, consisting of flashing indications arranged to form an arrow symbol, may be used with standard warning devices on highway obstructing maintenance and construction projects.

   1. A unit may be trailer mounted or it may be mounted on a vehicle and arranged so that it can be displayed or turned from view as necessary.

   2. When these units are used on a moving vehicle, controls and pilot lights should be located so that the message display can be monitored and changed from within the driving compartment of the vehicle.

8.4.4 Work Zone Enhancement Devices

Includes; telescoping bars, portable crowd control barriers, such as Color-cade barriers and other protective devices are used to provide additional measures for keeping pedestrians,

bicyclists, etc. from entering into the work area. Traffic control devices must meet the criteria for NCHRP Report 350 standards. However, common devices such as telescoping bars between cones and Color-cade barriers that are typically used within the work zone are not intended for vehicle protection but to prevent pedestrian incursion into the work zone.

9.0 INSTALLATION AND REMOVAL OF DEVICES

9.1 Protection

Installation and removal of devices, in itself, constitutes highway work that should be protected by means appropriate to the situation, such as hazard vehicle lights and vehicle emergency flashers. Establishing a work area within an intersection, or at a freeway interchange, may warrant greater protection.

9.2 Order of Work

1 Device installation normally proceeds from the beginning of the work zone to the far end. On a two-way road, the less affected direction should be set up before the more affected one. The work vehicle used should move in the same direction as traffic in the roadway half being set up.

2 On a one-way roadway, device removal is normally started at the downstream end with removal of the last work area protection device. Channelizing devices are then removed, from downstream to upstream, with those in advance of the workers continuing to provide protection, until the roadway is cleared. Removal of advance warning signs on the shoulder is normally accomplished with a work vehicle traveling in the direction of traffic flow.

10.0 EMPLOYEES EXPOSED TO VEHICULAR TRAFFIC

10.1 Clothing Requirements

a. High visibility safety apparel is required to maximize employee protection when exposed to the risks of moving roadway traffic or construction equipment.

b. Employees must wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Safety Apparel" or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 exposure.

c. High-visibility safety apparel is defined as company approved:

   1. Safety vests
   2. Rain gear (jacket or jacket and pants ensemble), or
   3. Garments worn over the outer layer of clothing

d. Flaggers - safety apparel meeting ANSI 107-2004 standard performance Class 3 risk exposure should be considered for:

   - Flagging at night
   - Flagging in inclement weather and similar lowlight conditions
   - Flagging in high speed/volume traffic areas
   - When determined by the competent person in charge

e. Any exception for not wearing high-visibility safety apparel must be valid and must be documented on the job brief by the individual exposed to the risks of moving roadway traffic or construction equipment and by the responsible person in charge.

11.0 FLAGGERS

11.1 Application

Consideration should always be given to the need for flaggers to control traffic on a maintenance or construction project where traffic is permitted to travel through or adjacent to the work area. However, the decision to use or not to use a flagger in a particular situation rests with the person in charge of the operation.

1 STOP/SLOW Paddles. Paddles are the preferred tool to use when performing flagging duties.

2 Flags. A 24" x 24" Red Flag may be used for flagging in emergencies when STOP/SLOW paddles are not available. Red Flags are also acceptable when flagging at four-way intersections.

11.2 Flagger Stations

11.2.1 Flagger stations should be located far enough from the work site so that vehicles will have sufficient distance to slow down before entering the project but not so far that vehicles will tend to speed up into the work site.

11.2.2 Normally the flagger will be positioned adjacent to the traffic lanes being controlled either on the shoulder or in the barricaded lane. At a spot obstruction the flagger should stand on the shoulder opposite the barricaded section.

11.2.3 The flagger should stand alone, never permitting a group of workers to congregate around him or her. The flagger should be stationed sufficiently in advance of the work area to warn workers of approaching danger, such as out-of-control vehicles.

11.2.4A flagger warning sign shall be used facing each direction of traffic. These advance warning signs are optional for very brief periods or emergency traffic control.

11.2.5 Flagger Stations at night time shall be illuminated, except in emergency situations.

11.3 One-Lane Control

Where traffic in both directions must, for a limited distance, use a single lane, provisions should be made for alternate one-way movement to pass traffic, through the constricted section. However, where the one-lane section is of any significant length, there should be some means of coordinating movements (for example, walkie-talkies, hand signals, etc.) at each end so that vehicles are not simultaneously moving in opposite directions in the section and so that delays are not excessive at either end. Control points at each end of the route should be chosen so as to permit easy passing of opposing lines of vehicles.

12.0 VEHICLES IN THE WORK AREA

1 All vehicles in the work area shall activate their vehicle hazard warning flashers in addition to their beacon/flashing lights for the duration of the work.

2 As vehicles approach the work area they should activate their vehicle hazard warning lights along with the beacon/flashing to indicate to traffic that they are slowing down and preparing to enter the work zone.

3 Drivers of vehicles with portable beacon lights shall not attempt to activate or affix the lights to the vehicle while driving.

4 Beacon/Flashing lights are intended as hazard warning lights. These lights are not considered “Emergency Response Lights” and should not be used as such. It is, however permissible to use the Beacon/Flashing light while performing patrol or shadow vehicle activities when the vehicle speed is below the normal speed limit creating a potential traffic hazard.

5 All vehicle lights shall be approved for use by Fleet and only used in accordance with manufacturers’ instructions, local, state and federal law.

13.0 REFERENCES

13.1 49 CFR, Manual of Uniform Traffic Control Devices. 2003, rev 1 & rev2

13.2 NYCRR, Title 17, Volume (b), Chapter V, Uniform Traffic Control Devices.

13.3 29 CFR 1926.201 - Signaling,

13.4 29 CFR 1926.202- Barricades,

13.5 29 CFR 1926.203- Definitions,

13.6 29 CFR 1910.269, Electrical Power Generation, Transmission and Distribution.

13.7 Utility Work Zone Traffic Control, Wayne State University, August 2008

13.8 ANSI 107-2004

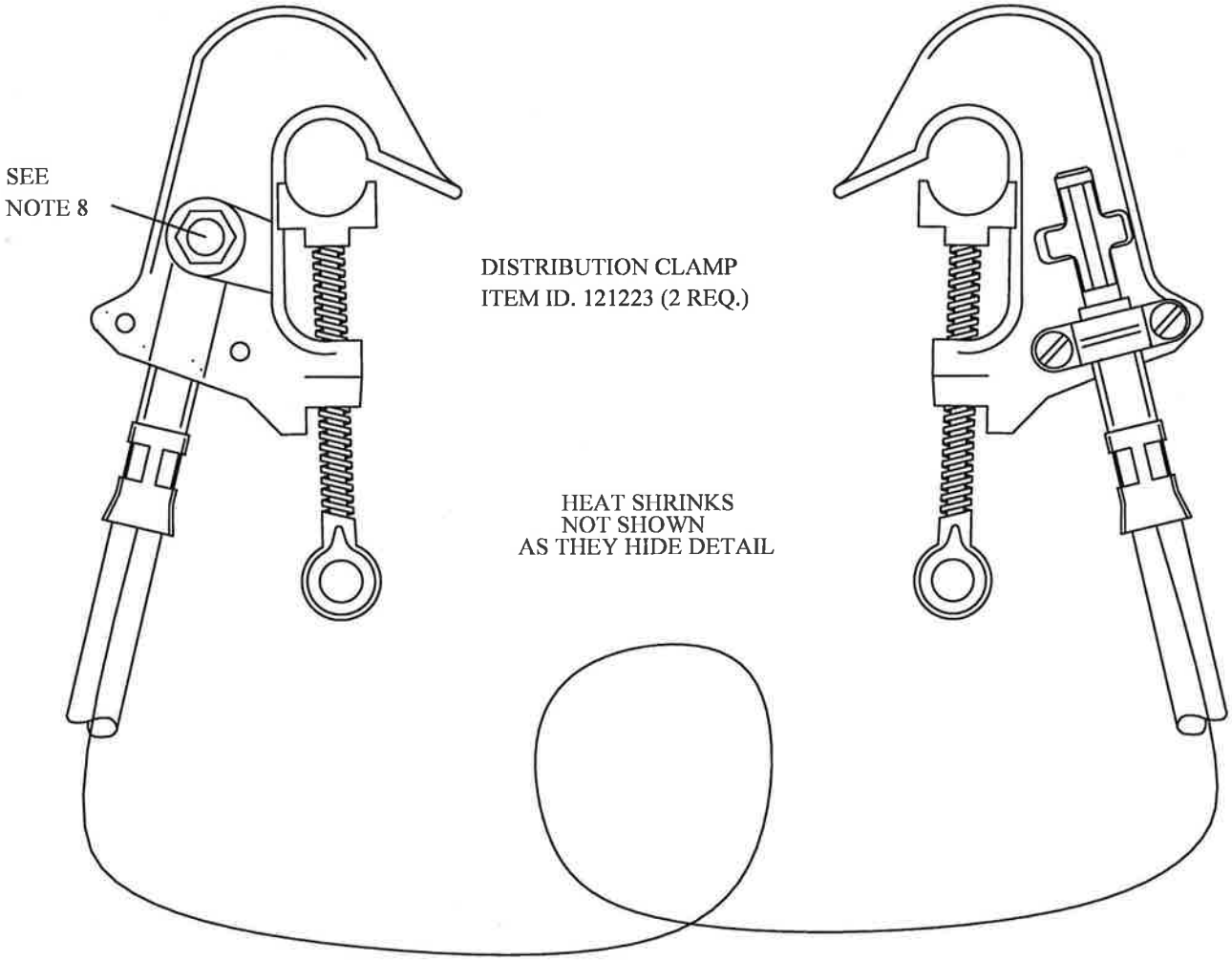
APPENDIX G

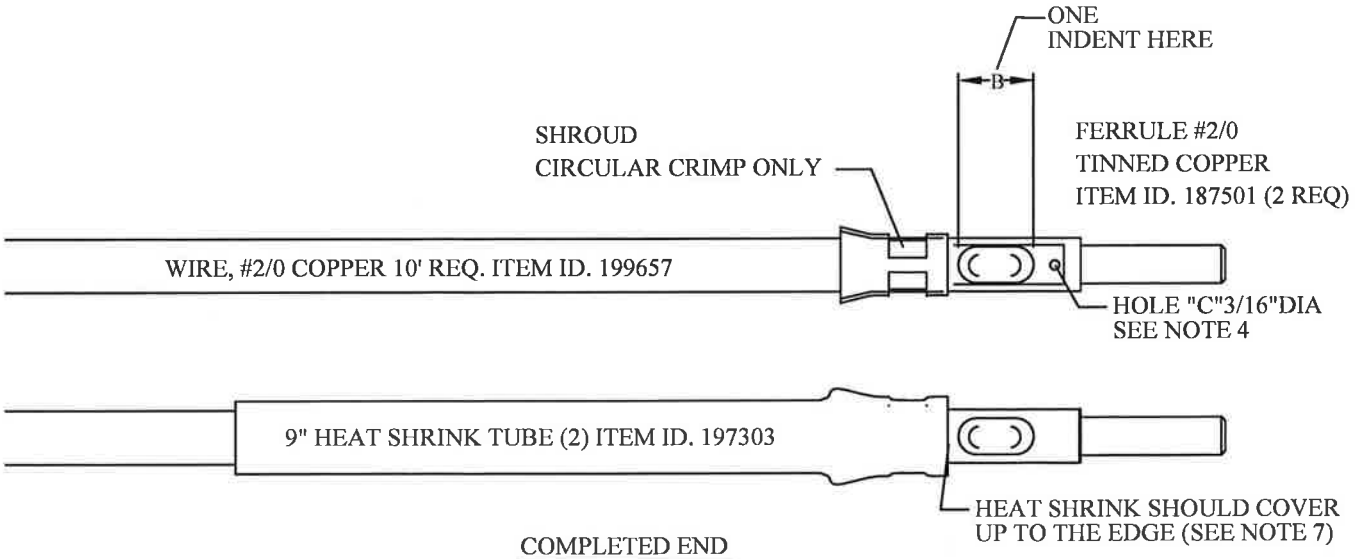
HASP ANNUAL CHECKLIST

Arverne (Former Edgemere) Substation Site HASP Annual Checklist Date Completed: _____	
Have all national Grid procedure revisions been incorporated into HASP?	
Are there any new procedures to be incorporated into the HASP?	
Is all contact information in the HASP current and correct?	
Has the scope of work changed? If so, are changes reflected in HASP?	
Does the Activity Hazard Analysis need to be revised?	
Have any attributes of the LIPA substation and its associated procedures and regulations changed?	
Does GEI have the most up to date LIPA maps?	
Has GEI obtained the most recent as-built drawings of the transmission/distribution line layout from National Grid?	

APPENDIX H

LIPA POLICIES

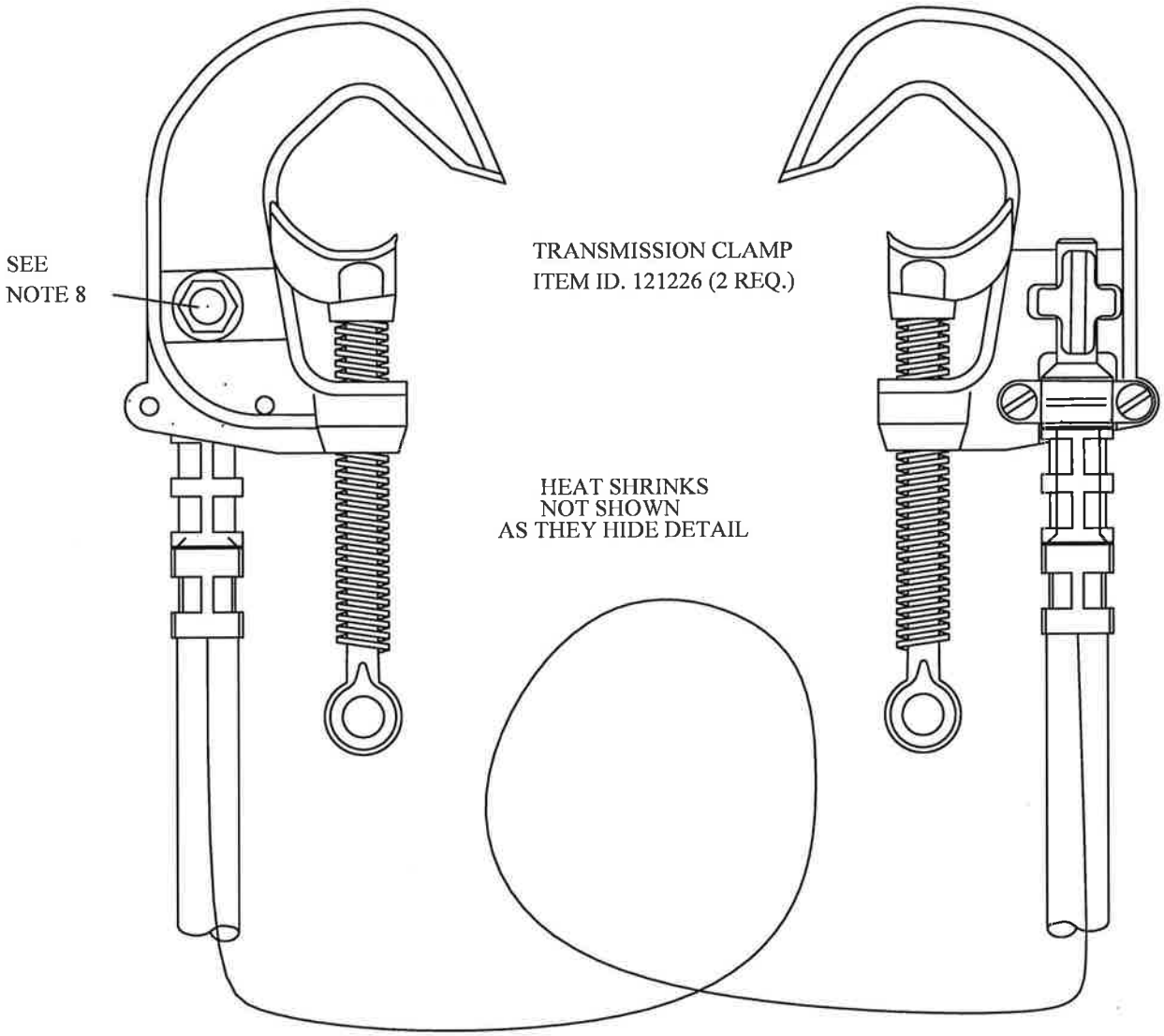


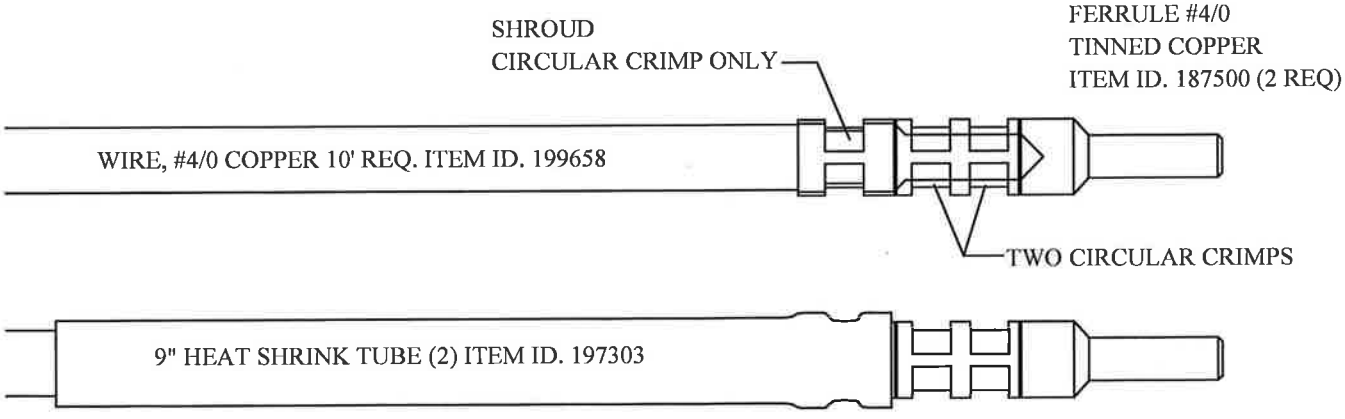


COMPLETED END

SEE SHEET 3 FOR PROCEDURE

APPROVED BY	REVISION	GROUNDING PRACTICES: GENERAL	CONSTRUCTION STANDARD DRAWN BY AH		
DATE: 09/14/04	12. 08/04: GENERAL UPDATE	PORTABLE GROUNDING ASSEMBLIES DISTRIBUTION (#2/0)	NUMBER	SHEET No	REV
LONG ISLAND POWER AUTHORITY			3575	1 of 3	12
prepared by KeySpan Energy Corporation					





COMPLETED END

SEE SHEET 3 FOR PROCEDURE

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	12. 08/04: GENERAL UPDATE	PORTABLE GROUNDING ASSEMBLIES TRANSMISSION (#4/0)	NUMBER	SHEET No	REV
LONG ISLAND POWER AUTHORITY KeySpan Energy Corporation			3575	2 of 3	12

NOTE: THE TWO CLAMPS FOR ONE ASSEMBLY MUST BE THE SAME.

PROCEDURE

1. CUT CABLE TO 10 FOOT LENGTH.

2. REMOVE NEOPRENE INSULATION AND PAPER SEPARATOR FOR DISTANCE INDICATED IN TABLE I.

3. PENCIL INSULATION FOR A DISTANCE OF 5/16" IF INDICATED IN TABLE I.

4. CHECK HOLE MARKED "C" (IF AVAILABLE) TO BE SURE THAT CONDUCTOR IS SNUG IN FERRULE.

5. APPLY INDENT OR CIRCULAR CRIMP WITH APPROPRIATE TOOL IN SECTION MARKED "B".

6. APPLY CIRCULAR CRIMP ON FERRULE COLLAR.

7. APPLY A 9" LONG HEAT SHRINK TO PROVIDE A SEAL BETWEEN THE FERRULE AND CONDUCTOR CONNECTION. IF HOLE "C" DOES EXIST SOLDER FILL THE HOLE COMPLETELY TO SEAL IT.

8. TORQUE 1/2" HARDWARE TO 25 FOOT POUNDS, AFTER ITEMS HAVE BEEN ASSEMBLIED.

TABLE I

FERRULE SIZE	REMOVE INSULATION	PENCIL LENGTH	TOOL	DIE	
				SECTION "B"	SHROUD
4/0	2"	-	Burndy Y-35	U - L	U - L
2/0	1"	5/16"	Burndy Y-35	U - 658 & Y35P3**	U - 658
			Burndy Y-34A ***	Nest A27D Indent Y34PR - 2	A - 658
			Amp 69099M1 *	46767 - 2 (2/0)	-

*For General Shops Use Only
**Must use 1/2 of each die set to make one indent crimp.
***May not work with ferrules from every manufacturer.

REVISION		GROUNDING PRACTICES: GENERAL	CONSTRUCTION STANDARD DRAWN BY AH		
	12. 08/04: GENERAL UPDATE	PORTABLE GROUNDING ASSEMBLIES #2/0 AND #4/0	NUMBER	SHEET No	REV
LONG ISLAND POWER AUTHORITY prepared by: KeySpan Energy Corporation			3575	3 of 3	12

Appendix E

Community Air Monitoring Plan

GEI Consultants

Geotechnical
Environmental and
Water Resources
Engineering

Community Air Monitoring Plan

Arverne (Former Edgemere) Substation Site

Rockaway Beach Boulevard and 53rd Street
Arverne, New York
AOC Index No. R2-0330-98-01
Site No. V00147

Submitted to:
National Grid
175 East Old Country Road
Hicksville, NY 11801

Submitted by:
GEI Consultants, Inc., P.C.
400 Unicorn Park Drive
Woburn, MA 01801
781-721-4000

110 Walt Whitman Road, Suite 204
Huntington Station, NY 11746
631-760-9300

December 1, 2014
093140

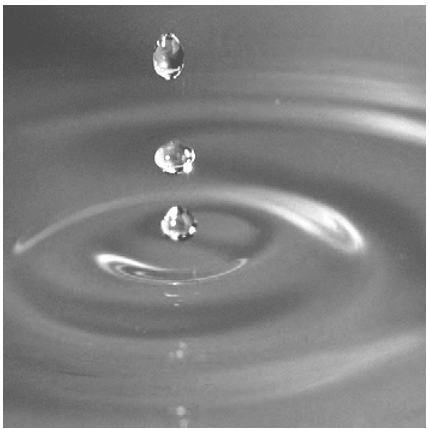


Table of Contents

Tables

Figures

Attachment 1

H:\WPROC\Project\NationalGrid\Edgemere\Site Management Plan\SMP-2014\FINAL\Appendix F - CAMP\SMP_AppF.v00147.2014-12-01.CAMP.docx

Abbreviations and Acronyms

CAMP	Community Air Monitoring Plan
CM	Construction Manager
DUSR	Data Usability Summary Report
GEI	GEI Consultants, Inc., P.C.
MGP	Manufactured Gas Plant
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PM-10	Particulate Matter Less than 10 Micrometers in Size
TVOC	Total Volatile Organic Compounds
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
$\mu g/m^3$	micrograms per meter cubed
ppm	parts per million

Executive Summary

This Community Air Monitoring Plan (CAMP) Work Plan has been developed to provide procedures for measuring, documenting, and responding to potential airborne contaminants during intrusive activities below the clean soil cover associated with the Arverne (Former Edgemere) Substation Site (Site) property. The procedures in this CAMP focus on air monitoring techniques and contingency measures designed to mitigate potential airborne contaminants. This CAMP Work Plan is based on the CAMP guidelines established by the New York State Department of Health (NYSDOH) in the New York State Department of Environmental Conservation (NYSDEC) *DER-10 Technical Guidance for Site Investigation and Remediation* (DER-10) (NYSDEC, 2010).

The CAMP provides Air Monitoring Procedures, Alert Levels, Response Levels, Action Levels, and Contingency Measures if Action Levels are approached. Alert Levels are National Grid internal established concentration levels for volatile organic compounds only and are not established by the NYSDOH or NYSDEC. Alert Levels are set below the levels established by the NYSDOH so that actions can be taken prior to exceeding a NYSDOH threshold. An Alert Level serves as a screening tool to trigger contingent measures if necessary, to assist in minimizing off-site transport of contaminants during remedial activities. A Response Level is a contaminant concentration level that triggers a temporary work stoppage, continued monitoring, and potential contingent measures. An Action Level is a contaminant concentration that triggers work stoppage and implementation of contingent measures to mitigate potential airborne contaminants prior to resuming work activities. Response Levels and Action Levels are NYSDOH threshold levels established in the May 2010 NYSDOH Generic CAMP presented in Appendix 1A of DER-10. Exceedances of either Response Levels or Actions Levels will be reported to NYSDEC and NYSDOH.

During times of potential related ground intrusive activities below the clean soil cover, perimeter air monitoring will be conducted using a combination of fixed-station, moveable tripod-mounted, and “walk-around” air monitoring equipment (as appropriate). Monitoring will be performed for total volatile organic compounds (TVOC) and dust along the Site perimeter 24 hours a day when fixed stations are used or during working hours if the movable tripod-mounted units are used. The Contingency Plan defines Alert Levels, Response Levels, Action Levels, and specific contingency measures to be implemented. The response actions, potentially including work stoppage and work area controls by various methods, are intended to prevent or significantly reduce the migration of airborne contaminants from the Site.

GEI Consultants, Inc., P.C. (GEI) will implement the CAMP and will report any exceedance of Response Levels and Action Levels to the Contractor, the Construction Manager, National Grid, NYSDOH, and NYSDEC. As specified in the DER-10, all 15-minute readings will be recorded and be available for State (NYSDEC and NYSDOH) personnel to review. The contractor conducting intrusive activities below the clean soil cover will be responsible for enacting contingency measures to respond to Alert Levels, if necessary, and to the exceedances of Alert and Action Levels as they may occur. GEI will provide data summary reports to the Contractor, the Construction Manager, National Grid, and NYSDEC each week during ground intrusive activity below the clean soil cover.

1. Introduction

The New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan (CAMP), as presented in New York State Department of Environmental Conservation's (NYSDEC) document *DER-10 Technical Guidance for Site Investigation and Remediation*, recommends that real-time monitoring for total volatile organic compounds (TVOC) and particulates (i.e. dust) be conducted at the downwind perimeter of each designated work area during ground intrusive activities at contaminated sites. As such, this work plan describes the proposed air monitoring means and methods that will be implemented during intrusive activities below the clean soil cover at the Arverne (Former Edgemere) Substation Site (Site). A site location map is shown in Figure 1.

The purpose of the CAMP is to provide early detection in the field of potential short-term emissions and will be conducted in accordance with the generic NYSDOH CAMP.

The objectives of the CAMP are as follows:

- Provide an early warning system to alert the Contractor, the Construction Manager (CM), National Grid, and NYSDEC that concentrations of TVOC or dust in ambient air are approaching Action Levels due to Site activities.
- Provide potential contingency measures to be enacted by the contractor conducting intrusive activities below the clean soil cover and related contractors that are designed to reduce the off-site migration of contaminants if established Action Levels are approached or exceeded.
- Determine whether construction controls are effective in reducing ambient air concentrations to below Action Levels and make appropriate and necessary adjustments.
- Develop a permanent record that includes a database of perimeter air monitoring results, equipment maintenance, calibration records, and other pertinent information.

1.1. Roles and Responsibilities

GEI Consultants, Inc., P.C. (GEI) will implement the monitoring and reporting components of this CAMP under contract with National Grid. The contractor performing intrusive activities below the clean soil cover is responsible for the selection and implementation of appropriate contingency measures that will mitigate the off-site

migration of contaminants in response to Action Levels being approached or exceeded. The remainder of this section specifies the roles and responsibilities of each entity relative to the CAMP. A communication flowchart is shown in Figure 2 with each entity and lines of communication for the CAMP.

1.1.1 GEI Consultants, Inc., P.C.

The scope of GEI's activities will be limited to CAMP monitoring and reporting used for the CAMP. GEI is responsible for the Health and Safety of their employees. GEI's CAMP roles and responsibilities are as follows:

- GEI will monitor and record total volatile organic compounds (TVOC) and dust at various locations around the Site as described in the following sections of this CAMP.
- On a daily basis, GEI will communicate to the following entities whether TVOC or dust exceeded Response Levels or Action Levels specified in Section 2.1, and suggest corrective actions required to address the situation. GEI will convey the CAMP results to the entities listed below and inform them if the Alert or Response Levels have been exceeded. GEI will direct contractors at the Site to take action if warranted.

    - **Contractor – TBD**
    - **New York State Department of Environmental Conservation**
      Sondra Martinkat – Environmental Engineer 2
      Office: (718) 482-4891
      Region 2 Office, Division of Environmental Remediation
      47-40 21st Street
      Long Island City, New York 11101
    - **National Grid**
      Theodore Leissing –Manager – Long Island Area
      Office: (516) 545-2563
      175 East Old Country Road
      Hicksville, NY 11801
    - **Construction Manager - TBD**

- GEI will provide, maintain, and operate the equipment used to implement the CAMP.
- GEI will provide data summary reports to the Contractor, CM, National Grid, and NYSDEC each week during intrusive activity. The reports will identify Response

Level and Action Level exceedances and will include data summary reports for all TVOC and dust data collected.

1.1.2 Contractor

The Contractor is the lead contractor responsible for site activities pertaining to the intrusive activities below the clean soil cover. The Contractor will be responsible for taking contingent actions in conjunction with National Grid in response to Response Level and Action Level exceedances. The Contractor will be responsible for taking contingent actions for Alert Levels, if required by GEI, CM, and/or National Grid. The Contractor is responsible for the Health and Safety of their employees.

1.1.3 National Grid

National Grid has the responsibility to provide mitigation services related to the release of MGP-related vapors in excess of CAMP Response Level and Action Levels. National Grid is also ultimately responsible for the remediation of the Site under an approved work plan with NYSDEC.

1.1.4 New York State Department of Environmental Conservation

NYSDEC is responsible for the environmental regulatory enforcement for all activities conducted at the site including compliance with this CAMP, stormwater runoff mitigation (erosion and sediment control), and all environmental and remediation regulations, policies, and guidance applicable to the Site. NYSDEC may provide on-site oversight personnel for the work being conducted.

1.1.5 Construction Manager

The CM is National Grid's representative on site and is responsible for day-to-day operations on the Site. The CM will be responsible for directing the Contractor to take contingent actions in conjunction with National Grid in response to Alert Level (TVOC only), Response Level, and/or Action Level exceedances. The CM is responsible for the Health and Safety of CM employees and subcontractors.

2. Sampling and Analytical Procedures

This section of the CAMP presents a detailed description of the air monitoring, air sampling, and analytical procedures, including data management that will be used during ground intrusive site activities. The intent of the real-time monitoring program is to provide early detection in the field of short-term emissions and off-site migration of site-related TVOC and dust.

Real-time monitoring methods will be utilized to measure ambient air concentrations during the project. Monitoring for TVOC and respirable particulate matter (particulate matter less than 10 micrometers in size [PM-10]) will occur at a minimum of two locations and wind direction will be monitored in real-time if an automated monitoring system is utilized. Supplemental monitoring for TVOC and PM-10 will occur along the perimeter of the project site on an as-needed basis. In the event of a possible exceedance of a Response Level or Action Level for TVOC or PM-10, GEI will compare upwind (background) concentrations to downwind concentrations within 60 minutes of the possible exceedance to determine if site activity is causing the Response Level or Action Level exceedance. The air monitoring procedures and equipment are detailed below.

2.1 Alert Level, Response Level, and Action Levels

Alert Levels are not established by the NYSDOH or NYSDEC. An Alert Level is a National Grid internally established concentration levels for TVOC only. An Alert Level is set below the levels established by the NYSDOH so that action can be taken prior to exceeding a NYSDOH threshold. An Alert Level serves as a preemptive screening tool for TVOC to trigger contingent measures if necessary, to assist in minimizing off-site transport of contaminants during remedial ground intrusive activities.

Response Levels are NYSDOH thresholds levels established in the May 2010 NYSDOH Generic CAMP presented in Appendix 1A of DER-10. A Response Level is a contaminant concentration that triggers a temporary work stoppage, continued monitoring, reporting, and/or potential contingent measures. A Response Level serves as a preemptive tool for PM-10 to trigger contingent measures if necessary, to assist in minimizing off-site transport of contaminants during remedial ground intrusive activities.

Action Levels are NYSDOH threshold levels established in the May 2010 NYSDOH Generic CAMP presented in Appendix 1A of DER-10. An Action Level is a contaminant concentration that triggers work stoppage, continued monitoring, reporting, and

implementation of contingent measures to mitigate potential airborne contaminants prior to resuming ground intrusive activities.

For example, if high concentrations of dust are detected on the Site, contingent measures such as spraying water on dry soils may be required to reduce the concentrations and keep them below the Response Level.

The following target parameters and corresponding Alert Levels, Response Levels, and Action Levels were developed in accordance with the NYSDOH Generic CAMP.

Target Parameter	**Alert Level**
TVOC (15-minute average concentration)	3.7 ppm greater than background*
Target Parameter	**Response Level**
Respirable Particulate Matter (PM-10)	100 $\mu g/m^3$ greater than background*
Target Parameters	**Action Level (**)**
TVOC (15-minute average concentration)	5.0 ppm greater than background*
TVOC (1-minute average concentration)	25 ppm
Respirable Particulate Matter (PM-10)	150 $\mu g/m^3$ greater than background*

ppm - parts per million
$\mu g/m^3$ - micrograms per meter cubed
TVOC – total Volatile Organic Compounds
* Background is defined as the current upwind fifteen-minute average concentration.
** Action Level Exceedance Requires Work Stoppage and Mitigation of the condition causing the Exceedance

2.2 Air Monitoring Procedures

During times of intrusive activities below the clean soil cover, perimeter air monitoring will be conducted using a combination of fixed-station, moveable tripod-mounted, and/or hand-held air monitoring equipment. Monitoring will be performed for TVOC and PM-10 along the Site perimeter 24 hours a day when fixed station equipment is used or during working hours if movable tripod-mounted or hand-held air monitoring equipment is used.

Monitoring for TVOC and PM-10 will occur at a minimum of two locations using real-time monitoring equipment. Readings will be checked manually on a predetermined periodic basis if tripod-mounted equipment is used. Readings will be recorded once per minute and transmitted to a centralized data logger system if fixed-station equipment is used. Supplemental hand-held perimeter monitoring for TVOC and PM-10 will occur along the perimeter of the project site on an as-needed basis. Each approach is detailed below.

It is anticipated that tripod-mounted equipment will be used for minimally intrusive work such as installation of soil borings or monitoring wells and during shallow intrusive work during substation facility upgrades. It is anticipated that fixed station equipment will only be used in the event of significant excavation work below the clean soil cover at the Site. Supplemental hand-held equipment will be used on an as-needed basis. This may include monitoring directed by National Grid or NYSDEC, or to supplement fixed monitoring station data in response to visible dust.

2.2.1 Fixed-Station Monitoring Procedures

Real-time fixed-station monitoring equipment will be positioned at a minimum of two locations upwind and downwind of the designated work area. The real-time fixed air monitoring stations will be positioned between the work zone and the largest number of potential off-site receptors. Therefore, the placement of the fixed air monitoring stations is based on the need to document all potential off-site migration on the perimeter, but also recognizes the potential off-site receptors and the location of the proposed construction activities. Figure 3 displays a typical arrangement of fixed air monitoring stations around the site. Real-time monitors will continuously gather data 24 hours a day 7 days a week.

The air monitoring stations will be supplemented with a meteorological station and a system of transmitting the real-time data to a central data storage location accessible by the project team in the project trailer or similar work area.

Each real-time fixed-station air monitoring station contains the following:

1. Station enclosure
2. A photoionization detector
3. A particulate aerosol monitor equipped with a PM-10 impactor
4. A data telemetry device

Air monitoring equipment will be housed in a protective weather-tight enclosure. Each monitoring station will continuously measure and record TVOC and PM-10 at a rate of one sample per minute and record 15-minute averages. Figure 4A shows an example of a fixed air monitoring station.

In addition to the air monitoring stations, a meteorological monitoring station will be established on site to continuously monitor and record temperature, relative humidity, wind speed, and wind direction. Fifteen-minute averages for each meteorological parameter will be transmitted to the central data storage location to determine upwind and downwind stations for assessing Alert, Response, and Action Levels.

All TVOC, PM-10, and meteorological data will be stored in data loggers located within each monitoring/meteorological station. Stored analytical data along with system performance data from each station will be sent in real-time, via telemetry, to the Site central computer system for monitoring and analysis. In the event of severe weather or power loss at the site, data recording and/or recovery may be affected.

2.2.2 Tripod Mounted Monitoring Procedures

Tripod-mounted monitoring equipment will be positioned along the Site perimeter to monitor the air based on a particular day's ground intrusive activities. At a minimum, one tripod-mounted station will be positioned upwind and one tripod-mounted station will be positioned downwind of the designated work area. Real-time monitors will continuously gather data during periods of ground intrusive activity during working hours. The equipment will be manually read on a predetermined periodic basis during the work activities.

The readings will be collected at a minimum of 15-minute intervals during periods of intrusive activities. Wind direction will be determined by using a wind sock or flagging placed on a pole at the Site.

Each tripod-mounted air monitoring station would include the following:

1. Station enclosure and Tripod
2. A photoionization detector
3. A particulate aerosol monitor equipped with a PM-10 impactor

Air monitoring equipment will be housed in a protective weather-tight enclosure. Each monitoring station will continuously measure and record TVOC and PM-10 at a rate of one sample per minute and record 15-minute averages. Figure 4B shows an example of a typical tripod-mounted air monitoring station.

All TVOC and PM-10 will be stored in data loggers located within each monitoring station. Data from each piece of equipment will be downloaded daily and stored on a central storage location. The location of each station, the work zone, and the wind direction will be recorded daily.

2.2.3 Supplemental Hand-held Monitoring

Supplemental hand-held monitoring equipment will be recorded downwind of the designated work area on an as-needed basis. Specific site conditions that may trigger supplemental hand-held monitoring include:

- Visible dust
- Detection of TVOC and/or PM-10 at an air monitoring station at concentrations exceeding an Alert Level, Response Level, and Action Levels
- Direction by the construction manager, National Grid, or NYSDEC

Fifteen-minute average TVOC and PM-10 readings will be recorded at a downwind location between the work area and the nearest receptors.

When a triggering condition is observed during ground intrusive activity, the supplemental downwind perimeter monitoring will occur until the conditions that triggered the monitoring have subsided. TVOC concentrations will be monitored and recorded using a photoionization detector. PM-10 will be measured and recorded using a particulate aerosol monitor equipped with a PM-10 impactor.

At each monitoring point, the 15-minute average value of TVOC and PM-10, sample time, and sample location will be collected and recorded. Additional temporary monitoring points may be established due to changing site or meteorological conditions.

2.2.4 Equipment Calibration

Equipment calibration will be performed according to manufacturer's instructions. Each photoionization detector will be calibrated once daily using an isobutylene gas mixture. Particulate monitors will be purged and zeroed daily. Other hand-held portable equipment will be calibrated before each use, or a minimum of once per week when not in use.

2.3 VOC Analytical Sampling

During significant excavation below the clean soil cover when fixed station monitoring is employed, verification Volatile Organic Compound (VOC) samples will be collected once per week at two air-monitoring stations (one upwind and one downwind). A duplicate sample will be collected once every twenty samples. The samples will be collected to demonstrate that the real-time monitoring stations are effective in measuring the concentration of the VOC target compounds. VOC samples will be collected using 6-liter Summa® canisters (or equivalent vacuum canisters) and analyzed using United States Environmental Protection Agency (USEPA) Method TO-15 modified to include naphthalene. An accredited laboratory will perform the analytical testing on the canisters and will provide Category B deliverables as required by the New York Analytical Services Protocol. The results will be validated according to USEPA National Functional Guidelines and New York State Requirements, and a Data Usability Summary Report

(DUSR) will be produced. The results will be submitted electronically to the NYSDEC's Environmental Information Management System.

2.4 Pre-Construction Baseline Sampling

For significant excavation below the clean soil cover, pre-construction monitoring will be completed to establish baseline ambient air concentrations prior to the start of excavation activities. Baseline conditions will be developed for TVOC and PM-10 in ambient air using real-time fixed station sampling methods. Monitoring methods will follow those described in subsection 2.2.1. TVOC and PM-10 data will be recorded 24 hours per day for a minimum of three days. In addition, air samples will be collected for time-weighted average VOC analysis.

2.5 Data Management Procedures

This section of the Plan discusses the data management procedures that will be used during the remedy. Data may be generated from a variety of sources, including real-time fixed station analytical monitoring, supplemental walk-around monitoring, tripod-mounted monitoring stations, and meteorological monitoring.

These data must be reduced, evaluated, verified, and presented to related parties in a timely manner to facilitate decision-making. The data management process for each source of data is discussed below.

Analytical data generated at each fixed-station are sent to the central computer system via radio telemetry or will be manually downloaded daily. The monitoring data will also be downloaded to the project database for data evaluation. The following daily charts, tables, or figures will be prepared:

- Instantaneous and averaged TVOC concentrations compared to the TVOC Action Level
- Instantaneous and averaged PM-10 concentrations compared to the PM-10 Action Level
- Supplemental Hand-Held PM-10 concentrations compared to the Action Level (if any)
- Supplemental Hand-Held TVOC concentrations compared to the TVOC Action Level (if any)
- Air monitoring station locations

The following weekly charts, tables, or figures will be prepared:

- Maximum 15-minute average concentrations of TVOC and PM-10
- Upwind and downwind comparison of Response Level and Action Levels reached during the week if the daily maximum 15-minute average concentrations of TVOC and PM-10 exceeded a Response Level or Action Levels
- Summary of site activities
- Air monitoring station locations

GEI will review all real-time data in a timely manner following collection and prepare a final summary report for National Grid.

3. Response Plan

The purpose of this section is to identify the procedures to be followed in response to elevated levels of target compounds measured during intrusive activities below the clean soil cover. Response actions will be enacted by the Contractor, CM, and National Grid. GEI will report any occurrences where a Response Level or Action Level is exceeded, which would require response measures to be enacted. The NYSDEC will be notified of any occurrence where a Response Level and/or Action Level (NYSDOH threshold) is exceeded. If there is a verified exceedance, GEI will inform the CM, National Grid, and NYSDEC within 60 minutes of the exceedance via e-mail at a minimum. In general, a tiered approach to site conditions with corresponding response actions will be implemented during the air monitoring program. The four tiers of site conditions are defined as follows.

- **Site Condition 1.** Normal or ambient air-conditions where TVOC and PM-10 are less than the Alert and Response Levels.
- **Preliminary Site Condition 2.** Concentration of TVOC only is equal to or greater than the Alert Level, but less than the Action Level.
- **Site Condition 2.** Concentration of PM-10 is equal to or greater than Response Level, but less than the Action Level.
- **Site Condition 3.** Concentration of TVOC or PM-10 is equal to or greater than the Action Level.

The response plan will rely on real-time data generated from the fixed-station equipment and tripod-mounted equipment, and meteorological equipment. These data sources will be evaluated together in order to make appropriate decisions concerning site conditions and potential control measures.

An explanation of the notification system, specific conditions, and response actions for TVOC and PM-10 is presented below.

TVOC and PM-10 concentrations in air will be measured and recorded by station monitors. PM-10 may be temporarily suspended during periods of rain. Figure 5 presents the TVOC decision diagram that will be used to determine the appropriate site condition based on contaminant concentrations. Figure 6 presents the PM-10 decision diagram.

Specific TVOC target concentrations for Site Condition 1, Preliminary Site Condition 2, Site Condition 2, and Site Condition 3 are summarized in Table 1.

3.1 Site Condition 1

Site Condition 1 represents normal site conditions and will be in effect when the TVOC concentration is less than the Alert Level of 3.7 ppm and PM-10 is less than the Response Level of 100 $\mu g/m^3$. Under a Site Condition 1, each photoionization detector and particulate monitor located at the monitoring stations will collect and analyze TVOC and PM-10 at a frequency of one sample per minute.

3.2 Preliminary Site Condition 2

Preliminary Site Condition 2 will be in effect if the TVOC concentration is greater than or equal to the Alert Level of 3.7 ppm but less than the Action Level of 5.0 ppm.

At this time, the upwind and downwind concentrations will be compared to determine if the Preliminary Site Condition 2 is due to site activities. If downwind TVOC concentrations are greater than upwind concentrations, then it will be assumed that the Preliminary Site Condition 2 is due to site activities.

If the above condition is true, then a Preliminary Site Condition 2 will be verified. Under a verified Preliminary Site Condition 2, GEI will inform the CM, if applicable, National Grid and the Contractor. The contractor will implement mitigation control measures to abate the emissions and reduce levels back below the Alert Level. Possible Preliminary Site Condition 2 response actions are listed in Table 2. The site will remain in Preliminary Site Condition 2 as long as the TVOC concentration is between 3.7 ppm (Alert Level) and 5.0 ppm (Action Level), based on 15-minute averages.

The site will return to Site Condition 1 if the 15-minute average concentration of TVOC is less than the Alert Level of 3.7 ppm.

3.3 Site Condition 2

Site Condition 2 will be in effect if the average 15-minute PM-10 concentration at a station is greater than 100 $\mu g/m^3$ and related to site activities.

The upwind and downwind PM-10 concentrations will be compared to determine if the elevated PM-10 concentrations are due to site activities. If downwind PM-10 concentrations are 100 $\mu g/m^3$ greater than upwind concentrations (Response Level), then it will be assumed that the Site Condition 2 is due to site activities.

Under Site Condition 2, GEI will inform the CM, if applicable, and National Grid. GEI or the CM, if applicable, will notify the Contractor, NYSDEC, and NYSDOH. The Site Condition 2 will remain in effect as long as the average PM-10 concentration is greater than or equal to 100 $\mu g/m^3$ above upwind conditions (Response Level), and less than or equal to 150 $\mu g/m^3$(Action Level). Under a verified Site Condition 2, dust suppression techniques must be implemented by the Contractor. At this point, routine monitoring continues and 15-minute averages continue to be evaluated. Work may continue with dust suppression techniques if downwind PM-10 levels do not exceed 150 $\mu g/m^3$ above the upwind level (Action Level) and if no visible dust is migrating offsite from the work area.

A contingency meeting/conference call attended by GEI, the Contractor, CM, National Grid, and NYSDEC will be held within 60 minutes of the verified Site Condition 2 if the condition is not mitigated by dust suppression techniques. Possible response actions for dust control are listed in Table 2.

3.4 Site Condition 3

Site Condition 3 will be in effect if the TVOC concentrations increase to greater than the Action Level of 25.0 ppm or the average 15-minute PM-10 concentration exceeds 150 $\mu g/m^3$ above the current average upwind concentration (Action Level). Site Condition 3 will remain in effect if one of the following conditions is true.

- The TVOC concentration is greater than 25 ppm (Action Level).
- The average 15-minute PM-10 concentration exceeds 150 $\mu g/m^3$ above the current average upwind concentration (Action Level)

Under Site Condition 3, GEI will inform the CM, if applicable, and National Grid. GEI or the CM, if applicable, will notify the Contractor, NYSDEC, and NYSDOH. All construction activities will be halted. The contractor will implement mitigation control measures to abate the emissions and reduce levels back below the Action Levels. Possible Site Condition 3 corrective measures/actions are listed in Table 2. After appropriate corrective measures/actions are taken, work activities may resume if the following conditions are met:

- TVOC concentration at the Site perimeter is no more than 5.0 ppm above background for the 15-minute average; and
- Dust suppression measures and other controls are successful in reducing the downwind PM-10 concentration to within 150 $\mu g/m3$ of the upwind level and in preventing visible dust migration.

3.5 Visible Dust

In addition to measured PM-10 levels, the CAMP requires monitoring of visible dust conditions. If visible airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques if downwind PM-10 levels do not exceed the Action Level concentration of 150 $\mu g/m^3$ above the upwind level and if no visible dust is migrating from the work area.

4. Reporting

GEI will prepare and submit weekly reports to the Contractor, CM, National Grid, and NYSDEC summarizing the CAMP monitoring data. Each report will consist of a letter-style report and charts/tables summarizing the following:

- Maximum 15-minute average concentrations of TVOC, and PM-10
- Upwind and downwind comparison of Response Levels and Action Level reached during the weekly period
- Summary of site activities
- Air monitoring station locations
- Meteorological conditions

Following the completion of all work, a report will be developed summarizing the intrusive activities. As part of the report, the CAMP activities will be documented.

References

New York State Department of Environmental Conservation. 2010. DER-10 / Technical Guidance for Site Investigation and Remediation. Division of Environmental Remediation. May 3, 2010. Appendix 1A. pp. 204-206.

Tables

Table 1
Target Concentrations for Site Conditions
Community Air Monitoring Plan
Arverne (Former Edgemere) Substation Site
Arverne, New York

Target Parameter	National Grid requirement[1]	DER-10 generic CAMP requirements[2]	
	Alert Level	Response Level	Action Level
TVOC (15-minute Average Concentration)	3.7 ppm	NA	5.0 ppm
TVOC (1-minute Measured Concentration)	NA	NA	25 ppm
PM-10 (15-minute Average Concentration)	NA	100 µg/m^3	150 µg/m^3

Site Condition	TVOC	PM-10	Notification Required
Site Condition 1	Less than Alert Level (<3.7 ppm)	Less than Response Level (<100 µg/m^3)	NA
Preliminary Site Condition 2	Greater than or equal to Alert Level less than Action Level (≥3.7 ppm and <5 ppm)	NA	National Grid, Construction manager (if applicable), Contractor
Site Condition 2	NA	Greater than or equal to Response Level and less than Action Level (≥100 µg/m^3 and <150 µg/m^3)	National Grid, Construction manager (if applicable), Contractor, NYSDEC, and NYSDOH
Site Condition 3	Greater than or equal to Action Level (≥5 ppm or ≥25 ppm)	Greater than or equal to Action Level (≥150 µg/m^3)	

Notes:

[1] Alert Levels are not established by the NYSDOH or NYSDEC and are National Grid internally established concentration levels for total volatile organic compounds. Alert Levels are set below the levels established by the NYSDOH so that actions can be taken prior to exceeding a NYSDOH threshold. An Alert Level serves as a preemptive tool to trigger contingent measures, if necessary, to assist in minimizing offsite transport of contaminants during remedial activities.

[2] Response Levels and Action Levels are defined in Appendix 1A of the New York State Department of Environmental Conservation *DER-10 / Technical Guidance for Site Investigation and Remediation* (NYSDEC, 2010).

µg/m^3 - micrograms per cubic meter

ppm - parts per million by volume

TVOC - total volatile organic compounds

PM-10 - particulate matter (i.e. dust) less than 10 microns in diameter

NA - not applicable

Table 2
Site Conditions and Response Actions
Community Air Monitoring Plan
Arverne (Former Edgemere) Substation Site
Arverne, New York

Site Condition	Control Measure
Site Condition 1	Normal site activities - No control measures required
Site Condition 2	Establish trend of data and determine if evaluation/wait period is warranted Temporarily stop work Temporarily relocate work to an area with potentially lower emission levels Apply water to area of activity or haul roads to minimize dust levels Reschedule work activities Cover all or part of the excavation area Apply VOC emission suppressant foam over open excavation areas Slow the pace of construction activities Change construction process or equipment that minimize air emissions Install a perimeter barrier fence Apply water on haul roads* Wet equipment and excavation faces* Spray water on buckets during excavation and dumping* Haul materials in properly tarped or watertight containers* Restrict vehicle speeds to 10 mph* Cover excavated areas and material after excavation ceases* Reduce the excavation size and/or number of excavations*
Site Condition 3	Halt work Encapsulate construction area and treat air exhaust Perform work during cold weather Cease construction activities Re-evaluate air monitoring work plan

Notes:

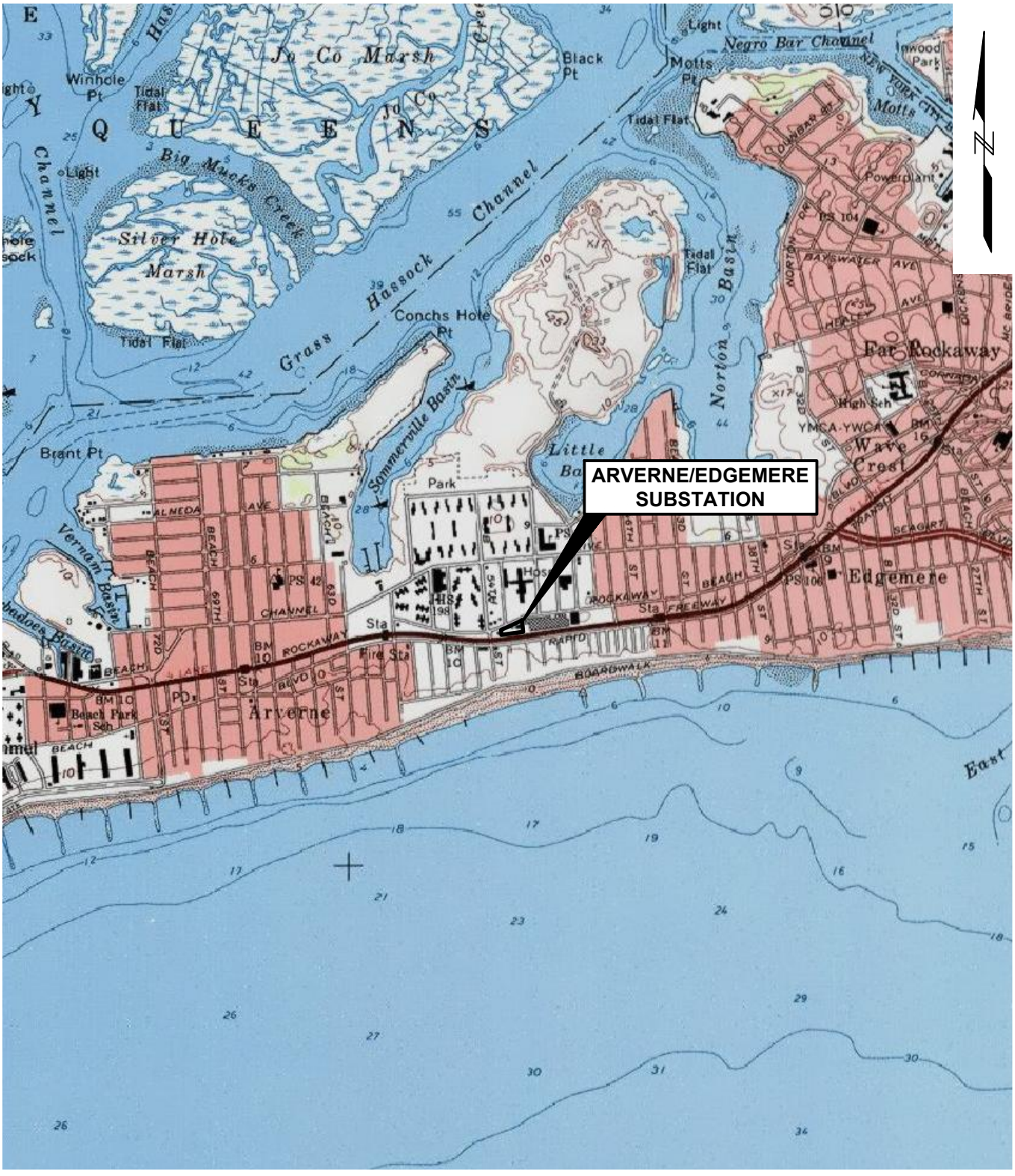
The control measures specified under each site condition can be implemented in any order that is most appropriate under the existing site conditions.

* control measures suggested in the New York State Department of Environmental Conservation *DER-10 / Technical Guidance for Site Investigation and Remediation* (NYSDEC, 2010)

VOC - volatile organic compound

mph - miles per hour

Figures



0 2000 4000

SCALE, FEET

SOURCE:

Map created with TOPO! ® ©2001 National Geographic (www.nationalgeographic.com/topo)

COMMUNITY AIR MONITORING PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
ARVERNE, NEW YORK

nationalgrid

GEI Consultants

SITE LOCATION MAP

Project 093140-1-1103

December 2014

Figure 1

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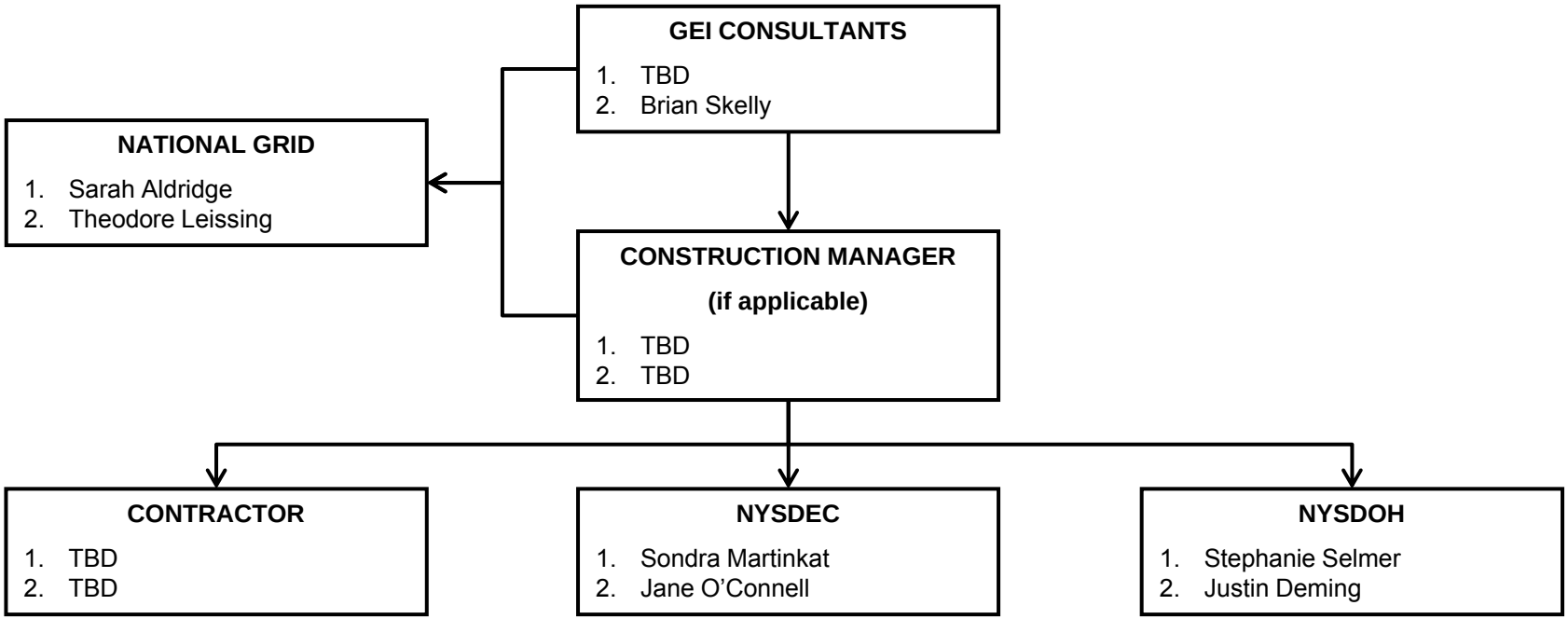

If the primary contact is unavailable, contact alternatives in the order shown

All applicable parties will be notified within 60 minutes of an exceedance of a Response Level or Action Level at the site perimeter.

NOTE:
TBD = To Be Determined

COMMUNITY AIR MONITORING PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
ARVERNE, NEW YORK

nationalgrid

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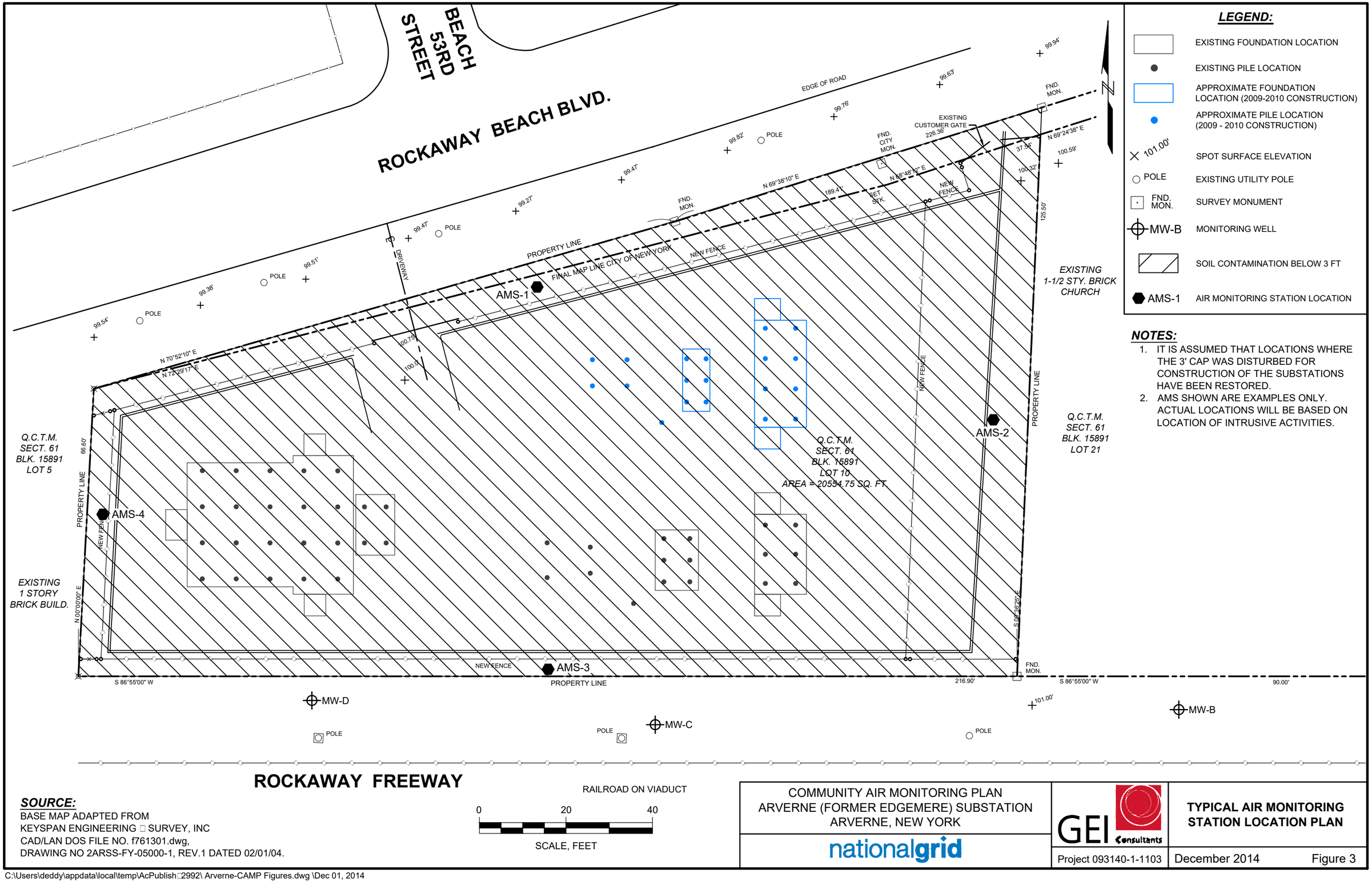
COMMUNICATION FLOWCHART

Project 093140 | December 2014 | Figure 2

I:\Project\National Grid\Edgemere\Arverne Substation\093140\CAMP\Arverne CAMP Fig 2-4-5-6.pptx



LEGEND:

- EXISTING FOUNDATION LOCATION
- EXISTING PILE LOCATION
- APPROXIMATE FOUNDATION LOCATION (2009-2010 CONSTRUCTION)
- APPROXIMATE PILE LOCATION (2009 - 2010 CONSTRUCTION)
- 101.00' — SPOT SURFACE ELEVATION
- POLE — EXISTING UTILITY POLE
- FND. MON. — SURVEY MONUMENT
- MW-B — MONITORING WELL
- SOIL CONTAMINATION BELOW 3 FT
- AMS-1 — AIR MONITORING STATION LOCATION

NOTES:

1. IT IS ASSUMED THAT LOCATIONS WHERE THE 3' CAP WAS DISTURBED FOR CONSTRUCTION OF THE SUBSTATIONS HAVE BEEN RESTORED.
2. AMS SHOWN ARE EXAMPLES ONLY. ACTUAL LOCATIONS WILL BE BASED ON LOCATION OF INTRUSIVE ACTIVITIES.

SOURCE:

BASE MAP ADAPTED FROM
KEYSPAN ENGINEERING □ SURVEY, INC
CAD/LAN DOS FILE NO. f761301.dwg,
DRAWING NO 2ARSS-FY-05000-1, REV.1 DATED 02/01/04.

COMMUNITY AIR MONITORING PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
ARVERNE, NEW YORK

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Project 093140-1-1103

TYPICAL AIR MONITORING STATION LOCATION PLAN

December 2014 Figure 3

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1. Solar Panel
2. Particulate aerosol monitor sample tubing with in-line condenser
3. Particulate aerosol monitor sample inlet with PM-10 impactor
4. Station enclosure
5. Particulate Aerosol Monitor
6. Photoionization detector (PID)
7. PID sample inlet
8. PID sample inlet tubing
9. Data communications device

NOTE:
Figure depicts an AirLogics™, LLC Light air monitoring station as an example and may not be representative of the actual system or components that will be employed at the site

COMMUNITY AIR MONITORING PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
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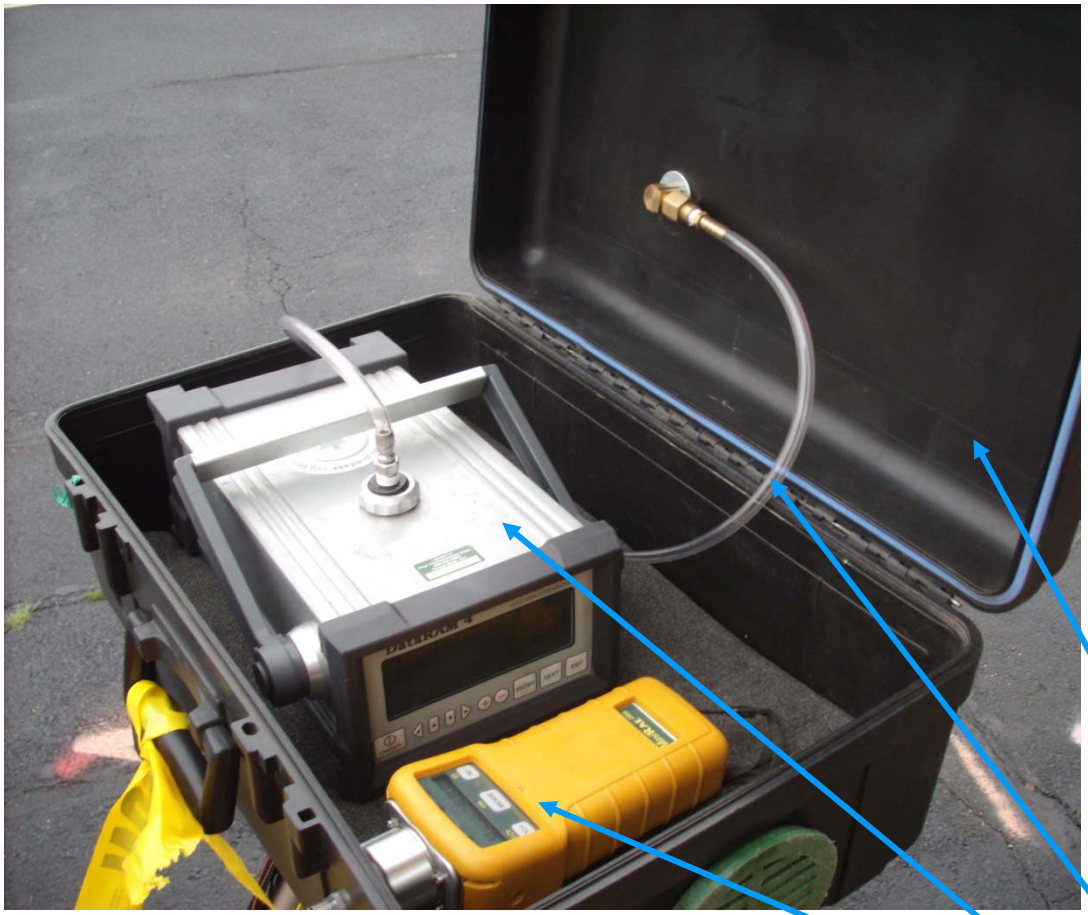
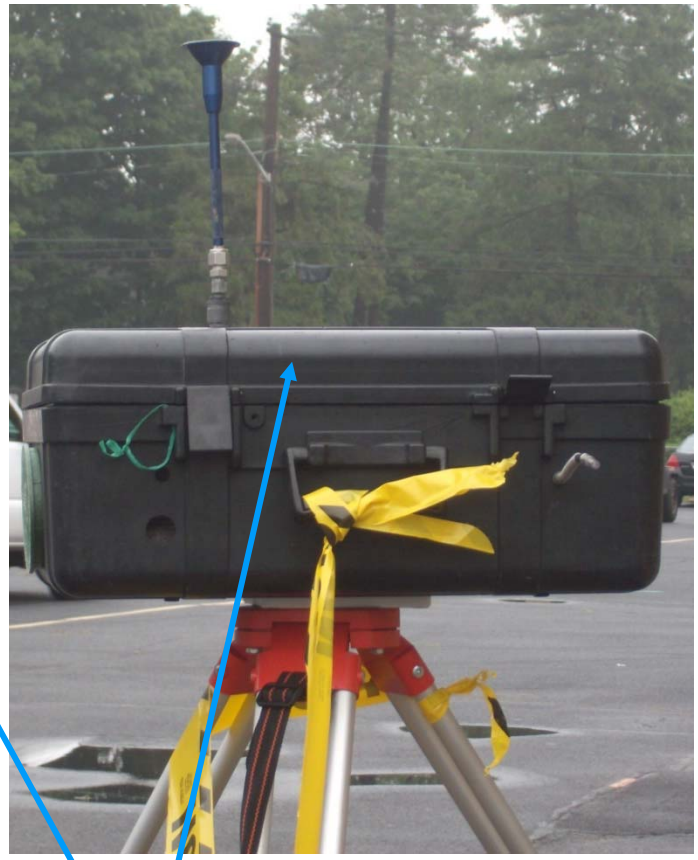
EXAMPLE FIXED STATION INTERNAL COMPONENTS

Project 093140 | December 2014 | Figure 4A

I:\Project\National Grid\Edgemere\Arverne Substation\093140\CAMP\Arverne CAMP Fig 2-4-5-6.pptx





(1) (2) (3) (4)

1. Photoionization detector (PID)
2. Particulate aerosol monitor
3. Particulate aerosol monitor sample tubing
4. Station enclosure

NOTE:
Figure depicts a Pine Environmental air monitoring station as an example and may not be representative of the actual system or components that will be employed at the site

COMMUNITY AIR MONITORING PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
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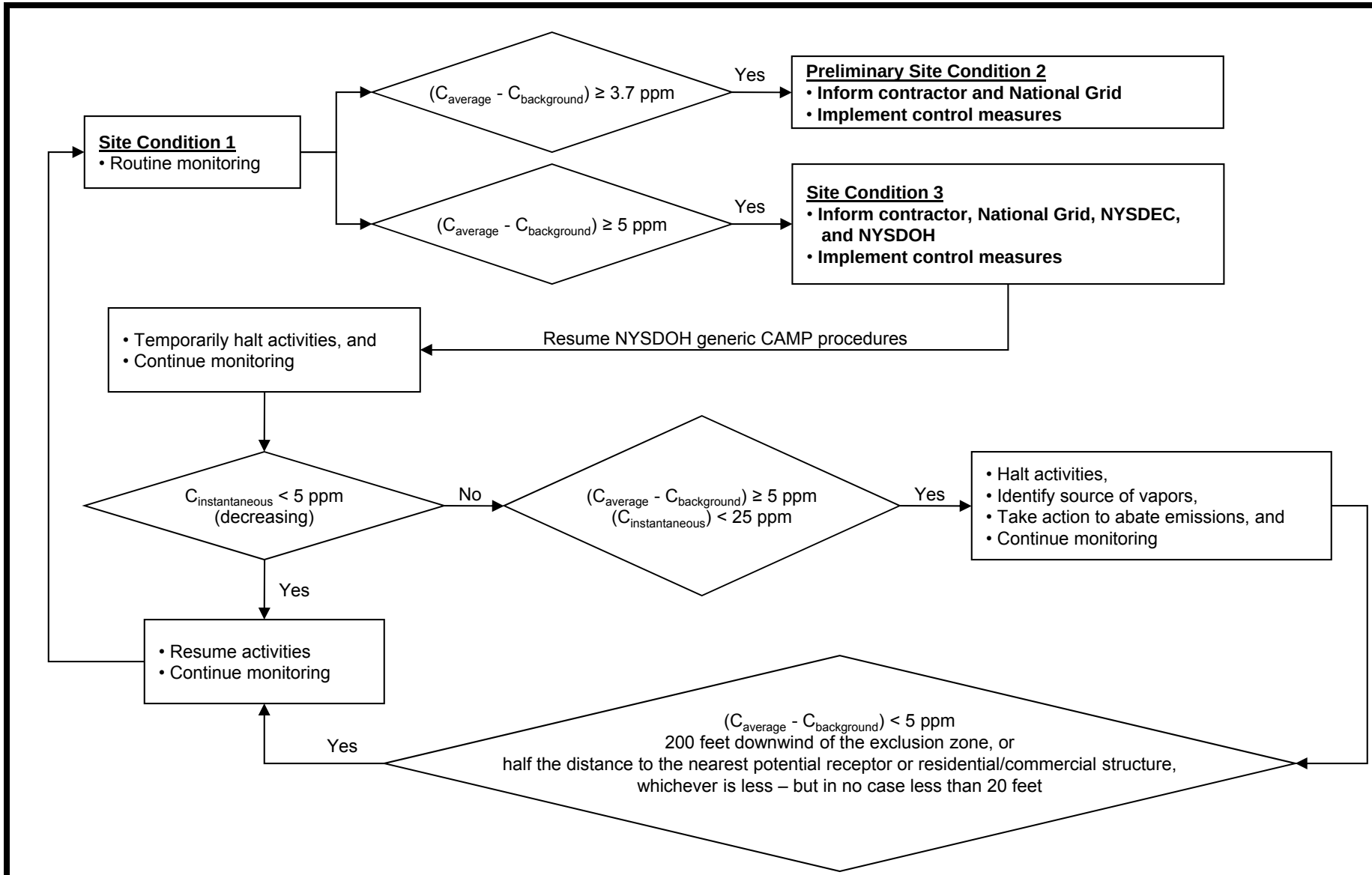
EXAMPLE TRIPOD MOUNTED STATION INTERNAL COMPONENTS

Project 093140 | December 2014 | Figure 4B

I:\Project\National Grid\Edgemere\Arverne Substation\093140\CAMP\Arverne CAMP Fig 2-4-5-6.pptx



NOTES:

1. TVOC – Total Volatile Organic Compound
2. ppm – parts per million
3. $C_{average}$ = 15-minute average concentration
4. $C_{background}$ = 15-minute average concentration upwind
5. $C_{instantaneous}$ = 1-minute measured concentration

COMMUNITY AIR MONITORING PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
ARVERNE, NEW YORK

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TVOC DECISION DIAGRAM

Project 093140 | December 2014 | Figure 5

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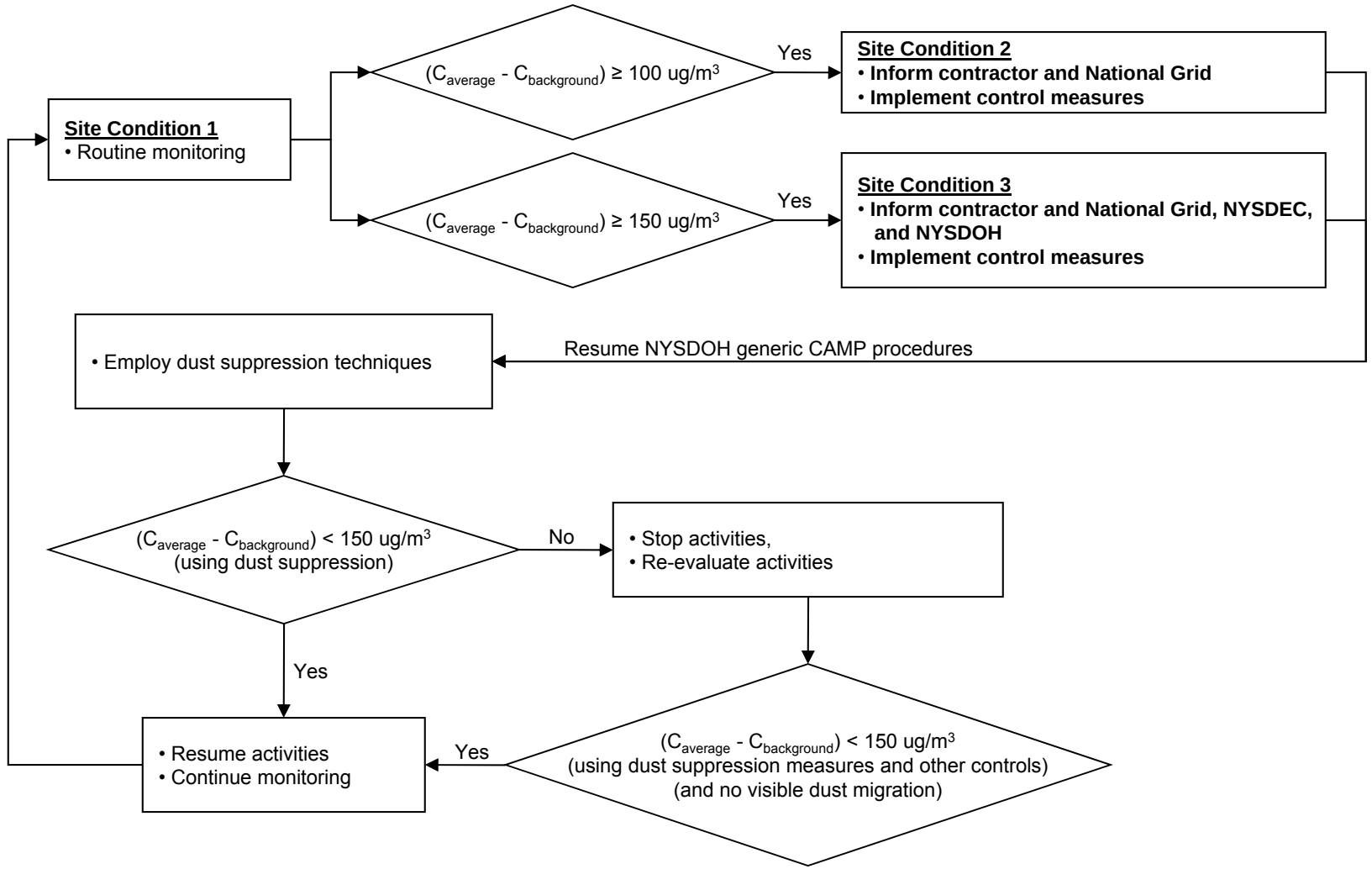

NOTES:

1. PM-10 – particulate matter
2. µg/m3 – micrograms per cubic meter
3. $C_{average}$ = 15-minute average concentration
4. $C_{background}$ = 15-minute average concentration upwind

COMMUNITY AIR MONITORING PLAN
ARVERNE (FORMER EDGEMERE) SUBSTATION
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PARTICULATE MATTER DECISION DIAGRAM

Project 093140 | December 2014 | Figure 6

I:\Project\National Grid\Edgemere\Arverne Substation\093140\CAMP\Arverne CAMP Fig 2-4-5-6.pptx

Appendix 1

NYSDOH Generic CAMP from DER-10 Appendix 1A

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

Overview

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

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

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

Community Air Monitoring Plan

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

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

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. A 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 ($\mu g/m^3$) 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 $\mu g/m^3$ 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 $\mu g/m^3$ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 $\mu g/m^3$ of the upwind level and in preventing visible dust migration.

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

December 2009

Appendix F

Site Management Forms

SITE INSPECTION FORM
Arverne (Former Edgemere) Substation

SITE INSPECTION DATE: _____ **TIME OF ARRIVAL:** _____

DEPARTURE: _____

WEATHER: _____

_____

National Grid SIR Representative(s): _____

_____

INSPECTION TYPE: **Annual Inspection or Emergency Inspection**

(if emergency indicate event that required an inspection): _____

_____

_____

_____

Are the Institutional Controls in place, performing properly, and remain effective?

Site Signage in Place? Yes / No

_____

Hazard Communication Documents Present? Yes / No

_____

_____

_____

Has ownership of the property changed since the last inspection? Yes / No

(Verify with Real Estate and Survey Departments)

_____

_____

_____

_____

Are there any changes to LIPA GO-10421 Excavation within Substations Yes / No

which would effect the SMP or institutional controls?

_____

_____

_____

_____

_____

_____

_____

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SITE INSPECTION FORM
Arverne (Former Edgemere) Substation

Are the Engineering Controls in place, performing properly, and remain effective?

Site Fencing in Place and in Good Condition? Yes / No

Surface Cover Intact (ie no evidence of erosion, excavations)? Yes / No

GENERAL SITE OBSERVATIONS:

Has there been any changes to the property since the last inspection? Yes / No

(i.e. new equipment or facilities, changes in site topography, erosion, etc.)

NOTE:

Inspections should be made a minimum once a year and within 5 days of an emergency, such as a natural disaster or an unforeseen failure or damage to the building occurs). Inspections will be conducted by National Grid SIR (or their agent) with assistance from LIPA.

COMPLETED BY:	**REVIEWED BY:**
SIGNATURE:	**SIGNATURE:**

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