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Feasibility Study Report

Erie Boulevard Former MGP Site
Syracuse, New York

June 2009

Revised July 2014

ARCADIS

Certification

I, Terry W. Young, P.E., am a professional engineer in the State of New York. To the best of my knowledge, and based on my inquiry of the persons involved in preparing this document under my direction, certify that this Feasibility Study Report for the Erie Boulevard former manufactured gas plant site was completed in general accordance with the 2003 Administrative Order on Consent (Index #A4-0473-0000) between National Grid and the New York State Department of Environmental Conservation. This Feasibility Study Report identifies and evaluates potential remedial alternatives to address environmental conditions at the site.

Terry W. Young, PE
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Feasibility Study Report

Erie Boulevard Former MGP Site
Syracuse, New York

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Acronyms and Abbreviations

ARAR	Applicable or Relevant and Appropriate Requirements
ARCADIS	ARCADIS of New York, Inc.
bgs	below ground surface
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CAMP	Community Air Monitoring Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Constituent of concern
CWG	Carbureted Water Gas
cy	Cubic Yard
DER	Division of Environmental Remediation
DNAPL	Dense Non-Aqueous Phase Liquid
FS	Feasibility Study
FWIA	Fish and Wildlife Impact Analysis
GRA	General Response Action
HASP	Health and Safety Plan
HHRA	Human Health Risk Assessment
IRM	Interim Remedial Measure

ISS	In-Situ Soil Stabilization
LDR	Land Disposal Restriction
LTTD	Low Temperature Thermal Desorption
MGP	Manufactured Gas Plant
MNA	Monitored Natural Attenuation
NAPL	Non-Aqueous Phase Liquid
NCP	National Contingency Plan
NYCRR	New York State Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	Operation & Maintenance
OBG	O'Brien & Gere, Inc.
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
ppb	parts per billion
PPE	Personal Protective Equipment
ppm	parts per million
PRAP	Proposed Remedial Action Plan
PSA	Preliminary Site Assessment

PSD	Prevention of Significant Deterioration
QA/QC	Quality Assurance/Quality Control
RAO	Remedial Action Objective
RCRA	Resource Conservation Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
SCG	Standards, Criteria & Guidance
SCO	Soil Cleanup Objective
SLERA	Screening Level Ecological Risk Assessment
SMP	Site Management Plan
SPLP	Synthetic Precipitation Leaching Procedure
SRI	Supplemental Remedial Investigation
SVI	Soil Vapor Investigation
SVOC	Semi-Volatile Organic Compound
TAGM	Technical and Administrative Guidance Memorandum
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TOGS	Technical and Operational Guidance Series
USAF	United States Air Force

USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
UTS	Universal Treatment Standards
VI	Vapor Intrusion
VOC	Volatile Organic Compound
WWTP	Wastewater Treatment Plant

Executive Summary

Background

This Feasibility Study (FS) Report evaluates potential remedial alternatives for the Erie Boulevard Former Manufactured Gas Plant (MGP) Site (the site) located in Syracuse, New York. This FS Report has been prepared in accordance with the requirements of the multi-site Order on Consent (Index No. A4-0473-0000[1]), between Niagara Mohawk Power Corporation (d/b/a National Grid) and the New York State Department of Environmental Conservation (NYSDEC), which was executed on November 7, 2003.

The approximate 10-acre site is occupied by a National Grid office complex. The site is improved with several multi-story office buildings, paved parking lots, landscaping, and a combination sheetpile/slurry/stone retaining wall along the western site limits (adjacent to Onondaga Creek). Subsurface soil and groundwater in the western portion of the site are impacted with residual coal tar non-aqueous phase liquid (NAPL) from historical MGP operations at the site from the mid-1800s to the 1930s. The MGP operations ceased in the 1930s and the MGP structures were subsequently dismantled and demolished by 1950. The National Grid Syracuse office complex (Office Complex) currently occupies the site.

Nature and Extent of Environmental Impacts

The nature and extent of MGP impacts to soil and groundwater have been identified and delineated for constituents associated with MGP operations through analysis of a total of 346 samples, collected from 50 soil borings and test pits, and 24 groundwater monitoring wells. Sediment, surface water, and pore water samples were collected to evaluate potential impacts to Onondaga Creek. Soil gas sampling and an indoor air survey were conducted to evaluate potential impacts to indoor air of onsite office buildings. No impacts were identified to the creek or indoor air.

Residual coal tar, exhibited as NAPL, is inferred to have originated from former gas holders and vessels used to separate tar from gas. The NAPL has depleted itself to residual saturation, and is immobile. NAPL-saturated soil at the site has been identified in limited depth intervals, typically below the water table (approximately 20 to 25 feet below ground surface [bgs]), and is primarily present in the northwestern portion of the western parking lot.

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[1] Formerly Index No. D0-0001-9210.

Soil was identified as NAPL-saturated if field descriptions indicated sufficient NAPL was present to be mobile; however, no measurable NAPL has ever (nearly 20 years of observations) been identified in monitoring wells at the site, including a well within the source area that was specifically constructed to recover mobile NAPL, if present.

The commercial-use soil cleanup objectives (SCOs) presented in 6 NYCRR Part 375-6.8 are applicable to the site given that the current and long-term future site use is commercial, and the unrestricted-use SCOs provide a baseline for comparison of the results. Constituents of concern (COCs) in soil at concentrations above the respective commercial use SCOs include benzene, toluene, ethylbenzene, and xylenes (BTEX); polycyclic aromatic hydrocarbons (PAHs); and cyanide. Soil with BTEX, PAHs, or cyanide at concentrations exceeding the commercial use SCOs is primarily located within the western portion of the site, generally at depths beginning approximately 8 to 10 feet bgs and extending to depths several feet below the water table.

Groundwater analytical results were compared to the Class GA groundwater quality standards/guidance values presented in the NYSDEC Technical & Operational Guidance Series (TOGS) 1.1.1. COCs identified in groundwater at concentrations above the TOGS standards/guidance values are found in shallow groundwater (i.e., approximately 18 to 38 feet bgs) in the western portion of the site. Concentrations generally decrease with depth and distance hydraulically downgradient (northwest) of the site. The offsite groundwater plume is a result of slow dissolution of NAPL. The constituents that exceed groundwater standards/guidance values in the offsite groundwater plume are almost exclusively BTEX and naphthalene (i.e., the most soluble and most mobile constituents dissolving from NAPL). Groundwater COC concentrations from 1995 to 2013 indicate that the groundwater plume is stable (it is not expanding in size and concentrations are staying approximately the same, or possibly decreasing).

Exposure Assessment

Existing site conditions are currently protective of human health and the environment, as summarized below.

- The site is currently and will continue to be owned by National Grid for the foreseeable future.
- Site access is restricted to the general public by perimeter fencing, locking gates, and an onsite security service.

- No complete exposure pathways currently exist. The potential for direct contact exposure is limited because most of the former MGP site impacts start at a depth of approximately 8 to 10 feet bgs. Potential exposure associated with future excavation activities (for utility maintenance or construction) could easily be controlled by a Site Management Plan.
- The site is almost entirely covered with buildings and asphalt pavement that limit infiltration of precipitation to subsurface soil containing NAPL.
- The offsite dissolved phase plume is deep (at least 40 feet bgs) and is located primarily beneath Onondaga Creek, highways, and associated access ramps.
- No site-related impacts are present in Onondaga Creek, which is a losing stream in the vicinity of the site (meaning that shallow groundwater moves away from the creek, not to the creek).
- Groundwater is naturally very saline, which renders it unsuitable for potable purposes. The Onondaga County Department of Health has confirmed that there are no known wells in the City of Syracuse used for potable water supply, and New York State law prohibits the installation of private wells where public water supply is available (unless approval is expressly granted by the public water authority per 10 NYCRR 5-1.31(b)).
- A substantial retaining wall system, consisting of steel sheet piling extending to depths greater than 40 feet below grade surface, historical stone wall, and flowable fill between the sheet piling and stone, extends along the western property boundary adjacent to Onondaga Creek and provides a physical barrier to impacted subsurface soil and potential erosion.
- No vapor intrusion associated with the former MGP site into onsite buildings is occurring as demonstrated by a vapor intrusion investigation.
- No measurable NAPL has ever been recovered from any of the wells.
- Site investigation data indicate that the former MGP structures (to the extent that such structures still remain) do not contain pooled NAPL.

Summary of Remedial Alternatives Identification

Remedial Action Objectives (RAOs) were identified for soil and groundwater to maintain and/or achieve conditions that are protective of public health and the environment. In general, the RAOs are designed to prevent exposure to and migration of the constituents in soil and groundwater over the long term. Also based on considerations specific to the site, remedial technologies that could potentially achieve the RAOs were identified, and then screened based on effectiveness, implementability, and relative cost. Based on the results of the technology screening, specific remedial alternatives were identified for soil and groundwater. The remedial alternatives were developed, evaluated, and recommended based on their ability to: (1) be protective of human health and the environment; and (2) comply with state and federal standards, criteria, and guidance that are applicable or relevant and appropriate to the remedial alternatives. The evaluated alternatives are presented below.

Soil Alternatives

- SM1 – No Further Action
- SM2 – Institutional Controls
- SM3 – Focused Soil Containment and Institutional Controls
- SM4 – Focused In-Situ Soil Stabilization and Institutional Controls
- SM5 – Large Scale Stabilization for Soil Exceeding Commercial Use SCOs and/or Exhibiting NAPL, and Institutional Controls
- SM6 – Excavation for Soil Exceeding Unrestricted Use SCOs and/or Exhibiting NAPL, and Institutional Controls

Groundwater Alternatives

- GW1 – No Action
- GW2 – Monitored Natural Attenuation and Institutional Controls
- GW3 – Enhanced Bioremediation and Institutional Controls

Alternative SM6 may not be feasible, but was included at the request of the NYSDEC for comparison purposes.

The soil and groundwater remedial alternatives were evaluated based on the following NYSDEC evaluation criteria: (1) compliance with regulatory standards/criteria/guidance; (2) overall protection of human health and the environment; (3) short-term effectiveness (risks during remedial action implementation); (4) long-term effectiveness (risks following completion of the remedial action); (5) reduction of toxicity, mobility, or volume; (6) implementability; and (7) cost. As part of the short-term effectiveness criterion, sustainability and green remediation practices during implementation of the remedial action were also considered.

Based on the comparative analysis, remedial alternatives SM2 (soil) and GW2 (groundwater) would cost-effectively achieve the best balance of the seven NYSDEC evaluation criteria, and therefore are the preferred remedial alternatives. Coupled together, remedial alternatives SM2 and GW2 would be protective of human health and the environment in the long-term. In addition to the engineering controls currently in place, institutional controls in the form of a land use restriction on the site property and a Site Management Plan would be used to control future access to the residual impacted soil and groundwater, and periodic monitoring would provide data to evaluate changes in groundwater quality in the long-term.

Summary of Preferred Remedial Alternatives Evaluation

Soil alternative SM2 includes implementation of a land use restriction, preparation of an SMP, and maintenance of the chain-link fence/security that currently exists around the property boundary. In addition, impacted soil would continue to be covered by the Office Complex, driveways, paved parking lots, concrete sidewalks, landscaping, mowed lawn, etc. The substantial retaining wall system would continue to be maintained as a barrier to mitigate the potential for MGP-impacted subsurface soil to be washed into Onondaga Creek and affect sediment quality.

Groundwater alternative GW2 would address constituents of interest in groundwater by implementing use restrictions. In addition, alternative GW2 would include: (1) long-term groundwater monitoring to evaluate the effectiveness of MNA over an extended period of time; and (2) installation of NAPL recovery wells near (along) the western site boundary and periodic monitoring to remove potentially mobile NAPL. Existing groundwater use laws [10 NYCRR 5-1.31(b)], which prohibit the installation of private wells where public supply is available (unless approval is expressly granted by the public water authority), would continue to minimize potential human exposure to constituents in groundwater at concentrations exceeding the groundwater quality standards/guidance values.

Alternatives SM2 and GW2 would: (1) quickly achieve the RAOs related to protection of human health and the environment; (2) be readily implemented; (3) have no short-term negative impacts or risks to the community; (4) be effective over the long-term; and (5) be implemented for a significantly lower cost (approximately 10 to 400 times lower) than other alternatives involving more remediation. Each of the remaining remedial alternatives would require institutional controls because soil and groundwater would not meet unrestricted use criteria, and groundwater would still not be potable due to naturally-occurring salinity. Hence, the additional costs associated with additional remediation are not justified by potential benefits.

1. Introduction

This Feasibility Study (FS) Report evaluates potential remedial alternatives to address constituents of interest in soil and groundwater at the Erie Boulevard Former Manufactured Gas Plant (MGP) Site (the site) located in Syracuse, New York (Figure 1). These impacted media, generally related to byproducts and wastes associated with the former MGP operations (primarily coal tar), are present primarily within the western portion of the site (below the parking area west of Buildings B, C, and D). The primary constituents of interest identified in these media at concentrations greater than standards/guidance values include benzene, toluene, ethylbenzene, and xylenes (BTEX compounds), polycyclic aromatic hydrocarbons (PAHs), and cyanide.

This FS Report has been prepared by ARCADIS of New York, Inc. (ARCADIS) in accordance with the requirements of the multi-site Order on Consent ("Consent Order") (Index No. A4-0473-0000[2]) between Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid") and the New York State Department of Environmental Conservation (NYSDEC), which was executed on November 7, 2003. The overall objective of this FS Report is to use the information from previous investigations at the site to develop, evaluate, and recommend remedial alternatives that are protective of human health and the environment, and comply with State and Federal standards, criteria, and guidance that are applicable or relevant and appropriate to the remedial alternatives.

A version of the FS Report was submitted to the NYSDEC in June 2009. Following the June 2009 submission of the FS Report, a January 16, 2013 meeting was held at the NYSDEC's request with National Grid and ARCADIS to discuss selection of the remedial alternative for the site. The NYSDEC presented comments related to the nature and extent of NAPL at the site and National Grid subsequently prepared a February 8, 2013 letter responding to NYSDEC comments (National Grid 2013a). The NYSDEC acknowledged receipt of the NAPL summary letter in a June 26, 2013 letter to National Grid (NYSDEC 2013), and indicated that a limited action remedial alternative would be evaluated in the revised FS Report.

The FS Report was revised to include additional information regarding the nature and extent of NAPL and further describe the limited action remedial alternative. The FS Report was also revised to include additional analytical data obtained since 2009, including: (1) the August 2012 soil investigation performed to support two construction projects at the site; and (2) the findings of the January 2013 groundwater monitoring event. Finally, an additional alternative remediating soil to unrestricted soil

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[2] Formerly Index No. D0-0001-9210.

cleanup objectives was included in the FS Report in response to a request from the NYSDEC during the January 16, 2013 meeting.

This FS Report has been prepared in general accordance with the following state and federal regulations and guidance, where appropriate:

- Applicable provisions of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) regulations contained in Part 300 of Title 40 of the Code of Federal Regulations (40 CFR 300).

- The United States Environmental Protection Agency (USEPA) guidance document titled "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] Interim Final 1988).

- NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4025 titled, "Guidelines for Remedial Investigations/Feasibility Studies," dated March 31, 1989.

- NYSDEC TAGM 4030 titled "Selection of Remedial Actions at Inactive Hazardous Waste Sites," revised May 15, 1990 (TAGM 4030).

- NYSDEC Division of Environmental Remediation's (DER) "DER-10 Technical Guidance for Site Investigation and Remediation," dated May 2010.

- 6 New York State Codes, Rules, and Regulations (NYCRR) Part 375 titled "Environmental Remediation Programs" dated December 14, 2006.

The environmental investigations at the site were also conducted consistent with the data requirements and guidance for developing soil cleanup objectives (SCOs) presented in the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046 titled "Determination of Soil Cleanup Objectives and Cleanup Levels" (TAGM 4046; NYSDEC, 1994). In December 2006, the NYSDEC's Environmental Remediation Program (6 NYCRR Part 375) replaced TAGM 4046. The objectives of both programs are consistent, but 6 NYCRR Part 375 also considers land use in establishing SCOs. The SCOs for commercial land use (the current and long-term future use of the site), which were not available under TAGM 4046, have been considered in this FS. The data generated by the previous investigations under TAGM 4046 have adequately defined the nature and extent of MGP-related impacts for purposes of this FS. NYSDEC concurrence with this conclusion is provided in a letter to National Grid dated November 12, 2008 that provides approval of the Final Remedial Investigation (RI).

1.1 Purpose and Report Organization

The FS Report has been organized into the following sections:

Section		Purpose
Section 1 –	Introduction	Provides background information relevant to the development of the FS Report and remedial alternatives evaluated.
Section 2 –	Identification of Standards, Criteria & Guidance (SCGs)	Identifies the SCGs to be considered in the identification of remedial action objectives (RAOs) and remedial alternatives.
Section 3 –	Remedial Action Objectives	Develops and presents RAOs based on previous investigations and applicable SCGs.
Section 4 –	Identification and Screening of Technologies and Development of Remedial Alternatives	Identifies and presents screening results for General Response Actions (GRAs) and remedial technology types and processes. An assembled list of potential remedial alternatives for meeting the RAOs for the site are presented in this section based on the results of the screening.
Section 5 –	Detailed Evaluation of Remedial Alternatives	Describes the NYSDEC and NCP criteria used to evaluate the remedial alternatives, and presents a detailed analysis of each remedial alternative for each media.
Section 6 –	Comparative Analysis of Alternatives	Presents a comparative analysis of each of the remedial alternatives.
Section 7 –	Selection of Preferred Remedial Alternative	Identifies the recommended remedial alternative for the site.
Section 8 –	References	Presents a list of the references cited in the FS Report.

The text of this FS Report is supported by tables and figures, as well as an appendix containing select project related correspondence.

1.2 Background Information

This section presents relevant background information used to develop and evaluate the remedial alternatives for the site. A description of locations and physical setting of the site is presented below, followed by a summary of relevant historical information, and a summary of previous investigations.

1.2.1 Location and Physical Setting

The site is located in a heavily urbanized area immediately west of the City of Syracuse's downtown business district in Onondaga County, New York (see Figure 1). The site is approximately 10 acres (7 of which were used for the former MGP). The site is within a city block bound by West Genesee Street to the north, North Franklin Street to the east, Erie Boulevard to the south, and Onondaga Creek to the west. The National Grid Syracuse office complex (Office Complex) currently occupies the site and consists of four adjoining multi-story office buildings (Buildings A through D), a separate two-story office building (Building F), and a guard house. The area around the buildings is covered by driveways, paved parking lots, concrete sidewalks, and landscaping. Access to the site is restricted by a chain link fence and manned security. The offsite area of investigation (northwest of the site) is mainly covered by highways (Interstate 690, the West Street Arterial, and associated ramps connecting the highways), intersecting city streets, various commercial properties, and Onondaga Creek. The existing layout of the site, surrounding area, and monitoring well locations are shown in Figure 2. Historical MGP structures and sampling locations are presented on Figure 3 (refer to the bold/dashed black line for the MGP limits).

Topographic relief across the site is relatively slight. Elevations range from a high of approximately 398 feet above mean sea level (AMSL[3]) in the southwest corner of the site to a low of approximately 387 feet along the east edge of the "western parking area" (i.e., the parking lot west of Buildings B, C, and D) and continuing into the parking area that extends below the elevated sections of Building C. For the most part, the eastern portion of the site slopes gently to the west, and the western portion of the site slopes gently to the north or east. Storm water is collected by catch basins at low points in the parking areas and conveyed offsite via subsurface storm sewer piping to Onondaga Creek. The western boundary of the site follows the creek and consists of a sheetpile retaining wall driven to a depth of approximately 20 feet below the creek bottom. The sheetpile wall was constructed in the spring of 1997 to reinforce an existing stone wall. A flowable fill cement/grout was used to fill the space between the sheetpile wall and stone wall. The flowable fill extends approximately 25 feet below ground surface (bgs), and the width is between 3.3- and 6.8-feet along the western perimeter of the site. As discussed later in this report, the sheetpile wall, flowable fill, and stone wall (collectively referred to as "the retaining wall") are an effective barrier to migration of MGP-impacted soil (e.g., erosion) offsite to the northwest (Onondaga Creek).

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[3] All elevations presented in this report are referenced to the North American Vertical Datum of 1988, unless noted otherwise.

The land surface beyond the sheetpile wall drops off to Onondaga Creek, which flows northward in a steep-sided, narrow channel. The bottom of the channel is roughly 25 feet below the elevation of the parking lot in the western portion of the site. The water surface in the creek is typically 22 feet below the elevation of the parking lot. Runoff from nearby city streets and parking lots is conveyed to Onondaga Creek via overland flow and through storm sewer outfalls that discharge into the creek upstream and downstream from the former MGP site.

1.2.2 Historic Site Operations

A chronological history of operations at the site and surrounding area is presented in the initial *Remedial Investigation Report* (ARCADIS, 2003) and summarized below.

Prior to the MGP operations, Onondaga Creek was dammed at Genesee Street in 1805. Two mills were constructed on the east bank of the creek at that location. In 1807, the dam washed out and a new log dam was constructed to the south at West Water Street. In 1824, the West Water Street dam was rebuilt as a stone dam, and a mill race was constructed east of and parallel to Onondaga Creek across the site. In 1824, the Erie Canal was constructed in an aqueduct that crossed over both Onondaga Creek and the mill race. The canal was filled in 100 years later in 1924.

By 1845, three mills and a tannery were located onsite between Onondaga Creek and the mill race. A salt mill was located at the southern end of Onondaga Creek near the Erie Canal, next to the tannery. A saw mill and linseed oil mill were at the northern end of the site, near Genesee Street. By 1849, the mill race and saw mill had been removed.

The first MGP at the site was constructed in 1849 and operated until 1916. Production of carbureted water gas (CWG) began in 1896 and continued until 1933. The former MGP included a total of at least six different gas holders, various oil tanks, a generator house, retorts, purifiers, offices, and several coal sheds over the course of the MGP operations. The layout of the former MGP structures in the early 1900s, when the coal gas and CWG facilities were operational, is shown on Figure 3.

The coal-gas plant was dismantled during the early 1930s, and the CWG plant was dismantled in 1938. Construction of the existing office buildings began in 1926 with the construction of a building in the northwestern corner of the property for the Syracuse Board of Education (this is now Building F). Construction of the main building at the site (Building A) began in 1931. Around the same time, a parking garage was built in the northern portion of the site, incorporating the western foundation wall of a former gas holder (Holder No. 3, as shown on Figure 3). Portions of the parking garage and the former holder foundation were later incorporated into construction of Building D. The last gas holders were removed by 1950.

1.2.3 Summary of Previous Investigations and Remedial Activities

Previous investigations conducted at the site include the following:

- Preliminary Site Assessment/Interim Remedial Measures (PSA/IRM) Study conducted by ARCADIS between 1995 and 1997.
- Initial Remedial Investigation (RI) conducted by ARCADIS between 2000 and 2003.
- Supplemental Remedial Investigation (SRI) conducted by ARCADIS between 2006 and 2007.
- Final RI conducted by ARCADIS in 2008.
- Vapor Intrusion (VI) Investigation conducted by ARCADIS in 2008 and 2009.
- Soil investigation conducted by ARCADIS in August 2012.
- Groundwater monitoring event conducted by ARCADIS in January 2013.

Summaries of the previous investigation activities are presented below.

<u>Preliminary Site Assessment/Interim Remedial Measures Study</u>

The site was the subject of a PSA/IRM study conducted from June 1995 through September 1997. The work was performed in accordance with a NYSDEC-approved Work Plan (Niagara Mohawk Power Corporation, 1995). The PSA/IRM study characterized subsurface conditions and the nature and occurrence of chemical constituents in soil and groundwater at the site, as well as sediments in Onondaga Creek. The field sampling programs included soil and groundwater sampling both on- and offsite to assess the presence and nature of site related by-products and other chemical constituents, and offsite sampling of sediments along the shoreline of Onondaga Creek. The study also included a fish and wildlife impact assessment (FWIA), a future groundwater usage evaluation, and a preliminary risk assessment to evaluate potential exposure pathways of constituents detected in soil and groundwater both on- and offsite. The results of the PSA/IRM study are summarized in the *Preliminary Site Assessment/Interim Remedial Measures Study Report* (ARCADIS G&M, 1998) (hereafter, “the PSA/IRM Report”). Based upon the results of the PSA/IRM study, the conclusion was drawn that characterization of the offsite conditions was insufficient to fully evaluate the extent of impacts, and an RI was recommended.

Initial Remedial Investigation

The Initial RI was conducted in phases from September 2000 through February 2003 pursuant to the *Remedial Investigation and Feasibility Study Work Plan* approved by the NYSDEC (ARCADIS G&M, 2000). The Initial RI further characterized site geology/hydrogeology and the extent of MGP-related impacts to offsite soil and to onsite and offsite groundwater. The Initial RI also evaluated the nature and occurrence of chemical constituents in surface water and further evaluated sediment quality in Onondaga Creek adjacent to and upstream/downstream from the site. A groundwater/surface water interaction study, a stream corridor characterization study of Onondaga Creek, a human health risk assessment (HHRA), and screening level ecological risk assessment (SLERA) were also completed as part of the Initial RI.

The subsurface soil investigation consisted of a soil boring and sampling program offsite to the west/northwest of the former MGP. Soil quality data (including laboratory geotechnical data) were obtained for further site characterization. Monitoring wells were installed at the subsurface soil borings for the purpose of further investigating offsite groundwater to the north/northwest of the former MGP, with a focus on determining the downgradient extent of MGP-related impacts. Groundwater samples were collected from each new and existing monitoring well. The creek investigation included the collection and analysis of surface water, sediment, and pore water samples from several locations in Onondaga Creek.

The results of the Initial RI are summarized in the *Remedial Investigation Report* (ARCADIS, 2003) (hereafter, “the Initial RI Report”). The Initial RI adequately characterized the site hydrogeology, the groundwater/surface water interaction, surface water/sediment quality and sediment transport in the Onondaga Creek corridor. The Initial RI identified the extent of the MGP-related impacts in groundwater downgradient from the site and determined that chemical constituents in Onondaga Creek were unrelated to the site.

Based on the outcome of the Initial RI, supplemental investigation and data collection activities were recommended to evaluate the potential soil vapor intrusion pathway. Also, based on subsequent discussions with the NYSDEC and New York State Department of Health (NYSDOH) during a March 7, 2008 project meeting, it was determined that additional groundwater and soil investigations (as part as a Final RI) were needed to: (1) evaluate changes in groundwater conditions since the previous sampling nearly 5 years earlier; (2) further evaluate conditions in the area of certain former MGP structures; and (3) provide additional data needed to evaluate potential remedial alternatives in the FS.

Supplemental Remedial Investigation

The SRI was conducted from June 2006 through March 2007 pursuant to the *Work Plan for Supplemental Remedial Investigation* (ARCADIS, 2005), follow-up correspondence, and a work plan addendum, which were approved by the NYSDEC on March 8, 2006. The SRI consisted of a soil vapor investigation (SVI) performed to evaluate the potential presence, concentration, and distribution of MGP-related volatile organic compounds (VOCs) in soil vapor at the site. Soil vapor probes were installed onsite in clusters (with 3 different depth intervals per cluster) to facilitate collection of depth-integrated soil vapor samples. A site reconnaissance was performed prior to soil vapor sampling to obtain information regarding building construction, underground utilities, and potential background soil vapor sampling locations. The investigation included collecting soil vapor samples from each of the soil vapor probes and ambient air samples for laboratory analysis of VOCs.

VOCs were detected at each of the soil vapor sampling locations at relatively low concentrations, including the potential background locations. The results of the SRI are summarized in the *Supplemental Remedial Investigation Report* (ARCADIS BBL, 2007) (hereafter, “the SRI Report”). The SRI concluded that no further soil vapor sampling was needed. However, in response to NYSDOH comments on the SRI Report and the April 18, 2008 letter from National Grid, additional vapor intrusion investigation (consisting of sub-slab vapor and indoor air sampling) was proposed to further evaluate the vapor intrusion pathway.

Final Remedial Investigation

The Final RI field work was conducted from April 2008 through June 2008 pursuant to discussions during a March 7, 2008 FS Scoping Meeting with the NYSDEC and NYSDOH and the work plan contained in an April 4, 2008 letter from National Grid, which was approved by the NYSDEC on April 14, 2008. The Final RI was conducted to further evaluate groundwater quality (to provide recent groundwater analytical data), further evaluate the extent to which certain MGP structures (the former tar cisterns and former relief holder in the western parking area) were removed as part of the site construction activities, and further characterize the nature of soils and extent of MGP-related impacts in and around certain former plant structures.

The field investigation included groundwater level measurements, non-aqueous phase liquid (NAPL) monitoring, well redevelopment, groundwater sampling and analysis, drilling of soil borings, subsurface soil sampling and analysis, and installation of a dense non-aqueous phase liquid (DNAPL) monitoring well. A review of historic documents and information was performed to assess the extent to which the MGP structures were removed during the previous construction.

Results obtained for the Final RI are summarized in letters to the NYSDEC dated April 25, 2008 and July 18, 2008 and in the *Final Remedial Investigation Report* (National Grid, 2008b) (hereafter, "the Final RI Report"). As summarized in the Final RI Report, NAPL was not found in any groundwater monitoring wells during the April 2008 gauging event, except for MW-8S, where visible NAPL was observed on the tip of the oil water interface probe (the thickness was not measureable). This observation was consistent with observations during previous sampling events. A sheen, trace NAPL, and petroleum like odor were observed in NAPL monitoring well MW-19 (which was installed in June 2008) during weekly/monthly monitoring performed between July and December 2008. Based on the data generated by the Final RI and previous investigations, it was determined that the area of groundwater that exceeds groundwater quality standards and guidance values at and downgradient from the site is stable, and may be decreasing.

Based on the subsurface investigation performed as part of the Final RI, competent (concrete or brick/mortar) bottoms appear to have been identified at the locations of two former MGP structures (Holder No. 3 and No. 7). For the other former MGP structures (except Holder No. 4, which was inaccessible due to its location below the Building D footprint), the inferred bottom was identified based on the transition from fill to native material. Based on data collected as part of the Final RI, the former holders and cisterns have been ruled out as potential ongoing sources of DNAPL to the subsurface (data indicate that there is no accumulated DNAPL in the structures), as summarized below.

- Data from borings drilled at the locations of former Holders No. 6 and No. 7 (borings SB-20 and SB-19, respectively) indicate that no DNAPL was observed in the fill above or in the native soils below the bottoms of these structures.

- Data from borings drilled at the former locations of the relief holder, the tar cistern, and underground cistern (borings SB-17, SB-12, and SB-15, respectively) suggest that these former structures do not contain potentially mobile DNAPL, since no DNAPL was observed in the fill material at each location, and no competent bottom was identified. However, these structures may represent historical sources of DNAPL to the subsurface.

- There is evidence that Holders No. 3 and No. 4 do not represent potential ongoing sources of DNAPL because design drawings indicate that some or all of their contents may have been removed when Building D was constructed. In addition, the absence of DNAPL accumulating in a well that is potentially within the limits of Holder No. 3 (MW-19) provides further evidence that this holder does not contain potentially mobile DNAPL. However, data from a boring installed within or immediately adjacent to the holder (boring SB-11) suggest that Holder No. 3 may have been a source of DNAPL to the subsurface in the past.

Based on the findings of the Final RI, it was concluded that the site was sufficiently characterized for the preparation of an FS. In a letter dated November 12, 2008, the NYSDEC and NYSDOH approved the Final RI Report and agreed that no further soil or groundwater investigation was needed, as sufficient data had been gathered for the preparation of a FS.

<u>Vapor Intrusion Investigation</u>

The VI Investigation field work was conducted from November 17, 2008 through November 19, 2008 pursuant to NYSDEC comments on the SRI Report, a letter from National Grid to the NYSDEC dated April 18, 2008 that responded to the comments, and the work plan contained in an October 27, 2008 letter from National Grid to the NYSDEC, which was approved by the NYSDEC on December 9, 2008. The VI Investigation was conducted to evaluate the potential presence, concentration, and distribution of MGP-related VOCs and other non MGP-related VOCs in soil vapor below certain existing onsite buildings, and the potential for vapor intrusion into onsite buildings. The field investigation included a building reconnaissance and product inventory, followed by sampling and analysis of sub-slab vapor, indoor air, and outdoor air.

The results of the VI Investigation are summarized in the *Vapor Intrusion Investigation Report* (ARCADIS, 2009) (hereafter, “the VI Investigation Report”). As summarized in the VI Investigation Report, certain VOCs were identified in the sub-slab vapor samples. However, MGP-related VOCs were not identified in any of the indoor air samples at concentrations exceeding typical background indoor air values. Non-MGP related VOCs (methylene chloride and trichloroethylene) were identified at two indoor air sampling locations at concentrations slightly greater than typical background indoor air values, but the concentrations at those sampling locations were less than NYSDOH published air guideline values.

The VI Investigation Report concluded the following: (1) there is no confirmed soil vapor intrusion exposure pathway; and (2) the VOCs detected in the indoor samples are operationally-related (not MGP-related) and less than the NYSDOH air guideline values. The low concentrations of VOCs identified in indoor air are primarily related to activities and operational use of various products within the Office Complex and not as a result of vapor intrusion. The VOC levels identified in indoor air within the buildings are within guidelines for residential settings. No further vapor intrusion investigation activities were proposed for the site.

The NYSDEC provided comments on the VI Investigation Report in a letter dated March 31, 2009. In response to those comments, a follow-up product inventory was performed inside the Stock Room of Building B on April 9 and 13, 2009. Findings of the follow-up product inventory were reported to the NYSDEC in a letter dated April 24, 2009. As summarized in that letter, several products were identified in the Stock Room that contained the same chlorinated VOCs detected in the November 2008 sub-slab vapor and indoor air samples from the room. In a letter dated March 31, 2009 and e-mail correspondence dated May 4, 2009, the NYSDEC agreed that no further VI investigation is needed.

August 2012 Soil Investigation

A soil investigation was performed at the site during the weeks of August 6 and 13, 2012 in support of two anticipated construction projects. The investigation was performed to assess conditions directly within the footprint of the two proposed construction areas, as follows:

- An approximately 0.2 acre area along the southern boundary of the site (between Building B and Onondaga Creek) where excavation was planned in connection with the rehabilitation of the Erie Boulevard bridge over Onondaga Creek.

- An approximately 200 square foot area immediately south of Building D where excavation to build a new handicap accessible entrance ramp into Building D was planned (ramp was constructed Summer 2013).

The soil investigation was performed by ARCADIS in accordance with the work plan presented in a July 30, 2012 letter from National Grid to NYSDEC, which was subsequently approved in July 31, 2012 e-mail correspondence from the NYSDEC. The investigation consisted of vacuum excavating soil (SB-22 through SB-28A, as shown on Figure 3) to assess the potential presence of utilities and drilling soil borings at five locations (SB-22 through SB-25, and SB-27) to assess conditions within the proposed construction areas. Refusal was encountered less than 2 feet bgs at the remaining three soil boring locations (SB-26, SB-28 and SB-28A) due to a concrete/brick surface interpreted to be part of the wall of former Holder No.3.

Soil recovered from soil borings SB-22 through SB-28A did not exhibit visible NAPL, staining, sheens, or obvious odors, as described in a April 16, 2013 letter from National Grid to NYSDEC (Appendix A). Soil analytical results from SB-22, SB-24, SB-25, and SB-27 contained SVOCs, inorganic compounds, and/or PCBs at concentrations slightly exceeding commercial use SCOs. Minimum environmental construction requirements for performing intrusive construction activities, handling materials (e.g., asphalt pavement and soil), importing fill materials, and placing a demarcation layer at the interface of the imported fill and the underlying soil were presented in the April 16, 2013 letter from National Grid to the NYSDEC.

January 2013 Groundwater Monitoring Event

Groundwater monitoring was conducted during the week of January 28, 2013 pursuant to discussions during a January 16, 2013 meeting attended by the NYSDEC, National Grid, and ARCADIS regarding remedial alternative selection for the site. The monitoring was performed to evaluate current groundwater conditions at and hydraulically downgradient from the site.

The groundwater monitoring activities included measuring groundwater levels, gauging NAPL (if any), and collecting groundwater samples from 16 accessible on- and offsite monitoring wells. Results obtained during the groundwater monitoring are summarized in a March 8, 2013 letter from National Grid to the NYSDEC (Appendix A). Groundwater analytical results from the January 2013 and previous sampling events suggest that the extent of constituents in groundwater that exceed groundwater quality standards and guidance values at and downgradient from the site is stable and may be decreasing.

1.3 Site Characterization/Nature and Extent of Impacts

As previously noted, the PSA/IRM Report, Initial RI Report, SRI Report, Final RI Report, March 8, 2013 groundwater sampling summary letter (National Grid 2013b), and April 16, 2013 soil investigation summary letter (National Grid 2013c) summarize the results of numerous environmental investigations that have been conducted both on- and offsite to evaluate the nature and extent of MGP-related impacts.

As the focus of the alternatives evaluation in this FS is on soil and groundwater, the tables and figures provided with this report present information and data related to the soil and groundwater investigations. Soil and groundwater sampling locations are shown on Figures 2 and 3. An analytical sample summary, which identifies soil and groundwater samples collected as part of the environmental investigations and the corresponding analyses, is included as Table 1. Subsurface intervals where NAPL, staining, sheens, or odors were encountered within the soil borings are summarized in Table 2. Construction details for the monitoring wells and piezometers are summarized in Table 3. Water level data is summarized in Table 4. Field parameter measurements obtained during groundwater sampling are presented in Table 5. Comprehensive soil and groundwater analytical results are presented in Tables 6 through 10.

For sediment, surface water, sediment pore water, soil vapor, sub-slab vapor, and indoor air data and information, prior reports are incorporated by reference in this document.

A discussion of the site geology is provided below, followed by a discussion of hydrogeology, groundwater usage, and the nature and extent of MGP-related impacts.

1.3.1 Geology

Subsurface investigations have identified eight principal geologic units of interest to this investigation. In order of increasing depth from the ground surface, these geologic units are presented in Table 1-1.

Table 1-1

Generalized Geologic Column

Thickness Range (feet)	Stratigraphic Unit
3-28	Fill - The surficial unit, which varies in composition and texture throughout the site and consists of poorly sorted sand, clay and gravel, cinders, fragments of brick, concrete, asphalt and wood. This unit is continuous across the site and thickens from east to west, toward Onondaga Creek.
2-20	Lacustrine Silt and Clay – Brown silt and clay, often with lesser amounts of sand and gravel. Generally occurs beneath the western portion of the site, but is locally absent.
2-25	Lacustrine Silt and Clay or Till – Gray-colored mixture of gravel, and sand embedded in a silt-and-clay matrix. This deposit is not continuous beneath the site, but generally occurs in the site's western half.
70-125	Sand and Gravel – Interbedded lenses of gravelly sand and sandy gravel, with occasionally discontinuous beds of sand, gravel and mixtures of the two. Percentage of fines (silt and clay) varies, but is generally low.
Approx. 30	Gravel – Gravel with some to little sand and little to trace amounts of silt and clay. Historic information for production wells at the site indicates that this unit may have intervals of very coarse grained material.
4->40	Sand – Moderately to well sorted, fine to medium sand.
Approx. 20	Till – Dense silty clay with some fine to medium sand and gravel. Unit was encountered at two locations (MW-9D_2 and MW-10D). Full thickness of 20 feet was penetrated at MW-10D location.
see note below	Bedrock – A Vernon shale, which is generally characterized as a sequence of shales and dolostones with interbedded limestone and minor gypsum. Based on regional mapping by Stewart (1937), the bedrock surface in the western portion of the site drops off steeply (toward the northwest) and ranges from approximately 100 to 250 feet AMSL. The bedrock surface was encountered at 250.4 feet AMSL (approximately 144 feet below grade) at well MW-10D.

Note: The thicknesses reported above are based on observations made during the previous investigations. Approximately 10 feet of bedrock was encountered at MW-10D, but based on regional conditions, the thickness of bedrock below the site is anticipated to be much greater than 10 feet (it is upwards of 700 feet regionally) (Stewart, 1937).

1.3.2 Hydrogeology

The major hydrologic feature near the site is Onondaga Creek, which drains highly developed, heavily commercialized and industrialized landscapes as it passes south to north through the city. Onondaga Creek is classified by the NYSDEC as a Class C water body. Onondaga Creek is a losing stream near the site, meaning that a fraction of the water in its channel leaks out of its channel and recharges groundwater.

As identified during the previous investigations, saturated conditions are first encountered within the gravelly silt; sand and gravel; or sand and silt unit. The water table occurs at a depth of approximately 20 to 25 feet bgs at the site. Hydraulic head data obtained from monitoring wells (Table 4) indicate that shallow groundwater moves away from the creek and downward, and the gradient is very slight (approximately 0.0009 ft/ft). Deeper groundwater moves predominantly northwestward. Figure 4 depicts the water table during April 2008. ARCADIS (2003) examined vertical gradients among well pairs. For well pairs comprised of a water-table well and a “moderate-depth” deep well (screen bottom between 60 and 100 feet deep), the direction of the vertical gradient was generally downward, particularly during seasonally wet periods. Looking more closely at these data, it is apparent that the average strength of the vertical gradient is about an order-of-magnitude greater than typical horizontal gradients measured from water table maps. This information means that the predominant flow direction for shallow groundwater is likely downward.

The Initial RI Report (ARCADIS, 2003) concluded that the best means of determining the direction of groundwater movement in the moraine and outwash deposits at the site is by using the orientation of the dissolved plume of MGP-related compounds. This information indicates that the groundwater in the moraine and outwash deposits moves northwestward from the site toward monitoring well MW-17D, generally following the alignment of the Onondaga trough. Lateral movement is also expected to dominate due to the increasing salinity, and hence density, of groundwater with depth in the moraine and outwash deposits. Denser, more saline water discharging from the underlying bedrock would tend to form a layer of saline groundwater at depth in the trough. This is evident in the conductivity and density data presented in Table 5, where both are highest in the deeper wells.

1.3.3 Groundwater Usage

Based on water supply mapping available from the Onondaga County Water Authority (OCWA) (http://www.ocwa.org/o2804.html), the City of Syracuse derives its potable water supply primarily from Skaneateles Lake (and from Lake Ontario as emergency backup). As summarized in the Initial RI Report, while the sand and gravel deposits associated with the Onondaga Lake trough are capable of producing large well yields, naturally high salinity and total dissolved solids (TDS) levels render groundwater derived from deeper portions of these deposits unusable for human consumption, and pumping high volumes of shallow groundwater (e.g., for commercial or industrial use) could result in increased TDS and chloride concentrations by drawing deep saline groundwater upward to the extraction well. In fact, chloride concentrations identified from sampling and analysis of deep groundwater beneath the site averaged just over 29,000 ppm (parts per million) (arithmetic average) and were as high as 100,000 ppm. These values are well-above the groundwater quality standard of 250 ppm for chloride, as presented in NYSDEC Division of Water Technical and Operational Guidance Series document titled "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (TOGS 1.1.1), dated June 1998 (last revised June 2004). TDS concentrations in deep groundwater beneath the site averaged just over 17,500 ppm (arithmetic average) and were as high as 110,000 ppm. These values are well-above the 1,000 ppm upper limit for freshwater as presented in TOGS 1.1.1.

As summarized in the Final RI Report, the Onondaga County Department of Health reported that there are no known wells in the City used for potable water supply. As summarized in the Initial RI Report, potential future development of groundwater for salt production or other industrial processes is unlikely due to potential production problems associated with high iron content, limited cost-effectiveness in extracting salt, etc. The only documented use of groundwater has been for former industrial/commercial purposes.

1.3.4 Nature and Extent of MGP-Related Impacts

The site investigations consisted of sampling surface soils and soil vapor within onsite sampling locations; sediment and surface water from offsite locations; and subsurface soil and groundwater from both on- and offsite locations. This section summarizes the chemical constituents detected in the samples collected as part of these investigations, observations of NAPL in samples recovered from the borings, and other key findings.

1.3.4.1 Surface and Subsurface Soil

A discussion of impacted surface and subsurface soils is presented below.

<u>Surface Soil</u>

Surface soil samples were collected from three separate offsite locations during the Initial RI activities, all of which were located adjacent to the western perimeter of the site along the Onondaga Creek stream bank. Remaining areas of the site are covered by asphalt pavement, concrete sidewalks, buildings, and landscaping (with little or no exposed surface soil). No BTEX, inorganics, or pesticides were identified in the samples at concentrations exceeding the commercial-use SCOs presented in 6 NYCRR Part 375-6.8(b), effective December 14, 2006 (hereinafter the "commercial use SCOs").

However, five PAHs were identified in each surface soil sample at concentrations exceeding the commercial-use SCOs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene]. The PAH concentrations identified in the samples ranged from just over 1 ppm to 27 ppm (vs. commercial use SCOs of 0.56 ppm to 5.6 ppm).

<u>Subsurface Soil</u>

A total of 204 subsurface soil samples were collected from 47 soil borings (includes borings for 24 monitoring wells) and 3 test pits as part of the PSA/IRM study, Initial RI, Final RI and 2012 Soil Investigation activities. Two soil samples from each test pit and up to 14 soil samples from each soil boring were submitted for laboratory analysis. Soil samples collected as part of the investigations were analyzed for one or more of the following: BTEX/VOCs, PAHs/semi-volatile organic compounds (SVOCs), metals, cyanide, pesticides, polychlorinated biphenyls (PCBs), constituents in extract generated by toxicity characteristic leaching procedure (TCLP) sample extraction, ignitability, corrosivity, and reactivity. Subsurface soil samples were collected throughout the site and offsite locations to the west/northwest of the site, but primarily focused on areas that were not covered with onsite office buildings (i.e., the western parking lot of the site near Onondaga Creek and to a lesser extent the northern and eastern parking lots).

BTEX, PAHs, and cyanide were detected in several of the soil samples collected as part of the previous investigations. For purposes of evaluating the soil analytical results, the results have been compared (in Tables 6 and 7) to the unrestricted use and commercial use SCOs presented 6 NYCRR Part 375-6.8(a) and (b). The unrestricted use SCOs provide a baseline for comparison of the results. The commercial use SCOs are applicable to the site given that the current and long-term future site use is commercial. The results in comparison to the commercial use SCOs are summarized below.

- BTEX compounds were either not detected or were identified at concentrations below the commercial use SCOs in each of the soil samples collected as part of the previous investigations, except for the samples from depths of 12 and 14 feet bgs from the MW-4S boring and from the 22 to 24 foot depth interval at boring SB-12.

- PAHs were not identified at concentrations exceeding the commercial use SCOs in any of the soil samples collected from the borings north or east of the Syracuse office complex. With two exceptions, PAHs also were not identified at concentrations exceeding the commercial use SCOs in soil samples from the offsite borings (PAHs were identified at concentrations exceeding the commercial use SCOs in samples from the borings for MW-14D and MW-16D, but the PAHs at those locations were determined to be unrelated to the former MGP site).

- One or more PAHs were identified at concentrations exceeding the commercial use SCOs in one or more soil samples from each soil boring and test pit in the western parking area, except soil borings SB-8 and SB-23. The highest PAH concentrations were identified in the soil sample collected at a depth of 12 feet bgs from the MW-4S boring. The next highest concentrations were identified at sampling locations SB-12 (22-24') and SB-13 (8-10').

- The soil sample from a depth of 14 feet bgs at the MW-4S boring exhibited benzene in leachate generated by TCLP sample extraction at a concentration exceeding the 0.5 ppm regulatory limit presented in 6 NYCRR Part 371 (refer to Table 10 for TCLP sample results). No other constituents besides benzene at this location were identified in leachate from the sample extractions at concentrations exceeding regulatory limits. Note that the sample from the 14 foot depth at MW-4S was also analyzed for Target Compound List (TCL VOCs) and the total benzene concentration identified in the sample (35 ppm) is less than the 44 ppm commercial use SCO.

- Cyanide was identified at concentrations below the 27 ppm commercial use SCO in all but two samples (the sample from the 22 to 24 foot depth interval at boring SB-12 and composite sample collected from SB-27). The cyanide concentrations detected at boring SB-12 (33.6 ppm) and SB-27 (27.4 ppm) were just slightly greater than the commercial use SCO. While purifier waste can be a source of cyanide at MGP sites, it is not considered to be a source of the cyanide at borings SB-12 and SB-27 (and is not a concern at this site). This is because purifier waste is usually easy to identify visually and has not been observed at these borings (or any of the sampling locations at the site).

In summary, soils at the site that exhibit BTEX, PAHs, or cyanide at concentrations exceeding the commercial use SCOs are primarily within the western portion of the site. These exceedances were generally at depths starting at 8 to 10 feet bgs and extending to depths several feet below the water table. Exceedances of commercial use SCOs for unsaturated soil in the western parking lot and the remaining investigation area are shown on Figures 5 and 6, respectively.

Sampling locations where total BTEX were identified in one or more intervals at concentrations greater than 10 ppm and total PAHs greater than 500 ppm are shown by the color-coded "dots" on Figures 7 and 8 (for unsaturated and saturated soil, respectively). The 10 ppm BTEX and 500 ppm total PAH values are consistent with the VOC and SVOC "cap" values presented in TAGM 4046. The 500 ppm total PAH value is also consistent with the SVOC "cap" value presented in 6 NYCRR Part 375-6.8(b) for commercial land use of the site.

1.3.4.2 NAPL

Several of the recovered soil samples contained visual evidence of NAPL (refer to Table 2). A number of these soil samples were analyzed for BTEX, PAHs, and cyanide (results are presented in Tables 6 and 7).

With respect to the presence of NAPL, the investigations provided information that can be summarized as follows:

- NAPL was observed in several soil borings, monitoring well borings, and test pits located onsite, primarily in the western parking lot.
  - NAPL was encountered in most of the locations in the southern portion of the parking area (south of the former relief holder), and the NAPL was generally observed to be in “stringers” or pockets, or the NAPL consisted of small oil droplets interspersed with the soil.
  - NAPL characterized as “thick oily liquid”, “oil”, “free-phase”, or similar terms (i.e., without any limiting qualifiers) was generally encountered in the northern portion of the parking area (southwest of Holder No. 3).
- At several boring locations in the western parking lot where NAPL was encountered in subsurface soil, the PAH analytical results (where available) were less than or generally consistent with the commercial use SCOs [this includes all sampling intervals at borings SB-9, SB-10, SB-15, SB-16, SB-18, and SB-21 and selected sampling intervals at other borings: SB-13 (20-22’) and SB-14 (18-20’)].
- At almost all boring locations, the upper 8 to 10 feet of soil was observed to be DNAPL-free. Available building plans for the current facilities at the site indicate that no substantial filling occurred during their construction. Therefore, it is inferred that the primary source of DNAPL to the subsurface was leakage from below-grade structures. Observations from the soil borings and building plans also support that the structures that were potential sources of DNAPL (gas holders and vessels used to separate tar from the raw gas – e.g., tar wells, tar cisterns, and tar separators) were constructed partially below grade.
- Figure 9 shows the locations and depth intervals where potential NAPL-saturated soil was observed. Intervals below the water table are identified with blue-colored shading. This figure was presented in a February 8, 2013 letter from National Grid to the NYSDEC (Appendix A). As summarized in the letter, “NAPL saturated” is defined as intervals of soil containing NAPL at a level above residual saturation, based on soil descriptions provided in the soil boring logs. As an

example, soil intervals described in the boring logs as containing NAPL stringers, blebs or staining were not considered NAPL-saturated. NAPL-saturated soils are those where the degree of NAPL saturation is believed to be high enough such that NAPL would drain from the soil into a well screened across the NAPL-containing interval.

- As shown on Figure 9, NAPL-saturated soil at the site appears to occur in limited depth intervals, typically below the water table (depths greater than 20 feet below the surface of the paved parking lot in the western portion of the site). In addition, the largest occurrence (volume) of NAPL-saturated soil was observed below the northwestern portion of the parking lot. Monitoring well MW-19 was installed in this portion of the site, in an attempt to recover NAPL. However, over the course of more than seven years since this monitoring well was installed in 2006, it has never produced any recoverable NAPL.

- No measurable amount of NAPL has been identified in on- or offsite monitoring wells during investigation and associated monitoring conducted at and downgradient from the site. The absence of NAPL entering the wells, which are adequately constructed to allow NAPL collection, indicates that NAPL in the subsurface soil does not appear to be mobile or recoverable (as summarized in February 8, 2013 letter from National Grid to NYSDEC, Appendix A).

- Figure 10 identifies the locations of geologic cross sections A-A’, B-B’, and C-C’ (Figures, 11, 12 and 13, respectively), which vertically show the locations and depths of NAPL saturated soil. For the most part, the NAPL was identified from approximately 10 to 60 feet bgs (primarily within the sand and gravel layer) and has not spread considerable distances from inferred sources. This is expected because no conditions were identified in the subsurface that would promote significant lateral spreading (i.e., there are no mappable low-permeability strata identified in the coarse-grained moraine and outwash deposits penetrated beneath the site, and deposits beneath the site are so permeable that the horizontal hydraulic gradient within them is very slight). Therefore, downward rather than lateral movement of the DNAPL is favored.

- The data also indicate that the DNAPL has depleted itself to residual saturation and is immobile (i.e., lateral or downward movement of NAPL is not still occurring). Observations of recovered soil samples indicated that the DNAPL saturation in the borings decreases with depth, and in several cases, samples from the bottom of the borings were DNAPL-free. In addition, as noted above no measurable NAPL has been identified in wells at or downgradient from the site.

1.3.4.3 Groundwater

Part of the investigations involved the installation and sampling of monitoring wells throughout the site between July 1995 and January 2013. These activities were performed to assess the nature and extent of MGP-related impacts to water quality. A total of 24 groundwater monitoring wells (in 17 clusters) and one NAPL monitoring well were installed during the PSA/IRM study, Initial RI, and Final RI activities. This includes 9 shallow wells (including one NAPL monitoring well) and 16 deep wells. Both onsite and offsite wells were installed, with a total of 13 wells located onsite and 12 offsite wells located to the west/northwest of the site. Several rounds of groundwater sampling have been performed at the wells, starting with an initial event in August 1995 and continuing with events in November 1995, July 1997, September 1997, November 2002, January 2003, April 2008 and January 2013. The samples were analyzed for MGP-related and non-MGP-related constituents and certain biogeochemical parameters.

Laboratory analytical results for the groundwater samples collected to date, including comparisons to the Class GA groundwater quality standards/guidance values presented in TOGS 1.1.1, are presented in Tables 8 and 9. Figure 14 shows all groundwater analytical results for BTEX compounds, PAHs, and cyanide that exceed the Class GA groundwater quality standards/guidance values. Onsite and offsite shallow monitoring wells where NAPL was encountered or where BTEX, PAHs, or cyanide were identified at concentrations exceeding groundwater quality standards/ guidance values are shown via color-coded “dots” on Figure 15. Deep onsite and offsite monitoring wells where BTEX and PAHs were identified at concentrations exceeding groundwater quality standards/guidance values are shown via color-coded “dots” on Figure 16. The approximate horizontal limits of deep offsite groundwater exhibiting BTEX and PAHs at concentrations exceeding groundwater quality standards and guidance values are shown on Figure 16.

As shown on Figure 16, the offsite plume of affected groundwater extends northwestward (which is consistent with regional flow information). The plume is a result of groundwater passing beneath the site and slowly, preferentially dissolving the more soluble compounds of the DNAPL. Groundwater then transports the compounds downward and northwestward. Upon leaving the site, the compounds that exceed criteria are almost exclusively BTEX and naphthalene (i.e., the most soluble and most mobile compounds dissolving from NAPL).

The groundwater analytical results are summarized below.

- For the shallow monitoring wells in the northern and eastern portion of the site (wells MW-2, MW-3S, and MW-6), no BTEX compounds, PAHs, or cyanide were identified at concentrations exceeding the groundwater quality standards or guidance values in any of the samples.

- For the monitoring wells in the western portion of the site and offsite, one or more BTEX compounds or PAHs were identified at concentrations exceeding the groundwater quality standards or guidance values in selected samples. BTEX and PAH exceedances for this area are summarized below.

- The highest BTEX and PAH concentrations in groundwater have been in the shallow wells along the west edge of the western parking area (wells MW-4S and MW-7S). The BTEX and PAH concentrations in the paired deep wells in the area (wells MW-4D and MW-7D) have been much lower. In general, the concentrations at these two deep wells have been only marginally greater than the groundwater quality standards/guidance values.

- The BTEX and PAH concentrations in MW-1S (north of Building D) and MW-8S (west of Building B), while greater than groundwater quality standards/guidance values, have been much lower than the concentrations at MW-4S and MW-7S. No exceedances of groundwater quality standards or guidance values were detected in the two most recent sets of groundwater samples collected from MW-1S (April 2008 and January 2013).

- Xylenes and naphthalene were detected at concentrations slightly greater than groundwater quality standards/guidance values in the 2003 sample from the shallow offsite well (MW-10S). No constituents were identified at concentrations exceeding standards/guidance values in the samples collected from MW-10S during the five other sampling events, including the most recent January 2013 sampling event.

- The BTEX and PAH concentrations in four deep offsite wells (MW-9D1, MW-10D, MW-15D, and MW-17D) have exceeded the groundwater quality standards/guidance values each time the wells were sampled. The concentrations in the deep offsite wells decrease with distance from the former MGP site. As indicated above, naphthalene is the primary PAH constituent of interest in the offsite wells. The naphthalene concentrations detected most recently (January 2013) in two of the first three deep offsite monitoring wells within the groundwater plume (MW-9D1 and MW-10D) and in the most downgradient well along the plume (MW-17D) were one-to-two orders of magnitude less than the concentrations identified in these wells during each of the previous monitoring events.

- No BTEX or PAHs have been identified at concentrations exceeding groundwater quality standards or guidance values in samples collected from the sentinel monitoring wells. This includes MW-12D (the first well west of the site), MW-14D (just north of the Interstate I-690 and West Street interchanges), MW-16D (on the church property just northwest of the intersection of Genesee Street and Plum Street), and MW-18 (the most downgradient monitoring well).

- BTEX concentrations in groundwater at several deep monitoring wells located along the offsite groundwater plume have generally decreased by one or two orders of magnitude since the previous monitoring events. BTEX concentrations have decreased by an order of magnitude at monitoring wells MW-9D1 and MW-11D (the first two downgradient wells from the site) and by two orders of magnitude at monitoring well MW-10D (the third downgradient well from the site). BTEX concentrations in the January 2013 groundwater samples collected from the next two downgradient wells along the plume axis (wells MW-15D and MW-17) appear to be slightly less than or generally consistent with analytical results collected in 2008, respectively, and less than analytical results collected from 2002 and 2003).

- Total cyanide was previously identified at concentrations exceeding the 200 part per billion (ppb) groundwater quality standard in only three wells (wells MW-1S, MW-4S, and MW-7S). Total cyanide concentrations in the April 2008 and January 2013 samples collected from these wells were less than the 200 ppb standard, except for the 2,100 ppb and 1,800 ppb concentrations at MW-4S in 2008 and 2013, respectively (which are less than the result for the previous sampling event conducted in 2003).

The inferred upper and lower limits of groundwater that contains one or more MGP-related compounds above the Class GA standards or guidance values at monitoring wells MW-15D and MW-17D are based on the depths at which MGP-like odors are first and last noted in the boring logs. The upper limit of the offsite plume generally ranges from approximately 40 feet bgs (MW-10S/10D) to 70 feet bgs (MW-15D). The plume is approximately 90 feet thick at MW-10S/10D and narrows with increasing distance from the site, to approximately 30 to 35 feet thick at wells MW-15D and MW-17D.

ARCADIS (2003) assessed the fate of affected groundwater. Part of the assessment included collecting biogeochemical data and evaluating conditions for biodegradation of the dissolved plume of affected groundwater. The data collected and evaluated included: (1) terminal electron acceptors such as dissolved oxygen, nitrate and sulfate; (2) the reduced byproducts of biodegradation such as carbon dioxide, ferrous iron, dissolved manganese, sulfide, and methane; and (3) general indicator parameters, including oxidation-reduction potential, pH, specific conductance, and temperature. The assessment also included advective transport predictions (using Darcy's law and assumptions of no degradation or dispersion of constituents within the plume) and review of existing groundwater BTEX and PAH analytical data.

As detailed in the RI Report, advective transport predictions suggested that the expected distance of migration of the degradable constituents in groundwater would be greater than the RI data showed. The less-than-expected distance of migration suggested that natural attenuation and biodegradation processes were occurring and mitigated the movement of impacted groundwater. Evaluation of the biogeochemical data collected during the RI supported that reducing conditions are preset across the site, most notably in the source area in the western portion of the site. Depletion of dissolved oxygen and possibly nitrate and the formation of carbon dioxide, ferrous iron, and methane indicated that a wide variety of terminal electron acceptors were being used in the microbially mediated degradation of MGP related constituents in groundwater.

The analyses concluded that the dissolved phase plume is stable (it is not expanding in size and concentrations are staying approximately the same). The plume size and concentrations have remained approximately the same (as opposed to increasing) due to attenuation, in large part, by biodegradation. The groundwater quality data collected during the January 2013 sampling event were consistent with the historical data and further support the conclusion that the dissolved plume of affected groundwater is stable, or possibly decreasing.

1.3.4.4 Sediment and Surface Water

As part of the environmental investigations, sediment, surface water, and sediment pore water samples were collected from Onondaga Creek and submitted for laboratory analysis. A summary of these sampling activities and the associated results are provided in the subsections below.

Collectively, the data indicate that no site-related impacts are present in Onondaga Creek. In NYSDEC's recommendation to the USEPA that the site not be designated as an upland source of contamination (i.e., a subsite) of the Onondaga Lake Superfund Site (USEPA ID #NYD986913580), NYSDEC noted that "Although there is DNAPL and contaminated groundwater associated with this site, the cumulative PSA and RI data indicate that there are no ongoing releases or impacts to Onondaga Creek nor to Onondaga Lake". The USEPA concurred with NYSDEC's recommendation and the site is not part of the Onondaga Lake Superfund Site, as documented in an April 28, 2005 letter from the USEPA to the NYSDEC (copy of USEPA's letter, which includes a copy of NYSDEC's Onondaga Lake National Priorities List [NPL] subsite evaluation, is provided in Appendix A).

1.3.4.4.1 Sediment

As part of the PSA/IRM study and Initial RI field investigations, sediment samples were collected from 26 sampling locations in Onondaga Creek upstream, adjacent to, and downstream of the site. The samples were submitted for laboratory analysis for VOCs, SVOCs, inorganic constituents (including cyanide), PCBs, and/or pesticides. The sediment analytical results are summarized below.

- VOCs were not detected in sediment at the majority of the sediment sampling locations, and when detected, the VOC concentrations were low (1 ppb or less).
- SVOCs were identified upstream, adjacent to, and downstream of the site. The presence of PAHs in sediment samples upstream of the site and the heavily urbanized nature of the surrounding area indicated that there are current sources of PAHs impacting the creek sediments that are unrelated to the site. No spatial trend was apparent relative to the concentrations of SVOCs in the creek and the site.
- Cyanide compounds were not identified in any of the sediment samples.

- Certain metals and pesticides were detected in the sediment samples, but are unrelated to the site.

Numerous storm sewers and outfalls that collect runoff from city streets and parking lots discharge to Onondaga Creek and were identified as a likely source of chemical constituents, including PAHs, to creek sediments throughout the corridor. The corridor study performed during the Initial RI indicated that chemical constituents in Onondaga Creek were not related to the site and former MGP operations.

1.3.4.4.2 Surface Water

As part of the Initial RI, surface water samples were collected from three locations in Onondaga Creek, including one location adjacent to the site, one location upstream from the site, and one location downstream from the site. The analysis performed on the surface water samples included VOCs, SVOCs, and inorganic constituents. VOCs were generally not detected in the surface water samples, and when detected, the constituents did not appear to be spatially related to the site. PAHs were not detected in any of the surface water samples. Various metals were detected in the surface water samples, but were not attributed to the site. Cyanide was not detected in any surface water samples.

The nature of the flow interaction between surface water in Onondaga Creek and shallow groundwater at and near the site was evaluated via a groundwater/surface water interaction study completed during the Initial RI. As part of the study, water level data were collected in varying streamflow conditions to assess the response of groundwater levels in adjacent onsite monitoring wells and offsite piezometers. The water level data collected as part of the study indicate that Onondaga Creek is a losing stream (i.e., a component of flow in the creek discharges to the groundwater system). Water level elevations at stream gauging stations were typically higher than the elevations in the adjacent monitoring wells and piezometers, and water level measurements from the piezometers indicate a horizontal hydraulic gradient to the east away from the creek.

1.3.4.4.3 Sediment Pore Water

As part of the Initial RI field investigations, sediment pore water samples were collected from the three surface water sampling locations in Onondaga Creek. The analysis performed on the sediment pore water samples included SVOCs and cyanide. SVOCs were generally not detected or were identified at very low concentrations in the samples, and cyanide was not detected in any of the samples.

1.3.4.5 Soil Vapor/Indoor Air

As part of the SRI field investigations, soil vapor samples were collected from 30 sampling locations onsite. Several VOC constituents, including BTEX and naphthalene, were identified in soil vapor samples collected from each sampling location (including the potential background locations) and overall, the VOC concentrations were relatively low, with the majority of the results ranging from non-detect to 10 micrograms per cubic meter (μg/m^3).

In response to NYSDOH comments, a vapor intrusion investigation was performed to further evaluate the vapor intrusion pathway and included collection of sub-slab vapor and indoor air samples. As previously mentioned, certain VOCs were identified in the sub-slab vapor samples. However, MGP-related VOCs were not identified in any of the indoor air samples at concentrations exceeding typical background indoor air values. Non-MGP related VOCs (methylene chloride and trichloroethylene) were identified at two indoor air sampling locations at concentrations slightly greater than typical background indoor air values, but the concentrations at those sampling locations were less than NYSDOH published air guideline values. The presence of methylene chloride and trichloroethylene in indoor air was attributed to operational use of products inside the buildings (not the former MGP). The data supported that there is no confirmed vapor intrusion pathway at the site.

1.3.5 Human Health Risk Assessment

A preliminary risk assessment was completed as part of the PSA/IRM study. An HHRA was completed as part of the Initial RI as a follow-up to the preliminary risk assessment. These studies assessed potential current and future risks to human health associated with chemicals at the site. The environmental media of interest included surface soil, subsurface soil, groundwater, surface water, and sediment. Findings of these studies are summarized below.

- Based on review of available data and discussions with state and regulatory agencies and City of Syracuse officials, no active users of groundwater at the site or vicinity were identified. In addition, there were no known plans for future groundwater development. As indicated in Section 1.3.3, naturally high salinity and TDS render groundwater from the deposits capable of producing high yields unusable for human consumption and infeasible to use for industrial purposes.

- Because of existing site features and conditions (depth to groundwater, paved parking lots and buildings, retaining wall between Onondaga Creek and impacted soils, no groundwater usage), no complete exposure pathways to affected soil or groundwater were identified, with the exception of a scenario where excavation were to occur in the future.

- The HHRA indicated that it is unlikely any site workers would ever contact surface soil because the vast majority of the site is paved or covered by buildings. With the exception of the construction worker scenario, predicted non-cancer hazards and cancer risks were all within or below the acceptable hazard benchmarks. Risks to construction workers associated with potential exposure to constituents in subsurface soil would be mitigated by use of proper personal protective equipment (PPE). Actual contact with impacted media during excavation activities would be further limited by the use of heavy equipment (e.g., backhoe, excavator, bulldozer) to complete excavations. For further details related to the HHRA, refer to Section 7 of the NYSDEC-approved *Remedial Investigation Report* (ARCADIS, 2003).

1.3.6 Fish and Wildlife Impact Analysis/Screening-Level Ecological Risk Assessment

An FWIA was performed as part of the PSA/IRM study to identify the fish and wildlife resources in the vicinity of the site, and to evaluate the potential for exposure of these resources to site-related constituents in environmental media. The SLERA was completed as part of the Initial RI to evaluate potential risks to ecological receptors from exposure to chemicals in environmental media. The environmental media of interest for these studies included surface water, sediment pore water, and sediment.

The site and vicinity were determined to be of limited value as habitat to fish and wildlife. These studies also indicated that Onondaga Creek is highly influenced by the urban nature of its surroundings. Surface water/sediment quality in the creek was found to be consistent with expectations for an urban body with multiple storm sewer discharges and outfalls. It was determined that no single chemical constituents, source, or location drives predicted ecological risks. Furthermore, the constituents detected in Onondaga Creek surface water and sediment is not associated with the site and former MGP operations. Therefore, it was determined that the site and former MGP operations have not affected ecological risks in Onondaga Creek. For further details related to the SLERA, refer to Section 7 of the NYSDEC-approved *Remedial Investigation Report* (ARCADIS, 2003).

2. Identification of Standards, Criteria and Guidance (SCGs)

2.1 General

One component involved in identifying, evaluating, and selecting remedial alternatives is a review of standards, criteria, and guidance (SCGs) that may be applicable to the site and/or contemplated remedial alternatives. Understanding federal, state, and local SCGs assists in identifying remedial objectives for the site, the type of remedial alternatives that may be appropriate, and the scope and extent to which each retained alternative would be designed and implemented.

The SCGs that have been identified for the project are presented in this section.

2.1.1 Definition of SCGs

"Standards and criteria" are cleanup standards, standards of control, and other substantive environmental requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance.

"Guidance" are non-promulgated criteria, advisories and/or guidance that are not legal requirements and do not have the same status as "standards and criteria"; however, remedial alternatives should consider guidance documents that, based on professional judgment, may be applicable to the project.

It is important to consider SCGs in the FS Report. Doing so allows for the development of each alternative to a reasonably accurate level of detail and provides for a common basis for comparison among alternatives.

2.1.2 Types of SCGs

SCGs have been categorized into the following classifications:

- Chemical-Specific SCGs – These SCGs are typically health- or risk-based numerical values that establish allowable concentrations for constituents associated with the impacted media (soil, groundwater, etc.).

- Action-Specific SCGs – These SCGs are typically technology- or activity-based requirements related to the performance of remediation activities. These types of SCGs typically influence the implementation aspects of a given alternative.

- Location-Specific SCGs – These SCGs include regulations related to activities conducted in floodplains, wetlands, and navigable waters. Location-specific SCGs also include local requirements such as noise mitigation requirements, building permit conditions for permanent or semi-permanent facilities constructed during the remedial activities (if any), sewer discharge requirements, street closing policy, etc.

The SCGs identified for the site are presented in Table 11 and summarized below.

2.2 SCGs

Site-specific SCGs are presented below.

2.2.1 Chemical-Specific SCGs

Because the existing and anticipated future use of this site is commercial, the commercial use SCOs presented in 6 NYCRR Part 375-6.8(b) are applicable for chemical constituents in soil at the site.

Although groundwater in the area of the site is not currently, and will not likely in the future, be used as a potable water supply, it is subject to the NYSDEC Class GA Groundwater Standards defined in 6 NYCRR Parts 700-705. The Class GA Groundwater Standards are presented in TOGS 1.1.1, which also provides a compilation of guidance values for use where there are no standards. In the area of the site, both the shallow and deep groundwater is generally saline. Fresh water was identified at only two wells (MW-1D and MW-2), and it was identified at these wells at only two of the five or six sampling events. Fresh water was not identified at any other wells. Fresh groundwater is defined in 6 NYCRR Part 700 as having a chloride concentration equal to or less than 250 ppm or TDS concentration equal to or less than 1,000 ppm. Groundwaters with higher chloride and TDS concentrations are defined as saline groundwaters. Through naturally occurring conditions, the groundwater in the area of the site meets NYSDEC's definition of saline groundwaters. Based on the historical groundwater analytical data (refer to Table 9), average chloride and TDS concentrations in deep groundwater are just over 29,000 ppm and 17,500 ppm, respectively. Average chloride and TDS concentrations in shallow groundwater are approximately 990 ppm and 2,200 ppm, respectively.

Saline groundwaters are defined as Class GSA, with best usage defined (NYCRR Part 701.16) as a source of potable mineral waters, or conversion to fresh potable waters, or as a raw material for the manufacture of sodium chloride or its derivatives or similar products. NYSDEC also defines another type of saline groundwaters, Class GSB, which are saline groundwaters that have chloride concentrations in excess of 1,000 ppm or TDS in excess of 2,000 ppm and their best use is as receiving water for disposal of wastes. The average chloride and TDS concentrations in the deep groundwater meet the definition of a Class GSB saline groundwater. However, this classification shall not be assigned to any groundwaters of the State, unless a determination is made by the commissioner (6NYCRR Part 701.18). There are no specific chemical standards for GSA or GSB groundwaters identified in TOGS 1.1.1. For the purposes of this FS, Class GA fresh water standards and guidance values for potable use are conservatively applied to the saline groundwater, which is not suitable for human consumption or likely to be used in the future.

Another set of chemical-specific SCGs that potentially apply to site soil if the soil is to be excavated (and then considered under the Resource Conservation and Recovery Act [RCRA] to be a "waste" that is generated) are the RCRA-regulated levels for TCLP constituents, as outlined in Title 40 of the Code of Federal Regulations (40 CFR) Part 261 and 6 NYCRR Part 371. The TCLP constituent levels are a set of numerical criteria at which solid waste subject to disposition is considered a hazardous waste by the characteristic of toxicity. In addition, the hazardous characteristics of ignitability, reactivity, and corrosivity also may apply depending on the results of waste characterization activities. Based on the hazardous characteristic soil testing performed as part of the previous investigations at the site, one TCLP constituent (benzene) was identified at one location at a concentration exceeding the maximum TCLP constituent levels identified in 6 NYCRR Part 371.3(e). In addition, the benzene concentrations in some groundwater samples (MW-4S) exceed the level in 6 NYCRR Part 371.3(e). Soil and groundwater generated under the remedial alternatives would be handled in accordance with applicable rules and regulations, including the action-specific SCGs described in the subsection below.

2.2.2 Action-Specific SCGs

Action-specific SCGs include topics such as general health and safety requirements and handling and disposing of hazardous waste (including permitting, manifesting, transportation and disposal, and treatment and disposal facility operations).

Remedial actions conducted within the site would need to comply with applicable requirements established by the Occupational Safety and Health Administration (OSHA). General industry standards, which specify training requirements for workers involved with hazardous waste operations and time-weighted average concentrations for worker exposure to various compounds, are outlined under OSHA (29 CFR 1910). The types of safety equipment and procedures to be followed during site remediation are specified under 29 CFR 1926, and recordkeeping and reporting-related regulations are outlined under 29 CFR 1904. Trenching and excavation requirements are outlined under 29 CFR 1926 (Parts 650-652). In addition to the requirements outlined under OSHA, the preparedness and prevention procedures, contingency plan, and emergency procedures outlined under RCRA (40 CFR 264) are potentially relevant and appropriate to those remedial alternatives that include the generation, treatment, or storing hazardous wastes.

Another set of action-specific SCGs are land disposal restrictions (LDRs), which regulate land disposal of hazardous wastes. The LDRs are applicable to alternatives involving the disposal of hazardous waste (if any). Because MGP wastes resulted from historical operations that ended before the passage of RCRA, MGP-impacted material is only considered a hazardous waste in New York if it is removed (generated) and it exhibits a characteristic of a hazardous waste. However, if the MGP-impacted material only exhibits the hazardous characteristic of toxicity for benzene (D018), it is conditionally exempt from the hazardous waste management requirements (6 NYCRR Parts 370-374 and 376) when destined for thermal treatment in accordance with the requirements set forth in NYSDEC's TAGM 4061 titled, "Management of Coal Tar Waste and Coal Tar Contaminated Soils and Sediment from Former Manufactured Gas Plants" (NYSDEC, 2002). If MGP-related hazardous wastes are destined for land disposal in New York, the state hazardous waste regulations apply, including LDRs and alternative LDR treatment standards for hazardous waste soil.

The LDR for hazardous waste soils is a 90% reduction in constituent concentration capped at 10 times the Universal Treatment Standards (10xUTS). This means that if concentrations of constituents in excavated soil exceed 10xUTS, the soil would have to be treated to reduce constituent concentrations to below 10xUTS prior to land disposal. Under the Phase IV, Part 2 regulations promulgated by the USEPA in 1998, characteristically hazardous MGP-impacted soil may be rendered non-hazardous after generation at the remediation site by mixing the soil with clean materials to render the impacted soil amenable to treatment and to reduce concentrations of the chemical constituents in soil to less than the hazardous characteristic(s). Following mixing, the soil would no longer be considered a hazardous waste, but would still have to meet the LDR requirements.

The United States Department of Transportation (USDOT) and New York State rules for the transport of hazardous materials are provided under 49 CFR Parts 107 and 171.1 through 172.558 and 6 NYCRR 372.3. These rules include procedures for packaging, labeling, manifesting, and transporting of hazardous materials and would potentially be applicable to the transport of hazardous materials under any remedial alternative. New York State requirements for waste transporter permits are included in 6 NYCRR Part 364, along with standards for the collection, transport, and delivery of regulated wastes within New York. The transport of waste materials offsite would need to be properly permitted.

Based on the TCLP data generated by the previous investigations (as previously discussed), if soil were to be removed from part of the site (near MW-4), that soil may exhibit the hazardous characteristic of toxicity. Therefore, the action-specific SCGs related to hazardous waste management (LDRs/UTSs, USDOT transportation requirements, etc.) would be applicable in that case. However, as previously mentioned, note that the concentration of benzene identified in the same sample by analysis for TCL VOCs was less than the commercial use SCO.

2.2.3 Location-Specific SCGs

Location-specific SCGs include local requirements such as building permit conditions for permanent or semi-permanent facilities constructed during the remedial activities (if any), and influent requirements of the wastewater treatment plant (WWTP) if water is to be treated at the site and discharged to the WWTP. Location-specific SCGs also generally include floodplain and wetland regulations, restrictions promulgated under the National Historic Preservation Act, Endangered Species Act, and other federal acts. However, as indicated by the SLERA performed as part of the Initial RI (refer to the *Remedial Investigation Report* [ARCADIS, 2003] for details), a review of NYSDEC National Wetland Inventory Maps and a field reconnaissance during the Initial RI confirmed the absence of wetlands near the site. In addition, the SLERA indicated that rare, threatened, and endangered species have not been documented onsite. A pair of peregrine falcons (formerly Federally-endangered species) was observed during the summer of 1995 (by a local bird organization), outside the 0.5-mile radius of the site.

3. Remedial Action Objectives

This section presents the RAOs that have been developed for the site. Based on considerations specific to the site (e.g., detected constituents, site use, and potential exposure pathways), RAOs are identified to maintain and/or achieve conditions that are protective of public health and the environment. The RAOs that have been developed for the site are consistent with the remedy selection process described in 6 NYCRR Part 375 and guidance presented in the documents titled *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (CERCLA Interim Final 1988) and *DER-10 Technical Guidance for Site Investigation and Remediation* (DER-10 2010). The RAOs are based on the results of the completed investigations, the SCGs presented in Section 2 of this FS Report, and the conclusions drawn from the HHRA and SLERA. The RAOs were used to identify the remedial alternatives presented in Section 4 of this FS Report. The RAOs developed for the site are presented in the following table, and further discussed in the text that follows the table.

TABLE 3-1
REMEDIAL ACTION OBJECTIVES

Medium	Constituents/ Materials of Concern	Remedial Action Objectives
Soil	BTEX PAHs NAPL	RAOs for Human Health Protection: - Prevent ingestion/direct contact with MGP-impacted subsurface soil. - Prevent exposure of persons to MGP-related constituents volatilizing from soil.
		RAO for Environmental Protection: - Prevent the migration of MGP-related constituents that would result in exceedances of groundwater or surface water quality standards.
Groundwater	BTEX PAHs NAPL Cyanide	RAOs for Human Health Protection: - Prevent ingestion of groundwater with MGP-related constituent levels exceeding Class GA water quality standards. – Prevent contact with, or inhalation of, MGP-related constituent levels exceeding Class GA water quality standards.
		RAOs for Environmental Protection: – Restore groundwater to pre-disposal/pre-release conditions, to the extent practicable. – Prevent offsite migration of groundwater containing MGP-related constituents at concentrations exceeding Class GA water quality standards/guidance values, to the extent practicable

Note: Class GA water quality standards are used as a conservative approach in the second RAO for groundwater protection, because standards have not been developed by New York State for Class GSA/ GSB waters.

An RAO for soil vapor is not needed based on the findings of the VI Investigation, which concluded that: (1) there is no confirmed MGP-related soil vapor intrusion exposure pathway; and (2) the VOCs detected in the indoor samples are operationally-related (not MGP-related) and less than the NYSDOH air guideline values.

The Initial RI Report concluded that Onondaga Creek water and sediments are unaffected by the site. Future impacts to surface water and sediment in Onondaga Creek from the site are not anticipated. Under current conditions, there is no potential for impacted subsurface soil to be washed into the creek and affect sediment quality, due to the existing retaining wall (as shown on Figure 17 plan view and Figure 18 cross-section view). Site groundwater does not discharge to Onondaga Creek, and groundwater flow patterns are not expected to change, under existing site conditions. For these reasons, RAOs for surface water and sediment are not required.

The subsections below describe the development of the RAOs identified for the site.

3.1 Soil

The majority of the former MGP site is covered by office buildings, driveways, paved parking lots, concrete sidewalks, and landscaping, with little or no exposed surface soil. Accordingly, RAOs specific to surface soil are not required.

Based on the findings of the HHRA, potential direct contact with subsurface soil is likely to occur only during construction/excavation activities (including utility work). The existing network of subsurface utilities located in the western portion of the site is shown on Figure 17. Inhalation of or exposure to constituents volatilizing from soil could occur during such activities. The HHRA indicated that predicted non-cancer hazards and cancer risks for construction and utility workers, based on exposure to subsurface soil, were not acceptable. Risks to construction workers associated with potential exposure to constituents in subsurface soil would be mitigated by use of proper personal protective equipment. Two RAOs have been developed for subsurface soil to reduce potential exposures from direct contact and inhalation.

An RAO was also developed for subsurface soil to be protective of the environment. This third RAO focuses on the potential for MGP-related constituents in soil to adversely affect groundwater at the site. This RAO considers the potential for MGP-related constituents to serve as a “source” of impacts to groundwater. The development of remedial alternatives to address this RAO (Section 4) considers existing groundwater data and current/future potential exposure pathways.

3.2 Groundwater

The first RAO for groundwater considers potential ingestion of constituents in groundwater at concentrations exceeding groundwater quality standards. This pathway is already limited because groundwater is not currently used for potable purposes at or in the vicinity of the site (the area is supplied by public water). As previously mentioned, naturally high salinity and TDS levels render deep groundwater unusable for human consumption, and pumping high volumes of shallow groundwater (e.g., for commercial or industrial use) could result in increased TDS and chloride concentrations by drawing deep saline groundwater upward to the extraction well. In addition, existing provisions in place in Title 10, Part 5 of the New York State Sanitary Code (10 NYCRR Part 5-1.31) restrict the use of groundwater when public water is available.

The second RAO for groundwater addresses potential contact with or inhalation of constituents or NAPL in groundwater. As mentioned in Section 1, groundwater at the site is approximately 20 to 25 feet bgs. As a result, there is a potential for human exposure to impacted groundwater via direct contact or inhalation of volatiles during construction/excavation work. This potential exposure pathway could be mitigated by using properly trained personnel and personal protective equipment. The remedial alternatives evaluated in Section 5 of this report also address this RAO via the establishment of institutional controls (e.g., deed restriction, and site management plan [SMP]).

The third RAO for groundwater is for environmental protection and focuses on restoring groundwater to pre-disposal/pre-release conditions, to the extent practicable, by decreasing (to the extent practical) the extent or magnitude of constituents and NAPL in soil. In doing so, it is expected that overall groundwater conditions would improve and the concentrations of constituents in groundwater would be reduced.

The fourth RAO for groundwater addresses offsite migration of groundwater that contains MGP-related constituents at concentrations exceeding the Class GA water quality standards/guidance values. The development of groundwater remedial measures to address this RAO focuses on deep groundwater flowing offsite to the northwest. Measures will be considered that would prevent, to the extent practicable, groundwater flowing from the site from containing MGP-related constituents at concentrations exceeding Class GA levels. As indicated above, Class GA water quality standards/guidance values are used as a conservative approach because standards and guidance values have not been developed by New York State for Class GSA/ GSB waters.

4. Identification and Screening of Technologies and Development of Remedial Alternatives

This section identifies remedial alternatives to achieve the RAOs described in Section 3.1. As an initial step, general response actions (GRAs) are identified to address impacted soil and groundwater. GRAs are medium-specific and describe actions that would satisfy the RAOs, and may include various actions such as treatment, containment, institutional controls, excavation, or any combination of such actions. From the GRAs, potential remedial technology types and process options are identified and screened to determine those that are the most appropriate for the site. Technologies/process options that are retained following the screening are used to develop remedial alternatives. Detailed evaluations of these remedial alternatives are presented in Section 5.

According to the USEPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (USEPA, 1988a), the term "technology type" refers to general categories of technologies while "technology process options" refers to specific processes within each technology type. For each GRA identified, a series of technology types and associated process options has been assembled. In accordance with the USEPA's guidance document, each technology type and associated processes are briefly described and evaluated against preliminary and secondary screening criteria. This approach was used to determine if the application of a particular technology type or process option is applicable given the site-specific conditions for remediation of the impacted media. Based on this screening, remedial technology types and process options were eliminated or retained and subsequently combined into potential remedial alternatives for further, more detailed evaluation. This approach is consistent with the screening and selection process provided in the NYSDEC's TAGM 4030, *Selection of Remedial Actions at Inactive Hazardous Waste Sites* (NYSDEC, 1990).

The NYSDEC Division of Environmental Remediation's (DER's) *Presumptive/Proven Remedial Technologies* (DER-15) allows for use of industry experience related to remedial cleanups to focus the evaluation of technologies to those that have been proven to be both feasible and cost-effective for specific site types and/or constituents. The objective of DER-15 is to use experience gained at remediation sites and scientific and engineering evaluation of performance data to make remedy selection quicker and consistent. In addition, known future use of the former MGP property by National Grid was considered during the screening process.

4.1 General Response Actions

Based on the RAOs identified in Section 3.1, the following site-specific GRAs were established for subsurface soil and groundwater at the site:

- No Further Action

- Institutional Controls
- In-Situ Containment/Controls
- In-Situ Treatment
- Removal
- Ex-Situ Onsite Treatment
- Offsite Treatment and/or Disposal

Within each of these GRAs, remedial technology types were identified for each impacted medium (soil and groundwater) as described below. A No Further Action GRA has been included and retained throughout the screening evaluation as required by USEPA and NCP guidance.

4.2 Identification of Remedial Technologies

Remedial technologies potentially applicable for achieving the RAOs for the site were identified through a variety of sources including vendor information, engineering experience and review of available literature, including the following documents:

- NYSDEC TAGM 4030, titled “Selection of Remedial Actions at Inactive Hazardous Waste Sites” (NYSDEC, 1990).
- *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (Interim Final)* (USEPA, 1988a).
- *Technology Screening Guide for Treatment of CERCLA Soils and Sludges* (USEPA, 1988b).
- Technology Briefs – Data Requirements for Selecting Remedial Action Technologies, (USEPA, various dates).
- *Remediation Technologies Screening Matrix and Reference Guide* (USEPA and United States Air Force [USAF], 1993).
- *Management of Manufactured Gas Plant Sites* (Gas Research Institute, 1996).

4.3 Screening of Remedial Technologies

The following subsections summarize the preliminary and secondary screening evaluations for the identified remedial technologies.

4.3.1 Preliminary Screening

Preliminary screening focuses the number of potentially applicable technology types on the basis of technical implementability and effectiveness (long- and short-term). Technical implementability was evaluated using site characterization information collected during the site investigations, including the types and concentrations of impacts and subsurface conditions, to screen out technology types and process options that could not effectively be implemented at the site. The general effectiveness of a technology is measured by its ability to meet the established RAOs.

4.3.1.1 Surface Soil

As presented in Section 1.3.5, complete exposure pathways do not exist for human exposure to surface soil. RAOs, therefore, were developed to reflect potential exposure to subsurface soil containing MGP-related constituents. Maintaining the existing surface cover material at the former MGP property would achieve these RAOs and therefore will be retained throughout the screening process and included in each alternative. Screening of additional technology types and process options for surface soil is therefore not necessary.

4.3.1.2 Subsurface Soil

The following remedial technologies were identified to address the GRAs identified for subsurface soil:

- No Further Action – No additional active remedial measures (other than the previous paving at the site and construction of the retaining wall along the western property boundary) would be implemented to address the subsurface soils.

- Institutional Controls – Remedial technologies associated with this GRA consist of non-intrusive administrative controls focused on minimizing contact with impacted subsurface soil.

- In-Situ Containment/Controls – Remedial technologies associated with this GRA include addressing the mobility and/or exposure to impacted subsurface soil without physical removal from the ground surface. Remedial technology types identified under the preliminary screening process consisted of surface control, capping, and containment.

- In-Situ Treatment – Remedial technologies associated with this GRA involve treating impacted subsurface soil without physical removal. Remedial technology types identified for the site included immobilization, chemical treatment, and biological treatment.

- Removal – Technologies associated with this GRA involve removal of impacted subsurface soil from the ground.

- Ex-Situ Onsite Treatment – Remedial technology types associated with this GRA consider the treatment of materials after they have been removed from the ground. Ex-situ onsite treatment technologies identified under the preliminary screening evaluation consist of immobilization, extraction (thermal desorption), and thermal destruction.

- Offsite Treatment and/or Disposal – Remedial technology types associated with this GRA consider the offsite treatment of impacted subsurface soil following removal from the ground. These remedial treatment technologies consist of recycle/reuse, extraction (thermal desorption) and disposal.

4.3.1.3 Groundwater

The following remedial technologies were identified to address the GRAs identified for groundwater:

- No Action – No active remedial measures would be implemented to address groundwater.

- Institutional Controls – Remedial technology types associated with this GRA consist of administrative controls focused on minimizing contact or use of the groundwater. Institutional controls identified under the preliminary screening consisted of groundwater use restrictions in the form of governmental and/or proprietary controls, enforcement and/or permit controls.

- Monitored Natural Attenuation (MNA) – The remedial technology type associated with this GRA consists of monitoring to evaluate the extent to which the mass and mobility of MGP-related constituents in groundwater are attenuated by natural processes. These processes include biodegradation, dispersion, dilution, and sorption.

- In-Situ Containment/Controls – Remedial technology types associated with this GRA involve addressing constituents in groundwater without physically extracting the groundwater. Remedial technology types identified under the preliminary screening process consisted of hydraulic control (limited to approaches that did not involve pumping groundwater) and physical containment.

- In-Situ Treatment – Remedial technology types associated with this GRA involve treating constituents in groundwater without physically extracting the groundwater. Remedial technology types identified included biological treatment, chemical treatment, and extraction (i.e., in-situ stripping).

- Removal – Remedial technology types associated with this GRA consider removal of groundwater and/or NAPL for treatment or disposal. The technology types identified under the preliminary screening process were groundwater extraction and NAPL extraction.

- Ex-Situ Onsite Treatment – Remedial technology types associated with this GRA consider the treatment of groundwater after it has been removed. Ex-situ onsite remedial treatment technologies identified to address the extracted groundwater under the preliminary screening evaluation consisted of chemical treatment and physical treatment.

- Offsite Treatment and/or Disposal – Remedial technology types associated with this GRA consider the offsite treatment and disposal of site groundwater that has been removed. Technology process options identified to address groundwater consisted of discharge to the sanitary sewer/WWTP and discharge to a commercially operated treatment facility.

4.3.2 Secondary Screening

To advance the alternatives development process, process options for subsurface soil and groundwater were subject to a secondary screening. The objective of the secondary screening was to identify, when possible, one process option to represent each technology type and for comparison to the following secondary screening criteria:

- Effectiveness – This criterion is used to evaluate each process option in terms of:

  - Effectiveness at reducing the toxicity, mobility, and/or volume of chemical constituents in the impacted medium.

  - Impacts to human health and the environment during the construction and implementation phase.

  - Reliability with respect to the nature and extent of impacts and conditions at the site.

- Implementability – This criterion encompasses both the technical and administrative feasibility of implementing a process option. Because technical implementability was used during the preliminary screening, this subsequent, more detailed evaluation places more emphasis on the institutional aspects of implementability (e.g., the ability to obtain necessary permits for offsite actions, the availability of treatment, storage, and disposal services, etc.). This criterion also evaluates the ability to construct the process option, and availability of specific equipment and technical specialists to design, implement and operate and maintain the equipment.

- Relative Cost – This criterion evaluates the overall cost required to implement the remedial technology. As a screening tool, relative capital and operation and maintenance (O&M) costs are used rather than detailed cost estimates. For each technology process option, relative costs are presented as low, moderate, or high, and made on the basis of engineering judgment and industry experience.

The results of the secondary screening of technology types and process options are presented in the subsections below.

4.3.2.1 Subsurface Soil

This section identifies the remedial technology types and process options that were retained for subsurface soil for further evaluation.

<u>No Further Action</u> – Consistent with NCP and USEPA guidance documents, the No Further Action alternative must be developed and examined as a baseline to which other remedial alternatives are compared. Although this technology does not include active remedial measures, natural attenuation processes would potentially reduce the toxicity, mobility, and volume of impacts to the environment over an extended period of time. However, monitoring of site conditions would not be conducted to document the natural attenuation processes. No action is required to implement the technology, and there is no cost associated with it.

<u>Institutional Controls</u> – Institutional controls (e.g., governmental, proprietary, enforcement, or permit controls and/or informational devices such as signs, postings, etc.) were retained for further evaluation. One element of the institutional controls for soil would be a Site Management Plan (SMP) that would identify requirements (e.g., environmental oversight, air monitoring, personal protective equipment requirements, and excavation procedures) for conducting intrusive activities at the former MGP and for handling and disposing of potentially impacted materials that may be encountered during subsurface activities. Although this technology does not include active remedial measures, natural attenuation processes would reduce the toxicity, mobility, and volume of impacts to the environment over an extended period of time. Institutional controls would not treat, contain, or remove impacted subsurface soil, but would support a reduced potential for contact with, inhalation or ingestion of, MGP-related constituents of interest. Additionally, institutional controls could enhance the effectiveness and

implementability of other technologies/process options. This technology is readily implementable and has a low relative cost.

<u>In-Situ Containment/Controls</u> – Surface controls (vegetation, pavement, buildings) were retained for further consideration. The existing cover materials on the former MGP site would continue to limit exposure to subsurface soil containing constituents of interest.

Other capping options evaluated during the secondary screening included asphalt, multimedia, and clay/soil caps. Capping options are easily implemented, and their relative costs are comparable (moderate to high). Although capping options would not further reduce the toxicity or volume of impacts, a cap with a lower permeability than the existing asphalt pavement parking surface (e.g., asphalt and multimedia cap) could incrementally reduce migration of MGP-related constituents by reducing infiltration of precipitation and vertical flow below the cap. Capping was only retained for further evaluation in conjunction with sheetpile containment as described below, because, given the foreseeable future use of the property, maintaining the existing cover materials is considered protective, and more cost effective, than each of the capping technology types alone.

Containment options include sheetpile, soldier pile and lagging wall, and slurry walls. An effective retaining (sheetpile) wall is already in-place along most of the western perimeter of the site. A deeper sheetpile wall that extends around the area of impacted soil (instead of just along the western extent of the impacted soil) and is combined with an enhanced surface cap, could incrementally further contain constituents in NAPL-impacted soil and reduce their migration via groundwater. This type of containment would not reduce the toxicity or volume of constituents in soil, but would reduce the volume of groundwater flowing through the impacted soil area. This, in turn, would reduce desorption of constituents from soil to groundwater and reduce transport of constituents via advection. Based on the site conceptual model, the NAPL presence and degree of impact at the site decreases with depth to residual saturation, and there is no indication of NAPL spreading laterally or vertically downward (i.e., NAPL inside the sheetpile wall would remain within the confines of the wall).

The deeper sheetpile wall envisioned under this concept would extend to a depth of approximately 70 feet bgs, which is below the lowest NAPL-containing interval for each boring drilled through the parking lot west of Buildings B, C, and D (except the boring at WB-2, where NAPL was observed to a lower depth). Installing a deeper sheetpile wall (to the confining layer – the underlying bedrock) was considered, but it is not feasible. Bedrock drops steeply to the northwest and is expected to be as much as 150 feet bgs along the western property boundary.

Sheetpile containment was retained for further evaluation. The soldier pile and lagging wall technology was also retained for further consideration, but only in connection with excavation bracing (for alternatives that involve excavation).

Space limitations and underground obstructions and utilities make these containment options difficult to implement. In addition, these process options could potentially affect existing site conditions by, for example, creating a change in groundwater flow direction and/or a hydraulic mound. The relative cost of this technology is moderate to high.

In-Situ Treatment – The in-situ remedial treatment technologies identified for subsurface soil include immobilization and steam injection/extraction (steam injection to mobilize constituents followed by extraction).

Solidification/stabilization is considered effective for immobilizing constituents of interest and was retained for further evaluation. The technology is potentially implementable with moderate capital and O&M costs, pending confirmation via bench-scale testing. The presence of extensive underground natural gas and utility lines (Figure 17), obstructions, onsite vehicular and pedestrian traffic, and subsurface debris could also affect the implementability and effectiveness of solidification/stabilization. In addition, lack of space to implement this technology and the presence of NAPL at significant depths, the Office Complex, subsurface structures, and retaining wall limit the effectiveness of this technology and preclude fully addressing the NAPL-containing soil. In addition, this technology could potentially affect existing site conditions by, for example, creating a change in groundwater flow direction (and flow velocity around the area of stabilized soil).

Various steam injection/extraction options were not retained due to concerns regarding potential mobilization of NAPL, reliability of vapor recovery, available space for treatment equipment, the presence and proximity of underground utilities, and potential public acceptance issues. The relative cost of these technologies is moderate to high.

An innovative option, in-situ surfactant flushing, was considered but not retained, because it: (1) has only been demonstrated at a few DNAPL sites; (2) would be complicated to implement at this site due to the lack of a suitable confining layer (bedrock is deep, as indicated above) to support surfactant and NAPL recovery; and (3) the cost of the technology is high.

Removal – Removing material from within the former MGP structures (former holders, underground cisterns, tar cistern, tanks) was not retained for further evaluation because: (1) investigations indicated that NAPL has not collected (pooled/accumulated) in the bottoms of these structures; (2) no concrete bottom was observed at the location of several of the structures; (3) there is no obvious difference in the amount of NAPL in soil below vs. outside the limits of the structures; (4) buildings have been constructed over several of the holders; and (5) notes on construction drawings indicate that the materials inside the holders within the building footprints were already removed prior to building construction, or would have been removed as part of construction.

Excavation of subsurface soil was retained for further evaluation. This technology type and process option is a proven process for removing impacted material. Excavation of soil in connection with containment and in-situ treatment process options is considered implementable.

A soil excavation alternative to remove soil that contains NAPL and constituents at concentrations exceeding unrestricted use SCOs is also retained for evaluation, as requested by the NYSDEC during the January 16, 2013 meeting with National Grid and ARCADIS. The alternative would include excavation to a depth of approximately 70 feet bgs, consistent with the deeper sheetpile wall containment option described above. This depth is below the lowest NAPL-containing interval for each boring drilled through the site, except the boring WB-2, where NAPL was observed at a lower depth. This depth is also below the vast majority of soil sampling intervals with analytical results exceeding the unrestricted use SCOs.

Excavation to 70 feet bgs at this site would be significantly difficult to implement, requiring considerable materials and construction equipment to support the excavation, dewater the excavation area and remove subsurface materials. Implementation would be complicated by the limited work space, the presence of numerous underground obstructions and utilities, the need to dewater high permeability sands and gravels, and the subsequent management and treatment of that water. The excavation would be further complicated by the adjacent Office Complex (including associated foundation systems) and the existing retaining wall along Onondaga Creek. Measures to protect the buildings and the retaining wall would be required. Additionally, an excavation enclosure (e.g., an open-span type structure) equipped with a vapor collection and treatment system may be required over the excavation areas to reduce the potential for exposures to vapors, dust, and/or odors during the excavation activities.

The relative cost of this technology is moderate when implemented in connection with containment and in-situ treatment process options; and extremely high when implemented as an excavation alternative. Equipment and labor capable of soil excavation is readily available, and while it has a moderate to extremely high capital cost, O&M costs are considered low.

<u>Offsite Treatment and/or Disposal</u> – Remedial technology types and process options eliminated from evaluation consisted of recycle/reuse (asphalt concrete batch plant, brick/concrete manufacture, and co-burn in a utility boiler). Offsite extraction (low temperature thermal desorption [LTTD]) and offsite disposal were retained due to the ease of implementability and effectiveness. In addition, multiple offsite treatment technologies could be utilized to treat or dispose of media with different concentrations of impacts. The relative cost of these technologies is moderate to high.

4.3.2.2 Groundwater

This section evaluates the groundwater remedial technologies and process options identified during the preliminary screening, identifies those that are retained for further consideration, and provides the basis for selecting or eliminating each. As previously identified, groundwater at and in the vicinity of the site is not used for potable purposes, and the greatest potential for exposure to impacted groundwater involves future excavation/construction activities that would encounter groundwater.

Active remedial technologies to address groundwater are limited to those that could be performed onsite because the offsite plume of impacted groundwater is deep and relatively inaccessible (generally 40 to 70 feet bgs and below existing highways, city streets, and developed commercial/industrial properties).

<u>No Action</u> – Consistent with the requirements of the NCP, the No Action alternative was retained as a remedial technology during the secondary screening step. Although this technology does not include active remedial measures, natural attenuation processes would reduce the toxicity, mobility, and volume of impacts to the environment over an extended period of time. However, monitoring of site conditions would not be conducted to document the natural attenuation processes. No action is required to implement the technology, and there is no cost associated with it.

<u>Institutional Controls</u> – Institutional controls for groundwater involving use restrictions were retained for further evaluation. Use restrictions would consist of governmental, proprietary, enforcement or permit controls and/or informational devices (e.g., signs, postings, etc.) and notification requirements. The institutional controls for groundwater would include an SMP that would identify guidelines to be followed for proper management of impacted groundwater that may be encountered and extracted during future intrusive activities. Although this technology does not include active remedial measures, natural attenuation processes would reduce the toxicity, mobility, and volume of impacts to the environment over an extended period of time. Institutional controls would not treat, contain, or remove impacted groundwater, but would reduce potential human exposure to groundwater containing MGP-related impacts and could enhance the overall effectiveness of remedial alternatives when paired with other technologies/ technology process options. Institutional controls are readily implementable and have a low relative cost.

<u>Monitored Natural Attenuation</u> – Monitored natural attenuation was retained for further evaluation. Under this technology, the mass and mobility of MGP-related constituents in groundwater are attenuated by natural processes. These processes include biodegradation, dispersion, dilution, and sorption. The effectiveness of these processes is actively monitored over time.

The Final RI indicated that the mass and mobility of MGP-related constituents in groundwater are being naturally attenuated, demonstrating this technology's effectiveness and reliability. The Final RI also indicated that the plume of affected groundwater is either stable or decreasing in concentration and does not pose an unacceptable risk to human health or the environment, under current conditions. The January 2013 groundwater analytical results confirmed these conclusions, as described in the March 8, 2013 letter from National Grid to NYSDEC (Appendix A). Implementing this technology would involve developing and implementing an appropriate monitoring program to demonstrate continued effectiveness. The relative cost to implement this technology is low.

In-Situ Treatment – The in-situ remedial treatment technologies identified for groundwater include biological treatment, chemical treatment (chemical oxidation), and extraction (in-situ stripping).

The biological treatment option evaluated during the secondary screening consisted of enhanced bioremediation. This technology was retained because it could potentially: (1) reduce concentrations of dissolved BTEX and PAHs in groundwater; (2) result in only minimal impacts to human health and the environment during implementation; and (3) be implemented for a moderate cost. As previously summarized, existing data support that natural degradation by existing microbial communities is occurring. The rate and extent to which the dissolved constituents in groundwater are degraded could be increased by enhancements (e.g., introduction of oxygen, sulfate, nitrate, or other amendments, as appropriate) to increase microbial activity (i.e., aerobic or anaerobic degradation). Because enhanced bioremediation would involve application of innocuous materials into the subsurface and would require only a minimal amount of construction and O&M, it would present only minor risks to short- and long-term human health associated with construction and implementation. Enhanced bioremediation would require bench-scale, tracer, and pilot testing to verify the reliability and effectiveness (whether by aerobic or anaerobic means), and approximate timeframe to achieve RAOs.

The chemical treatment option evaluated during the secondary screening included chemical oxidation. This option was eliminated from further consideration primarily because of concerns over its potential effectiveness at reducing dissolved phase concentrations over the long-term, potential negative impacts to human health and the environment associated with construction and implementation, and high cost. Continued dissolution of constituents from soil that exhibits immobile NAPL and/or constituents at concentrations greater than SCOs would require multiple/frequent costly treatments over a long period of time (i.e., until all NAPL has dissolved). These treatments would increase the potential for negative short- and long-term human health impacts to construction workers and Office Complex personnel via: (1) handling of potentially dangerous materials (chemical oxidant) required for treatment system operation; and (2) contacting subsurface impacts during construction and O&M of treatment systems. Also, from an implementability standpoint, a large amount of chemical oxidant would be required to overcome the demand from natural organic material in the subsurface, and delivery of chemical oxidant to impacted areas may be difficult due to the presence of the Office Complex and retaining wall (which limit access) and heterogeneities and obstructions in the subsurface (which limit the ability of delivered oxidant from reaching impacts). Other concerns with this alternative are as follows: (1) between individual treatment applications, groundwater migrating offsite may contain constituents at concentrations exceeding cleanup objectives (due to dissolution of constituents from NAPL-containing soil); and (2) during or after individual treatment applications, chemical oxidant could potentially migrate offsite if it were not completely consumed.

The extraction options evaluated during the secondary screening included dynamic underground stripping (DUS) and hydrous pyrolysis/oxidation (HPO). DUS involves injection of steam and air into the subsurface to create a "steam front" to sweep constituents toward extraction wells. Extracted vapors are then treated (e.g., using carbon, steam boilers, etc.). HPO is based on the principles of DUS and involves rapidly oxidizing constituents at steam temperatures. In HPO, constituents are destroyed in place without the surface treatment that is required in DUS. These options were not retained due to concerns over reliability and generating high temperatures in close proximity to the office buildings. Use of steam to heat the subsurface requires a considerable amount of energy, and therefore results in high costs. Other concerns with implementing these technologies include the mobilization and recovery of dissolved constituents, the reliability of vapor recovery, and potential public acceptance issues.

<u>In-Situ Containment/Controls</u> – Containment of NAPL-impacted soil (and associated groundwater within the containment area) via installation of a sheetpile wall and surface cap is considered under the soil technologies in this FS. By limiting infiltration of precipitation and groundwater flow through the containment area, the sheetpile wall and cap would reduce the dissolution of constituents from saturated soil to groundwater that might otherwise occur.

A more robust containment concept was also considered, whereby there would be full containment of the onsite aqueous plume (as an alternate to plume restoration), but it was not retained. The physical containment structure would encompass not only the western parking lot onsite, but also the parking lot between Office Complex Buildings D and F to achieve a closed structure that encompasses each location where NAPL has been identified in soil. The containment structure would be a sheetpile wall that extends much deeper than the existing wall (also deeper than the wall described above) and has watertight construction. The sheetpile wall would need to be installed to depths significantly below MGP-related impacts (greater than 115 feet bgs), which may not be achievable. The containment structure would also need to be terminated in a lower hydraulic conductivity layer (e.g., silty clay, clay, bedrock) to maintain adequate hydraulic control within the structure, and such a suitable layer is highly variable and potentially encountered at excessive depths (100 to 150 feet, or more). The extensive network of underground utilities at the site would also affect implementability and cost to drive sheeting (e.g., relocating utilities).

Containment would not effectively treat or remove MGP-related impacts. In addition, containment could potentially affect existing site conditions by, for example, creating a hydraulic mound and/or change in groundwater flow direction. Additional measures (e.g., groundwater extraction) might also be needed.

The containment option would increase the potential for negative short- and long-term human health impacts to construction workers, Office Complex personnel, and the public by performing extensive intrusive subsurface activities (driving sheeting after pre-excavating, where needed) that require heavy machinery. The relative costs of the groundwater containment technology would be high to extremely high.

Groundwater Removal, Ex-Situ Onsite Treatment, and Offsite Treatment and/or Disposal – Each of these technology types/process options were not retained for further evaluation.

The primary objectives of groundwater removal would be to recover dissolved phase constituents from groundwater while maintaining hydraulic control of the site. However, as previously noted, groundwater extraction to maintain hydraulic control of the site would not be feasible. Subsurface site conditions would necessitate extremely high groundwater extraction rates. A former non-contact cooling water well at this site pumped at 475 to 500 gallons per minute with no measurable drawdown in a similarly-screened well located 32 feet away (Stearns & Wheeler, 1992). While groundwater containing dissolved phase MGP-related compounds would be captured and treated, the continued dissolution of MGP-related impacts from NAPL to groundwater would require constant, expensive treatment.

High pumping rates may also create a gradient with deep saline groundwater. Such a gradient could act as a conduit for saline groundwater with high concentrations of chloride and TDS to be extracted during removal activities. The treatment of saline groundwater (e.g., chloride and TDS) would be relatively costly and also may affect permitting, discharge, or disposal of groundwater. Each of the technologies could be implemented, but the large volumes of impacted groundwater would create significant difficulties related to removal, treatment, and discharge/disposal.

Extraction and treatment of groundwater would also increase the potential for negative short- and long-term human health impacts to construction workers, Office Complex personnel, and the public due to the following: (1) performing additional intrusive subsurface activities for construction of removal/treatment systems (requiring heavy machinery and treatment equipment); (2) handling potentially dangerous materials (treatment chemicals, extracted groundwater, etc.) required for treatment system operation; (3) pumping large volumes of impacted groundwater, which would increase the potential for on- and offsite spills; and (4) contacting subsurface impacts during O&M of extraction/treatment systems.

Conclusion of treatment would depend on nearly complete dissolution of NAPL, which is not likely in the foreseeable future (even with soil remediation). In addition, based on the existing footprint of the Office Complex, space needed to construct long-term treatment facilities required under this option would be relatively limited. The relative cost of these technologies/process options is high to extremely high.

NAPL removal (e.g., via wells or a trench) was also considered during secondary screening. The site conceptual model developed in the Final RI Report, which is based on all available data through 2008, suggests that there is likely to be little to no collectible NAPL beneath the site. The evidence indicates that NAPL saturations at the site are at or below residual saturation (by definition, NAPL at or below residual saturation is immobile), as described in February 8, 2013 and March 8, 2013 letters from National Grid to the NYSDEC (Appendix A). As documented therein and summarized in Section 1.3.4.2 above, no measureable NAPL has been identified in on- or offsite wells, including MW-19 specifically installed in an area of the site thought to contain NAPL saturated soil. MW-19 is screened within the fill and silt/clay layers, above the sand and gravel layer (see Figure 12). Because NAPL has been primarily identified in the sand and gravel layer, further consideration of NAPL removal via a well(s) installed in an area(s) thought to contain NAPL saturated soil and screened within the sand and gravel layer was retained for further evaluation. NAPL removal technologies could be easily implemented and the relative cost of this technology is low.

4.4 Development of Remedial Alternatives

This section uses the screened technologies presented in Section 4.3 to develop remedial alternatives for the site. The assembled subsurface soil and the groundwater remedial alternatives are summarized in Sections 4.4.1 and 4.4.2, respectively.

4.4.1 Soil Remedial Alternatives

Six remedial alternatives, SM1 through SM6, have been identified to address the RAOs for subsurface soil at the site. In keeping with NCP and USEPA requirements, Alternative SM1, No Further Action, is provided as a basis for comparison for the other alternatives. Alternative SM2, Institutional Controls, in the form of governmental, proprietary, enforcement, or permit controls is evaluated as a subsurface alternative. In the process of developing the remedial alternatives, focused alternatives were considered (Alternatives SM3 [Containment] and SM4 [In-Situ Soil Stabilization]), which also include institutional controls. These focused alternatives include the containment/stabilization of soil that, based on previous investigations, appears to contain the greatest amount of NAPL and highest concentrations of PAHs. Alternative SM5 includes stabilization of onsite soil that exhibits constituents at concentrations exceeding the commercial use SCOs presented in 6 NYCRR Part 375-6.8(b) and/or is visually impacted by NAPL. Alternative SM6, as requested by the NYSDEC, includes excavation of onsite soil that exhibits constituents at concentrations exceeding the unrestricted use SCOs presented in 6

NYCRR Part 375-6.8(a) and/or is visually impacted by NAPL. Alternatives SM5 and SM6 also include institutional controls.

Brief descriptions of the potential remedial alternatives for subsurface soils are presented below, followed by a brief description of potential remedial alternatives for groundwater. Detailed descriptions are presented in Section 5.

4.4.1.1 Alternative SM1 – No Further Action

Under this alternative, no additional active remedial measures would be conducted.

4.4.1.2 Alternative SM2 – Institutional Controls

This alternative includes implementation of a land use restriction (in the form of a deed restriction or environmental easement), preparation of an SMP, and maintenance of the chain-link fence/security that currently exists around the property boundary. In addition, impacted soil would continue to be covered by the Office Complex, driveways, paved parking lots, concrete sidewalks, landscaping, mowed lawn, etc. The substantial retaining wall system (Figure 17) would continue to be maintained as a barrier to mitigate the potential for MGP-impacted subsurface soil to be washed into Onondaga Creek and affect sediment quality.

4.4.1.3 Alternative SM3 – Focused Soil Containment and Institutional Controls

This alternative involves installing a water-tight sheetpile wall and engineered cap to isolate (contain) MGP-impacted subsurface soil extending both above and below the water table in the northwestern corner of the parking lot located west of Buildings B, C, and D (within a 9,540 square foot [sf] area as shown on Figure 19). This area has been identified based on visual descriptions and analytical data from the previous investigations, which indicate that the greatest amount of NAPL in subsurface soil is located in this area. Outside this area, NAPL was generally observed to be only in “stringers” or pockets, or the NAPL consisted of small oil droplets that were interspersed with the soil. As indicated earlier in this report, the highest concentrations of BTEX and PAHs in soil were observed in the northwest portion of the parking lot, at boring SB-12 and at the MW-4S/4D boring, respectively. In addition, the highest concentrations of constituents in leachate generated by TCLP extraction of soil samples were from the MW-4S/4D boring.

Under this alternative, water-tight sheetpiling would be driven to a depth of approximately 70 feet bgs. This depth is below the lowest NAPL-containing interval for each boring drilled through the parking lot west of Buildings B, C, and D (except the boring at WB-2, where NAPL was observed to a lower depth). The sheetpiling containment would greatly reduce the horizontal flow of groundwater through the most impacted subsurface soil. The flow would be reduced because the hydraulic conductivity of the water-tight sheetpile (typically around 0.00028 feet/day) is much less than the hydraulic conductivity of the sand/gravel and gravel layers (estimated to be as much as 206 feet/day). An engineered cap, with a lower hydraulic conductivity than the existing pavement, would also be installed to cover the area enclosed by the sheetpiling to reduce the infiltration of precipitation into the containment area. By reducing the volume of groundwater flowing through the impacted soil area, the desorption of constituents from soil to groundwater would be reduced. In turn, the transport of constituents in groundwater via advection would be reduced. As described above, the NAPL presence and degree of impact at the site decreases with depth to residual saturation, and there is no indication of NAPL spreading laterally or vertically downward. Accordingly, consistent with current site conditions, NAPL inside the sheetpile wall would not be mobile and would remain within the confines of the wall. The containment under this alternative could potentially reduce the mass flux of constituents (via groundwater) from this focused area and could potentially reduce the overall mass flux of constituents from the site.

This alternative would also involve relocation of subsurface utilities, establishment of the same institutional controls described under Alternative SM2, and other activities as detailed in Section 5.

4.4.1.4 Alternative SM4 – Focused In-Situ Soil Stabilization and Institutional Controls

This alternative involves in-situ soil stabilization (ISS) in the focused area described above in Section 4.4.1.3, as shown on Figure 19.

Under this alternative, pre-ISS excavation would first be performed to a depth of approximately 10- to 15-feet throughout the focused area, resulting in the removal of up to approximately 5,300 cubic yards (cy) of material. This would remove subsurface debris (such as the brick/concrete debris that was encountered in the test pit previously excavated in this area) and historic foundations for MGP-related- or other structures that might otherwise cause ISS auger refusal. Excavation to 10- to 15- feet would result in removal of a significant amount of NAPL-free fill material, and would be consistent with the excavation “cut-off” depth under a Track 2 cleanup as identified in 6 NYCRR Part 375-3.8(e)(2)(iii). The excavated soil would be transported for offsite disposal.

The ISS portion of this alternative involves mixing Portland cement or other pozzolanic materials into the soil to form a solidified matrix to: (1) reduce leaching and mobility of MGP-related constituents; (2) minimize the amount of free liquids in the soil pore space; and (3) decrease the hydraulic conductivity of the soil. ISS would immobilize approximately 12,400 cy soil from a depth of approximately 15- to 50-feet bgs. NAPL in soil greater than 50 feet bgs was only observed at a few locations (and the NAPL saturation below 50 feet bgs generally appeared to be less than in overlying intervals). ISS augering to depths below 50-feet bgs would be difficult to implement based on site conditions (dense soil and limited available workspace).

This alternative would also involve treatability testing, relocation of subsurface utilities or measures to work around the utilities (e.g., jet grouting), installation of excavation bracing to support removal activities and prevent instability in existing structures (Building D and the existing retaining wall), implementation of a quality assurance/quality control (QA/QC) program, waste transportation and disposal, establishment of the same institutional controls described for Alternative SM2, and other activities as detailed in Section 5.

4.4.1.5 Alternative SM5 – Large Scale Stabilization for Soil Exceeding Commercial Use SCOs and/or Exhibiting NAPL, and Institutional Controls

This alternative is essentially the same as Alternative SM4, except stabilization would occur in a much larger area. Stabilization would be performed within an approximately 46,890 sf area that covers most of the parking lot west of Buildings B, C, and D. The approximate remedial limits under this alternative are shown on Figure 20. This alternative addresses each location at the site where soil was found to contain NAPL and/or MGP-related constituents at concentrations exceeding the commercial use SCOs, with the exception of two locations northwest of Building D (SB-1 and MW-1D) where only a trace amount of NAPL was encountered (note that PAHs were not identified at these two locations at concentrations exceeding the commercial use SCOs).

Similar to Alternative SM4, excavation would first be performed to a depth of up to approximately 10- to 15-feet to remove subsurface debris, foundations, or other structures that might otherwise cause ISS auger refusal. Up to approximately 26,050 cy of material would be excavated and transported for offsite disposal. ISS would be performed on the remaining soils extending to depths of 50 feet bgs. This alternative would also include the same institutional controls described for Alternative SM2.

Based on the larger size of the stabilization areas and their locations under this alternative as compared to Alternative SM4, this alternative would require: (1) re-location of more underground utilities; (2) installation of more excavation bracing for excavation sidewall support; (3) more soil handling and disposal; (4) more waste characterization soil sampling; and (5) greater interference and disruption of Office Complex operations.

4.4.1.6 Alternative SM6 – Excavation for Soil Exceeding Unrestricted Use SCOs and/or Exhibiting NAPL, and Institutional Controls

This alternative, as requested by the NYSDEC, includes excavation of onsite soil that exhibits MGP-related constituents at concentrations exceeding the unrestricted use SCOs presented in 6 NYCRR

Part 375-6.8(a) and/or is visually impacted by NAPL. Excavation would be performed to an approximate depth of 70 feet bgs, within an approximately 96,200 sf area that includes the parking lot west of Buildings B, C, and D and the parking lot between Buildings D and F. This area is more than twice the area that would be remediated under Alternative SM5, which would remediate the site to the commercial land use SCOs (the current and future long-term use of the site is commercial). The approximate excavation limits under Alternative SM6 are shown on Figure 21.

Alternative SM6 addresses each location at the site where soil was found to contain NAPL, except the boring at WB-2, where NAPL was observed at a lower depth. This alternative also addresses the vast majority of MGP-related constituents at concentrations exceeding the unrestricted use SCOs. The volume of soil to be excavated and transported for offsite treatment/disposal is approximately 250,000 cy and approximately the same volume of clean fill would be transported to the site to restore the excavation areas.

As shown on Figure 21, the soil excavation limits encompass a vast majority of the very limited work space that is available at the site for the remedial alternatives. Detailed planning and construction sequencing, along with strategic movement of equipment, materials, and ancillary support facilities would be required to implement this alternative.

Removal of approximately 250,000 cy of soil to a depth of 70 feet bgs and transportation of approximately 500,000 cy of excavated soil and clean backfill would require many supporting activities, including those listed below and others, as detailed in Section 5.

- Completing an extensive pre-design investigation/test boring program to support the remedial design (RD)

- Disconnecting, removing, and relocating numerous subsurface utilities, including water, storm/sanitary sewer, natural gas, electric, and telecommunications lines

- Installing and subsequently removing an extensive lateral excavation support system (e.g., internal bracing) to support the deeper soil removal activities and prevent instability in existing structures (i.e., four adjacent buildings and the existing retaining wall)

- Implementing a soil dewatering program required to excavate the soil to a depth of approximately 70 feet bgs and an onsite water treatment program to allow discharge of billions of gallons of water under a SPDES permit

- Managing saturated soils, including staging and/or adding a stabilization admixture prior to offsite transport to remove free liquids

- Implementing a vapor, dust and odor control program which is anticipated to require an open-span structure to mitigate potential exposures
- Procuring alternate parking for approximately 200 personnel working in the Office Complex and managing other disruptions to Office Complex operations (e.g., closing of existing loading docks)
- Establishing the same institutional controls described for Alternative SM2 for areas of MGP-impacted subsurface soil that cannot be removed under Alternative SM6 due to proximity to existing structures

4.4.2 Groundwater Remedial Alternatives

Three remedial alternatives have been developed for addressing impacted groundwater at the Erie Boulevard site and are presented below.

4.4.2.1 Alternative GW1 – No Action

Under this alternative, no active remedial measures would be performed.

4.4.2.2 Alternative GW2 – Monitored Natural Attenuation and Institutional Controls

This alternative would address constituents of interest in groundwater by implementing use restrictions (e.g., in the form of a deed restriction or environmental easement). In addition, long-term groundwater monitoring would be performed under this alternative to evaluate the effectiveness of MNA over an extended period of time. Existing groundwater use laws [10 NYCRR 5-1.31(b)], which prohibit the installation of private wells where public supply is available (unless approval is expressly granted by the public water authority), would continue to minimize potential human exposure to constituents in groundwater at concentrations exceeding the groundwater quality standards/guidance values.

This alternative also includes NAPL removal (if any) via wells that would be installed in areas potentially containing NAPL saturated soil and would be screened in the sand and gravel layer. It is anticipated that these wells would be installed near (along) the western site boundary and constructed similar to MW-19, including a 4-foot long sump and 4-inch diameter polyvinyl chloride (PVC) riser pipe and screen section. Additionally, the screen section would be a factory slotted screen (0.02-inch slot size) with appropriately-sized sand installed in the annular space around the screen. These wells would be periodically monitored for the absence/presence of NAPL. Measureable NAPL, if any, would be removed, properly containerized, and subsequently treated/disposed offsite.

4.4.2.3 Alternative GW3 – Enhanced Bioremediation and Institutional Controls

This alternative involves amending groundwater to enhance naturally occurring biodegradation processes along the western property boundary and between Buildings B and F (hydraulically within/downgradient from the areas where the highest concentrations of BTEX and PAHs have been identified in groundwater). Because of the unique site conditions, the alternative would include a step-wise approach consisting of bench-scale, tracer, and pilot testing to determine the appropriate methodology for full-scale implementation. The bench-scale testing would evaluate and compare the potential effectiveness of aerobic and anaerobic degradation of BTEX and PAHs in groundwater. In addition, the bench-scale testing would assess the effect of TDS and salinity on the degradation rates and potential amendments that could optimize the degradation rates. Following evaluation of the bench-scale testing, tracer testing would be implemented to further evaluate site hydrogeology in the vicinity of the enhanced bioremediation treatment zone. The results of bench-scale and tracer testing would be evaluated to design and conduct the pilot testing to gather data needed to assess parameters for full-scale design and implementation of the biodegradation treatment process anticipated to be most suited for reducing BTEX and PAH concentrations in groundwater. Based on the outcome of the pilot testing (and follow-up pre-design investigation if needed), the enhanced bioremediation remedy identified as the most effective at achieving the groundwater RAO for environmental protection would be selected.

This alternative also involves subsurface construction (monitoring and application well installation), installation of equipment and instrumentation, establishment of institutional controls similar to those described for Alternative GW2, and other activities as detailed in Section 5.

5. Detailed Evaluation of Remedial Alternatives

This section further evaluates the remedial alternatives identified in Section 4. These remedial alternatives were evaluated with respect to the criteria specified in TAGM 4025, which incorporate the NCP by reference, and the USEPA guidance document titled, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (USEPA, 1988a). The evaluation criteria are arranged in the order specified in TAGM 4030. These criteria encompass statutory requirements and include other gauges of overall feasibility and acceptability of remedial alternatives.

The detailed evaluation of each remedial alternative presented in this section consists of an assessment of the following seven criteria:

- Compliance with SCGs.
- Overall Protection of Human Health and the Environment.
- Short-Term Effectiveness.
- Long-Term Effectiveness.
- Reduction of Toxicity, Mobility, or Volume.
- Implementability.
- Cost.

As indicated in 6 NYCRR Part 375-1.8(f), other criteria to be considered when evaluating potential remedial alternatives are land use and community acceptance. Land use may be considered in the FS provided there is reasonable certainty associated with such land use. The community acceptance assessment will be completed by the NYSDEC after community comments on the Proposed Remedial Action Plan (PRAP) are received. The results of the evaluation are typically considered when the NYSDEC selects a preferred remedial alternative and are typically presented in a Responsiveness Summary completed by the NYSDEC. The Responsiveness Summary is part of the Record of Decision (ROD) for the project and responds to all comments and questions raised during a public meeting associated with the PRAP, as well as comments received during the associated public comment period.

Sustainability and green remediation were also considered in the remedial evaluation with the goal of minimizing ancillary environmental impacts such as greenhouse gas emissions (GHGs) during the implementation of remedial programs, in accordance with DER-10. The evaluation considered the alternative's ability to minimize energy use, reduce greenhouse gas and other emissions, maximize reuse of land and recycling of materials, etc. Sustainability and green remediation practices utilized are discussed under the short-term effectiveness criterion.

In addition to assessing each potential remedial alternative against the seven criteria presented above, the detailed analysis of the remedial alternatives presented in this section also includes a detailed technical description of each remedial alternative. In addition, unique engineering aspects (if any) of the physical components of the remedial alternative are discussed.

5.1 Description of Evaluation Criteria

A brief description of each of the seven evaluation criteria is presented in the following sections.

5.1.1 Compliance with SCGs

This evaluation criterion evaluates each remedial alternative with respect to New York State SCGs and Federal Applicable or Relevant and Appropriate Requirements (ARARs) that were identified in Section 2. Compliance with the following types of SCGs were considered:

- Chemical-specific SCGs.
- Action-specific SCGs.
- Location-specific SCGs.

5.1.2 Overall Protection of Human Health and the Environment

This criterion assesses the protection of human health and the environment provided by each alternative. The assessment of overall protectiveness draws on the analysis of other criteria evaluated for each alternative (specifically short- and long-term effectiveness and compliance with SCGs). It also considers the manner in which the alternative achieves protection over time, the degree to which site risks would be reduced, and the manner in which each source of impacts would be eliminated, reduced, or controlled.

5.1.3 Short-Term Effectiveness

The short-term effectiveness of a remedial alternative is evaluated relative to its potential effect on human health and the environment during the construction and implementation phases. The evaluation of each alternative with respect to its short-term effectiveness considered the following:

- Potential short-term impacts to the community during implementation.
- Potential short-term impacts to workers during implementation and the effectiveness and reliability of protective measures.
- Potential short-term environmental impacts and the effectiveness of mitigation measures to be used.
- Time required to achieve the RAOs for protection of health and the environment.
- The sustainability of the alternative and use of green remediation practices during implementation of the remedial alternative.

5.1.4 Long-Term Effectiveness

This criterion evaluates the remedial alternative in terms of the potential risks remaining at the site after the remedial activities have been completed. The following factors were assessed during the evaluation of long-term effectiveness:

- Environmental impacts from untreated waste or treatment residuals remaining at the completion of the remedial alternative.
- The adequacy and reliability of controls (if any) that would be used to manage treatment residuals or remaining untreated waste at the completion of the remedial alternative.
- The risks remaining at the completion of the remedial alternative.
- The ability of the alternative to meet RAOs established for the site.

5.1.5 Reduction of Toxicity, Mobility, and Volume

This evaluation criterion addresses the degree to which the remedial alternative would permanently reduce the toxicity, mobility, or volume of the impacts present in the site media. This criterion addresses the preference for remedial actions that permanently and significantly reduce the toxicity of impacts, irreversibly reduce the mobility of the impacts, and/or reduce the total volume of media containing impacts. The evaluation focused on the following factors:

- The process the remedy would employ and the amount of materials that would be treated.
- The anticipated ability of the remedy to reduce the toxicity, mobility, or volume of impacts present in site media.
- The nature and quantity of residuals that would remain after treatment.
- The relative amount of MGP-related residuals that would be destroyed, treated, or recycled.
- The degree to which the treatment is irreversible.

5.1.6 Implementability

This evaluation criterion addresses the technical and administrative feasibility of implementing the remedial alternative, including the availability of the various services and materials required for implementation. The following analysis factors were considered during the implementability evaluation:

- *Technical Feasibility* – This refers to the relative ease of implementing or completing the remedial alternative based on site-specific conditions. In addition, the ease of construction, operational reliability, and ability to monitor the effectiveness of the remedial alternative are considered.
- *Administrative Feasibility* – This refers to items such as coordination with other agencies and availability of services and materials, such as treatment, storage and disposal services, as well as required technical specialists and contractor services.

5.1.7 Cost

This criterion refers to the total cost to implement the remedial alternative on the basis of present worth analysis. The total cost of each alternative represents the sum of the direct capital costs (materials, equipment, and labor), indirect capital costs (engineering, licenses or permits, and contingency allowances), and O&M costs (operating labor, energy, chemicals, and sampling and analysis).

The present worth costs were estimated with expected accuracies of -30 to +50 percent in accordance with both NYSDEC and USEPA guidance. Because detailed RD activities have not been performed, a 20 percent contingency has been included to each alternative account for potential changes in scope (and costs) that may be identified during the design and implementation activities. Present value costs are calculated for alternatives expected to last more than 2 years. In accordance with USEPA guidance, a 7 percent discount rate (before taxes and after inflation) was used to calculate present worth.

5.2 Detailed Evaluation of Alternatives

This section presents a detailed description of the retained alternatives for subsurface soil and groundwater, and an evaluation of each alternative with respect to the seven evaluation criteria described in Section 5.1.

5.2.1 Subsurface Soil

Six soil alternatives were developed for detailed analysis:

- Alternative SM1 – No Further Action.
- Alternative SM2 – Institutional Controls.
- Alternative SM3 – Focused Soil Containment and Institutional Controls.
- Alternative SM4 – Focused In-Situ Soil Stabilization and Institutional Controls.
- Alternative SM5 – Large Scale Stabilization for Soil Exceeding Commercial-Use SCOs and/or Exhibiting NAPL, and Institutional Controls.
- Alternative SM6 - Excavation for Soil Exceeding Unrestricted Use SCOs and/or Exhibiting NAPL, and Institutional Controls

5.2.1.1 Alternative SM1 - No Further Action

<u>Technical Description</u>

Alternative SM1 serves as the baseline for comparison of the overall effectiveness of the other remedial alternatives. Under this alternative, the site would remain in its current condition. The existing cover material (i.e., asphalt pavement, Office Complex, and landscaping), retaining wall, and fencing/security at the former MGP property would be maintained, to the extent National Grid continues to own and occupy the property.

Compliance with SCGs

- *Chemical-Specific SCGs*: Because removal or treatment is not included as part of this alternative, RAOs that relate to chemical-specific SCGs would not be met. While exceedances of certain chemical-specific SCGs would exist, such exceedances do not necessarily equate to a current risk to human health or the environment.

- *Action-Specific SCGs*: Action-specific SCGs are not applicable because the No Further Action alternative does not involve the implementation of active remedial measures.

- *Location-Specific SCGs*: Location-specific SCGs are not applicable because the No Further Action alternative does not involve the implementation of active remedial measures.

Overall Protection of Human Health and the Environment

The No Further Action alternative is not considered an effective or “stand alone” means of achieving the RAOs. The No Further Action alternative does not include any additional activities to address MGP-related constituents at the site. Therefore, the alternative may not be effective in meeting the RAOs established for the site. However, to the extent to which current conditions are already protective of human health and the environment, and such conditions remain in the future, aspects of the RAOs would be achieved. For instance, existing ground surface cover in the form of asphalt pavement, the Office Complex structure, and landscaping prevents direct contact with, or ingestion of, soil by site workers and prevents exposures to soil via wind-blown dust. However, the alternative may not address future exposures to construction workers performing subsurface excavation/construction activities, as a SMP and institutional controls would not be in place for intrusive subsurface activities.

This alternative would involve natural degradation processes to reduce concentrations of constituents of interest in soil. The timing and extent of COC degradation (if any) has not been estimated.

Short-Term Effectiveness

No remedial activities would be performed under the No Further Action alternative. Therefore, there would be no short-term environmental impacts or risks to onsite workers or the community (or construction workers, because there would not be any workers performing any remedial activities) associated with implementation of the alternative.

Long-Term Effectiveness

There is a potential for construction worker exposure to MGP-impacted subsurface soil during future intrusive activities (e.g., during excavation to repair or replace existing subsurface utilities/structures or install new underground facilities). The No Further Action alternative does not include additional actions or measures to address MGP-related impacts in subsurface soil or potential human exposure. Therefore, the No Further Action alternative is not considered to be effective over the long-term at addressing RAOs related to potential direct contact, ingestion, or inhalation human health exposure pathways. This alternative, however, may meet the RAO related to preventing the migration of chemical constituents from soil that would result in exceedances of groundwater quality standards if the existing ground surface cover is maintained over the long-term. The cover would continue to limit infiltration of precipitation into the overburden, which reduces the migration of MGP-related constituents. Additionally, as noted above, natural degradation processes would continue to reduce concentrations of constituents of interest in soil

Reduction of Toxicity, Mobility, or Volume

MGP-impacted subsurface soil would be left in place and not actively treated (other than by natural processes), recycled, or destroyed. Reduction of toxicity, mobility, and mass of the impacted subsurface soil would potentially occur over an extended period of time as a result of natural processes.

Implementability

The No Further Action alternative does not involve any active remedial response and poses no technical or administrative implementability concerns.

Cost

There are no costs associated with Alternative SM1.

5.2.1.2 Alternative SM2 – Institutional Controls

Technical Description

The Institutional Controls alternative would not involve active remedial measures to remove, treat, or contain MGP-impacted subsurface soil at the site. However, the existing ground cover material (i.e., asphalt pavement, Office Complex structures, and landscaping), retaining wall, and fencing/security at the site would be maintained. Institutional controls would be implemented to limit disturbance of the ground cover materials and place health and safety requirements on subsurface activities. The institutional controls would include: (1) a land use restriction in the form of a deed restriction or environmental easement; and (2) an SMP.

As mentioned in Subsection 4.4.1.2, the land use restriction would: (1) restrict future use of the site to commercial activities; (2) notify future property owners of the presence of MGP-related constituents in soil at the site; and (3) notify future property owners of the applicability of the SMP. The SMP would be prepared to: (1) address possible future disturbances of site soil ; (2) identify known locations of MGP-impacted soil at the site; and (3) set forth the inspection and maintenance activities for the perimeter fencing and cover materials.

The actual land use restriction implemented under this alternative (deed restriction, environmental easement) would be determined in consultation with the NYSDEC. Periodic reports would be filed with the NYSDEC to demonstrate that the institutional controls are being maintained and remain effective.

<u>Compliance with SCGs</u>

- *Chemical-Specific SCGs*: While exceedances of certain chemical-specific SCGs would exist, such exceedances do not necessarily equate to a current risk to human health or the environment. Measures to address potential exposure pathways would be implemented as part of this alternative (e.g., restricting land use to commercial, requiring adherence to provisions of the SMP).

- *Action-Specific SCGs*: Action-specific SCGs are not applicable because the Institutional Controls alternative does not involve the implementation of active remedial measures.

- *Location-Specific SCGs*: Location-specific SCGs are not applicable because the Institutional Controls alternative does not involve the implementation of active remedial measures.

<u>Overall Protection of Human Health and the Environment</u>

This alternative would meet the RAOs related to protecting human health and may meet the RAO related to protecting the environment in the long-term. The existing ground surface cover in the form of asphalt pavement, Office Complex structures, and landscaping would continue to prevent direct contact with, or ingestion of, soil by site workers and prevent exposures to soil via wind-blown dust. These cover materials would continue to be maintained under this alternative per requirements of the SMP. Potential exposures to construction workers performing subsurface excavation/construction activities would also be addressed by the SMP. The land use restriction would notify future property owners of the constituents of interest in soil and the applicability of the SMP.

This alternative would involve natural degradation processes to reduce concentrations of constituents of interest in soil. Additionally, the ground surface cover would continue to limit infiltration of precipitation into the overburden, which reduces the migration of MGP-related constituents.

Short-Term Effectiveness

No active remediation would be performed under the Institutional Controls alternative. Therefore, there would be no short-term environmental impacts or risks to onsite workers or the community associated with implementation of the alternative.

Long-Term Effectiveness

As mentioned above, the Institutional Controls alternative would involve natural degradation processes to reduce concentrations of constituents of interest in soil. The reduction of concentrations of MGP-related constituents via natural processes is permanent, although it cannot currently be predicted and would not be documented/monitored. Through the establishment of a land use restriction and SMP, this alternative would effectively meet the RAOs related to potential future direct contact, ingestion, or inhalation human health exposure pathways, but may not fully meet the RAO related to preventing the migration of chemical constituents from subsurface soil that would result in exceedances of groundwater quality standards. This alternative does involve natural degradation processes to reduce concentrations of constituents of interest in soil and the ground surface cover would continue to limit infiltration of precipitation into the overburden, thereby reducing the migration of MGP-related constituents of concern (COCs).

The land use restriction and SMP would be kept in place, unchanged, unless site conditions or soil cleanup objectives for commercial site use were to change. The SMP would set forth the actions to be taken to protect the health and safety of site workers and the community and properly handle impacted materials under a variety of site maintenance/future construction scenarios (e.g., utility repair or installation, construction, landscaping, maintenance activities, etc.). If changes were to occur that would require modifications to the land use restriction/SMP, such modifications would be presented to the NYSDEC for review and approval, as appropriate. Both the land use restriction and SMP would be apparent to possible future site owners during comprehensive due diligence activities performed in connection with property transfer. Taken together, these institutional controls could be expected to adequately and reliably provide for the management of impacted material to be left in place.

Reduction of Toxicity, Mobility, or Volume

MGP-impacted subsurface soil would be left in place and not actively treated (other than by natural processes), recycled, or destroyed. Reduction of toxicity, mobility, and mass of the impacted subsurface soil would potentially occur over an extended period of time as a result of natural processes.

Implementability

This alternative would be both technically and administratively implementable. No permit approvals, and only minimal coordination with other agencies would be required.

Cost

The capital costs associated with this alternative are related to preparing the appropriate documentation for the land use restriction and preparing the SMP. Annual O&M costs associated with this alternative include costs associated with inspection and maintenance of ground cover materials and preparation of an annual certification report. The total estimated 30-year present worth cost for implementation of this alternative is approximately $582,000. A detailed breakdown of the estimated costs associated with this alternative is presented in Table 12.

5.2.1.3 Alternative SM3 – Focused Soil Containment and Institutional Controls

Technical Description

This alternative would isolate (contain) MGP-impacted subsurface soil extending above and below the water table through installation of a low-permeability vertical containment wall and an engineered cap. This alternative would focus on the northwest corner of the parking lot west of Buildings B, C, and D (a 9,540 sf area, as shown on Figure 19). The rationale for selection of this area is presented in Section 4.4.1.3. As previously discussed, several utilities are present in the containment area (including natural gas, storm sewer, and electric lines), as shown on Figure 17, and would need to be relocated prior to driving sheetpiling and installing the cap.

The containment wall would extend from several feet below the existing ground surface to approximately 70 feet bgs. A pre-design investigation/test boring program would be conducted to further assess the geology, hydrogeology, and depth of impacts along the path of the containment wall. The containment wall would consist of interlocking watertight sheets that would be installed using cantilever sheetpile driving to target depths without excavating or removing the soil. The interlocking sheets would encompass the focused area to create a continuous horizontal low-permeability barrier to groundwater flowing through the impacted soil. Groundwater flow through the area would be reduced because the hydraulic conductivity of the water-tight sheetpile (typically around 0.00028 feet/day) would be much less than the hydraulic conductivity of the sand/gravel and gravel layers contained within the sheetpile (estimated to be as much as 206 feet/day).

The cap would include a low-permeability liner (e.g., high-density polyethylene [HDPE]) to cover the area enclosed by the sheetpiling. A concrete pile cap would be installed along (above) the perimeter of the sheetpiling to provide a watertight interface between the sheetpiling and HDPE cover material. Prior to installing the cap, the existing pavement and a portion of the underlying sub-base and fill materials would be removed. Grading would be performed to provide a slope for water that might otherwise accumulate on the surface of the cap, to drain away from the containment area. Channels would be installed in the liner, as needed to enhance drainage. Following the liner and pile cap installation, new sub-base materials and asphalt pavement would be installed to restore the parking area.

Combined, the sheetpile wall and cap would reduce the flow of water through the most impacted area of the site, which in turn, would reduce the mass flux of constituents from the site via groundwater flow. This alternative would result in a change in groundwater flow directions, as groundwater would be diverted around the containment area (through a path of least resistance). This, in turn, would result in a slight increase in groundwater flow velocity in the area outside the containment wall. Since groundwater would not “collect” behind the wall (it would move around the wall with minimal mounding), no other hydraulic controls (i.e., pumping) would be provided under this alternative.

The sheetpile wall and cap installation activities would generally be conducted using conventional construction equipment, such as excavators, pile-drivers, front-end loaders, rollers, dump trucks, etc. The excavation work required under this alternative (for pre-trenching along the sheetpile wall alignment and for re-locating utilities) would not encounter the water table. Therefore, it would not be necessary to perform dewatering activities.

A foam spray or other vapor control measures would be used to suppress odors and volatile organic vapors originating from the soils disturbed by containment and capping activities, as needed. A Community Air Monitoring Plan (CAMP) would be followed throughout the completion of these activities to document airborne particulate and volatile organic vapor concentrations surrounding the excavation area.

Long-term O&M would be conducted to assess the condition of the cap and to perform maintenance or repairs as needed. The O&M would also consist of monitoring water levels inside and outside (upgradient and downgradient from) the containment area. Groundwater monitoring would be performed as an element of the groundwater remedial alternatives to evaluate potential changes in groundwater concentrations.

This alternative would also include the same institutional controls provided under Alternative SM2 (as described above in Subsection 5.2.1.2) because subsurface soil at the site would still contain chemical constituents at concentrations exceeding soil cleanup objectives.

Compliance with SCGs

- *Chemical-Specific SCGs*: This alternative does not actively remove or treat impacted soils at the site other than potentially impacted soil removed during utility relocation and cap installation. As such, soils under this alternative would continue to exhibit chemical constituents at concentrations exceeding the commercial use SCOs [6 NYCRR Part 375.6.8(b)]. However, installation of the containment structure would reduce the potential desorption of chemical constituents from saturated soil and their subsequent migration via groundwater flow because infiltration of precipitation and groundwater flow (velocity and volume) through the impacted soil area would be significantly reduced. This reduced mass flux of constituents from the containment area might result in a reduction in concentrations in offsite groundwater downgradient from the site, which would be further reduced over time via natural processes.

- *Action-Specific SCGs*: Action-specific SCGs that apply to this alternative are associated with installing sheeting and the engineered cap, monitoring requirements, and OSHA health and safety requirements. Workers and work activities that occur during implementation of this alternative must comply with OSHA requirements for training, safety equipment and procedures, monitoring, recordkeeping, and reporting as identified in 29 CFR 1910, 29 CFR 1926, and 29 CFR 1904. Compliance with action-specific SCGs would be accomplished by following a NYSDEC-approved Remedial Design/Remedial Action (RD/RA) Plan and site-specific Health and Safety Plan (HASP). Measures would be taken (as appropriate) to control levels of airborne particulate matter during sheeting and capping installation activities, in accordance with 40 CFR 50 National Ambient Air Quality Standards.

  National Ambient Air Quality Standards (including particulate levels) would be applicable and adhered to during pre-trenching for sheeting and during capping installation activities. The SCGs applicable to air emissions include the prevention of significant deterioration (PSD) air emission provisions contained in 40 CFR 51 and all relevant requirements under the Clean Air Act contained in 40 CFR 1-99. In addition, New York State regulations regarding air emissions would apply.

- *Location-Specific SCGs*: Remedial activities at the site would be conducted in accordance with local building/construction codes and ordinances.

Overall Protection of Human Health and the Environment

The installation of a physical containment structure would meet the soil RAOs related to protecting human health and the environment. The cap installed in the containment area and the existing asphalt pavement, Office complex structures, and landscaping located elsewhere would continue to prevent direct contact with, or ingestion of, soil by site workers and prevent exposures to soil via wind-blown dust. The land use restriction would further mitigate potential exposure by notifying future site owners of the constituents of interest in soil and the applicability of the SMP. The SMP would mitigate potential exposure to soil at the site by identifying known locations of constituents at concentrations exceeding SCOs and setting forth actions to address possible future disturbances of subsurface soil.

The containment structure would reduce future impacts to groundwater because the flow velocity and flow volume through the containment area would be greatly reduced, which would mean less transfer of constituents from soil to groundwater and less subsequent mass flux of constituents from the containment area to the downgradient offsite area. This alternative would involve natural degradation processes to reduce concentrations of constituents of interest in soil. The timing and extent of COC degradation (if any) is uncertain.

Short-Term Effectiveness

During implementation of this alternative, onsite remedial construction workers may potentially be exposed to impacted soil by ingestion, dermal contact, and/or inhalation. Potential exposure of onsite workers to chemical constituents would be minimized by the use of PPE, as specified in a site-specific HASP that would be developed during the RD. Air monitoring would be performed during implementation of this alternative to determine the need for additional engineering controls (e.g., use of water sprays and/or foam to suppress dust/vapors/odors following removal of cover materials, modifying the rate of construction activities, etc.) and to confirm that dust and volatilized organic vapors are within acceptable levels, as specified in the site-specific HASP. Vibration monitoring would also be performed to confirm that vibrations caused by driving sheetpiling close to existing structures are within limits set forth in the RD documents.

The community would not have access to the site during implementation of the remedial activities because site access is currently and would continue to be limited by fencing and manned security. However, Office Complex workers, especially those in Building D, would have an increased risk of exposure, due to the close proximity to remedial activities. Risks to the Office Complex workers would be minimized by providing fencing around the work area and implementing a CAMP to minimize the potential migration of volatile organic vapors or impacted dust from the work area. In addition, actions would be taken, if needed, to minimize potential MGP nuisance odors (although the MGP-impacted soils are typically below the depth of excavation that would likely take place for pre-trenching along the sheetpile wall alignment and for construction of the cap). Office Complex workers may also encounter additional risks relating to vibrations, noise, and exhaust originating from construction equipment, and would lose points of access to the building and parking space for the duration of the remedial action. Provisions may be needed to minimize subsurface vibrations associated with the sheetpiling and capping operations that might otherwise cause structural damage to Building D and/or the retaining wall.

Alternative SM3 involves a limited remediation footprint (containment of an approximate 9,540 sf area) and does not actively remove or treat MGP-impacted soils at the site other than potentially impacted soil removed during utility relocation and cap installation. The relative carbon footprint (as compared to the other active remediation alternatives) is the smallest based on a number of factors including fuel used, waste generation, and greenhouse and other air emissions.

Based on the extent of remedial activities described herein, containment activities under this remedial alternative may require approximately two months to complete.

Long-Term Effectiveness

Implementation of this containment alternative would meet the soil RAOs related to protecting human health and may meet those related to the environment over the long-term. Contact with impacted soil or inhalation of impacted soil via wind-blown dust would be limited (similar to the way it is currently) by the cover materials in the form of the cap, existing asphalt pavement, Office complex structures, and landscaping. Potential exposures to future construction workers performing subsurface excavation/construction activities would be addressed by the SMP. The cover materials would be maintained in accordance with requirements of the SMP.

This alternative, like the institutional controls alternative, would involve natural degradation processes to reduce concentrations of constituents of interest in soil. The reduction of concentrations of MGP-related constituents via natural processes is permanent, although the rate or extent cannot currently be predicted. As previously discussed, the mass flux of MGP-related constituents from the containment area would be reduced in the long-term by the reduced velocity and volume of groundwater flowing through the containment area.

Verification of the long-term effectiveness and permanence of the containment would be performed via a monitoring program. Water levels inside and outside (upgradient and downgradient from) the containment area would be measured. In addition, groundwater monitoring would be performed to evaluate potential changes in groundwater concentrations (i.e., as an element of the groundwater remedial alternatives).

The land use restriction and SMP would be kept in place, unchanged, unless site conditions or soil cleanup objectives for commercial site use were to change. The SMP would set forth the actions to be taken to protect the health and safety of site workers and the community and properly handle impacted materials under a wide variety of site maintenance/future development scenarios (utility repair or installation, building construction, landscaping, maintenance activities, etc.). If changes were to occur that would require modifications to the land use restriction/SMP, such modifications would be presented to the NYSDEC for review and approval, as appropriate. Both the land use restriction and SMP would be apparent to possible future site owners during comprehensive due diligence activities performed in connection with property transfer. Taken together, these institutional controls could be expected to adequately and reliably provide for the management of impacted material to be left in place.

Reduction of Toxicity, Mobility, or Volume

This alternative would reduce the mobility of constituents in the impacted soil by reducing the infiltration of precipitation and flow of groundwater through the impacted area. Since there would be no active treatment of soil, reduction of the toxicity and volume of the impacted subsurface soil would be left to take place by natural processes. This would occur over an extended period of time.

Because the sheetpile wall and cap would reduce the flow of water through the most impacted area of the site (and transport of constituents from soil to groundwater by advection), the mass flux of constituents from the site via groundwater flow would be reduced. As a result, the toxicity of the groundwater (i.e., the groundwater concentrations) downgradient from the containment area would likely decrease over time.

Implementability

Containment of impacted soil is technically feasible. Remedial contractors for the installation of sheetpiling and an engineered cap are readily available. Difficulties associated with this alternative are: (1) installing the sheetpiling and engineered cap in close proximity to existing structures (retaining wall and Building D); (2) the relocation of subsurface utilities (including natural gas, storm sewer, and electric lines) that would be required; (3) the potential need to remove subsurface obstructions to drive sheetpiles to required embedment depths; (4) controlling odors that would potentially be generated during sheetpile pre-trenching activities in close proximity to the Office Complex (i.e., Building D); and (5) minimizing noise and disruption to Office Complex workers. The total area encompassed by the containment footprint and needed for the staging of equipment would take up most of the western parking lot onsite. With access severely limited to the western parking lot under this alternative, parking for approximately 65 employees would need to be relocated and operations for four loading docks and one garage would require significant coordination with remedial activities, or suspension/temporary relocation. The lack of access/ egress to portions of the Office Complex would also present operational and safety concerns (loading/unloading docks for receipt of products needed for Office Complex operations would be limited and several entrances to Buildings D would be blocked).

Technical problems could result in schedule delays (e.g., unforeseen subsurface structures/debris, equipment failure, coordination issues, etc.), but could be minimized with proper advanced planning and coordination of the remedial activities.

A test boring program would be implemented in connection with design of this alternative to confirm that sheetpiling can be driven into the subgrade to the required depths. The time associated with successful implementation of this alternative, not including the pre-design soil boring program or time to obtain necessary permits to conduct these activities, would be several months, and the long-term monitoring and maintenance could last 30 years or more.

Cost

The capital costs associated with this alternative include a test boring program, mobilization, site preparation, steel sheetpiling, concrete pile cap, engineered surface cover, site restoration, and preparation of the SMP and appropriate documentation for the land use restriction. Annual O&M costs associated with this alternative include costs associated with inspection and maintenance of cover materials (asphalt pavement and the sheetpile wall), and preparation of an annual certification report. The total estimated 30-year present worth cost for implementation of this alternative is approximately $5,890,000. A detailed breakdown of the estimated costs for this alternative is presented in Table 13.

5.2.1.4 Alternative SM4 – Focused In-Situ Soil Stabilization and Institutional Controls

Technical Description

This alternative would address impacted unsaturated and saturated soil at the site through ISS and would include the same focused area described above for Alternative SM3, as shown on Figure 19. The rationale for selection of this area is presented in Section 4.4.1.3.

Under this alternative, excavation would be performed to remove the upper 10- to 15-feet of soil in preparation for ISS of underlying soils. The approximate soil removal volume is 5,300 cy. Prior to excavation, a temporary soldier pile and lagging wall would be installed around the perimeter of the proposed excavation area to stabilize excavation sidewalls (and to comply with OSHA requirements) and permit soil removal to the target depths. Underground utilities in the area (including natural gas, storm sewer, and electric lines), as shown on Figure 17, would need to be relocated in connection with installation of the soldier pile and lagging wall. The location of the soldier pile and lagging wall would be determined based on visual characterization and/or laboratory analytical results obtained for in-situ pre-excavation verification soil sampling. Soil to be removed under this alternative is anticipated to be above the water table. Therefore, it would not be necessary to dewater the excavation (other than to remove precipitation that enters and accumulates within the excavation).

The excavation of impacted soils would generally be conducted using conventional construction equipment, such as excavators, front-end loaders, dump trucks, etc. Given the large size of the excavation area and limited available space onsite for staging, the excavated soil would be pre-characterized for offsite transportation and disposal. For purposes of the FS, it is assumed that samples would be collected at a frequency of 1 per 750 cy of soil excavated.

Soil removed from the excavation would be direct-loaded for offsite disposal, to the extent possible. Alternatively, the soil would be stockpiled in a lined material staging area (or portion of the excavation area) for stabilization, if needed, prior to offsite disposal. Specifics of the handling approach would be determined during RD. Based on the results of characterization sampling performed during the PSA/IRM study, it is anticipated that the majority of soil removed would be characterized as non-hazardous, with the exception of soil in the vicinity of MW-4S which may require management in accordance with NYSDEC TAGM 4061 (based on previous sampling results for TCLP benzene). Verification soil samples would not be collected from the bottom of the excavation, as ISS would be performed on soil below this depth.

The soil removal would allow room for: (1) the soil volume increase (bulking) that would occur when stabilizing agents are added; and (2) placement of clean imported sand/gravel backfill and replacement cover materials. Specific design details would be addressed as part of the RD. In addition, re-location of utilities and obstacles would be performed, as needed prior to and during soil removal.

A foam spray or other vapor control measures would be used to suppress odors and volatile organic vapors originating from the excavation and the excavated soil, as needed. A CAMP would be followed throughout the completion of these activities to document airborne particulate and volatile organic vapor concentrations surrounding the excavation area.

The next phase of this alternative would be ISS, which would involve treating impacted soils via immobilization. ISS would be applied to soil within the focused excavation area described above. ISS would be performed to immobilize approximately 12,400 cy of soil from an approximate depth of 15- to 50-feet bgs within the excavation footprint.

ISS would be performed by mixing a fluid cement/pozzolanic grout into a column of soil without excavating or removing the soil. ISS treatment would limit potential future impacts from soil to groundwater by: (1) reducing the leaching/mobility of constituents in soil; (2) minimizing the amount of free liquids in the soil pore space; and (3) reducing the hydraulic conductivity of the soil. With less soil pore space and reduced conductivity, the potential mobility of groundwater and associated COCs would be reduced in the treated area. There are several methods for implementing ISS, two of which are described below:

- One method involves using a large crane or excavator-mounted drill to turn a special mixing tool into the soil while cement-bentonite grout is pumped through the tool and mixed into the soil. The resulting material is generally a homogeneous mixture of soil and grout that hardens to become a weakly-cemented material. The mixing tool for an application such as the Erie Boulevard site may be 6 to 12 feet in diameter. In order to create continuous zones of treatment, the columns of mixed soil and cement are overlapped to provide continuity.

- Another method consists of jet-grouting, whereby a fluid cement-bentonite grout would be injected into a column of soil using high pressure. This approach is usually used to form a panel of solidified soil as part of a grout cutoff wall or in the vicinity of subsurface obstructions (e.g., foundations, utilities) to obtain immobilization without the need for excavating the soil.

Spoils, consisting of a mixture of soil, groundwater, and grout, would be generated by ISS, whether performed using the mixing tool method or jet-grouting method. The volume of spoils generated is estimated as 15%-25% of the soil volume treated by the mixing tool method or 100% of the soil volume treated by the jet-grouting method. The spoils would be allowed to bulk within the excavation footprint to an approximate depth of 5- to 10-feet bgs, therefore eliminating the need for offsite transportation and disposal.

Prior to full-scale implementation of ISS, a bench-scale study may be required to evaluate the effectiveness of various cement-bentonite mixtures (i.e., soil stabilization mixtures) at reducing the leachability and permeability of the impacted soil at the site. The bench-scale testing activities would consist of testing various mixtures of blast furnace slag, Portland cement, bentonite, and water for compatibility with the constituents of interest in soil at the site. Solidification mixtures would be tested for density, permeability, strength, and leachability of VOCs and SVOCs (using the synthetic precipitation leaching procedure [SPLP]).

Post-ISS quality assurance/quality control (QA/QC) sampling and analysis would be performed to verify that performance criteria are met for the stabilized soil columns (i.e., unconfined compressive strength, permeability, and PAH concentrations in SPLP extract). For the purposes of estimating a cost for this alternative, it is assumed that QA/QC activities would include: (1) sampling approximately 20% of the solidified columns; (2) analyzing each of the samples for unconfined compressive strength; and (3) analyzing 10% of the samples for permeability and PAHs in SPLP extract. Long-term O&M would consist of monitoring constituent concentrations in the groundwater downgradient of ISS treatment areas.

Following ISS, the parking area would be restored by providing, placing, and compacting select fill, as needed, to within approximately 6 to 9 inches of the approximate former grade. Paving would then be performed to restore the parking area.

This alternative would also include the same institutional controls provided under Alternative SM2 (as described above in Subsection 5.2.1.2) because subsurface soil at the site would still contain chemical constituents at concentrations exceeding commercial use SCOs.

Compliance with SCGs

- *Chemical-Specific SCGs*: Excavation would result in the removal of soils exhibiting chemical constituents at concentrations exceeding the commercial use SCOs [6 NYCRR Part 375.6.8(b)] to a depth of 10- to 15-feet bgs. ISS would not meet the SCOs for soil below the excavation to a depth of 50-feet bgs. ISS would also not be expected to meet applicable SCGs for site groundwater (standards/guidance values presented in TOGS 1.1.1). However, the potential for dissolution of chemical constituents from the solidified material would be greatly reduced. Also, free liquids (e.g., impacted groundwater) within the stabilized material would be reduced.

- *Action-Specific SCGs*: Action-specific SCGs that apply to this alternative are associated with excavation, transportation and disposal of the impacted soil, monitoring requirements, ISS monitoring, and OSHA health and safety requirements. Workers and work activities that occur during implementation of this alternative must comply with OSHA requirements for training, safety equipment and procedures, monitoring, recordkeeping, and reporting as identified in 29 CFR 1910, 29 CFR 1926, and 29 CFR 1904. Compliance with action-specific SCGs would be accomplished by following a NYSDEC-approved RD/RA Plan and site-specific HASP. Measures would be taken (as appropriate) to control levels of airborne particulate matter during soil excavation activities, in accordance with 40 CFR 50 National Ambient Air Quality Standards.

  Additional SCGs applicable to this alternative are associated with the transportation and disposal of the excavated materials. Transportation of the excavated materials would be completed in accordance with procedures identified in 6 NYCRR 364 and 372, 49 CFR 107, and 40 CFR 262, 263, 171, and 172. Disposal activities would be completed in accordance with 6 NYCRR 372, 373, and 376 and 40 CFR 262, 263, 170-179, and 270.

  National Ambient Air Quality Standards (including particulate levels) would be applicable and adhered to during excavation activities. The SCGs applicable to air emissions include the PSD air emission provisions contained in 40 CFR 51 and all relevant requirements under the Clean Air Act contained in 40 CFR 1-99. In addition, New York State regulations regarding air emissions would apply.

  Waste materials generated during implementation of this alternative (e.g., excavated soil) would be characterized to determine appropriate offsite disposal requirements. If any of the materials were to be characterized as a hazardous waste (although most is anticipated to be non-hazardous based on existing data), then the RCRA UTSs/LDRs and USDOT requirements for the packaging, labeling, transportation, and disposal of hazardous or regulated materials may be applicable. However, if the MGP-impacted material only exhibited the hazardous characteristic of toxicity for benzene (D018), it would be conditionally exempt from the hazardous waste management requirements (6 NYCRR Parts 370-374 and 376) when destined for thermal treatment in accordance with the requirements set forth in TAGM 4061. Compliance with these requirements would be achieved by utilizing licensed waste transporters and properly permitted treatment/disposal facilities.

- *Location-Specific SCGs*: Remedial activities at the site would be conducted in accordance with local building/construction codes and ordinances.

Overall Protection of Human Health and the Environment

Implementation of this stabilization alternative would meet the soil RAOs related to protecting human health and may meet those related to the environment over the long-term. Contact with or ingestion of the impacted soil to a depth of 10- to 15-feet would be minimized because it would be physically removed from the site and treated/disposed at permitted facilities. Contact with or ingestion of impacted soil beneath this depth would be minimized because it would be bound up in a solidified/stabilized matrix. In addition, the clean cover material (asphalt pavement, sub-base, select fill) placed over the solidified/stabilized soil would prevent direct contact with, or ingestion of, soil by site workers. Remaining soil that exhibits MGP-related impacts would continue to be below cover materials and generally inaccessible for human exposure. The land use restriction would further mitigate potential exposure by notifying future site owners of the constituents of interest in soil and the applicability of the SMP. The SMP would mitigate potential exposure to soil at the site by identifying known locations of constituents at concentrations exceeding SCOs and setting forth actions to address possible future disturbances of subsurface soil.

ISS would minimize future impacts to groundwater and minimize potential contact with, or ingestion of, impacted groundwater since the impacted groundwater within the treatment area would be contained (and/or completely bound) within the solidified/stabilized material.

Short-Term Effectiveness

During implementation of this alternative, onsite remedial construction workers may potentially be exposed to impacted soil by ingestion, dermal contact, and/or inhalation. Potential exposure of onsite workers to chemical constituents would be minimized by the use of personal protective equipment (PPE), as specified in a site-specific HASP that would be developed during the RD. Air monitoring would be performed during implementation of this alternative to determine the need for additional engineering controls (e.g., use of water sprays and/or foam to suppress dust/vapors/odors following removal of cover materials, modifying the rate of construction activities, etc.) and to confirm that dust and volatilized organic vapors are within acceptable levels, as specified in the site-specific HASP. Vibration monitoring would also be performed to confirm that vibrations caused by installing soldier piles and performing ISS auger mixing are within limits set forth in the RD documents.

The community would not have access to the site during implementation of the remedial activities because site access is currently and would continue to be limited by fencing and manned security. However, Office Complex workers, especially those in Building D, would have an increased risk of exposure, due to the close proximity to remedial activities. Risks to the Office Complex workers would be minimized by providing fencing around the work area and implementing a CAMP to minimize the potential migration of volatile organic vapors or impacted dust from the work area. In addition, actions would be taken, if needed, to minimize potential MGP nuisance odors. Office Complex workers may also encounter additional risks relating to vibrations, noise, and exhaust originating from construction equipment, and would lose points of access to the building and parking space for the duration of the remedial action. Provisions may be needed to minimize subsurface vibrations and address changes to subsurface conditions (soil weight, strength, drainage, etc.) associated with the excavation and stabilization operations that might otherwise cause structural damage to Building D and/or the retaining wall.

The excavated soil would pose a risk while onsite and during transportation from the site to the treatment/disposal facility since it would be more accessible to human exposure. Under this alternative, traffic resulting from the transportation of approximately 5,300 cy of impacted soil for offsite disposal (approximately 265 one-way truckloads) and for importing approximately 2,800 cy of clean fill materials (approximately 140 one-way truckloads) would pose a potential nuisance to the community and increase the risk for accidents and spills. The clean fill volume was calculated as a smaller amount than the offsite disposal volume based on the assumptions that there would be a 20% bulking of soil during ISS mixing and the pre-excavation grades would be achieved during site restoration. The transportation activities would be managed to minimize en-route risks to the community. Waste transport trucks would have watertight tailgates with a gasket between the box and the tailgate regardless of the designation of the load.

Alternative SM4 involves the same remediation footprint as SM3 (approximately 9,540 sf area), but also includes excavation and offsite treatment/disposal of approximately 5,300 cy of soil and importing approximately 2,800 cy of clean fill materials to support ISS. The relative carbon footprint for SM4 is considered greater than that for SM3 based on a number of factors, including consumption of resources (fuel used, soil imported from borrow sources, and filling of air-space within landfills) and greenhouse and other air emissions. Implementation would require fuel for trucking and construction equipment, and create a proportionate amount of associated air emissions.

Based on the extent of remedial activities described herein, soil removal and ISS activities under this remedial alternative may require approximately six months to complete.

Long-Term Effectiveness

Implementation of this alternative would meet the soil RAOs related to protecting human health and may meet those related to the environment over the long-term. Contact with or ingestion of impacted soil would be minimized in the long-term because soil would be removed to 10- to 15-feet bgs (pre-ISS) and the underlying soil would be bound up in a solidified/stabilized matrix to 50-feet bgs. Potential exposures to future construction workers performing subsurface excavation/construction activities would also be addressed by the SMP. In addition, the several feet of clean cover materials placed over the solidified/stabilized soil would prevent direct contact with, or ingestion of, soil by site workers. The cover materials would be maintained in accordance with requirements of the SMP.

Verification of the long-term effectiveness and permanence of the ISS would potentially require a long-term monitoring plan. Long-term effectiveness of the ISS could potentially be inhibited by the presence of subsurface utilities and other obstructions that might impede or otherwise prevent installation of the auger or grout probe to the required depth. Subsurface obstructions could potentially create “blind” areas within the “monolith” where constituents of interest may not be immobilized.

The land use restriction and SMP would be kept in place, unchanged, unless site conditions or soil cleanup objectives for commercial site use were to change. The SMP would set forth the actions to be taken to protect the health and safety of site workers and the community and properly handle impacted materials under a wide variety of site maintenance/future development scenarios (utility repair or installation, building construction, landscaping, maintenance activities, etc.). If changes were to occur that would require modifications to the land use restriction/SMP, such modifications would be presented to the NYSDEC for review and approval, as appropriate. Both the land use restriction and SMP would be apparent to possible future site owners during comprehensive due diligence activities performed in connection with property transfer. Taken together, these institutional controls could be expected to adequately and reliably provide for the management of impacted material to be left in place.

Reduction of Toxicity, Mobility, or Volume

The soil removal component of this alternative would reduce the toxicity, mobility, and volume of impacted unsaturated soil beneath the site to a depth of between approximately 10- and 15-feet bgs. ISS would reduce the mobility of constituents in the underlying impacted soil through stabilization of these constituents to a depth of 50 feet bgs. The toxicity of the immobilized soil would be reduced since the constituents of interest would be encapsulated within the grout monolith. The volume of constituents would not change with the stabilization/solidification activities.

By minimizing the mobility of constituents of interest in soil, ISS would limit the potential future migration of constituents from soil to groundwater. In addition, since ISS would extend to soils below the water table, saturated soils that might otherwise result in groundwater quality impacts would be contained (and/or completely bound) within the solidified/stabilized matrix.

Implementability

Impacted soil removal and offsite treatment/disposal is technically feasible. Remedial contractors for the removal of the impacted soil are readily available. Difficulties associated with the excavation component of this alternative are: (1) excavation in close proximity to existing structures (retaining wall and Building D); (2) the relocation of subsurface utilities (including natural gas, storm sewer, and electric lines) that would be required; (3) the potential need to remove subsurface obstructions to drive soldier piles (or other excavation reinforcements) to required embedment depths; (4) minimizing vibrations during soldier pile installation and ISS mixing near existing structures; (5) controlling odors that would potentially be generated during excavation in close proximity to the Office Complex (i.e., Building D); (6) securing a sufficient number of waste haulers to expeditiously transport the excavated soil for offsite disposal; and (7) minimizing noise and disruption to Office Complex workers.

The excavation would be further complicated by soil removal extending up to (and along) the side of Building D. The total area encompassed by the excavation/stabilization footprint, and staging of soil, backfill, and equipment, would conservatively require a majority of the western parking lot onsite. With access severely limited to the western parking lot under this alternative, parking for approximately 65 employees would need to be relocated and operations for four loading docks and one garage would require significant coordination with remedial activities, or suspension/temporary relocation. The lack of access/egress to portions of the Office Complex would also present operational and safety concerns (loading/unloading docks for receipt of products needed for Office Complex operations would be limited and several entrances to Buildings D would be blocked).

Soil solidification/stabilization is technically feasible and a proven technology. Remedial contractors that perform this technology are available. However, this type of equipment and skilled labor is usually provided by “specialty-type” contractors. A difficulty associated with this technology is the presence of subsurface utilities and potential obstructions (foundations or debris), some of which would be removed/relocated by the excavation that precedes the ISS. Jet-grouting (or alternative immobilization methods) could potentially be used to stabilize soil near utilities in some cases. Obstructions could impede or prevent the advancement of and potentially damage the drilling/injecting equipment used for ISS.

Technical problems could result in schedule delays (e.g., equipment failure, treatment difficulties, coordination issues, etc.), but could be minimized with proper advanced planning and coordination of the remedial activities.

A test boring program would be implemented in connection with design of this alternative to confirm that excavation reinforcements (e.g., soldier piles) can be driven into the subgrade at the required depths. The time associated with successful implementation of this alternative, not including the pre-design soil boring program or time to obtain necessary permits to conduct these activities, would be several months, and the long-term monitoring and maintenance could last 30 years or more.

Cost

The capital costs associated with this alternative include a test boring program, treatability (bench-scale) study, mobilization, site preparation, soil excavation, transportation, treatment and disposal, solidification/stabilization, site restoration, and preparation of the SMP and appropriate documentation for the land use restriction. Annual O&M costs associated with this alternative include costs associated with inspection and maintenance of cover materials (asphalt pavement and the sheetpile wall), and preparation of an annual certification report. The total estimated 30-year present worth cost for implementation of this alternative is approximately $5,540,000. A detailed breakdown of the estimated costs for this alternative is presented in Table 14.

5.2.1.5 Alternative SM5 – Large Scale Stabilization for Soil Exceeding Commercial Use SCOs and/or Exhibiting NAPL, and Institutional Controls

Technical Description

Alternative SM5 represents a larger stabilization of impacted soil than Alternative SM4. Stabilization would be performed within most of the parking lot west of Buildings B, C, and D (within the approximately 46,890 sf area shown on Figure 20). The rationale for selection of this area is presented in Section 4.4.1.4.

Similar to Alternative SM4, excavation would first be performed to a depth of approximately 10- to 15-feet bgs to remove subsurface debris, foundations, or other structures that might otherwise cause ISS auger refusal. Approximately 26,050 cy of material would be excavated and transported for offsite disposal. ISS would be performed on the remaining soils extending to depths of 50 feet bgs (an estimated 60,800 cy).

Alternative SM5 would involve the same elements included under Alternative SM4, including pre-excavation verification soil sampling, in-situ waste characterization sampling, utility relocation, pre-design test boring program, installation of excavation bracing (e.g., soldier pile and lagging wall), excavation, air monitoring/vapor control, offsite transportation and disposal, treatability (bench-scale) testing, solidification/stabilization, backfilling, restoration, etc.

Based on the larger size of the stabilization areas and their locations under this alternative as compared to Alternative SM4, this alternative would at least require: (1) re-location of more underground utilities; (2) installation of more soldier pile and lagging wall for excavation sidewall support; (3) more soil handling and offsite disposal; (4) more waste characterization and verification sampling; and (5) more soil stabilization.

This alternative would also include the same institutional controls provided under Alternative SM2 (as described above in Subsection 5.2.1.2) because certain soil at the site would still contain chemical constituents at concentrations exceeding unrestricted use soil cleanup objectives.

<u>Compliance with SCGs</u>

- *Chemical-Specific SCGs*: This alternative would address each location at the site where soil was found to contain NAPL and/or MGP-related constituents at concentrations exceeding the commercial use SCOs, with the exception of two locations northwest of Building D (SB-1 and MW-1D) where only a trace amount of NAPL was encountered (note that PAHs were not identified at these two locations at concentrations exceeding the commercial use SCOs). Some soil near these locations (between the Office complex and existing retaining wall and portions of the temporary soldier pile and lagging wall along the remedial limits) would be left in place to maintain support for the buildings/retaining wall.

- *Action-Specific SCGs*: Action-specific SCGs that apply to this alternative are associated with the excavation and disposal of the impacted soil, monitoring requirements, ISS monitoring, and OSHA health and safety requirements, and would be the same as under Alternative SM4 (refer to the discussion under Alternative SM4 for details).

- *Location-Specific SCGs*: Remedial activities at the site would be conducted in accordance with local building/construction codes and ordinances.

<u>Overall Protection of Human Health and the Environment</u>

Implementation of this alternative would meet the soil RAOs related to protecting human health and may meet those related to the environment over the long-term. Contact with or ingestion of the impacted soil to a depth of 10- to 15-feet bgs would be minimized because it would be physically removed from the site and treated/disposed at permitted facilities. Contact with or ingestion of impacted soil beneath this depth would be minimized because it would be bound up in a solidified/stabilized soil matrix. In addition, the clean cover material (asphalt pavement, subbase, fill) placed over the solidified/stabilized soil would prevent direct contact with, or ingestion of, soil by site workers. Remaining soil that exhibits MGP-related impacts would continue to be below cover materials and generally inaccessible for human exposure. The land use restriction would further mitigate potential exposure by notifying future site owners of the constituents of interest in soil and the applicability of the SMP. The SMP would mitigate potential exposure to soil at the site by identifying known locations of constituents at concentrations exceeding SCOs and setting forth actions to address possible future disturbances of subsurface soil.

ISS would minimize future impacts to groundwater and minimize potential contact with, or ingestion of, impacted groundwater since the impacted groundwater within the treatment area would be contained (and/or completely bound) within the solidified/stabilized material.

Short-Term Effectiveness

As with Alternative SM4, during the implementation of this alternative, onsite remedial workers may be exposed to impacted soil by ingestion, dermal contact, and/or inhalation. Potential exposure of onsite workers to chemical constituents would be minimized by the use of PPE, as specified in a site-specific HASP. Air monitoring would be performed during implementation of this alternative to determine the need for additional engineering controls (e.g., use of water sprays/foam suppressants to suppress dust/vapors/odors following removal of cover materials, modifying the rate of construction activities, etc.) and to confirm that dust and volatilized organic vapors are within acceptable levels, as specified in the site-specific HASP. Vibration monitoring would also be performed to confirm that vibrations caused by installing soldier piles and performing ISS auger mixing are within limits set forth in the RD documents.

The community would not have access to the site during implementation of the remedial activities because site access is currently and would continue to be limited by fencing and manned security. However, Office Complex workers, especially those in Buildings B, C, and D, would have an increased risk of exposure due to the close proximity to remedial activities. Risks to the Office Complex workers would be minimized by providing fencing around the work area and implementing a CAMP to minimize the potential migration of volatile organic vapors or impacted dust from the work area. In addition, actions would be taken, if needed, to minimize potential MGP nuisance odors. Office Complex workers may also encounter additional risks relating to vibrations, noise, and exhaust originating from construction equipment, and would lose points of access to the buildings and parking space for the duration of the remedial activities. Provisions may be needed to minimize subsurface vibrations and address changes to subsurface conditions (soil weight, strength, drainage, etc.) associated with the excavation and stabilization operations that might otherwise cause structural damage to the buildings and/or the retaining wall.

The excavated soil would pose a risk while onsite and during transportation from the site to the treatment/disposal facility since it would be more accessible to human exposure. Under this alternative, traffic resulting from the transportation of approximately 26,050 cy of impacted soil for offsite disposal (approximately 1,300 one-way truckloads) and for importing approximately 13,900 cy of clean fill materials (approximately 695 one-way truckloads) would pose a potential nuisance to the community and increase the risk for accidents and spills. The clean fill volume was calculated as a smaller amount than the offsite disposal volume based on the assumptions that there would be a 20% bulking of soil during ISS mixing and the pre-excavation grades would be achieved during site restoration. The transportation activities would be managed to minimize en-route risks to the community. Waste transport trucks would have watertight tailgates with a gasket between the box and the tailgate regardless of the designation of the load.

The relative carbon footprint of Alternative SM5 compared to Alternative SM4 is greater as it involves a remediation footprint that is nearly three times larger, with corresponding larger volumes of soil to be solidified and/or excavated and disposed offsite. A corresponding larger volume of clean fill would also be imported. The relative carbon footprint for SM5 is considered greater than that for Alternatives SM2, SM3, and SM4 based on a number of factors, including consumption of resources (fuel used, soil imported from borrow sources, and filling of air-space within landfills) and greenhouse and other air emissions. Implementation would require fuel for trucking and construction equipment, and create a proportionate amount of associated air emissions.

Based on the extent of remedial activities described herein, soil stabilization activities under this remedial alternative may require up to one year to complete.

Long-Term Effectiveness

Implementation of this alternative would meet the soil RAOs related to protecting human health and may meet those related to the environment over the long-term. Contact with or ingestion of impacted soil would be minimized in the long-term because soil would be removed to 10- to 15-feet bgs (pre-ISS) and the underlying soil would be bound up in a solidified/stabilized matrix to 50-feet bgs. Potential exposures to future construction workers performing subsurface excavation/construction activities would also be addressed by the SMP. In addition, the several feet of clean cover materials placed over the solidified/stabilized soil would prevent direct contact with, or ingestion of, soil by site workers. The cover materials (asphalt pavement) would be maintained in accordance with requirements of the SMP.

Verification of the long-term effectiveness and permanence of the ISS would potentially require a long-term monitoring plan. Long-term effectiveness of the ISS could potentially be inhibited by the presence of subsurface utilities and other obstructions that might impede or otherwise prevent installation of the auger or grout probe to the required depth. Subsurface obstructions could potentially create “blind” areas within the “monolith” where constituents of interest may not be immobilized.

The land use restriction and SMP would be kept in place, unchanged, unless site conditions or soil cleanup objectives for commercial site use were to change. The SMP would set forth the actions to be taken to protect the health and safety of site workers and the community and properly handle impacted materials under a wide variety of site maintenance/future development scenarios (utility repair or installation, building construction, landscaping, maintenance activities, etc.). If changes were to occur that would require modifications to the land use restriction/SMP, such modifications would be presented to the NYSDEC for review and approval, as appropriate. Both the land use restriction and SMP would be apparent to possible future site owners during comprehensive due diligence activities performed in connection with property transfer. Taken together, these institutional controls could be expected to adequately and reliably provide for the management of impacted material to be left in place.

Reduction of Toxicity, Mobility, or Volume

The soil removal component of this alternative would reduce the toxicity, mobility, and volume of impacted unsaturated soil beneath the site to a depth of between approximately 10- and 15-feet bgs. ISS would reduce the mobility of constituents in the underlying impacted soil through the stabilization of these constituents to a depth of 50 feet bgs. The toxicity of the immobilized soil would be reduced since the constituents of interest would be encapsulated within the grout monolith. The volume of constituents would not change with the stabilization/solidification activities.

By minimizing the mobility of constituents of interest in soil, ISS would limit the potential future migration of constituents from soil to groundwater. In addition, since ISS would extend to soils below the water table, saturated soils that might otherwise result in groundwater quality impacts would be contained (and/or completely bound) within the solidified/stabilized matrix.

Implementability

Impacted soil removal and offsite treatment/disposal is technically feasible. Remedial contractors for the removal of the impacted soil are readily available. Difficulties associated with the excavation component of the remedial alternative are: (1) excavation in close proximity to existing structures (retaining wall and Office Complex Buildings B, C, and D); (2) the relocation of subsurface utilities (including natural gas, water, storm sewer, and electric lines) that would be required; (3) the potential need to remove subsurface obstructions to drive soldier piles (or other excavation reinforcements) to required embedment depths; (4) minimizing vibrations during soldier pile installation and ISS mixing near existing structures; (5) controlling odors that would potentially be generated during excavation in close proximity to Office Complex (i.e., Buildings B, C, and D); (6) securing a sufficient number of waste haulers to expeditiously transport the excavated soil for offsite disposal; and (7) minimizing noise and disruption to Office Complex workers.

The excavation would be further complicated by soil removal extending up to (and along) the sides of Office Complex Buildings B, C, and D (which surround the excavation area). With access essentially cut off to the western parking lot onsite under this alternative, parking for approximately 125 employees would need to be relocated and operations for four loading docks and one garage would be suspended or temporarily relocated. The lack of access/egress to portions of the Office Complex would present operational and safety concerns (loading/unloading docks for receipt of products needed for Office Complex operations would be blocked and several entrances to Buildings B and D would be blocked). There would also be limited access/egress for waste hauling vehicles (dump trucks, dump trailers) because the excavation limits would encompass nearly all of the parking lot.

Soil solidification/stabilization is technically feasible and a proven technology. Remedial contractors that perform this technology are available. However, this type of equipment and skilled labor is usually provided by “specialty-type” contractors. A difficulty associated with this technology is the presence of subsurface utilities and potential obstructions (foundations or debris), some of which would be removed/relocated by the excavation that precedes the ISS. Jet-grouting (or alternative immobilization methods) could potentially be used to stabilize soil near utilities in some cases. Obstructions could impede or prevent the advancement of and potentially damage the drilling/injecting equipment used for ISS. Given that the ISS treatment area would take up nearly the entire parking lot and the adjacent areas consist of buildings and Onondaga Creek, there would be limited space for ISS support facilities (they might need to be placed within the remedial limits and relocated as needed).

Technical problems could lead to schedule delays (i.e., equipment failure, treatment difficulties, coordination issues, traffic issues, etc.) but could be minimized with proper advance planning and coordination of the remedial activities.

A test boring program would be implemented in connection with design of this alternative to confirm that excavation reinforcements (e.g., soldier piles) can be driven into the subgrade at the required depths. The anticipated time associated with successful implementation of this alternative, not including the pre-design soil boring program or time to obtain necessary permits to conduct these activities, would be approximately 10 months, and the long-term monitoring and maintenance could last 30 years or more.

Cost

The capital costs associated with this alternative include a test boring program, treatability (bench-scale) study, mobilization, site preparation, pre-ISS soil excavation, transportation, treatment/disposal, solidification/stabilization, site restoration, and preparation of the SMP and appropriate documentation for the land use restriction. Annual O&M costs associated with this alternative include costs associated with inspection and maintenance of cover materials (asphalt pavement and the sheetpile wall), and preparation of an annual certification report. The total estimated 30-year present worth cost for implementation of this alternative is approximately $19,800,000. A detailed breakdown of the estimated costs for this alternative is presented in Table 15.

5.2.1.6 Alternative SM6 – Excavation for Soil Exceeding Unrestricted Use SCOs and/or Exhibiting NAPL, and Institutional Controls

Technical Description

Alternative SM6 is the most aggressive soil remedial alternative and includes excavation of onsite soil that exhibits constituents at concentrations exceeding the unrestricted use SCOs presented in 6 NYCRR Part 375-6.8(a) and/or is visually impacted by NAPL. Inclusion of this alternative in the FS was requested by NYSDEC during the January 16, 2013 meeting among representatives from the NYSDEC, National Grid, and ARCADIS.

Implementation of Alternative SM6 involves excavating soil to approximately 70 feet bgs, within an approximate 96,200 sf area that covers the parking lot west of Buildings B, C, and D and the parking lot between Buildings D and F. This area is more than twice the area to be addressed under Alternative SM5, which would remediate the site to the commercial land use SCOs. The approximate excavation limits under Alternative SM6 are shown on Figure 21. Alternative SM6 addresses each location at the site where soil was found to contain NAPL, except soil boring WB-2, where NAPL was observed deeper than 70 feet bgs. This alternative also addresses each onsite location where soil was found to contain MGP-related constituents at concentrations exceeding the unrestricted use SCOs, except in four of the soil samples collected from the site at depths below 70 feet bgs: WB-1 (76-78’ and 84-86’); WB-2 (86-88’); and MW-4D (75-77’). These concentrations were however, lower than the commercial use SCOs. The estimated volume of soil to be excavated and transported for offsite treatment/disposal is approximately 250,000 cy.

As shown on Figure 21, the approximate soil excavation limits include the limited work space at the site that is available for the remedial alternatives. Detailed planning and construction sequencing, along with strategic movement of equipment, materials, and ancillary support facilities during excavation would be required to implement Alternative SM6.

Similar to Alternatives SM3 through SM5, a pre-design investigation/test boring program would be required to facilitate the RD of SM6. The program for SM6, however, would be much more extensive and would include (but not be limited to) further assessment of the geology, hydrogeology, and geotechnical properties of the soil, as well as further characterization of the soil for offsite treatment/disposal purposes. Soil samples would not be collected to verify achievement of the unrestricted use SCOs, as the limits of the excavation will be defined by the ability to excavate soils given the numerous site constraints, including the adjacent Office Complex buildings and the retaining wall. Further assessment of groundwater may be necessary to design the onsite water treatment system that would be used to treat water pumped from the excavation area.

Prior to excavation, utilities within or proximate to the excavation area (e.g., water, storm/sanitary sewer, natural gas, electric, and telecommunications lines) would be disconnected and removed, and replaced/installed outside of the excavation area. An excavation support system (e.g., reinforced secant retaining wall and internal bracing) would be installed to support deep soil removal activities and prevent instability in existing structures (e.g., the Office Complex and the existing retaining wall). For purposes of developing an FS cost estimate, it has been assumed that a reinforced secant retaining wall would be installed around the perimeter of the excavation (shown on Figure 21) and also within the excavation to form five excavation cells. It is also assumed that the reinforced secant retaining wall will be constructed by jet grouting overlapping, 2.5-feet diameter columns to the low hydraulic conductivity till layer (approximately 170 feet below ground surface), and installing steel H-piles within the wet slurry of every second column to serve as additional excavation support. During installation of the reinforced secant retaining wall, groundwater controls would be required and spoils, consisting of a mixture of soil, groundwater, and grout, would be generated. The spoils would be transported offsite for treatment/disposal in accordance with applicable rules and regulations. In addition to the reinforced secant retaining wall, it is also assumed (for the purposes of this FS) that internal excavation bracing would be required for the deep excavations. The actual excavation support system would be further evaluated and determined as part of the RD.

Excavation of shallower soil would likely be conducted using conventional construction equipment such as an excavator, whereas a large crane would be required to remove soil from the deeper excavations. Soil dewatering would also be required for the excavation activities, as the water table was identified at a depth of approximately 20 to 25 feet bgs at the site. Additionally, Onondaga Creek is a losing stream near the site, meaning that a fraction of the water in its channel recharges groundwater.

Water within the excavation would be generated from three sources, including: (1) groundwater stored within pore spaces of soil within the limits of the reinforced secant retaining wall; (2) water resulting from flow through the bottom of the excavation due to the induced hydraulic gradient caused by pumping from the inside of the excavation area; and (3) water leakage through the reinforced secant retaining wall due to the induced hydraulic gradient across the wall. The pumping rate required to dewater the excavation areas would be dependent on the performance of the secant retaining wall installation. The initial pumping rates for each excavation area may approach 500 to 1,000 gpm and the pumping rates would likely decrease over time (to approximately 100 gpm) once the groundwater storage has been removed from the inside of the excavation areas and relatively steady-state conditions have been met. If, however, the integrity of the reinforced secant retaining wall is compromised and substantial leakage occurs, the groundwater pumping rates required to dewater the excavation areas could be as high as 1,000 gpm or more throughout the duration of the excavation activities. The ability to obtain water tight seals and mitigate cracking at the joints of the reinforced secant retaining wall would lessen with deeper depths (the anticipated required depth for the wall is approximately 170 feet bgs). Groundwater generated during the dewatering activities would be treated on site to meet the requirements of a NYSDEC SPDES permit for discharge to Onondaga Creek.

Soil removed from the excavation would be direct-loaded into transport vehicles for offsite treatment/disposal, to the extent possible. As previously identified, waste characterization sampling would be conducted during the pre-design activities to support profiling necessary for offsite treatment/disposal and facilitate direct-loading of the excavated soils. Alternatively, excavated soil would be stockpiled within a lined material staging area (or portion of the excavation area) for stabilization, if needed, to remove free liquids prior to offsite transport. Details of the handling approach would be determined during the RD.

Based on the results of characterization sampling performed during the environmental investigations, it is anticipated that the vast majority of soil removed would be characterized as non-hazardous and that hazardous soils (if any) would be limited to those exhibiting the hazardous characteristic of toxicity for benzene which are conditionally exempt from certain hazardous waste management requirements when destined for thermal treatment (further explained in Section 2.2.2). For the purpose of cost estimating, the excavated soil is assumed to be non-hazardous and would be transported for offsite disposal at a permitted landfill. The costs for thermal treatment of hazardous wastes (if any) would be accounted for in the contingency costs applied to this alternative, noting that commercial facilities that thermally treat MGP-related wastes are readily available.

It is anticipated that an open-span enclosure equipped with a vapor collection and treatment system would be constructed over the excavation areas to reduce the potential for offsite migration of and potential exposures to vapors, dust, and odors during excavation activities. Additionally, foam spray or other vapor control measures may be used to suppress odors and volatile organic vapors originating from the excavation and the excavated soil, as needed. A CAMP would be followed throughout the completion of these activities to document and address (as needed) the airborne particulate and volatile organic vapor concentrations resulting from implementation of this alternative.

Restoration of the site would be significant, requiring (at minimum) replacement of parking areas and utilities, as well as installation of an appropriate ground surface cover over MGP-impacted subsurface soils that would remain (i.e., not feasible to excavate based on site constraints).

Approximately 250,000 cy of imported fill would be transported to the site and used to backfill the excavation. The fill would meet the unrestricted use SCOs set-forth in 6 NYCRR Part 375 and included in Appendix 5 of DER-10.

Given the complex nature of implementing Alternative SM6 within an active Office Complex with limited work space and hundreds of employees, adjacent to four buildings and the substantial retaining wall, and along busy streets within the City of Syracuse, the actual excavation, dewatering, material handling, and monitoring details would be identified and developed as part of the RD for this alternative.

This alternative would also include the same institutional controls provided under Alternative SM2 (as described above in Subsection 5.2.1.2) to address areas of MGP-impacted subsurface soil that cannot be removed under Alternative SM6 (e.g., due to proximity to existing structures).

<u>Compliance with SCGs</u>

- *Chemical-Specific SCGs*: Excavation would result in the removal of the vast majority of site soils exhibiting chemical constituents at concentrations exceeding the unrestricted use SCOs [6 NYCRR Part 375.6.8(a)]. The alternative, which includes removal of an estimated 250,000 cy of soil and billions of gallons of groundwater to dewater the excavation area, would be expected to meet applicable SCGs for site groundwater (standards/guidance values presented in TOGS 1.1.1).

- *Action-Specific SCGs*: Action-specific SCGs that apply to this alternative are associated with excavation, transportation and disposal of the impacted soil; storage, treatment and discharge of impacted water (e.g., groundwater generated during soil dewatering); community air monitoring requirements; and OSHA health and safety requirements. Workers and work activities that occur during implementation of this alternative must comply with OSHA requirements for training, safety equipment and procedures, monitoring, recordkeeping, and reporting as identified in 29 CFR 1910, 29 CFR 1926, and 29 CFR 1904. Compliance with action-specific SCGs would be accomplished by following a NYSDEC-approved RD/RA Plan and site-specific HASP. Measures would be taken (as appropriate) to control levels of airborne particulate matter during soil excavation and onsite management activities, in accordance with DER-10 (e.g., Appendix 1B - Fugitive Dust and Particulate Monitoring) and 40 CFR 50 National Ambient Air Quality Standards.

  Additional SCGs applicable to this alternative are associated with the transportation and disposal of the excavated materials. Transportation of the excavated materials would be completed in accordance with procedures identified in 6 NYCRR 364 and 372, 49 CFR 107, and 40 CFR 262, 263, 171, and 172. Disposal activities would be completed in accordance with 6 NYCRR 372, 373, and 376 and 40 CFR 262, 263, 170-179, and 270.

National Ambient Air Quality Standards (including particulate levels) would be applicable and adhered to during excavation activities. The SCGs applicable to air emissions include the PSD air emission provisions contained in 40 CFR 51 and all relevant requirements under the Clean Air Act contained in 40 CFR 1-99. In addition, New York State regulations regarding air emissions would apply.

Excavated soils and other solid waste materials generated during implementation of this alternative (e.g., subsurface debris/structures) would be characterized to determine appropriate offsite disposal requirements. If any of the materials were to be characterized as a hazardous waste (although most is anticipated to be non-hazardous based on existing data), then the RCRA UTSs/LDRs and USDOT requirements for the packaging, labeling, transportation, and disposal of hazardous or regulated materials may be applicable. However, if the MGP-impacted material only exhibited the hazardous characteristic of toxicity for benzene (D018), it would be conditionally exempt from the hazardous waste management requirements (6 NYCRR Parts 370-374 and 376) when destined for thermal treatment in accordance with the requirements set forth in TAGM 4061. Compliance with these requirements would be achieved by utilizing licensed waste transporters and properly permitted treatment/disposal facilities.

Water generated during implementation of this alternative (e.g., groundwater from soil dewatering, decontamination water) would be temporarily stored, sampled and treated onsite (as necessary) to meet the requirements of a SPDES permit prior to discharge to Onondaga Creek.

- *Location-Specific SCGs*: Remedial activities at the site would be conducted in accordance with local building/construction codes and ordinances.

<u>Overall Protection of Human Health and the Environment</u>

Implementation of this alternative would meet the soil RAOs related to protecting human health and over time would be expected to meet those related to the environment. Contact with or ingestion of the impacted soil would be eliminated when physically removed from the site and treated/disposed at permitted facilities. As noted above, some MGP-impacted soil would remain as the limits of the excavation will be defined by the ability to excavate soils given the numerous site constraints, including the adjacent Office Complex buildings and the retaining wall. The excavation limits would be defined in the RD documents.

The surface cover materials on the site (e.g., asphalt pavement) and established institutional controls would prevent direct contact with, or ingestion of, soil by site workers. Soil that remains and exhibits MGP-related impacts would continue to be below cover materials and generally inaccessible for human exposure. The land use restriction would further mitigate potential exposure by notifying future site owners of the constituents of interest in soil and the applicability of the SMP. The SMP would mitigate potential exposure to soil at the site by identifying known locations of constituents at concentrations exceeding SCOs and setting forth actions to address possible future disturbances of subsurface soil.

This alternative would significantly minimize or perhaps eliminate future site-related impacts to groundwater and potential contact with, or ingestion of, impacted groundwater because, in addition to the removal of approximately 250,000 cy of soil (including an approximate 50-foot thickness of saturated soils), the groundwater within and adjacent to the excavation area would be removed during soil dewatering. Billions of gallons of groundwater would be removed and treated/discharged to Onondaga Creek in accordance with the requirements of SPDES permit.

Short-Term Effectiveness

During implementation of this alternative, onsite remedial construction workers may potentially be exposed to impacted soil and groundwater by ingestion, dermal contact, and/or inhalation. Potential exposure of onsite workers to chemical constituents would be minimized by the use of personal protective equipment (PPE), as specified in a site-specific HASP that would be developed during the RD. It is anticipated that an open-span enclosure equipped with a vapor collection and treatment system would be constructed over the excavation areas to reduce the potential for offsite migration of and potential exposures to vapors, dust, and odors during excavation activities. Air monitoring would be performed during implementation of this alternative to determine the need for additional engineering controls (e.g., use of water sprays and/or foam to suppress dust/vapors/odors following removal of cover materials, modifying the rate of construction activities, etc.) and to confirm that dust and volatile organic vapors are within acceptable levels, as specified in the site-specific HASP and CAMP.

Worker safety concerns also include working with and around large construction equipment, potential for excavation heave, noise generated from operating construction equipment, and increased vehicle traffic associated with transportation of excavated material from the site and delivery of fill materials. Extraction and treatment of groundwater would also increase the potential for negative short-term human health impacts to construction workers due to handling potentially dangerous materials (treatment chemicals, extracted groundwater, etc.) required for treatment system operation; and pumping large volumes of impacted groundwater, which would increase the potential for on- and offsite spills.

The limited available work space at the site, as well as conducting the excavation activities within an open-span structure would exacerbate worker safety concerns. These concerns would be minimized by using engineering controls and appropriate health and safety practices.

The community would not have access to the site during implementation of the remedial activities because site access is currently and would continue to be limited by fencing and manned security. However, Office Complex workers, especially those in Buildings B, C, D, and F would have an increased risk of exposure, due to the close proximity to remedial activities. Risks to the Office Complex workers would be minimized by providing fencing around the work area and implementing a CAMP and traffic control plan.

Office Complex workers may also encounter additional risks relating to vibrations, noise, and exhaust originating from construction equipment, and would lose points of access to the building and parking space for the duration of the remedial action. Provisions may be needed to minimize subsurface vibrations and address changes to subsurface conditions (soil weight, strength, drainage, etc.) associated with the excavation and stabilization operations that might otherwise cause structural damage to adjacent buildings and/or the retaining wall. Vibration monitoring would be performed to confirm that vibrations caused by implementing this alternative are within limits set forth in the RD.

The excavated soil would pose a risk while onsite and during transportation from the site to the treatment/disposal facility since it would be more accessible to human exposure. Under this alternative, traffic resulting from the transportation of approximately 250,000 cy of impacted soil for offsite disposal (approximately 12,500 one-way truckloads) and for importing approximately 250,000 cy of clean fill materials (an additional 12,500 one-way truckloads) would pose a potential nuisance to the community, increase wear on public roadways, and increase the risk for accidents and spills. The transportation activities would be managed to minimize en-route risks to the community, by developing and implementing (for instance) a comprehensive traffic control plan. Waste transport trucks would have watertight tailgates with a gasket between the box and the tailgate regardless of the designation of the load.

Alternative SM6 does not employ green remediation practices and the relative carbon footprint (as compared to the other active alternatives) is the greatest. Moreover, the carbon footprint of Alternative SM6 is considered extreme based on the volume of soil to be excavated and treated/disposed offsite and corresponding volume of clean fill to be imported. These volumes directly relate to consumption of resources (fuel used, soil imported from borrow sources, and filling of air-space within landfills), as well as extent of earth moving/support activities, waste generation, and greenhouse and other air emissions. Implementation of Alternative SM6 would require a significant amount of fuel for trucking and construction equipment, and create a proportionate amount of associated air emissions.

Based on the massive extent of soil removal activities and required supporting activities (e.g., installation of reinforced secant retaining wall, soil dewatering and onsite water treatment, etc.), the construction components of this remedial alternative may require approximately 10 years to complete. This estimated duration does not include the time required to complete the non-construction components, such as the pre-design investigation/test boring program and the RD, or the time to obtain the necessary permits and approvals to implement this alternative.

Long-Term Effectiveness

Implementation of this alternative would meet the soil RAOs related to protecting human health and over time would be expected to meet the RAOs related to the environment over time. Contact with or ingestion of the impacted soil would be eliminated when physically removed from the site and treated/disposed at permitted facilities. As noted above, some MGP-impacted soil may remain, as the limits of the excavation would be defined by the ability to excavate soils given the numerous site constraints, including the adjacent Office Complex buildings and the retaining wall. Potential exposures to future construction workers performing subsurface excavation/construction activities would also be addressed by the SMP. In addition, surface cover materials would prevent direct contact with, or ingestion of, soil by site workers. The cover materials would be maintained in accordance with requirements of the SMP.

As previously noted, this alternative would significantly minimize or perhaps eliminate future impacts to groundwater and potential contact with, or ingestion of, impacted groundwater because the impacted groundwater within and adjacent to the excavation area would be removed during soil dewatering and treated/discharged in accordance with the requirements of a SPDES permit. Additionally, this alternative addresses each location at the site where soil was found to contain NAPL, except soil boring WB-2, where NAPL was observed to a lower depth. This alternative also addresses each location onsite where soil was found to contain MGP-related constituents at concentrations exceeding the unrestricted use SCOs. There were, however, concentrations higher than the unrestricted use SCOs (but lower than the commercial use SCOs) in four of the soil samples collected onsite at depths below 70 feet bgs: WB-1 (76-78' and 84-86'); WB-2 (86-88'); and MW-4D (75-77').

The land use restriction and SMP would be kept in place, unchanged, unless site conditions or soil cleanup objectives for commercial site use were to change. The SMP would set forth the actions to be taken to protect the health and safety of site workers and the community and properly handle MGP-impacted materials under appropriate potential scenarios dependent on the locations/depths of MGP-impacted materials remaining. If changes were to occur that would require modifications to the land use restriction/SMP, such modifications would be presented to the NYSDEC for review and approval, as appropriate. Both the land use restriction and SMP would be apparent to possible future site owners during comprehensive due diligence activities performed in connection with property transfer. Taken together, these institutional controls would adequately and reliably provide for the management of MGP-impacted material to be left in place.

Reduction of Toxicity, Mobility, or Volume

Alternative SM6 includes the excavation of approximately 250,000 cy of material to address the vast majority of soil containing COCs at concentrations greater than 6 NYCRR Part 375-6 unrestricted use SCOs, which includes each location at the site where soil was found to contain NAPL, except the boring at WB-2, where NAPL was observed to a lower depth. Excavated material would be transported offsite for treatment and/or disposal in accordance with applicable rules and regulations.

Alternative SM6 also includes removal and onsite treatment of billions of gallons of groundwater in order to dewater the excavation area. Treated groundwater would be discharged to Onondaga Creek in accordance with the requirements of a SPDES permit.

Implementability

Although administratively feasible, implementation of Alternative SM6 has significant technical and health and safety difficulties. Difficulties associated with implementing this remedial alternative are: (1) the significant depth of excavation in close proximity to existing structures (retaining wall and Office Complex Buildings B, C, D and F); (2) limited available work space; (3) significant lateral excavation support required, possibly to depths up to 170 ft bgs to key into the low-permeability till; (4) dewatering issues, including the significant groundwater pumping rates required to dewater the excavation within the high permeability underlying sands and gravels, the potential for heaving of excavation bottoms, and the need to treat recovered groundwater onsite prior to discharge; (5) the chloride concentrations in the recovered groundwater may affect permitting and discharge of treated water; (6) relocating numerous subsurface utilities (including natural gas, water, storm sewer, and electric lines) (7) protecting adjacent (and occupied) buildings and the retaining wall; (8) controlling dust, vapors and odors that would be generated during excavation in close proximity to the Office Complex; (9) securing a sufficient number of waste haulers to expeditiously transport the excavated soil for offsite disposal; and (10) minimizing noise and disruption to Office Complex workers.

As shown on Figure 21, the approximate soil excavation limits for Alternative SM6 encompass the vast majority of the very limited work space available at the site for any remedial alternative. Detailed planning and construction sequencing, along with strategic movement of equipment, materials, and ancillary support facilities during excavation would be required to implement Alternative SM6.

The excavation would be further complicated by soil removal extending up to (and along) the sides of Office Complex Buildings B, C, D and F (which surround the excavation area). With access essentially cut off to the western and northern parking lots onsite under this alternative, parking for approximately 186 employees would need to be relocated and operations for four loading docks and one garage would be suspended or temporarily relocated. The lack of access/egress to portions of the Office

Complex for up to 10 years would present operational and safety concerns (loading/unloading docks for receipt of products needed for Office Complex operations would be blocked and several entrances to Buildings would be blocked). There would also be limited access/egress for waste hauling vehicles (dump trucks, dump trailers) because the excavation limits would encompass nearly all of the adjacent parking lot.

Technical problems could lead to schedule delays (i.e., equipment failure, treatment difficulties, coordination issues, traffic issues, etc.). While these problems would be minimized with proper advance planning and coordination of the remedial activities, the enormity of this alternative combined with the site-specific constraints, increases the potential for technical problems.

A pre-design investigation/test boring program would be implemented in connection with design of this alternative to confirm that excavation reinforcements are feasible and to obtain other information required to implement this alternative. The anticipated time associated with successful implementation of this alternative, not including the pre-design activities, the RD, or time to obtain necessary permits and approvals to conduct these activities, would be approximately 10 years, and the long-term monitoring and maintenance could last 30 years or more.

Cost

The capital costs associated with this alternative include a pre-design investigation/test boring program, mobilization, site preparation (e.g., installation of excavation support system, construction and use of an onsite water treatment system, use of an open-span structure with air treatment, etc.), soil excavation, transportation, treatment/disposal, site restoration, and preparation of the SMP and appropriate documentation for the land use restriction. Annual O&M costs associated with this alternative include costs associated with inspection and maintenance of cover materials (e.g., asphalt pavement), and preparation of an annual certification report. The total estimated 30-year present worth cost for implementation of this alternative is approximately $234,000,000. A detailed breakdown of the estimated costs for this alternative is presented in Table 16.

5.2.2 Groundwater

Three groundwater alternatives were developed for detailed analysis and include:

- Alternative GW1 – No Action.
- Alternative GW2 – Monitored Natural Attenuation and Institutional Controls.
- Alternative GW3 – Enhanced Bioremediation and Institutional Controls.

5.2.2.1 Alternative GW1 – No Action

Technical Description

Alternative GW1 would involve no action related to groundwater. Alternative GW1 serves as the baseline for comparison of the overall effectiveness of the groundwater remedies. This alternative involves natural attenuation processes to reduce concentrations of constituents of interest in groundwater. However, no monitoring would be performed to evaluate the timing and extent of natural degradation.

Compliance with SCGs

- *Chemical-Specific SCGs*: As detailed in Section 2.2.1, the Class GA groundwater quality standards presented in 6 NYCRR Parts 700-705 and in NYSDEC TOGS 1.1.1 are conservatively applied for the purposes of this FS Report as chemical-specific SCGs for this site even though the groundwater meets NYSDEC's definition of saline groundwater. Due to the natural salinity of the groundwater, concentrations of chloride and TDS are, and would continue to be, well-above groundwater quality standards. Natural attenuation processes may result in reduced concentrations of MGP-related constituents in groundwater, but it is unlikely that groundwater quality standards would be achieved.

- *Action-Specific SCGs*: Action-specific SCGs are not applicable because this alternative does not involve the implementation of active remedial measures.

- *Location-Specific SCGs*: Location-specific SCGs are not applicable because this alternative does not involve the implementation of active remedial measures.

Overall Protection of Human Health and the Environment

Existing groundwater use laws [10 NYCRR 5-1.31(b)] prohibit the installation of private wells where public water supply is available, unless approval is expressly granted by the public water authority. These laws would continue to minimize potential human exposure to MGP-related constituents in groundwater at concentrations exceeding standards/guidance values.

This alternative would not address exposures to construction workers performing intrusive activities below the water table (such as activities to repair existing, or install new, subsurface utilities/facilities), but such activities would be unlikely due to the depth of groundwater (approximately 20 to 25 feet bgs).

Although there are constituents in groundwater at concentrations exceeding standards/guidance values, the Final RI Report demonstrated that concentrations of constituents in groundwater downgradient from the site are stable and may be decreasing. As previously summarized, a reducing environment is present in the subsurface and provides opportunities for microbial communities to naturally degrade BTEX and PAHs in groundwater. Natural attenuation processes over time may result in decreases in concentrations of constituents of interest in groundwater.

Short-Term Effectiveness

No remedial activities would be performed under the No Action alternative. Therefore, there would be no short-term environmental impacts or risks to onsite workers or the community (or construction workers, because there would not be any construction workers) associated with implementation of the alternative.

Long-Term Effectiveness

Based on current conditions, there is a potential for construction worker exposure to impacted groundwater during future intrusive activities (e.g., during excavation below the water table to repair existing, or install new, subsurface utilities/facilities), but is unlikely due to the depth of groundwater. The No Action alternative does not include actions or measures to address potential construction worker exposure to impacted groundwater. Therefore, the No Action alternative is not considered to be effective at addressing the RAO related to potential direct contact or inhalation of volatiles from groundwater.

Reduction of Toxicity, Mobility, or Volume

Constituents of interest in groundwater would not be actively treated (other than by natural processes), recycled, or destroyed. Reduction of toxicity, mobility, and the volume of impacted groundwater would potentially occur over an extended period of time as a result of natural processes.

Implementability

The No Action alternative does not involve any active remedial response and poses no technical or administrative implementability concerns.

Cost

There are no costs associated with Alternative GW1.

5.2.2.2 Alternative GW2 – Monitored Natural Attenuation and Institutional Controls

Technical Description

Alternative GW2 consists of use restrictions on groundwater, natural attenuation processes to reduce concentrations of constituents of interest in groundwater, NAPL removal (if any) via wells, and long-term groundwater monitoring to evaluate changes in groundwater conditions. As discussed earlier in this report, data from the Initial RI indicates that there are microbial communities and conditions which support natural degradation of BTEX and PAHs in groundwater.

This alternative also includes NAPL removal (if any) via wells that would be installed in areas thought to contain NAPL saturated soil and would be screened in the sand and gravel layer. It is anticipated that these wells would be installed near (along) the western site boundary and constructed similar to MW-19, including a 4-foot long sump and 4-inch diameter polyvinyl chloride (PVC) riser pipe and screen section. Additionally, the screen section would be a factory slotted screen (0.02-inch slot size) with appropriately-sized sand installed in the annular space around the screen. These wells would be periodically monitored for the absence/presence of NAPL. Measureable NAPL, if any, would be removed, properly containerized, and subsequently treated/disposed offsite. For the purposes of developing a cost estimate for this FS Report, it has been assumed that three new wells would be installed under this alternative. The actual locations and construction of these site wells would be detailed in the RD documents for this alternative.

A land use restriction (e.g., in the form of a deed restriction or environmental easement) would notify future property owners of the presence of MGP-related constituents in groundwater at the site, restrict the use of onsite groundwater, and notify the owners of the applicability of an SMP. Existing groundwater use laws [10 NYCRR 5-1.31(b)], which prohibit the installation of private wells where public supply is available (unless approval is expressly granted by the public water authority), would continue to minimize potential human exposure to constituents in groundwater at concentrations exceeding the groundwater quality standards/guidance values.

An SMP would be prepared under this alternative to: (1) identify areas of impacted groundwater associated with the site; (2) address possible future intrusive activities that would result in the potential for contact with impacted groundwater (to minimize the performance of work below the water table and/or dewatering without appropriate controls and measures); and (3) provide details for implementing the long-term groundwater monitoring program.

Long-term monitoring would be performed under this alternative to evaluate the effectiveness of MNA over an extended period of time. Samples would be collected from selected existing monitoring wells and analyzed for constituents of interest. Site wells would also be monitored for the absence/presence of NAPL and measureable NAPL (if any) would be removed, properly containerized, and subsequently treated/disposed offsite. For the purposes of this FS Report, it is assumed that the new wells to be installed under this alternative would be monitored quarterly for the first year and annually for the next four years. The results of the groundwater monitoring would be summarized and presented to the NYSDEC in annual reports. After a five year period, an evaluation of the long-term monitoring would be made and presented to the NYSDEC. Based on the monitoring results and trends in groundwater constituent concentrations, National Grid would propose modifications to the monitoring program. For the purposes of this FS Report, it is assumed that annual sampling to document monitored natural attenuation would be conducted for an additional 25 years (i.e., for a total of 30 years).

Current and future property owners would be required to complete and submit annual certification to the NYSDEC that administrative and engineering controls were put in place as part of the site remedy, are still in place, have not been altered, and are still effective.

<u>Compliance with SCGs</u>

- *Chemical-Specific SCGs*: As detailed in Section 2.2.1, the Class GA groundwater quality standards presented in 6 NYCRR Parts 700-705 and in NYSDEC TOGS 1.1.1 are conservatively applied for the purposes of this FS Report as chemical-specific SCGs for this site even though the groundwater meets NYSDEC's definition of saline groundwater. Due to the natural salinity of the groundwater, concentrations of chloride and TDS are, and would continue to be, well-above groundwater quality standards. Natural attenuation processes may result in reduced concentrations of MGP-related constituents in groundwater, but it is unlikely that groundwater quality standards would be achieved.

- *Action-Specific SCGs*: Action-specific SCGs that potentially apply to this alternative are associated with installation of additional site wells, periodic groundwater monitoring, and NAPL removal (if any). These SCGs include the handling, transportation, and disposal of NAPL or waste material (e.g., purge water) in accordance with NYSDEC and NYSDOT requirements, and performance of work in accordance with OSHA health and safety requirements.

- *Location-Specific SCGs*: Location-specific SCGs are not applicable to this alternative.

<u>Overall Protection of Human Health and the Environment</u>

The existing groundwater use laws under 10 NYCRR 5-1.31(b) would continue to minimize potential human exposure to MGP-related constituents in groundwater at concentrations exceeding standards/guidance values. In addition, the SMP to be prepared (and referenced in a land use restriction) would address exposures to construction workers performing intrusive activities below the water table (e.g., activities to repair existing, or install new, subsurface utilities), but exposures to groundwater are unlikely due to the depth of groundwater. The SMP would identify requirements for use of personal protective equipment and proper management of impacted groundwater that may be encountered.

Although there are MGP-related constituents in groundwater at concentrations exceeding standards/guidance values, the Final RI and the results of the January 2013 groundwater sampling event demonstrated that concentrations of constituents in groundwater downgradient from the site are stable and may be decreasing. As previously summarized, a reducing environment is present in the subsurface and provides opportunities for microbial communities to naturally degrade BTEX and PAHs in groundwater. Natural attenuation processes over time may result in decreases in concentrations of constituents of interest in groundwater.

The site conceptual model (developed in the Final RI Report) suggests that there is likely to be little to no collectible NAPL beneath the site. The evidence indicates that NAPL saturations at the site are at or below residual saturation (by definition, NAPL at or below residual saturation is immobile), as summarized in February 8, 2013 and March 8, 2013 letters from National Grid to the NYSDEC (Appendix A). As documented therein and summarized in Section 1.3.4.2 of this FS Report, no measureable NAPL has been identified in site monitoring wells, including MW-19, which was installed in an area of the site thought to contain NAPL saturated soil. Under this alternative, three new wells would be installed in areas thought to contain NAPL saturated soil and screened within the sand and gravel layer. Measurable NAPL (if any) removed from these wells would further support the ongoing natural attenuation processes.

Short-Term Effectiveness

Installation of additional site wells and monitoring would be the only field work performed pursuant to this alternative. Personnel performing the field work would use PPE and follow requirements of a site-specific HASP.

There would be no short-term environmental impacts or risks the community (or construction workers, because there would not be any construction) associated with implementation of this alternative.

Long-Term Effectiveness

Natural attenuation processes may be effective over the long-term at reducing concentrations of constituents of interest in groundwater. As previously discussed, a reducing environment is present in the aquifer and provides opportunities for microbial communities to naturally degrade BTEX and PAHs. Long-term monitoring would be performed to evaluate changes in groundwater conditions.

Through the establishment of a land use restriction and SMP, this alternative would meet the groundwater RAOs related to potential direct contact, ingestion, and inhalation human health exposure pathways. The land use restriction and SMP would be kept in place, unchanged, unless site conditions were to change and make these measures unnecessary. If changes were to occur that would require modifications to the land use restriction/SMP, such modifications would be presented to the NYSDEC for review and approval, as appropriate. Both the land use restriction and SMP would be apparent to possible future site owners during comprehensive due diligence activities performed in connection with property transfer. Taken together, these institutional controls could be expected to adequately and reliably provide for the management of groundwater exhibiting constituents at concentrations exceeding standards.

Reduction of Toxicity, Mobility, or Volume

MGP-impacted groundwater would not be contained, removed, or actively treated (other than by natural processes and removal of measureable NAPL from site wells if present). Reduction of the toxicity, mobility, and volume of impacted groundwater would potentially occur over an extended period of time via natural attenuation processes.

Implementability

This alternative would be both technically and administratively implementable. No permit approvals, and only minimal coordination with other agencies would be required.

Cost

The capital costs associated with this alternative are related to installing NAPL recovery wells, preparing the appropriate documentation for the land use restriction, and preparing the SMP. Annual O&M costs associated with this alternative include costs associated with periodic groundwater monitoring, reporting, preparing an annual certification report, and offsite treatment/disposal of generated waste materials (e.g., drilling cutting from installation of wells, purge water generated during groundwater sampling). The total estimated 30-year present worth cost for implementation of this alternative is approximately $1,140,000. A detailed breakdown of the estimated costs associated with this alternative is presented in Table 17.

5.2.2.3 Alternative GW3 – Enhanced Bioremediation and Institutional Controls

Alternative GW3 involves treating impacted groundwater by enhancing microbial degradation. This alternative also involves groundwater monitoring and institutional controls (i.e., a land use restriction and SMP as described for Alternative GW2) for groundwater containing MGP-related constituents at concentrations exceeding Class GA groundwater quality standards/guidance values.

Background information related to bioremediation is presented below, followed by the conceptual enhanced bioremediation approach for this site.

Enhanced Bioremediation Background Information

Aquifers impacted by aromatic hydrocarbons (such as the aquifer at the site) are typically anaerobic because the natural levels of dissolved oxygen (DO) existing in the aquifer from rainfall infiltration or other mechanisms are consumed by indigenous microbes. DO is the most thermodynamically favorable electron acceptor and source of energy for microorganisms and is preferentially utilized over other electron acceptors, such as nitrate, ferric iron, manganese (IV), sulfate, or carbon dioxide. In aquifers impacted by aromatic hydrocarbons, utilization of DO by native microorganisms is associated with consumption of dissolved hydrocarbons, which serve as electron donors. However, dissolved hydrocarbons can be consumed by microorganisms utilizing other electron acceptors, although typically at a slower rate than if DO is utilized as the electron acceptor.

Enhancement of natural biodegradation processes is a proven effective technology for remediation of dissolved hydrocarbons in groundwater. Both aerobic and anaerobic microbial degradation of aromatic hydrocarbons have been shown to be successful. Oxidation is the dominant intrinsic degradation process for aromatic hydrocarbons, whether under aerobic or anaerobic conditions.

Bioremediation under aerobic conditions proceeds at a faster rate than under anaerobic conditions because microorganisms derive a greater amount of energy when using oxygen (as compared to other electron acceptors) to metabolize hydrocarbons. However, transitioning an aquifer from anaerobic to aerobic conditions can be complicated and may not be able to be achieved completely due to subsurface conditions (e.g., oxygen sinks and preferential pathways) and delivery system considerations. Therefore, treatability studies would be conducted under this alternative to evaluate the enhancement of aerobic and anaerobic degradation of BTEX and PAHs (consisting primarily of naphthalene) in site groundwater. The treatability studies would also evaluate the effects of elevated TDS and salinity on the degradation rates and potential amendments to optimize the degradation rates, as indicated below.

- The elevated groundwater TDS may negatively influence the ability of indigenous bacteria to degrade MGP-related compounds by asserting undesirable osmotic pressure on the microbes themselves, and would have a greater negative impact on aerobic microorganisms than anaerobic microorganisms. The effect of elevated TDS on will be evaluated during bench-scale and pilot testing.

- The elevated groundwater salinity levels may slow initial growth of microbes, but would ultimately be expected to have little to no effect on the microbial community once it is established, and a slightly saline environment could potentially be beneficial for degradation of MGP-related compounds.

There are numerous oxygen delivery technologies, such as air sparging, pure oxygen sparging, oxygen diffusion through permeable tubing, down-well electrolytic oxygen generation, dilute hydrogen peroxide injection, oxygenated water recirculation (OWR), and application of oxygen-releasing materials (PermeOx®, ORC®). However, given the elevated concentrations of TDS and dissolved iron, there are potential well fouling issues related to continuous oxygen delivery methods such as oxygen sparging and OWR. The addition of oxygen to a highly reduced aquifer impacted with MGP-related compounds will also require overcoming the natural oxygen demand related to many oxygen scavenging compounds such as ferrous iron, reduced manganese, and naturally occurring organic matter.

Anaerobic degradation of MGP-related compounds involves microorganisms using alternative electron acceptors such as nitrate, ferric iron, sulfate, and carbon dioxide to respire while using MGP-related compounds as the electron donor and source of energy. Anaerobic processes occur at kinetic rates slower than the kinetic rate of oxygen utilization. However, these alternative electron acceptors could still represent a viable enhancement strategy, especially given the existing geochemical environment at the site (as described in Section 1.3.4.3). Sulfate and nitrate have the advantage of being much more soluble than oxygen in groundwater. Therefore, it is possible to inject a high nitrate and/or sulfate concentration, thereby improving distribution in the subsurface. Anaerobic microorganisms also are less likely to cause well clogging issues. This is because the microbes receive less energy during anaerobic respiration, which means there is less of a likelihood of rapid increase in microbial mass. The effectiveness of different electron acceptors to enhance the biodegradation of BTEX and naphthalene will be evaluated during bench-scale testing.

As part of the bench-scale testing, bio-traps would be deployed to facilitate evaluation of the indigenous microbial community. Bio-traps are a versatile option to collecting groundwater samples or soil samples for this purpose. The use of groundwater samples often results in a biased understanding of the microbial community size and composition, and the use of soil samples is expensive due to costs for additional drilling to collect soil samples from within the aquifer at a depth of 70 to 90 feet bgs. Bio-traps are modular solid platforms for bacterial colonization that can be lowered into existing groundwater monitoring wells, allowed to incubate, recovered, and then analyzed. Multiple bio-trap configurations could be deployed to answer a variety of technical questions about: (1) the effectiveness of biodegradation of specific constituents under differing electron acceptor types and doses; and (2) the composition of the indigenous microbial communities.

Upon evaluating the bench-scale testing results, pilot testing would be designed and implemented to further evaluate those treatments with the most potential for effectively addressing BTEX and naphthalene in site groundwater. Additional information on aquifer hydraulics would also be gathered to better define volume and loading requirements. The results of the pilot studies (and follow-up pre-design investigation, if needed) would be used to select the technology(ies) that are most appropriate to address BTEX and naphthalene in site groundwater and to determine system design parameters for the enhanced bioremediation program.

Enhanced Bioremediation Conceptual Approach

The conceptual approach for enhanced bioremediation at the site includes optimizing groundwater conditions to create an environment to: (1) promote the biodegradation of BTEX and naphthalene along the western property boundary; (2) reduce the mass of constituents migrating offsite; and (3) expedite natural attenuation of the constituents in groundwater downgradient from the site. This alternative would focus on actively treating groundwater along the western edge of the parking lot west of Buildings B, C, and D and in the driveway area between Buildings D and F. These locations are within or downgradient from the area where the highest concentrations of BTEX and naphthalene have been identified in groundwater. The treatment would also target the downgradient end of the deep plume as it leaves the site. Active treatment would not be performed offsite because: (1) offsite concentrations would decrease once levels in groundwater leaving the site decrease; and (2) there is little to no access for offsite treatment (the offsite area is covered by the West Street Arterial, I-690, associated ramps, intersecting city streets, and various commercial properties).

Review of existing geochemical data suggests that anaerobic biodegradation may potentially be the most effective technology, utilizing sulfate as an electron acceptor and source of energy. For purposes of estimating a cost for this alternative, it is assumed that groundwater would be treated by injecting magnesium sulfate in a series of application wells that would be installed along the western edge of the parking lot west of Buildings B, C, and D and in the driveway area between Buildings D and F (refer to Figure 22). One application well would be installed every 30 feet over a total distance of 600 feet (for a total of 20 application wells). Treatment would focus on groundwater at depths of between approximately 70 and 90 feet bgs. The treatment approach, including quantity, configuration, locations, spacing, and depths of the application wells, is subject to change and would be determined during the RD. Soil cuttings generated during drilling would be characterized and transported for proper offsite disposal.

Enhanced bioremediation would be expected to reduce the mass flux of constituents offsite by: (1) reducing concentrations of MGP-related constituents in groundwater; and (2) to a lesser extent, degrading residual NAPL located within and hydraulically downgradient from the treatment zone. Groundwater monitoring would be performed under this alternative to evaluate potential changes in groundwater conditions. Samples would be collected and analyzed for BTEX, PAHs, and biogeochemical parameters, as appropriate. Modifications to the enhanced bioremediation treatment would be made, as needed, based on monitoring results.

Compliance with SCGs

- *Chemical-Specific SCGs*: As detailed in Section 2.2.1, the Class GA groundwater quality standards presented in 6 NYCRR Parts 700-705 and in NYSDEC TOGS 1.1.1 are conservatively applied for the purposes of this FS Report as chemical-specific SCGs for this site even though the groundwater meets NYSDEC's definition of saline groundwater. Due to the natural salinity of the groundwater, concentrations of TDS and chloride are, and will continue to be, well-above groundwater quality standards. However, the enhanced bioremediation (as a remedy alone by itself or in combination with a remedy for soil) is expected to result in reduced concentrations of MGP-related constituents in groundwater, which could come close to or meet groundwater quality standards.

- *Action-Specific SCGs*: Action-specific SCGs that apply to this alternative are associated with installing monitoring and application wells, injecting amendments into groundwater, monitoring groundwater conditions, and transporting waste materials (soil cuttings) for offsite disposal. Workers and work activities that occur during implementation of this alternative must comply with OSHA requirements for training, safety equipment and procedures, monitoring, recordkeeping, and reporting as identified in 29 CFR 1910, 29 CFR 1926, and 29 CFR 1904. Compliance with action-specific SCGs would be accomplished by following a NYSDEC-approved RD/RA Plan and site-specific HASP. Measures would be taken (as appropriate) to control levels of airborne particulate matter during activities that disturb soil (drilling, etc.), in accordance with 40 CFR 50 National Ambient Air Quality Standards.

  Waste materials generated during implementation of this alternative (i.e., soil borings) would be characterized to determine appropriate offsite disposal requirements. If any of the materials were to be characterized as a hazardous waste, then the RCRA UTSs/LDRs and USDOT requirements for the packaging, labeling, transportation, and disposal of hazardous or regulated materials may be applicable. Based on the results of characterization sampling performed during the PSA/IRM study, it is anticipated that the majority of soil would be characterized as non-hazardous, with the exception of soil in the vicinity of MW-4S which may require management in accordance with NYSDEC TAGM 4061 (based on previous sampling results for TCLP benzene). However, if the MGP-impacted material only exhibited the hazardous characteristic of toxicity for benzene (D018), it would be conditionally exempt from the hazardous waste management requirements (6 NYCRR Parts 370-374 and 376) when destined for thermal treatment in accordance with the requirements set forth in TAGM 4061. Compliance with these requirements would be achieved by utilizing licensed waste transporters and properly permitted treatment/disposal facilities.

Injecting amendments into groundwater may require submitting inventory information about the proposed injection wells/activities to the USEPA Underground Injection Control Program.

- *Location-Specific SCGs*: Remedial activities would be designed and conducted in accordance with local codes and ordinances.

Overall Protection of Human Health and the Environment

Implementation of the enhanced bioremediation alternative would meet the groundwater RAOs related to protecting human health and could meet those related to protecting the environment. Concentrations of MGP-related constituents in groundwater would likely be reduced by stimulating degradation by existing microbial communities in the subsurface. This, in turn, could reduce or eliminate offsite migration of MGP-related constituents at concentrations exceeding Class GA water quality standards.

Although constituents currently in groundwater are at concentrations exceeding standards/guidance values, previous investigations have indicated that Onondaga Creek is a losing stream and groundwater is not impacting surface water or sediment. This conclusion was also noted in a NYSDEC document attached to USEPA's April 28, 2005 letter (Appendix A): "Although there is DNAPL and contaminated groundwater associated with this site, the cumulative PSA and RI data indicate that there are no ongoing releases or impacts to Onondaga Creek nor to Onondaga Lake".

Existing groundwater use laws under 10 NYCRR 5-1.31(b) would continue to minimize potential human exposure to MGP-related constituents (and chloride/TDS) in groundwater at concentrations exceeding standards/guidance values. In addition, the SMP to be prepared (and referenced in a land use restriction) would address exposures to construction workers performing intrusive activities below the water table, such as activities to repair existing, or install new, subsurface utilities/facilities. The SMP would identify requirements for use of personal protective equipment and proper management of impacted groundwater that may be encountered.

Short-Term Effectiveness

During subsurface work under this alternative (drilling, installation of monitoring and application wells, etc.), onsite remedial construction workers may potentially be exposed to impacted soil by ingestion, dermal contact, and/or inhalation. Potential exposure of onsite workers to chemical constituents would be minimized by the use of PPE, as specified in a site-specific HASP that would be developed during the RD. Air monitoring would be performed during the construction under this alternative to determine the need for additional engineering controls (e.g., use of water sprays and/or foam to suppress dust/vapors/odors following removal of cover materials, modifying the rate of construction activities, etc.) and to confirm that dust or volatilized organic vapors are within acceptable levels, as specified in the site-specific HASP.

The community would not have access to the site during implementation of the remedial activities because site access is currently and would continue to be limited by fencing and manned security. Risks to the community also would be minimized by providing security around the work area and implementing a CAMP to minimize the potential migration of volatile organic vapors or impacted dust from the site. In addition, actions would be taken, if needed, to minimize potential MGP nuisance odors. Construction activities required for the enhanced bioremediation system at the site may require a few months to complete.

Monitoring would also be performed pursuant to this alternative. The anticipated reduction in concentrations of MGP-related constituents in groundwater would not take place in the short-term. It is expected to take at least several months or years to occur.

Personnel performing groundwater monitoring would use PPE and follow requirements of a site-specific HASP.

Long-Term Effectiveness

Enhanced bioremediation may be effective over the long-term at reducing concentrations of MGP-related constituents in groundwater. Existing microbial communities in the subsurface would be stimulated to increase the natural degradation of MGP-related constituents. Long-term monitoring would be performed to evaluate changes in groundwater conditions.

Direct contact, ingestion, and inhalation human health exposures to MGP-impacted groundwater would be reduced in the long-term through the enhanced bioremediation because concentrations would be reduced. However, there would continue to be the potential for exposure to high groundwater salinity levels (i.e., concentrations of TDS and chloride exceeding groundwater quality standards). Potential exposures would be further addressed via the establishment of a land use restriction and SMP. The land use restriction and SMP would be kept in place, unchanged, unless site conditions were to change and make these measures unnecessary. If changes were to occur that would require modifications to the land use restriction/SMP, such modifications would be presented to the NYSDEC for review and approval, as appropriate. Both the land use restriction and SMP would be apparent to possible future site owners during comprehensive due diligence activities performed in connection with property transfer.

Operation of the enhanced bioremediation system and establishment of institutional controls could be expected to adequately and reliably provide for the management of groundwater exhibiting constituents at concentrations exceeding standards.

Reduction of Toxicity, Mobility, or Volume

Enhanced bioremediation would reduce the toxicity of MGP-related constituents in groundwater through the treatment of these constituents. The volume of constituents in groundwater would decrease as a result of the enhanced bioremediation. The mobility of constituents in groundwater would not be substantially affected by this alternative, as the volume of water/sulfate injected during treatment is relatively small (when compared to the flow of groundwater beneath the site) and would not result in mounding that would otherwise change flow rates and patterns.

By reducing the toxicity and volume of constituents of interest in groundwater, this alternative limits the potential impacts to human health and the environment. Natural attenuation of the downgradient offsite groundwater plume and impacts hydraulically upgradient from the treatment zone would potentially occur over the long-term and further reduce the toxicity, mobility, and volume of MGP-related impacts.

Implementability

Enhanced bioremediation is technically feasible and a proven technology. The monitoring and application wells envisioned under this alternative can be installed relatively quickly and easily with minor disruption to existing Office Complex operations. Periodic O&M would be performed to verify that the application wells are operating as designed and to collect groundwater samples to evaluate treatment performance and potential modifications.

It is anticipated that concentrations of MGP-related constituents in groundwater could be reduced under this alternative within a matter of a few years' time (potentially to levels that are consistent with groundwater quality standards or asymptotic levels that are close to standards). The time associated with successful implementation of the enhanced bioremediation would be upwards of 5 years and potentially longer. Long-term monitoring and maintenance could last 30 years or more.

Cost

The capital costs associated with this alternative include bench-scale, tracer, and pilot testing, installation of application and monitoring wells, installation of treatment equipment, site restoration, and preparation of the land use restriction and SMP.

Annual O&M costs associated with this alternative include costs associated with system monitoring and maintenance (magnesium sulfate, municipal water, periodic groundwater monitoring/reporting) and preparation of an annual report summarizing treatment system O&M and results for groundwater monitoring. The total estimated 30-year present worth cost for implementation of this alternative is approximately $6,130,000. The cost for this alternative could potentially increase to $7,000,000 or more if a different approach, such as oxygenated water recirculation, were to be selected and implemented based on the outcome of the pilot studies or pre-design investigation. A detailed breakdown of the estimated costs for this alternative (based on the conceptual approach described above) is presented in Table 18.

6. Comparative Analysis of Alternatives

6.1 General

This section presents the comparative analysis of each remedial alternative using the seven evaluation criteria identified in Section 5.1. The comparative analysis identifies the advantages and disadvantages of each alternative relative to each other and with respect to the seven criteria. The results of the comparative analysis were used as a basis for recommending remedial alternatives for addressing the RAOs identified for the site.

6.2 Comparative Analysis – Subsurface Soil Alternatives

This section provides a comparative analysis of the five subsurface soil alternatives:

- Alternative SM1 – No Further Action.
- Alternative SM2 – Institutional Controls.
- Alternative SM3 – Focused Soil Containment and Institutional Controls.
- Alternative SM4 – Focused In-Situ Soil Stabilization and Institutional Controls.
- Alternative SM5 – Large Scale Stabilization for Soil Exceeding Commercial Use SCOs and/or Exhibiting NAPL, and Institutional Controls.
- Alternative SM6 – Excavation for Soil Exceeding Unrestricted Use SCOs and/or Exhibiting NAPL, and Institutional Controls

6.2.1 Compliance with SCGs

Chemical-Specific SCGs

Under each soil remedial alternative, there would continue to be exceedances of certain chemical-specific SCGs as follows: (1) Alternatives SM1 and SM2 generally involve natural degradation processes with no removal or treatment, and the timing and extent of improvement (if any) by natural degradation processes in soil is uncertain; (2) Alternatives SM3 and SM4 involve containment and stabilization/solidification, respectively, and would result in soil exhibiting potentially the greatest amount of NAPL and chemical constituents exceeding commercial use SCOs being contained or immobilized; (3) Alternative SM5 involves stabilization/solidification to a larger extent, and includes each location at the site where soil was found to contain NAPL and/or MGP-related constituents at concentrations exceeding the commercial use SCOs, with the exception of two locations northwest of Building D (SB-1 and MW-1D) where only a trace amount of NAPL was encountered (as previously summarized, PAHs were not identified at these two locations at concentrations exceeding the commercial use SCOs); and (4) Alternative SM6 anticipates excavating onsite soil at each onsite location found to contain NAPL and/or MGP-related constituents at concentrations exceeding the unrestricted use SCOs presented in 6 NYCRR Part 375-6.8(a), with the exception of the following three locations: WB-1, WB-2, MW-4 where NAPL (WB-1 only) and/or exceedances of several unrestricted use SCOs were observed at depths below the approximate depth of excavation under this alternative (70 feet bgs). Additional MGP-impacted soil would, however, remain at certain locations, as the limits of the excavation would be defined by the ability to excavate soils given the numerous site constraints, including the adjacent Office Complex buildings and the retaining wall and the need to maintain support for the buildings and retaining wall. Alternative SM6 also involves extracting and treating billions of gallons of groundwater prior to discharge into Onondaga Creek in accordance with the requirements of SPDES permit.

The NAPL or MGP-related constituents in subsurface soil to remain under the alternatives do not necessarily equate to a current risk to human health or the environment. Measures to address potential exposure pathways would be implemented under Alternatives SM2 through SM6 (e.g., restricting land use to commercial, requiring adherence to provisions of an SMP).

Action-Specific SCGs

Action-specific SCGs are not applicable to Alternatives SM1 and SM2 because they do not involve the implementation of active remedial measures. For Alternatives SM3, SM4, SM5, and SM6, health and safety-related SCGs would be addressed by following a site-specific HASP during remedy implementation. In addition, appropriate procedures would be followed for Alternatives SM3, SM4, SM5, and SM6 to comply with SCGs related to the handling and disposal of impacted soil (including transportation and disposal, permitting, manifesting, and disposal facilities). Procedures would also be followed to comply with air emissions for Alternatives SM3, SM4, SM5 and SM6. Action-specific SCGs would be achieved for each of the alternatives.

Location-Specific SCGs

Location-specific SCGs are not applicable to Alternatives SM1 and SM2 because they do not involve the implementation of active remedial measures. For Alternatives SM3, SM4, SM5 and SM6, potentially applicable location-specific SCGs include the acquisition of regulatory approvals/permits (including local building permits). The requirements of these approvals/permits would be met during the design and implementation phases of these alternatives.

6.2.2 Overall Protection of Human Health and the Environment

Current conditions are already protective of human health and the environment to an extent. For instance, existing ground surface cover in the form of asphalt pavement (parking areas and driveways), the Office Complex structures, and landscaping prevents direct contact with, or ingestion of, soil by site workers and prevents exposures to soil via wind-blown dust. The existing ground surface cover also limits infiltration of precipitation into the overburden, which reduces the migration of MGP-related constituents. No site-related impacts are present in Onondaga Creek and the existing retaining wall functions as an effective barrier to soil erosion along the western property boundary. The data from the VI investigation indicates that there is no confirmed MGP-related soil vapor intrusion exposure pathway. The NYSDEC agreed that VOCs detected in the indoor samples were operationally-related (not MGP-related) and concentrations were less than the NYSDOH air guideline values.

As indicated in Section 1.3.5, the HHRA determined that potential human receptors that could be exposed to constituents of interest in soil include future construction workers and subsurface utility workers. Potential exposures to these workers would be addressed by the land use restriction and SMP included under each alternative, except under Alternative SM1. Also, as previously discussed, MGP-related site impacts are generally not encountered until approximately 8 to 10 feet bgs (this is below the typical depth of most subsurface utilities other than potentially some sewers).

Potential exposure would be even further limited under Alternatives SM3, SM4, SM5 and SM6 by the active remedial measures to address soil. Contact with or ingestion of soil would be further minimized under Alternatives SM3, SM4, SM5, and SM6 because the soil would be contained, removed, or bound up in a solidified/stabilized matrix. The exposure potential would be reduced equally under Alternatives SM3 and SM4, and even further reduced under Alternative SM5 (due to a larger volume of soil treated). Alternative SM6 would provide the greatest reduction in long-term potential exposure due to the massive volume of soil to be removed.

Under each of the alternatives, there is a potential for constituents of interest in remaining impacted soil to migrate to groundwater. The potential migration of chemical constituents from soil to groundwater would be reduced under Alternatives SM3, SM4, SM5, and SM6, as chemical constituents in soil would be contained, removed, or bound in a stabilized/solidified matrix within the treatment area. Impacted soil would remain in certain locations under each alternative.

6.2.3 Short-Term Effectiveness

There are no short-term negative impacts associated with Alternatives SM1 and SM2. Potential short-term impacts under Alternatives SM3, SM4, and SM5 are primarily associated with the soil disturbance that would occur during containment (i.e., pre-trenching for sheetpile wall installation), pre-ISS excavation, offsite transportation and disposal, and stabilization/solidification, and include: (1) remedial construction worker exposure to soil containing constituents of interest; (2) Office Complex worker exposure to MGP nuisance odors, volatile organic vapors, or dust from the site; (3) increased risks for accidents and spills; (4) potential damage to existing buildings and structures without proper support systems; (5) increased noise; and (6) increased wear on public roadways. These same potential short-term impacts apply to Alternative SM6 but to a much greater extent, as well as additional impacts including (but not limited to): excavation safety concerns due to potential excavation heave, exposure to chemicals for onsite treatment of billions of gallons of extracted groundwater, and difficulties associated with conducting the massive excavation activities within the confined limits of an open span structure equipped with a vapor collection and treatment system.

The magnitude of the short-term impacts are related to the volume of material handled under the alternatives, and are therefore highest under Alternative SM6 and second highest under Alternative SM5. Short-term impacts would be even less under Alternative SM3 as only limited soil handling would be performed (i.e., pre-trenching for sheetpile wall installation and limited excavation prior to cap construction). Appropriate measures would be implemented to mitigate risks under Alternatives SM3, SM4, SM5, and SM6 and would include, but are not limited to, advance planning, using PPE, implementing a HASP and CAMP that include an air monitoring program, performing vibration monitoring, and implementing engineering controls such as modifying the rate of construction (or equipment used), using water sprays, and/or using foam (as needed) to keep dust, organic vapors, and vibrations within acceptable levels.

It is anticipated that the amount of time needed to implement the alternatives would be: a couple months for Alternative SM2, several months for Alternatives SM3 and SM4, approximately 1 year for Alternative SM5, and approximately 10 years for Alternative SM6 The active remedial measures under Alternatives SM4 and SM5 would be highly disruptive to Office Complex operations, and slightly less disruptive under Alternative SM3. Alternative SM6, the most aggressive remedial alternative, would be the most disruptive to the Office Complex operations for a duration that is expected to be 10 times longer than Alternative SM5.

6.2.4 Long-Term Effectiveness

Alternative SM1 would not effectively meet the RAOs related to potential direct contact, ingestion, and inhalation human health exposure pathways. Over the long-term, Alternatives SM2 through SM6 would effectively meet these RAOs, alone, by the institutional controls (land use restriction and SMP) that are included with these alternatives.

The institutional controls would be kept in place, unchanged, unless site conditions or soil cleanup objectives for commercial site use were to change. The SMP would set forth the actions to be taken to protect the health and safety of site workers and the community and properly handle impacted materials under a variety of site maintenance/future construction scenarios (utility repair or installation, building rehabilitation or addition, maintenance activities, landscaping, etc.). If changes were to occur that would require modifications to the land use restriction/SMP, such modifications would be presented to the NYSDEC for review and approval, as appropriate. Both the land use restriction and SMP would be apparent to possible future site owners during comprehensive due diligence activities performed in connection with property transfer. Taken together, these institutional controls could be expected to adequately and reliably provide for the management of impacted material to be left in place. Periodic reports would be filed with the NYSDEC to demonstrate that the institutional controls are being maintained and remain effective.

Alternatives SM3, SM4, and SM5 would involve active remedial measures, including containment and stabilization, in response to the RAO related to environmental protection (the potential migration of chemical constituents for soil). Alternative SM3 and SM4 would target soils within the most impacted area at the site, and Alternative SM5 would target most of the soils at the site that contain NAPL and constituents at concentrations exceeding commercial use SCOs. Under Alternatives SM3, SM4, or SM5, certain MGP-impacted soil that is not accessible due to its proximity to buildings or the retaining wall would not be addressed.

Alternative SM6 was developed at the request of NYSDEC and would also involve active remedial measures, including soil excavation and groundwater removal. Implementation of this alternative would meet the soil RAOs related to protecting human health and would be expected to meet the RAOs related to the environment over time. Contact with or ingestion of MGP-impacted soil would be eliminated when physically removed from the site and treated/disposed at permitted facilities. However, even under this aggressive remedial alternative, which addresses SCOs that are not required for the current and future long-term commercial use of the site, some MGP-impacted subsurface soil would remain due to its proximity to adjacent Office Complex buildings and the retaining wall.

6.2.5 Reduction of Toxicity, Mobility, or Volume

Alternatives SM1 and SM2 would involve natural degradation processes to reduce concentrations of constituents of interest in subsurface soil. The timing and extent of COC degradation (if any) is uncertain. Reduction of toxicity, mobility, and mass of the impacted subsurface soil would potentially occur over an extended period of time as a result of natural processes.

Alternatives SM3, SM4, SM5 and SM6 would involve active remedial measures to address impacted subsurface soil. Alternative SM3 would not reduce the toxicity or volume of chemical constituents in soil, but would potentially limit future migration of chemical constituents via groundwater by reducing groundwater flow through the containment area (thereby reducing the mobility of constituents in the area). Under Alternatives SM4 and SM5, pre-ISS excavation would reduce the toxicity, mobility, and volume of chemical constituents in soil to a depth of 10- to 15-feet bgs at the site, as the soil would be transported for offsite disposal, and imported clean backfill (and new pavement) would ultimately be provided to restore the excavated areas. ISS would reduce the mobility and toxicity of constituents in soil from approximately 15- to 50-feet bgs (through stabilization of these constituents and encapsulation in a grout monolith, respectively), but the volume of impacted soil would remain unchanged. Alternatives SM4 and SM5 would each limit potential future migration of constituents from soil to groundwater by minimizing the mobility of constituents of interest in soil and removing the impacted soil.

Under Alternative SM6, excavation of approximately 250,000 cy of soil would reduce the toxicity, mobility, and volume of chemical constituents in soil at the site, as the soil would be transported for offsite treatment/disposal, and imported clean backfill (and new pavement) would ultimately be provided to restore the excavated areas. Alternative SM6 also includes removal and onsite treatment of billions of gallons of groundwater in order to dewater the excavation area, further reducing the toxicity, mobility, and volume of MGP-related constituents. Treated groundwater would be discharged to Onondaga Creek in accordance with the requirements of a SPDES permit.

6.2.6 Implementability

Each of the alternatives could be implemented at the site. Alternative SM2 would be the most straightforward action alternative to implement. Alternatives SM3, SM4, and SM5 would be increasingly more difficult to implement for a number of reasons, most of which are related to working at an active office facility with remedial limits extending up toward the edge of existing, occupied buildings. Alternative SM6 would be the most difficult action alternative to implement for many reasons, all of which are directly related to the limits of excavation encompassing the majority of the very limited available space within the Office Complex, the significant depth of excavation (to approximately 70 feet bgs), and the enormous volume of soil to be excavated with a corresponding volume of clean fill to be imported.

- One of the greatest challenges from an implementability standpoint for Alternatives SM3, SM4, SM5, and SM6 would be to plan and coordinate activities to minimize the disruption to Office Complex workers and operations and potential damage to existing structures (the buildings and the retaining wall).
  - The disruption would be significant under Alternatives SM4 and SM5, and even more significant for a much longer period of time under Alternative SM6. The soil remediation area under Alternatives SM3 and SM4 is large, and is even larger under Alternative SM5. The remediation area under Alternative SM6 is the largest, more than twice the area that would be

addressed under Alternative SM5, which would remediate the site to the commercial land use SCOs (the current and future long-term use of the site is commercial). The disruption under Alternative SM3 would be considerably less than under Alternative SM4 because much less soil would be removed and there would be no in-situ soil mixing/treatment. Sheetpile installation to a depth of 70 feet would be easier and less disruptive to perform than ISS soil mixing to the target shallower depth of 50 feet.

- There would be limited space for equipment, material staging, and/or for stockpiling excavated soil under these alternatives, particularly under Alternatives SM5 and SM6 because the remediation area takes up nearly the entire parking lot(s) and is essentially bounded by Office Complex Buildings and Onondaga Creek. Support facilities might need to be located within the actual remedial limits and be relocated as work progresses for Alternative SM5, and further relocations would be required for implementation of Alternative SM6.

- Soil containment or removal/stabilization up toward existing buildings and the existing retaining wall under Alternatives SM3, SM4, SM5, and SM6 would potentially require provisions to address changes to subsurface conditions (e.g., soil weight, strength, drainage, etc.) and/or minimize subsurface vibrations that might otherwise cause structural damage to the buildings or retaining wall. The pre-ISS excavations under Alternatives SM4 and SM5 would need to be conducted and supported to prevent undermining the building foundations. The excavation under SM6 would require installation of an extensive lateral excavation support system (e.g., steel reinforced secant retaining wall and internal bracing) to support the deep soil removal activities and prevent instability in existing structures (e.g., four adjacent buildings and the existing retaining wall.

- Access to part of Building D would be limited under Alternatives SM3, SM4, SM5 and SM6, access to parts of Building B would also be limited under Alternatives SM5 and SM6, and access to parts of Building F would also be limited under Alternative SM6. This would affect the loading docks along the north side of Building B and certain entrances into Buildings B, C and F. The lack of access to portions of the buildings would present operational and safety concerns. Also, truck access into the work area would be limited to two narrow driveways, one that extends under Building C and has limited clearance and one that originates along Erie Boulevard West and runs adjacent to Onondaga Creek.

• The presence of extensive subsurface utilities (i.e., natural gas, water, storm sewer, and electric), as identified on Figure 17, as well as subsurface foundations and the retaining wall in close proximity to the containment/treatment/excavation areas would also present implementation challenges that significantly increase with the level of remedial activities to be conducted.

Relocation of subsurface utilities would likely be required under Alternatives SM3, SM4, and SM5; and would certainly be required under Alternative SM6.

- A significant implementation challenge unique to Alternative SM6 is the management of billions of gallons of recovered groundwater. The groundwater pumping rates required to dewater the excavation within the high permeability underlying sands and gravels would be significant (possibly up to 1,000 gpm), and the recovered groundwater would need to be treated onsite prior to discharge to Onondaga Creek in accordance with the requirements of a SPDES permit. The chloride concentrations in the recovered groundwater may affect permitting and discharge of treated water.

- Pre-ISS excavation under Alternatives SM4 and SM5 would be complicated by the need to handle, load, transport, and dispose of large volumes of soil, meaning there would be a significant amount of truck traffic in and out of the property (in tight quarters) and on City and area roads. Much less excavation would be performed under Alternative SM3 as compared to Alternatives SM4 and SM5, and the excavation volume under Alternative SM6 would be approximately 10 times greater than under SM5. Although administratively feasible, implementation of Alternative SM6 has significant technical and health and safety difficulties.

- Each of the surface soil alternatives that include active remediation would require a pre-design investigation/test boring program to support various aspects of the RD. ISS under Alternatives SM4 and SM5 would also require a treatability study to determine the appropriate stabilization agent and injection technology.

6.2.7 Cost

The following table summarizes the estimated costs associated with each of the six subsurface soil remedial alternatives.

Alternative	Estimated Capital Cost (Rounded)	Estimated Present Worth O&M Cost (Rounded)	Estimated Total Cost (Rounded)
SM1	$0	$0	$0
SM2	$97,500	$484,000	$582,000
SM3	$5,400,000	$484,000	$5,890,000
SM4	$5,056,000	$484,000	$5,540,000
SM5	$19,322,000	$484,000	$19,800,000
SM6	$233,099,000	$484,000	$234,000,000

Total costs associated with implementing the action Alternatives are ranked as follows (in order from lowest to highest cost): SM2, SM4, SM3, SM5, and SM6.

6.3 Comparative Analysis – Groundwater Alternatives

This section provides a comparative analysis of the three groundwater alternatives:

- Alternative GW1 – No Action.
- Alternative GW2 – Monitored Natural Attenuation and Institutional Controls.
- Alternative GW3 – Enhanced Bioremediation and Institutional Controls.

6.3.1 Compliance with SCGs

Chemical-Specific SCGs

For each alternative, the Class GA groundwater quality standards presented in 6 NYCRR Parts 700-705 and in NYSDEC TOGS 1.1.1 are conservatively applied for the purposes of this FS Report as chemical-specific SCGs for this site even though the groundwater meets NYSDEC's definition of saline groundwater. Alternatives GW1 and GW2 include natural attenuation processes for reductions in concentrations of constituents of interest in groundwater, but it is unlikely that standards would be met, as described in the secondary screening discussion under Subsection 4.4.2.2. Alternative GW3 includes active groundwater treatment and would be expected (as a remedy alone by itself or in combination with a remedy for soil) to reduce concentrations of MGP-related constituents in groundwater, which could come close to or could meet groundwater standards.

Action-Specific SCGs

Action-specific SCGs are not applicable to Alternative GW1 because it does not involve the implementation of active remedial measures. Action-specific SCGs that potentially apply to Alternative GW2 are associated with installation of NAPL recovery wells and periodic groundwater monitoring. For Alternative GW3, appropriate procedures would be followed to comply with action-specific SCGs related to installing monitoring and application wells, injecting an electron acceptor/source of energy for microbes existing in the subsurface (e.g., magnesium sulfate), monitoring groundwater conditions, and transporting waste materials for offsite disposal. Action-specific SCGs would be achieved for Alternatives GM2 and GM3.

Location-Specific SCGs

Location-specific SCGs are not applicable to either Alternative GW1 or GW2. For Alternative GW3, remedial activities would be designed and conducted in accordance with local codes and ordinances.

6.3.2 Overall Protection of Human Health and the Environment

Under each alternative, the existing groundwater use laws under 10 NYCRR 5-1.31(b) would continue to minimize potential human exposure to VOCs in groundwater at concentrations exceeding standards/guidance values.

The SMP to be prepared under Alternatives GW2 and GW3 (and referenced in a land use restriction) would address exposures to construction workers performing intrusive activities below the water table, such as activities to repair existing, or install new, subsurface utilities/facilities. However, such activities would be unlikely due to the depth of groundwater (approximately 20 to 25 feet bgs). The SMP would identify requirements for use of personal protective equipment and proper management of impacted groundwater, if encountered. The SMP would also provide details for implementing the long-term groundwater monitoring program. An SMP would not be prepared under Alternative GW1.

Although there are COCs in groundwater at concentrations exceeding standards/guidance values, Onondaga Creek is a losing stream, and previous investigations indicate that there are no site-related impacts present in Onondaga Creek. As previously summarized, a reducing environment is present in the subsurface and provides opportunities for microbial communities to naturally degrade BTEX and PAHs in groundwater. Under Alternatives GW1 and GW2, natural attenuation processes over time may result in decreases in concentrations of constituents of interest in groundwater. Measurable NAPL (if any) removed from the wells included in the long-term monitoring program under Alternative GM2 would further support the ongoing natural attenuation processes. Under Alternative GW3, existing microbial degradation would be enhanced by the addition of sulfate/amendments. Therefore, MGP-related constituents in groundwater would be degraded faster under Alternative GW3 than under Alternatives GW1 and GW2. Because groundwater concentrations would be reduced more under Alternative GW3 than under Alternatives GW1 and GW2, Alternative GW3 would provide a higher level of protection to human health and the environment.

6.3.3 Short-Term Effectiveness

There would be no active remedial measures implemented under Alternative GW1. Therefore, there would be no short-term environmental impacts or risks to onsite workers or the community (or construction workers, because there would not be any construction) associated with implementation of this alternative. Alternative GW2 includes installation of several NAPL recovery wells, long-term groundwater monitoring and removal of measurable NAPL (if any) from site wells. Personnel conducting these activities under Alternative GW2 would use PPE and follow requirements of a site-specific HASP.

Under Alternative GW3, there would be potential short-term effects to site workers and the community as a result of subsurface construction work, including drilling of borings and installation of monitoring and application wells. However, these short-term effects are considered minimal and could easily be mitigated through the use of advance planning, PPE, a site-specific HASP, and a CAMP. An air monitoring program would be implemented and engineering controls such as water sprays and/or foam would be used (as needed) to keep dust and organic vapors within acceptable levels.

Construction of facilities needed for the enhanced bioremediation system under Alternative GW3 would require a few months to complete. As indicated above, there would be no construction under Alternative GW1 and Alternative GW2 involves installation of several NAPL recovery wells, which would require a few weeks to complete.

6.3.4 Long-Term Effectiveness

Under Alternatives GW1 and GW2, natural attenuation processes may be effective over the long-term at reducing concentrations of constituents of interest in groundwater. As previously discussed, a reducing environment is present in the aquifer and provides opportunities for microbial communities to naturally degrade BTEX and PAHs. Long-term monitoring would be performed under Alternative GW2 (but not Alternative GW1) to evaluate changes in groundwater conditions.

Based on current conditions, there is a limited potential for construction worker exposure to impacted groundwater during future intrusive activities. Alternative GW1 does not include actions or measures to address potential construction worker exposure to impacted groundwater.

Under Alternative GW3, existing microbial degradation would be enhanced and MGP-related constituents in groundwater would be degraded to a greater extent than under Alternatives GW1 and GW2. Because groundwater concentrations would be reduced more under Alternative GW3, this alternative would provide a higher level of protection to human health and the environment than Alternatives GW1 and GW2 and would also be more effective in the long-term. Long-term monitoring would also be performed under Alternative GW3 to evaluate changes in groundwater conditions.

Through the establishment of a land use restriction and SMP, Alternatives GW2 and GW3 would meet the groundwater RAOs related to potential direct contact, ingestion, and inhalation human health exposure pathways. The land use restriction and SMP would be kept in place, unchanged, unless site conditions were to change and make these measures unnecessary. If changes were to occur that would require modifications to the land use restriction/SMP, such modifications would be presented to the NYSDEC for review and approval, as appropriate. Both the land use restriction and SMP would be apparent to possible future site owners during comprehensive due diligence activities performed in connection with property transfer. Taken together, these institutional controls could be expected to adequately and reliably provide for the management of groundwater exhibiting constituents at concentrations exceeding standards.

6.3.5 Reduction in Toxicity, Mobility, and Volume

MGP-impacted groundwater would not be contained, removed, or actively treated (other than by natural processes) under Alternatives GW1 and GW2 and by removal of measureable NAPL from site wells (if present) under Alternative GW2. Reduction of the toxicity, mobility, and volume of impacted groundwater would likely be reduced over an extended period of time via natural attenuation processes under Alternatives GW1 and GW2.

Under Alternative GW3, active treatment would be conducted in the form of enhanced bioremediation and would reduce the toxicity and volume of MGP-related constituents in groundwater. The active treatment under Alternative GW3 would be expected to result in lower concentrations than could be achieved by natural processes without enhancement. Therefore, Alternative GW3 is considered the most effective groundwater alternative for this evaluation criterion.

6.3.6 Implementability

Alternatives GW1, GW2, and GW3 are considered technically and administratively implementable. Alternative GW2 would be the most straightforward action alternative to implement. Alternative GW3 would involve construction and O&M related to actively treating groundwater, and would involve more labor hours and effort to implement than the other groundwater alternatives. The enhanced bioremediation under Alternative GW3 could be implemented with relatively little disruption to facility operations.

6.3.7 Cost

The following table summarizes the estimated costs associated with each of the groundwater remedial alternatives.

Alternative	Estimated Capital Cost (Rounded)	Estimated Present Worth O&M Cost (Rounded)	Estimated Total Cost (Rounded)
GW1	$0	$0	$0
GW2	$163,800	$786,000	$1,140,000
GW3	$748,000	$5,382,000	$6,130,000

As indicated in the table above, total costs associated with implementing Alternative GW3 are higher than costs for implementing the other action alternative (GW2).

The final cost for Alternative GW3 could be $0.75 million to $1.5 million greater than the amount listed above if pilot testing or performance monitoring were to show that a more aggressive groundwater bioremediation approach were to be needed.

7. Selection of Preferred Remedial Alternative

This section presents the preferred remedial alternatives to address soil and groundwater conditions at the site. For reference, the comparison of remedial alternatives is presented in Table 19.

7.1 Preferred Soil Remedial Alternative

Based on the comparative analysis of the six soil remedial alternatives presented in Section 6, Alternative SM2 would cost-effectively achieve the best balance of the seven NYSDEC evaluation criteria, and is therefore the preferred alternative. Alternative SM2 would quickly achieve the RAOs related to protection of human health via the land use restriction and SMP. Alternative SM2 is easily implemented, has no short-term negative impacts, will be effective over the long-term, and will be implemented for a significantly lower cost than Alternatives SM3, SM4, SM5, and SM6. The key advantages of Alternative SM2 over the other alternatives evaluated in this FS Report are summarized below.

- Alternative SM2 is more easily implemented than Alternatives SM3, SM4, SM5, and SM6, and is protective of human health and the environment because of the following key points: (1) access to this National Grid owned site is restricted to the public; (2) the site is almost entirely covered with buildings and asphalt pavement that limits infiltration of precipitation to subsurface soil and mitigates potential exposure; (3) most of the MGP-related impacts in subsurface soil start at a depth of 8 to 10 feet bgs, further limiting potential exposure; (4) a substantial retaining wall system extends along the western property boundary adjacent to Onondaga Creek and provides a physical barrier to impacted subsurface soil; (5) no site-related impacts are present in Onondaga Creek; (6) no vapor intrusion associated with the former MGP site into onsite buildings is occurring; and (7) no measureable NAPL has been identified in monitoring wells.

- The additional actions under Alternatives SM3 (containment),SM4 and SM5 (soil stabilization), and SM6 (excavation) would result in significantly increased short-term risks related to construction (e.g., worker exposure, injury, odors, noise, spills, traffic, etc.), and the "potential" added benefits of those actions would not outweigh those risks. While it is possible that the additional actions under Alternatives SM3 through SM6 might, to varying degrees, be more protective of human health over the long term than Alternative SM2, the increased environmental protectiveness of those alternatives is questionable given that not all NAPL-impacted material or soil with exceedances of commercial use SCOs would be contained, stabilized, or excavated.

- Alternative SM2 will not result in a disruption to Office Complex operations as would occur under Alternatives SM3 through SM6. The disruption under Alternative SM3 would be moderate, the disruption under Alternatives SM4 and SM5 would be much more significant, and Alternative SM6 would be the most disruptive. Specifically, Alternative SM2 would not: (1) require work in close proximity to the existing buildings that could potentially result in structural damage: (2) block access to certain portions of the buildings; (3) require re-location of subsurface utilities that are integral to the facility; (4) take out of service driveways and parking lots needed for access to areas of the facility, for employee parking, and for loading dock operations; (5) result in increased vehicle (truck) traffic at the site (which could increase potential for accidents and spills), particularly on narrow driveways that extend below an occupied building and adjacent to Onondaga Creek; (6) result in MGP odors, vapors, or dust that would need to be controlled at the site in connection with a large open excavation; and (7) result in noise and vibrations that would be disruptive to office workers conducting business.

The additional costs for Alternatives SM3 through SM6 (nearly 10 to 402 times greater than Alternative SM2) are not justified considering that Alternative SM2 is protective of human health and the environment, is appropriate for the existing land use, and can be readily implemented.

7.2 Preferred Groundwater Remedial Alternative

Based on the comparative analysis of the three groundwater remedial alternatives presented in Section 6, Alternative GW2 would cost effectively achieve the best balance of the seven NYSDEC evaluation criteria, and is therefore the preferred alternative. The land use restriction proposed under the preferred soil remedial alternative will be expanded to notify future property owners of the presence of constituents of interest in groundwater and prohibit groundwater use. The SMP proposed under the preferred soil remedial alternative will also be expanded to include the necessary elements to address groundwater. Long-term groundwater monitoring under the preferred groundwater remedial alternative will provide data to evaluate changes in groundwater conditions. Alternative GW2 will quickly achieve the RAOs related to protection of human health. The preferred remedial alternative is easily implemented, has no short-term negative environmental impacts or risks to the community, will be effective over the long-term, and will be implemented for significantly lower cost than Alternative GW3.

Alternative GW2 is protective of human health and the environment and is more easily implemented than Alternative GW3. The additional actions under Alternative GW3 would result in increased short-term risks related to construction (e.g., worker exposure, injury, spills, etc.), and the “potential” added benefits and costs of those actions would not outweigh those risks. Although it may be possible to reduce concentrations of MGP-related constituents in groundwater faster under Alternative GW3 than Alternative GW2 (via enhanced degradation vs. natural attenuation and removal of measurable NAPL [if any] from monitoring wells), concentrations of TDS and chloride, which are naturally occurring in groundwater below the site, will continue to be well-above groundwater standards under either alternative. Groundwater derived from these deposits would continue to be unusable for human consumption.

The additional costs associated with Alternative GW3 are not justified when: (1) groundwater would continue to be unusable for human consumption, as discussed above; (2) site groundwater is not impacting Onondaga Creek; (3) existing groundwater use laws which prohibit the installation of private wells where public supply is available, would continue to minimize potential human exposure to constituents in groundwater; (4) there are no vapor intrusion concerns associated with MGP-related constituents in groundwater onsite or offsite; (5) the dissolved phase plume is stable (it is not expanding in size and concentrations are staying approximately the same or decreasing) due to attenuation, in large part, by biodegradation; and (6) the offsite plume is deep and largely inaccessible due to highways, associated onramps, intersecting city streets, and commercial development (data indicate that the upper limit of the plume offsite generally ranges from approximately 40 feet bgs to 70 feet bgs).

Coupled together, Alternatives SM2 and GW2 will be protective of human health and the environment.

7.3 Recommended Alternative Cost Estimate

The following table summarizes the total estimated costs associated with the preferred subsurface soil and groundwater alternatives.

Alternative	**Estimated Capital Cost (Rounded)**	**Estimated Present Worth O&M Cost (Rounded)**	**Estimated Total Cost (Rounded)**
SM2	$97,500	$484,000	$582,000
GW2	$163,800	$973,000	$1,140,000
		Total Present Worth Cost Estimate:	**$1,722,000**

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Tables

TABLE 1
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Location	Sample Depth	Sample Date	VOCs/ BTEX	SVOCs/ PAHs	Inorgancis	Cyanide	Pesticides	PCBs	TCLP Parameters	Wet Chemistry	Misc.	Dissolved Gas Analysis	Natural Attenuation
Surface Soil Samples													
SS-1	- -	6/27/2002	X	X	X	X	X						
SS-2	- -	6/27/2002	X	X	X	X	X						
SS-3	- -	6/27/2002	X	X	X	X	X						
Subsurface Soil Samples													
SB-1	30	8/8/1995	X	X	X	X	X	X					
	36	8/8/1995	X(B)	X(P)		X			X		X		
SB-2	30	8/15/1995	X	X	X	X	X	X					
SB-3	30	8/15/1995	X(B)	X(P)		X							
	36	8/15/1995	X	X	X	X	X	X					
Erie-DUP-2 [SB-3]	36	8/15/1995	X	X	X	X	X	X					
SB-4	10	8/23/1995	X(B)	X(P)		X							
	20	8/23/1995	X(B)	X(P)		X							
	28	8/23/1995	X	X	X	X	X	X	X		X		
	42	8/23/1995	X(B)	X(P)		X							
	50	8/23/1995	X(B)	X(P)		X							
SB-5	8	8/21/1995	X(B)	X(P)		X							
	22	8/21/1995	X	X	X	X	X	X	X		X		
	44	8/21/1995	X(B)	X(P)		X							
	50	8/21/1995	X(B)	X(P)		X							
DUP [SB-5]	22	8/21/1995	X	X	X	X	X	X					
SB-7C	28	8/23/1995	X	X	X	X	X	X	X		X		
	38	8/23/1995	X(B)	X(P)		X							
	50	8/23/1995	X(B)	X(P)		X							
SB-8	16	8/18/1995	X(B)	X(P)		X							
	26	8/18/1995	X	X	X	X	X	X					
	28	8/18/1995	X(B)	X(P)		X			X		X		
	48	8/18/1995	X(B)	X(P)		X							
SB-9	16	8/22/1995	X(B)	X(P)		X							
	20	8/22/1995	X(B)	X(P)		X							
	38	8/22/1995	X	X	X	X	X	X	X		X		
SB-10	22	8/22/1995	X(B)	X(P)		X							
	28	8/22/1995	X	X	X	X	X	X	X		X		
	40	8/22/1995	X(B)	X(P)		X							
	50	8/22/1995	X(B)	X(P)		X							
SB-12	12-14	5/28/2008	X(B)	X(P)		X							
	22-24	5/28/2008	X(B)	X(P)		X							
SB-13	8-10	5/29/2008	X(B)	X(P)		X							
	20-22	5/29/2008	X(B)	X(P)		X							
SB-14	8-10	5/30/2008	X(B)	X(P)		X							
	18-20	5/30/2008	X(B)	X(P)		X							
SB-15	14-16	6/2/2008	X(B)	X(P)		X							
	22-24	6/2/2008	X(B)	X(P)		X							
SB-16	12-14	6/5/2008	X(B)	X(P)		X							
	18-20	6/5/2008	X(B)	X(P)		X							
DUP 6-5-08 [SB-16]	12-14	6/5/2008	X(B)	X(P)		X							
SB-18	4-6	6/3/2008	X(B)	X(P)		X							
	24-26	6/3/2008	X(B)	X(P)		X							
DUP 6-3-08 [SB-18]	24-26	6/3/2008	X(B)	X(P)		X							
SB-21	14-16	6/9/2008	X(B)	X(P)		X							
	20-22	6/9/2008	X(B)	X(P)		X							
SB-22	0-16	8/10/2012		X	X	X		X					
	13-15	8/10/2012	X										
SB-23	0-5	8/10/2012		X	X	X		X					
	3-4	8/10/2012	X										
SB-24	0-15.5	8/13/2012		X	X	X		X					
	12-13	8/13/2012	X										
SB-25	0-11	8/13/2012		X	X	X		X					
	8-10	8/13/2012	X										

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SB-27	0-20	8/13/2012		X	X	X		X					
	3-4	8/13/2012	X										
	20-21.2	8/10/2012	X										
TP-1	5	8/28/1995	X(B)	X(P)		X							
	8	8/28/1995	X	X	X	X	X		X		X		
TP-2	5	8/28/1995	X(B)	X(P)		X							
	11	8/28/1995	X	X	X	X	X						
DUP-01 [TP-2]	11	8/28/1995	X	X	X	X	X						
TP-2A	6	9/19/1995	X	X	X	X	X						
	10	9/19/1995	X	X	X	X	X						
DUP [TP-2A]	10	9/19/1995	X	X	X	X	X						
WB-1	0-6	3/29/1995	X	X	X	X	X	X					
	12-14	3/29/1995	X(B)	X(P)		X							
	34-36	3/30/1995		X(P)									
	36-38	3/30/1995	X(B)			X							
	40-42	3/30/1995		X(P)									
	44	3/30/1995	X(B)			X							
	44-46	3/30/1995	X(B)	X(P)									
	52-54	3/30/1995		X(P)									
	70-72	3/31/1995		X(P)									
	76-78	3/31/1995	X(B)			X							
	80-82	3/31/1995		X(P)									
	84-86	3/31/1995	X(B)										
WB-2	0-6	4/14/1995	X	X	X	X	X	X					
	16-18	4/14/1995		X(P)									
	36-38	4/17/1995	X(B)										
	42-44	4/17/2995		X(P)		X							
	50-52	4/17/1995	X(B)										
	54-56	4/17/1995		X(P)									
	64-66	4/17/1995	X(B)	X(P)									
	80-82	4/18/1995		X(P)									
	86-88	4/19/1995	X(B)	X(P)		X							
WB-3	0-6	4/4/1995	X	X	X	X	X	X					
	12-14	4/4/1995	X(B)	X(P)									
	30-32	4/4/1995	X(B)	X(P)		X							
	52-53.5	4/5/1995	X(B)	X(P)									
	58-60	4/5/1995				X							
	62-64	4/5/1995		X(P)									
	76-78	4/6/1995	X(B)	X(P)		X							
WB-4	0-6	4/12/1995	X	X	X	X	X	X					
	6-8	4/12/1995	X(B)	X(P)		X							
	9	4/13/1995							X		X		
	20-22	4/12/1995	X(B)	X(P)		X							
	38-40	4/12/1995	X(B)	X(P)		X							
	50-52	4/12/1995	X(B)	X(P)		X							
	56-58	4/13/1995		X(P)		X							
	66-67.5	4/13/1995	X(B)	X(P)		X							
WB-5	0-6	4/10/1995	X	X	X	X	X	X					
	6-8	4/10/1995	X(B)	X(P)		X							
	54-56	4/11/1995	X(B)	X(P)		X							
WB-6	0-6	4/20/1995	X	X	X	X	X	X					
	14-16	4/20/1995	X(B)	X(P)		X							
	30-32	4/20/1995	X(B)	X(P)		X							
	48-50	4/21/1995	X(B)	X(P)									
	64-66	4/21/1995		X(P)									
	68-70	4/21/1995	X(B)	X(P)		X							
MW-1D	20	8/9/1995	X(B)	X(P)		X							
	32	8/9/1995	X	X	X	X	X	X					
	40	8/9/1995	X(B)	X(P)		X							

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MW-2	24	7/27/1995	X	X	X	X	X	X					
MW-3D	32	7/20/1995	X(B)	X(P)		X							
MW-4S	12	8/17/1995	X	X	X	X	X	X					
	14	8/17/1995	X(B)	X(P)		X			X		X		
	30	8/17/1995	X(B)	X(P)		X							
	36	8/17/1995	X(B)	X(P)		X							
MW-4D	65-67	6/11/1997	X(B)	X(P)		X							
	69-71	6/11/1997	X(B)	X(P)		X							
	75-77	6/11/1997	X	X	X	X	X	X					
	113-115	6/11/1997	X(B)	X(P)		X							
	133-135	6/12/1997	X(B)	X(P)		X							
MW-6	36	7/28/1995	X	X	X	X	X	X					
MW-7S	16	8/7/1995	X	X	X	X	X	X					
	18	8/7/1995	X(B)	X(P)		X			X		X		
Erie-DUP-1 [MW-7]	16	8/7/1995	X	X	X	X	X	X					
MW-7D	32-34	6/16/1997	X	X	X	X	X	X					
	73-75	6/16/1997	X(B)	X(P)		X							
	93-95	6/16/1997	X(B)	X(P)		X							
MW-8D	36	7/31/1995	X	X	X	X	X	X					
	60	8/1/1995	X(B)	X(P)		X							
$MW\text{-}9D_2$	28-30	6/20/1997	X(B)	X(P)		X							
	65-67	6/20/1997	X(B)	X(P)		X							
	93-95	6/20/1997	X	X	X	X	X	X					
	113-115	6/20/1997	X(B)	X(P)		X							
	153-155	6/20/1997	X(B)	X(P)		X							
MW-10D	16-18	6/17/1997	X(B)	X(P)		X							
	73-75	6/17/1997	X(B)	X(P)		X							
	91-93	6/17/1997	X(B)	X(P)		X							
	119-121	6/17/1997	X	X	X	X	X	X					
	133-135	6/17/1997	X(B)	X(P)		X							
	151-153	6/17/1997	X(B)	X(P)		X							
DUP-1 [MW-10D]	16-18	6/17/1997	X(B)	X(P)		X							
MW-11D	25-27	6/18/1997	X(B)	X(P)		X							
	55-57	6/18/1997	X(B)	X(P)		X							
	67-69	6/18/1997	X(B)	X(P)		X							
	83-85	6/18/1997	X	X	X	X	X	X					
DUP-2 [MW-11D]	83-85	6/18/1997	X	X	X	X	X	X					
MW-12D	25-27	6/19/1997	X(B)	X(P)		X							
	65-67	6/19/1997	X(B)	X(P)		X							
	93-95	6/19/1997	X	X	X	X	X	X					
MW-13	30-32	9/20/2000	X	X	X	X	X						
	40-42	9/20/2000	X	X	X	X	X						
	50-52	9/20/2000	X	X	X	X	X						
MW-14	4-6	9/22/2000	X	X	X	X	X						
	14-16	9/22/2000	X	X	X	X	X						
	24-26	9/22/2000	X	X	X	X	X						
	30-32	9/22/2000	X	X	X	X	X						
	34-36	9/22/2000	X	X	X	X	X						
	44-46	9/22/2000	X	X	X	X	X						
	54-56	9/22/2000	X	X	X	X	X						
	62-64	9/22/2000	X	X	X	X	X						
	72-74	9/22/2000	X	X	X	X	X						
	76-78	9/22/2000	X	X	X	X	X						
	82-84	9/22/2000	X	X	X	X	X						
	88-90	9/25/2000	X	X	X	X	X						
	92-94	9/25/2000	X	X	X	X	X						
	96-98	9/25/2000	X	X	X	X	X						

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DUP-1 [MW-14]	30-32	9/22/2000	X	X	X	X	X						
MW-15	8-10	9/26/2000	X	X	X	X	X						
	18-20	9/26/2000	X	X	X	X	X						
	32-34	9/26/2000	X	X	X	X	X						
	40-42	9/26/2000	X	X	X	X	X						
	48-50	9/27/2000	X	X	X	X	X						
	58-60	9/27/2000	X	X	X	X	X						
MW-15B	70-72	9/28/2000	X	X	X	X	X						
	76-78	9/28/2000	X	X	X	X	X						
	82-84	9/28/2000	X	X	X	X	X						
	88-90	9/28/2000	X	X	X	X	X						
	94-96	9/28/2000	X	X	X	X	X						
	102-104	9/28/2000	X	X	X	X	X						
	108-110	9/28/2000	X	X	X	X	X						
	120-122	9/28/2000	X	X	X	X	X						
DUP-3 [MW-15B]	102-104	9/28/2000	X	X	X	X	X						
MW-16	10-12	10/4/2000	X	X	X	X	X						
	22-24	10/4/2000	X	X	X	X	X						
	30-32	10/4/2000	X	X	X	X	X						
	40-42	10/4/2000	X	X	X	X	X						
	50-52	10/4/2000	X	X	X	X	X						
	60-62	10/4/2000	X	X	X	X	X						
	70-72	10/4/2000	X	X	X	X	X						
	80-82	10/4/2000	X	X	X	X	X						
	90-92	10/5/2000	X	X	X	X	X						
	100-102	10/5/2000	X	X	X	X	X						
	110-112	10/5/2000	X	X	X	X	X						
	118-120	10/5/2000	X	X	X	X	X						
MW-17B	10-12	10/6/2000	X	X	X	X	X						
	20-22	10/9/2000	X	X	X	X	X						
	30-32	10/9/2000	X	X	X	X	X						
	40-42	10/9/2000	X	X	X	X	X						
	50-52	10/9/2000	X	X	X	X	X						
	60-62	10/9/2000	X	X	X	X	X						
	68-70	10/9/2000	X	X	X	X	X						
	74-76	10/9/2000	X	X	X	X	X						
	80-82	10/9/2000	X	X	X	X	X						
	86-88	10/10/2000	X	X	X	X	X						
	92-94	10/10/2000	X	X	X	X	X						
	98-100	10/10/2000	X	X	X	X	X						
	108-110	10/10/2000	X	X	X	X	X						
	118-120	10/10/2000	X	X	X	X	X						
DUP [MW-17B]	80-82	10/9/2000	X	X	X	X	X						
MW-18	10-12	9/3/2002	X	X	X	X	X						
	64-66	9/4/2002	X	X	X	X	X						
	88-90	9/4/2002	X	X	X	X	X						
DUP-1 [MW-18]	88-90	9/4/2002	X	X	X	X	X						
Groundwater Samples													
MW-1S	- -	8/30/1995	X	X	X	X	X	X		X			
	- -	11/20/1995	X	X	X	X	X	X		X			
	- -	7/10/1997	X	X	X	X	X	X		X(N)			
	- -	9/9/1997	X	X	X	X	X	X					
	- -	11/8/2002	X	X	X	X	X			X(D)		X	X
	- -	1/29/2003	X	X	X	X	X			X(D)		X	X
	- -	4/9/2008	X	X		X							
	- -	1/29/2013	X	X		X							

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MW-1D	- -	8/30/1995	X	X	X	X	X	X		X			
	- -	11/20/1995	X	X	X	X	X	X		X			
	- -	7/10/1997	X	X	X	X	X	X		X(N)			
	- -	9/9/1997	X	X	X	X	X	X					
	- -	11/8/2002	X	X	X	X	X			X(D)		X	X
	- -	1/29/2003	X	X	X	X	X			X(D)		X	X
MW-2	- -	8/30/1995	X	X	X	X	X	X		X			
	- -	11/20/1995	X	X	X	X	X	X		X			
	- -	7/9/1997	X	X	X	X	X	X		X(N)			
	- -	9/10/1997	X	X	X		X	X					
	- -	11/6/2002	X	X	X	X	X			X(D)		X	X
	- -	1/28/2003	X	X	X	X	X			X(D)		X	X
	- -	4/14/2008	X	X									
	- -	1/29/2013	X	X									
MW-3S	- -	8/30/1995	X	X	X	X	X	X		X			
	- -	11/20/1995	X	X	X	X	X	X		X			
	- -	7/9/1997	X	X	X	X	X	X		X(N)			
	- -	9/9/1997	X	X	X	X	X	X					
	- -	11/12/2002	X	X	X	X	X			X(D)		X	X
	- -	1/17/2003	X	X	X	X	X			X(D)		X	X
	- -	4/9/2008	X	X									
MW-3D	- -	8/30/1995	X	X	X	X	X	X		X			
	- -	11/20/1995	X	X	X	X	X	X		X			
	- -	7/10/1997	X	X	X	X	X	X		X(N)			
	- -	9/9/1997	X	X	X	X	X	X					
	- -	11/12/2002	X	X	X	X	X			X(D)		X	X
	- -	1/17/2003	X	X	X	X	X			X(D)		X	X
MW-4S	- -	8/31/1995	X	X	X	X	X	X		X			
	- -	11/15/1995	X	X	X	X	X	X		X			
	- -	7/9/1997	X	X	X	X	X	X		X(N)			
	- -	9/10/1997	X	X	X	X	X	X					
	- -	11/5/2002	X	X	X	X	X			X(D)		X	X
	- -	1/23/2003	X	X	X	X	X			X(D)		X	X
	- -	4/10/2008	X	X		X							
	- -	1/29/2013	X	X		X							
DUP [MW-4S]	- -	8/31/1995	X	X	X	X	X	X		X			
DUP-4/10/08 [MW-4S]	- -	4/10/2008	X	X		X							
DUP-1-012913 [MW-4S]	- -	1/29/2013	X	X		X							
MW-4D	- -	7/9/1997	X	X	X	X	X	X		X(N)			
	- -	9/9/1997	X	X	X	X	X	X					
	- -	11/5/2002	X	X	X	X	X			X(D)		X	X
	- -	1/23/2003	X	X	X	X	X			X(D)		X	X
DUP-1 [MW-4D]	- -	7/9/1997	X	X	X		X	X		X(N)			
MW-6	- -	8/30/1995	X	X	X	X	X	X		X			
	- -	11/15/1995	X	X	X	X	X	X		X			
	- -	7/10/1997	X	X	X	X	X	X		X(N)			
	- -	9/10/1997	X	X	X		X	X					
	- -	11/12/2002	X	X	X	X	X			X(D)		X	X
	- -	1/23/2003	X	X	X	X	X			X(D)		X	X
	- -	4/9/2008	X	X									
	- -	1/29/2013	X	X									
MW-7S	- -	8/31/1995	X	X	X	X	X	X		X			
	- -	11/15/1995	X	X	X	X	X	X		X			
	- -	7/9/1997	X	X	X	X	X	X		X(N)			
	- -	9/9/1997	X	X	X	X	X	X					
	- -	11/5/2002	X	X	X	X	X			X(D)		X	X
	- -	1/27/2003	X	X	X	X	X			X(D)		X	X
	- -	4/10/2008	X	X		X							
	- -	1/29/2013	X	X		X							

TABLE 1
SUMMARY OF SAMPLING LOCATIONS AND LABORATORY ANALYSES

NATIONAL GRID
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Location	Sample Depth	Sample Date	VOCs/ BTEX	SVOCs/ PAHs	Inorgancis	Cyanide	Pesticides	PCBs	TCLP Parameters	Wet Chemistry	Misc.	Dissolved Gas Analysis	Natural Attenuation
MW-7S DUP [MW-7S]	- -	11/5/2002	X	X	X	X	X			X(D)		X	
MW-7D	- -	7/9/1997	X	X	X	X	X	X		X(N)			
	- -	9/9/1997	X	X	X	X	X	X					
	- -	11/5/2002	X	X	X	X	X			X(D)		X	X
	- -	1/27/2003	X	X	X	X	X			X(D)		X	X
MW-8S	- -	8/30/1995	X	X	X	X	X	X		X			
	- -	11/15/1995	X	X	X	X	X	X		X			
	- -	7/8/1997	X	X	X	X	X	X		X(N)			
	- -	9/9/1997	X	X	X	X	X	X					
	- -	11/5/2002	X	X	X	X	X			X(D)		X	X
	- -	1/28/2003	X	X	X	X	X			X(D)		X	X
	- -	4/9/2008	X	X									
	- -	1/29/2013	X	X									
MW-8D	- -	8/30/1995	X	X	X	X	X	X		X			
	- -	11/15/1995	X	X	X	X	X	X		X			
	- -	7/8/1997	X	X	X	X	X	X		X(N)			
	- -	9/9/1997	X	X	X	X	X	X					
	- -	11/6/2002	X	X	X	X	X			X(D)		X	X
	- -	1/28/2003	X	X	X	X	X			X(D)		X	X
DUP [MW-8D]	- -	11/15/1995	X	X	X	X	X	X		X			
MW-8D DUP [MW-8D]	- -	1/28/2003	X	X	X	X	X			X(D)			
MW-9D$_1$	- -	7/9/1997	X	X	X	X	X	X		X(N)			
	- -	9/8/1997	X	X	X	X	X	X					
	- -	11/6/2002	X	X	X	X	X			X(D)		X	X
	- -	1/21/2003	X	X	X	X	X			X(D)		X	X
	- -	4/10/2008	X	X									
	- -	1/31/2013	X	X									
MW-9D$_2$	- -	7/10/1997	X	X	X	X	X	X		X(N)			
	- -	9/8/1997	X	X	X	X	X	X					
	- -	11/6/2002	X	X	X	X	X			X(D)		X	X
	- -	1/21/2003	X	X	X	X	X			X(D)		X	X
MW-10S	- -	7/9/1997	X	X	X	X	X	X		X(N)			
	- -	9/8/1997	X	X	X	X	X	X					
	- -	11/7/2002	X	X	X	X	X			X(D)		X	X
	- -	1/22/2003	X	X	X	X	X			X(D)		X	X
	- -	4/10/2008	X	X									
	- -	1/28/2013	X	X									
MW-10D	- -	7/9/1997	X	X	X	X	X	X		X(N)			
	- -	9/8/1997	X	X	X	X	X	X					
	- -	11/7/2002	X	X	X	X	X			X(D)		X	X
	- -	1/22/2003	X	X	X	X	X			X(D)		X	X
	- -	4/10/2008	X	X									
	- -	1/28/2013	X	X									
MW-11D	- -	7/8/1997	X	X	X	X	X	X		X(N)			
	- -	9/10/1997	X	X	X	X	X	X					
	- -	11/7/2002	X	X	X	X	X			X(D)		X	X
	- -	1/16/2003	X	X	X	X	X			X(D)		X	X
	- -	4/9/2008	X	X									
	- -	1/31/2013	X	X									
MW-12D	- -	7/8/1997	X	X	X	X	X	X		X(N)			
	- -	9/8/1997	X	X	X	X	X	X					
	- -	11/7/2002	X	X	X	X	X			X(D)		X	X
	- -	1/16/2003	X	X	X	X	X			X(D)		X	X
	- -	4/10/2008	X	X									
	- -	1/30/2013	X	X									
DUP [MW-12D]	- -	9/8/1997	X	X	X	X	X	X					
DUP [MW-12D]	- -	1/16/2003	X	X	X	X	X						X

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MW-13D	- -	11/7/2002	X	X	X	X	X			X(D)		X	X
	- -	1/22/2003	X	X	X	X	X			X(D)		X	X
	- -	4/10/2008	X	X									
MW-14D	- -	11/8/2002	X	X	X	X	X			X(D)		X	X
	- -	1/16/2003	X	X	X	X	X			X(D)		X	X
	- -	4/11/2008	X	X									
	- -	1/30/2013	X	X									
MW-15D	- -	11/12/2002	X	X	X	X	X			X(D)		X	X
	- -	1/21/2003	X	X	X	X	X			X(D)		X	X
	- -	4/10/2008	X	X									
	- -	1/30/2013	X	X									
MW-16D	- -	11/13/2002	X	X	X	X	X			X(D)		X	X
	- -	1/22/2003	X	X	X	X	X			X(D)		X	X
	- -	4/14/2008	X	X									
	- -	1/30/2013	X	X									
MW-17D	- -	11/13/2002	X	X	X	X	X			X(D)		X	X
	- -	11/13/2002	X										
	- -	1/21/2003	X	X	X	X	X			X(D)		X	X
	- -	4/11/2008	X	X									
	- -	1/30/2013	X	X									
DUP [MW-17D]	- -	11/13/2002	X	X	X	X	X			X(D)		X	X
MW-18	- -	11/13/2002	X	X	X	X	X			X(D)		X	X
	- -	1/23/2003	X	X	X	X	X			X(D)		X	X
	- -	4/11/2008	X	X									
	- -	1/30/2013	X	X									

TABLE 1
SUMMARY OF SAMPLING LOCATIONS AND LABORATORY ANALYSES

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Notes:

1. Samples were collected by the following:
   - Engineering-Science from March 1995 to April 1995.
   - ARCADIS from August 1995 to present.
2. DUP = Blind duplicate [corresponding sampling location is identified in brackets].
3. Laboratory analysis of the Remedial Investigation (RI) samples (2000-2003), Final RI samples (2008), and 2012 Soil Investigation was performed by TestAmerica Laboratories, Inc. (TestAmerica) of Shelton, Connecticut and Accutest Laboratories of Marlborough, Massachusetts for one or more of the analyses listed below:
   - Target Compound List (TCL) Volatile Organic Compounds (VOCs)/Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) using USEPA SW-846 Method 8260.
   - TCL Semi Volatile Organic Compounds (SVOCs)/Polynuclear Aromatic Hydrocarbons (PAHs) using USEPA SW-846 Method 8270.
   - Target Analyte List (TAL) Inorganics using USEPA SW-846 Methods 6010 and 7470/7471.
   - Pesticides using USEPA Method 8080.
   - Wet Chemistry parameters (including Oil & Grease and Total Dissolved Solids) by the following:
     - ● Biochemical Oxygen Demand (BOD) using USEPA Method 405.1.
     - ● Chloride using USEPA Method 9250.
     - ● Chemical Oxygen Demand (COD) using USEPA SW-846 Method 410.1.
     - ● Dissolved Organic Carbon (DOC) using USEPA Method 9060.
     - ● Nitrate/Nitrite using USEPA SW-846 Method 9200.
     - ● Sulfate using USEPA Method 9036.
     - ● Sulfide using USEPA Method 9031.
   - Dissolved Gas Analysis (CO, CO_2, and CH_4) using Method AM-15.01.
   - Natural Attenuation parameters (dissolved iron and manganese) using USEPA SW-846 Method 6010.
4. Laboratory analysis of the Preliminary Site Assessment / Interim Remedial Measure (PSA/IRM) study samples (1995-1997) was performed by Industrial and Environmental Analysts, Inc. (IEA) of Monroe, Connecticut for:
   - TCL VOCs/BTEX using USEPA SW-846 Method 8240.
   - TCL SVOCs/PAHs using USEPA SW-846 Method 8270.
   - TAL Inorganics using USEPA SW-846 Methods 6010 and 7470/7471.
   - Cyanide using USEPA Method 335.4.
   - Pesticides using USEPA Method 8080.
   - Polychlorinated Biphenyls (PCBs) using USEPA SW-846 Method 8082.
   - Toxicity Characteristic Leaching Procedure (TCLP) Parameters using Method 1311 for extraction:
     - ● VOCs using USEPA Method series 8000.
     - ● SVOCs using USEPA Method series 8000.
     - ● Metals and cyanide using USEPA Method series 6000 and 7000.
   - Wet Chemistry parameters (including Hardness [$CaCO_3$], Oil & Grease, and Total Dissolved Solids) by the following:
     - ● Biochemical Oxygen Demand (BOD) using USEPA Method 405.1.
     - ● Chloride using USEPA Method 9250.
     - ● Chemical Oxygen Demand (COD) using USEPA SW-846 Method 410.1.
     - ● Nitrite using USEPA SW-846 Method 9200.
     - ● Sulfate using USEPA Method 9036.
     - ● Sulfide using USEPA Method 9031.
   - Miscellaneous parameters ("misc") (including Reactive Cyanide, Reactivity, and Reactive Sulfide) by the following:
     - ● Corrosivity using USEPA SW-846 Method 9040.
     - ● Ignitability using USEPA SW-846 Method 1010.
5. Laboratory analysis of the wall boring soil samples collected in March/April 1995 (samples designated by the prefix "WB-") was performed by Galson Laboratory, Inc. of East Syracuse, New York using the same methods that were used for analysis of the PSA/IRM study soil samples.
6. Samples were analyzed by Exygen Research (Exygen) located in State College, Pennsylvania for
   - Cyanide (available) using USEPA OIA 1677.
7. Samples corresponding with the screened intervals for wells MW-4D, MW-7D, $MW\text{-}9D_2$, and MW-10D through MW-18D were analyzed by Parratt Wolff Labs (PW) of Syracuse, New York for geotechnical parameters including:
   - Percent Moisture using ASTM D2216.
   - Bulk Density using ASTM D4253 & D4254 or USACOE Method EM-1110-2-1906, Apendix II.
   - Grain Size using ASTM C136 & C117 or D422 & D1140.

   PW subcontracted for analysis of the samples for:
   - Total Organic Carbon (TOC) by the USEPA Method 9060.
   - pH using USEPA SW-846 Method ASTM D4972.
   - Atterberg Limits using ASTM D4318.
8. An X indicates analysis was conducted.
9. X(B) - Indicates analysis of BTEX compounds only.
10. X(D) - Wet chemistry parameters and DOC were analyzed, except hardness.
11. X(N) - Wet chemistry parameters were analyzed, except nitrate.
12. X(P) - Indicates analysis of PAH compounds only.
13. - - = A depth is not applicable for the sample.

TABLE 2
SOIL SAMPLING LOCATIONS EXHIBITING NAPL, SHEENS, STAINING, OR ODORS

NATIONAL GRID
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Sample ID/ Depth Interval (feet bgs)	Sample Analyzed / Sample Depth (feet bgs)		Description	Total PAHs (ppm)	Total BTEX (ppm)
SB-1					
24-26			Strong hydrocarbon odor, little sheen		
26-30	X	30	Strong odor, sheen, trace visible brownish oil	0.66 J	0.0050 J
30-34			Slight odor, sheen		
34-36	X	36	Oily stringers throughout	35 J	0.25 J
36-38			Oily stringers in tip		
40-42			Trace oily "bubbles", trace sheen		
42-44			Trace sheen		
44-46			Slight sheen, faint odor		
46-48			Stronger odor, slight sheen, oil in tip		
48-50			Sheen, faint odor		
SB-2					
24-26			Faint sheen		
26-28			Faint sheen, faint hydrocarbon odor		
SB-3					
28-30	X	30	Sheen, faint odor	0.088 J	<0.012
30-32			Sheen more evident than above		
32-34			Faint odor, faint sheen		
34-36	X	36	Trace sheen	0.019 J [0.018 J]	<0.013 [<0.012 J]
SB-4					
6-12	X	10	Odor	180 J	45 J
12-14			Odor, thick oily stringers		
14-16			Odor		
16-18			Odor, oil droplets		
18-20	X	20	Odor, oily stringers and droplets	570 J	58
20-22			Odor		
24-44	X	28 & 42	Odor, oil	690 J & 230 J	93 & 16 J
44-46			Odor, oil/oil in pockets		
46-48			Odor, oil		
48-50	X	50	Odor, oil droplets	560 J	31 J
SB-5					
8-16	X	8	Odor	52 J	0.021 J
16-18			Odor, sheen around the outside of profile		
18-22	X	22	Odor, oil in pockets	840 J [580 J]	75 J [50 J]
22-24			Odor		
24-26			Odor, oil in pockets		
26-28			Odor, oily stringers		
28-34			Odor		
34-36			Odor, sheen		
36-38			Odor, oil in pockets		
38-40			Odor		
40-42			Oil droplets		
42-44	X	44	Odor	95 J	7.7
44-48			Odor, oil in pockets		
48-50	X	50	Odor	940 J	0.91 J

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Sample ID/ Depth Interval (feet bgs)	Sample Analyzed / Sample Depth (feet bgs)		Description	Total PAHs (ppm)	Total BTEX (ppm)
SB-7					
24-28	X	28	Odor	0.77 J	<0.023
28-30			Odor, sheen		
30-32			Odor		
32-34			Odor, sheen		
34-40	X	38	Odor	0.19 J	<0.012
40-46			Slight odor		
48-50	X	50	Slight odor	0.14 J	<0.011
SB-8					
12-14			Black stained gravel and sand, black/brown oil		
14-16	X	16	Sheen, black staining	14 J	0.59
16-18			Sheen		
18-20			Very faint (trace) sheen		
20-22			Very faint (trace) sheen, faint odor		
22-24			Sheen, faint odor		
24-26	X	26	Sheen, trace visible oil (brown thin liquid)	21 J	0.088 J
26-30	X	28	Sheen, brown oily stringers	20 J	0.015 J
30-34			Sheen, trace visible oil		
34-36			Some sheen		
36-38			Sheen, oily liquid (has a copper-colored appearance)		
38-40			Little to trace oily droplets		
40-42			Little faint sheen		
42-44			Little to trace oil		
44-46			Trace sheen		
46-48	X	48	Trace to little sheen	4.6 J	0.0070 J
48-50			Sheen		
SB-9					
12-14			Odor		
14-16	X	16	Oil in pockets, odor	490 J	0.73
16-18			Oil droplets, odor		
18-20	X	20	Odor	7.0 J	0.0054 J
22-24			Slight odor		
24-30			Odor, sheen, oily stringers		
30-34			Odor, oily stringers		
34-38	X	38	Odor, oily droplets	290 J	0.33 J
SB-10					
22-24	X	22	Odor, sheen	22 J	<0.010
24-34	X	28	Odor	40 J	12 J
34-36			Odor, oil in pockets		
36-38			Odor		
38-40	X	40	Odor, oil in pockets	380 J	0.80 J
40-44			Odor		
44-46			Odor, oil in pockets		
46-50	X	50	Odor	250 J	0.034 J

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Sample ID/ Depth Interval (feet bgs)	Sample Analyzed / Sample Depth (feet bgs)		Description	Total PAHs (ppm)	Total BTEX (ppm)
SB-11					
14-16			0-6": Organic odor 12-24": Organic odor		
16-18			Black stained, odor		
18-24			Black stained, oil-like material, sheen, odor, tar-like material present @ 22'		
26-28			0-4": Stong odor, oil-like material 4-24": Oil-like material, black stained @ 28'		
28-30			Black stained		
30-32			0-8": Black stained, tar-like material, sheen, odor 8-24": Black stained, odor, oil-like material, sheen, mix of tar-like material @ 32'		
32-34			Black stained, odor, oil-like material, sheen		
34-36			Odor and tar-like material, sheen		
36-38			6-24": Black staining, odor, mix of tar-like material @ 38'		
38-40			Black staining, odor		
40-42			0-11": Tar-like material, sheen		
SB-12					
8-10			0-5": Trace odor and sheen 5-24": Tar-like material, odor and sheen		
12-14	X	12-14	3-24": Slight odor	460	0.75
14-18			Trace tar-like material, slight odor		
18-22			Oil-like material, odor, sheen		
22-24	X	22-24	0-4": Oil-like material, odor, sheen 4-24": Odor	5,300 J	3,700
26-28			Some oil-like material and tar-like material blebs, odor		
28-38			Little tar-like material and sheen, odor		
38-42			Less saturated with NAPL, sheen, odor		
42-44			More separate phase NAPL, sheen, odor		
44-46			0-3": More separate phase NAPL, sheen, odor 3-17": Brown NAPL staining		
46-48			Brown oil stains		
48-50			0-12": Brown oil stains		
50-52			0-6": blebs of tar-like material 6-24": Slight to no odor		
52-54			Slight to no odor		
54-56			0-7": Slight to no odor 7-24": Slight odor and staining		
56-58			0-3": Slight odor and staining 3-24": Slight odor		
58-60			Slight odor		

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Sample ID/ Depth Interval (feet bgs)	Sample Analyzed / Sample Depth (feet bgs)		Description	Total PAHs (ppm)	Total BTEX (ppm)
SB-13					
8-10	X	8-10	1-5": Slight odor 5-9": Dark brown/black-stained 9-19": oil-like material, significant odor	2, 600	390 J
10-12			3-9": Black staining, odor evident 9-24": Black stained		
12-14			Black stained, oil-like material present @ 13.5'		
18-20			3-14": Trace staining, slight odor 14-24": Some oil-like material, significant odor		
20-22	X	20-22	Some oil-like material, significant odor	96 J	200
22-24			Some oil-like material		
24-26			Some oil-like material, significant odor		
26-32			Oil-like material, odor		
32-34			Tar-like material		
34-36			Gray oil-like material		
36-38			0-4": Gray oil-like material 4-24": Oil-like material, odor		
38-42			Oil-like material, some staining		
42-44			Oil-like material		
46-54			Slight odor, trace oil-like sheens		
SB-14					
8-10	X	8-10	4-24": Brown/black stained, some odor	950 J	360 J
10-12			Brown/black stained, some odor		
12-14			Possible oil-like material		
16-18			0-16": Oil-like material with small tar-like blebs, odor		
18-20	X	18-20	0-3": Slight odor 3-24": Some NAPL (droplets)	110 J	130
20-24			Trace black (oil-like material) staining		
24-26			Tar-like material (droplets), odor		
26-28			Some odor		
28-30			Some black (oil-like material) staining and tar-like material (droplets)		
30-34			Oil-like material with small blebs of tar-like material		
34-38			Oil-like material, strong odor and sheen		
38-40			0-9": Oil-like material, strong odor and sheen 9-24": Tar-like material and oil material, strong odor and sheen		
40-42			Tar-like material and oil material, strong odor and sheen		
42-46			Some tar-like material (droplets), tar-like material blebs @ 43.4'		
46-50			Significant tar-like material		

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Sample ID/ Depth Interval (feet bgs)	Sample Analyzed / Sample Depth (feet bgs)		Description	Total PAHs (ppm)	Total BTEX (ppm)
SB-15					
14-16	X	14-16	2-24": Black stained, some odor, light brown/trace staining, slight odor @ 15.1'	93 J	<0.0073
16-18			0-19": Some tar-like material (droplets), significant odor 19-24": Slight odor		
18-20			Some tar-like material (droplets), odor		
22-24	X	22-24	6-20": Little blebs of tar-like material, some	38 J	0.065 J
24-28			0-6": Trace tar-like material (droplets), some odor 6-24": Some tar-like material		
28-40			Trace tar-like material, slight odor		
SB-16					
8-10			Slight staining @ 8'		
10-12			0-12": Black stained 12-24": Black stained and trace oil-like material (about 5%)		
12-14	X	12-14	0-2": Black stained and trace oil-like material (about 5%) 2-13.5": Trace tar-like material (about 5%) 13.5-24": Black to brown stained, odor	240 J [150 J]	110 J [19 J]
14-16			0-9": Black to brown stained, odor 9-24": Slight odor		
16-18			Slight odor, trace staining on exterior of sample (16-16.2")		
18-20	X	18-20	3-5": Sheen, slight odor	68	3.0
20-22			0-13": Slight odor, trace blebs of tar-like material @ 20' 13-24": Some odor		
22-24			0-18": Some odor 18-24": Trace tar-like material (droplets)		
24-26			Trace tar-like material		
30-32			6-24": Some odor, trace to no sheen and staining		
32-34			0-4": Some odor, trace to no sheen and staining 4-24": Tar-like material, trace sheen, odor @ 33.6'		
34-36			Tar-like material, trace sheen		
36-38			Tar-like material, sheen and odor		
38-40			Slight odor, trace sheen on outside of recovery		
40-44			Slight odor		
44-46			0-5": Slight odor		
48-50			Trace sheen on outside of recovery		

TABLE 2
SOIL SAMPLING LOCATIONS EXHIBITING NAPL, SHEENS, STAINING, OR ODORS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Sample ID/ Depth Interval (feet bgs)	Sample Analyzed / Sample Depth (feet bgs)		Description	Total PAHs (ppm)	Total BTEX (ppm)
SB-17					
8-10			12-24": Trace odor		
10-12			Trace odor		
12-14			Trace odor, sheen		
14-16			0-2": Trace odor 2-5": Some odor and sheen 5-24": Droplets of tar-like material, staining and odor, sheen throughout		
16-18			Droplets of tar-like material, staining, and odor, sheen throughout, brown saturated tar-like material @ 16.3'		
18-20			0-6": Droplets of tar-like material, staining, and odor, sheen throughout 6-24": Trace droplets of tar-like material, slight sheen and odor		
20-22			Some odor and staining		
22-24			0-14": Some odor and staining		
24-26			Mix of water and tar-like material (~%5), odor and sheen		
26-28			Some brown droplets on water surface		
28-30			Tar-like material (~5-10%), significant sheen @ 28'		
30-32			Odor and sheen, trace droplets/pockets of tar-like material		
32-34			0-15": Odor and sheen, trace droplets/pockets of tar-like material 15-24": Some droplets of tar-like material within spaces		
34-40			spaces		
40-42			0-16": Some droplets of tar-like material within spaces 16-24": Little pockets/droplets of tar-like material within spaces, odor, and staining and some sheen		
42-44			Little pockets/droplets of tar-like material within spaces, odor, and staining and some sheen		
44-46			0-5": Little pockets/droplets of tar-like material within spaces, odor, and staining and some sheen 5-24": Some pockets of tar-like material and odor		
46-52			Some pockets of tar-like material and odor		

TABLE 2
SOIL SAMPLING LOCATIONS EXHIBITING NAPL, SHEENS, STAINING, OR ODORS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Sample ID/ Depth Interval (feet bgs)	Sample Analyzed / Sample Depth (feet bgs)		Description	Total PAHs (ppm)	Total BTEX (ppm)
SB-17 (cont'd)					
52-54			0-18": Some pockets of tar-like material and odor 18-23": Little pockets of tar-like material, sheen and odor 23-24": Slight odor		
54-56			0-16": Some pockets of tar-like material and odor 16-24": Little pockets of tar-like material, sheen and odor		
56-62			Little pockets of tar-like material, sheen and odor		
62-64			0-3.5": Little pockets of tar-like material, sheen and odor 3.5-18": Few pockets of brown NAPL with sheen on water outside of recovery, some odor, trace staining		
SB-18					
24-26	X	24-26	Little tar-like material (droplets within pore space), odor and sheen	150 [190]	11 [0.31 J]
26-38			Little tar-like material (droplets, about 1%), odor and sheen		
38-40			0-6": Little tar-like material (droplets, about 1%), odor and sheen 6-24": Trace tar-like material and sheen, slight odor		
42-44			Trace tar-like material and sheen, slight odor		
SB-19					
0.5-4			Slight odor (tar)		
24-28			Trace sheen		
28-30			0-12": Trace sheen		
SB-20					
- -			- -		
SB-21					
0.5-2			Slight odor		
8-10			18-24": Slight petroleum like odor		
10-12			Petroleum like odor		
14-16	X	14-16	Petroleum like odor	57 J	1.3 J
16-18			0-17.4": Petroleum like odor 17.4-24": Dark gray stained, slight petroleum like odor		
18-20			12-24": Gray to brown stained		
20-22	X	20-22	0-21": Gray to brown stained 21-24": Petroleum like odor	64 J	13 J
22-24			Slight petroleum like odor		
24-26			0-26": Slight petroleum like odor 26-28": Petroleum like odor		
26-28			Petroleum like odor		

TABLE 2
SOIL SAMPLING LOCATIONS EXHIBITING NAPL, SHEENS, STAINING, OR ODORS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Sample ID/ Depth Interval (feet bgs)	Sample Analyzed / Sample Depth (feet bgs)		Description	Total PAHs (ppm)	Total BTEX (ppm)
SB-21 (cont'd)					
28-30			Slight odor, sheen		
30-32			Tiny blebs of oil-like material, petroleum like odor, sheen		
32-34			Very small blebs of oil-like material, petroleum like odor		
34-36			Little blebs of oil-like material, petroleum like odor, sheen, small blebs of tar-like material @ 36'		
36-38			Little blebs of oil-like material, petroleum like odor, sheen		
38-40			0-14": Little blebs of oil-like material, petroleum like odor, sheen 14-24": Petroleum like odor		
48-50			Slight organic matter odor @ 48'		
SB-22					
- -			- -		
SB-23					
- -			- -		
SB-24					
- -			- -		
SB-25					
- -			- -		
SB-26					
- -			- -		
SB-27					
20-21.2	X	20-21.2	Coal tar like odors and sheen	32 J	
SB-28/SB-28A					
- -			- -		
TP-1					
2.5-5	X	5	Some gray-black staining	140 J	8.5 J
6-7			Faint odor, black staining		
7-8	X	8	Thick oily liquid, odors	1,300 J	230
8-9			Black stained fill materials, wood planks (4x6 possibly railroad ties?)		
TP-2					
6-7			Some black staining (coal, cinders, and/or asphalt), evident - shiny appearance		
TP-2A					
5-10	X	6 & 10	Trace black "staining" from coal or cinders(?) - oil not evident	280 J & 270 J [190 J]	<0.012 & 0.0010 J [0.0020 J]
WB-1					
12-14	X	14	Brown stains	NA	0.0050 J
34-38	X	38	Trace stain	NA	0.0010 J
39-40			Trace stain		
40-44	X	44	Stained	NA	0.049 J
44-51	X	46	Brown stains	NA	0.058
54-60			Stained		
60-77			Sheen		

TABLE 2
SOIL SAMPLING LOCATIONS EXHIBITING NAPL, SHEENS, STAINING, OR ODORS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Sample ID/ Depth Interval (feet bgs)	Sample Analyzed / Sample Depth (feet bgs)		Description	Total PAHs (ppm)	Total BTEX (ppm)
WB-1 (cont'd)					
80-82			Some sheens		
82-84			Little sheens, odor		
84-86	X	86	Sheens	NA	81
WB-2					
8.5-14			Sheens		
14-16			Sheens and brown spots		
16-18.5			Strong odor and sheens		
22-23			Odor		
23-26			Trace of black sheen		
28-29			Sheens		
32-34			Slight septic odor		
34-40	X	38	Slight odor	NA	0.010 J
44-45			Trace sheen		
47			Trace of free phase		
48.5-49			Trace of free phase		
54-60			Scattered free phase		
60-62			Trace free phase in seams		
62-64			Sheen		
64-66	X	66	Scattered free phase layers 1"	NA	9.1 J
66-66.5			Free phase		
70.5-71			Free phase		
72-76			Free phase		
76.75-77			Free phase		
81			2" free phase on top of silt at 81'		
84-88	X	88	Sheen, free phase	NA	13
WB-3					
13-22	X	14	Sheens	NA	<0.030
22-28			Strong Sheen		
28-40	X	32	Sheens	NA	12
40-44			Slight sheen		
44-46.5			Little stains		
46.5-50			Trace odor		
50-52			Trace odor, 2" gravel layer stained		
52-58	X	53.5	Trace odor, stains	NA	27
58-61			Slight odor		
61-68			Very slight odor		
68-70			Tace sheen		
WB-4					
3.5-6	X	6	Black silt with odor	NA	<0.0060
6-10	X	8	Odor and sheen	NA	0.76 J
10-14			Sheen, free phase, odors		
14-21			Stain, sheen, free phase, purifier odor		
21-28	X	22	Brown stain, sheen, free phase, odor	NA	32 J
28-32			Brown stain, sheen, free phase, odor, center appears clean		
39-42	X	40	Free phase, odor, sheen	NA	0.09
42-46			Stained, odor, sheen		
46-48			Odor		
56-61			Brown stains		
62-64			Sheens		

TABLE 2
SOIL SAMPLING LOCATIONS EXHIBITING NAPL, SHEENS, STAINING, OR ODORS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Sample ID/ Depth Interval (feet bgs)	Sample Analyzed / Sample Depth (feet bgs)		Description	Total PAHs (ppm)	Total BTEX (ppm)
WB-5					
3-6.5	X	6	Trace coal, 1" layer of yellow cinders	NA	0.0050 J
6.5-7			Sewer odor		
13-21			Slight odor		
24-36			Slight odor		
WB-6					
10-15			Odor, stained (10.5-14.75)		
16-19	X	16	Stained	NA	67
19-20			Thick black free phase		
22-24			Sheen		
24-26			Brown free phase		
26-28			Sheen		
28-30			Sheen and odor		
30-32	X	32	Heavy sheen, little free phase	NA	250
32-34			Free phase		
34.3-38.25			Heavy sheen		
40-44			Sheen		
44-48			Trace sheen		
MW-1D					
18-20	X	20	Some staining	21 J	0.0020 J
26-28			Faint odor, faint sheen.		
28-30			Sheen, trace petroleum droplets		
30-34	X	32	Little oily stringers	0.93 J	0.0059 J
34-40	X	40	Faint odor	0.41 J	<0.0012
50-52			Trace to no sheen		
MW-2					
- -			- -		
MW-3D					
30-32	X	32	Trace sheen, faint odor	0.069 J	<0.058
32-34	X		Fainter odor		
MW-4S/4D					
8-10			Black cinder/asphalt-like material		
10-14	X	12 & 14	Thick oily liquid, odor	47,000 J & 12,000 J	470 & 330
14-16			Staining, some thick oily stringers		
16-18			Oily liquid, odors		
18-24			Oily liquid		
24-26			Thick oily liquid		
26-28			Oily liquid		
28-30			Oil and sheen		
30-34	X	30	Blue/black sheen, brown/black oil	190 J	19 J
34-36	X	36	Blue/black sheen, brown/black oil (decreasing with depth)	150 J	31
36-38			Some oil and sheen (more at top)		
38-55			Product saturated		
55-69	X	65-67	Strong odor	6.8 J	0.13
69-71	X	69-71	Sheen noted	3.1 J	0.048 J
71-83	X	75-77	Strong odor and sheen noted	19 J	0.021 J
83-85			Slight odor and sheen noted		
85-103			Sheen noted		

TABLE 2
SOIL SAMPLING LOCATIONS EXHIBITING NAPL, SHEENS, STAINING, OR ODORS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Sample ID/ Depth Interval (feet bgs)	Sample Analyzed / Sample Depth (feet bgs)		Description	Total PAHs (ppm)	Total BTEX (ppm)
MW-6					
34-36	X	36	Faint odor, faint (trace) sheen	0.42 J	<0.056
36-38			Very faint odor		
MW-7S/7D					
6-8			Coal, faint odor		
10-12			Black staining of soil, and thick oily smearing		
12-14			Black stained, oil (black stringers),		
14-16	X	16	Brown stained, little visible thick black oily substance, strong odor	510 J [840 J]	61 [32]
16-18	X	18	Some staining, lenses or bubbles of brown oil throughout, odor	130 J	2.5 J
18-22			Little visible brown oil, odor		
22-24			Little staining		
24-26			Sheen, odor, oily stringers		
26-28			Sheen, odor, oily stringers, more visible oil		
28-30			Sheen		
30-32			Black free product		
32-34	X	32-34	Strong odor and sheen noted	430 J	2.6 J
35-55			Slight odor		
MW-8S/8D					
30-32			Faint odor, trace brown oily stringers, trace sheen		
32-34			Oily stringers, odor		
34-38	X	36	Sheen, little to trace oil, odor	89 J	1.6 J
38-44			Rust-colored oily coating on outside of spoon, little to some visible inside, sheen		
44-46			Sheen, little oily stringers		
46-48			Sheen, little oily stringers (decreasing with depth)		
48-50			Trace oily stringers, little sheen		
50-52			Trace sheen, faint odor		
52-56			Trace sheen		
56-60	X	60	Little sheen	3.3 J	0.011
60-66			Trace sheen		
MW-9D_1/9D_2					
77-103	X	93-95	Strong odor	8.5 J	0.86
103-113			Sheen and strong odor		
113-115	X	113-115	Sheen and brown stringers noted	17 J	0.024 J
115-119			Strong odor		
121-123			Strong odor		
MW-10D					
73-75	X	73-75	Slight odor	0.45 J	0.0050 J
75-82			Strong odor		
85-89			Strong odor		
MW-11D					
68-75	X	67-69	Strong odor	1.1	0.047 J
77-89	X	83-85	Strong odor	4.5 J [9.2 J]	0.21 J [0.20 J]
MW-12D					
- -			- -		

TABLE 2
SOIL SAMPLING LOCATIONS EXHIBITING NAPL, SHEENS, STAINING, OR ODORS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Sample ID/ Depth Interval (feet bgs)	Sample Analyzed / Sample Depth (feet bgs)		Description	Total PAHs (ppm)	Total BTEX (ppm)
MW-13D					
- -			- -		
MW-14D					
2-4			Slight oily odor at bottom		
30-32	X	30-32	Strong organic odor	9.8 J [18 J]	0.027 J [0.012 J]
74-76			Slight organic odor		
76-78	X	76-78	Slight MGP odor	0.66 J	0.0035 J
78-80			Stronger MGP odor		
80-82			MGP odor		
82-84	X	82-84	Slight sheen	1.2 J	0.082
84-90	X	88-90	Slight MGP odor	5.0 J	0.039 J
MW-15D					
76-82	X	76-78	Slight MGP odor	0.19 J	0.033 J
84-86			Slight MGP odor		
88-96	X	88-90 & 94-96	MGP odor	7.6 J & 8.0 J	0.41 J & 0.18 J
96-102			Slight MGP odor		
102-104	X	102-104	Less MGP odor	5.7 J [4.7 J]	0.15 [0.19]
MW-16D					
46-48			Slight organic/swampy odor		
48-50			Slight organic odor		
62-76	X	70-72	Slight organic odor	1.6 J	0.0015 J
78-84	X	80-82	Organic odor	2.2	0.00090 J
84-88			Slight organic odor		
94-98			Slight organic odor		
MW-17D					
2-4			Bottom 4" black ash		
8-12	X	10-12	Black ash	14 J	<0.0060
16-18			Trace ash		
22-24			Slight organic odor		
58-60			Slight organic odor		
60-62	X	60-62	Organic sulfur odor	0.089 J	<0.0060
62-64			Organic odor		
64-70	X	68-70	Slight MGP odor	0.26 J	0.15 J
70-78	X	74-76	MGP odor	0.13 J	0.64 J
78-80			Slight MGP odor		
80-86	X	80-82	MGP odor	0.16 J [< 0.37]	1.5 J [<0.0060]
86-92	X	86-88	Diminishing MGP odor	10	0.41
92-94	X	92-94	Slight MGP odor	0.019 J	0.028 J
94-100	X	98-100	Less MGP odor	0.47 J	0.15
MW-18D					
10-12	X	10-12	Little wood chips	<0.48	<0.0070
14-16			Trace wood chips		
42-46			Slight odor		
46-48			Less odor		
60-64			Slight odor		
64-66	X	64-66	Medium odor	0.047	0.083
66-70			Slight odor		

TABLE 2
SOIL SAMPLING LOCATIONS EXHIBITING NAPL, SHEENS, STAINING, OR ODORS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Sample ID/ Depth Interval (feet bgs)	Sample Analyzed / Sample Depth (feet bgs)		Description	Total PAHs (ppm)	Total BTEX (ppm)
MW-19					
14-16			Dark brown stained, petroleum like odor, slightly stained @ 14'		
16-18			Dark brown stained, petroleum like odor		
18-20			Partly saturated with oil-like material, strong petroleum like odor		
20-22			Partly saturated to saturated with oil-like material, strong petroleum like odor, scarce small blebs of tar-like material, sheen		
22-24			0-21": Partly saturated to saturated with oil-like material, strong petroleum like odor, scarce small blebs of tar-like material, sheen 21-24": Dark gray to gray/black stained, parts partly saturated with oil-like material, scarce very small tar-like blebs, sheen		
24-26			0-21": Dark gray to gray stained, parts partly saturated with oil-like material, scarce very small tar-like blebs, sheen 21-24": Slight petroleum like odor		
26-28			Tar-like blebs located in the space between crushed shale fragments, petroleum like odor, sheen		
28-30			Organic like odor and sheen at the tip		
PZ-1, PZ-2, and PZ-3					
All Intervals			No NAPL, sheens, staining, or odors		

TABLE 2
SOIL SAMPLING LOCATIONS EXHIBITING NAPL, SHEENS, STAINING, OR ODORS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
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Notes:

1. All samples were collected by ARCADIS from 1995-2008, except for samples collected from the wall borings (designated by the sample pre-fix "WB-"), which were collected by Engineering-Science (1995).
2. Subsurface drilling/excavation activities were performed by the following:
   - Wall borings by Northstar Drilling from March 1995 to April 1995.
   - Monitoring wells by Alliance Environmental, Inc. of Marietta, Ohio, during June 1997.
   - Soil borings, monitoring wells, and test pits by Parratt-Wolff, Inc. (Parratt-Wolff) of East Syracuse, New York, from August 1995 to June 2008, excluding borings from June 1997.
3. Only those intervals where non-aqueous phase liquid (NAPL), sheens, staining, or odors were identified are summarized.
4. bgs = below ground surface.
5. The intervals presented in the column titled "Description" are reported in inches and refer to the portion of the 24-inch sampling interval where NAPL, sheens, staining, or odors were observed (0" refers to the top of the interval, and 24" refers to the bottom of the interval.
6. BTEX = Benzene, toluene, ethylbenzene and xylenes.
7. PAHs = Polycyclic aromatic hydrocarbons.
8. Samples collected in 1995 and designated by the pre-fix "WB-" were analyzed by Galson Laboratories, Inc. of East Syracuse, New York, and all other samples collected between 1995 and 1999 were analyzed by Industrial and Environmental Analysts, Inc. (IEA) of Monroe, Connecticut. Analysis was performed for:
   - BTEX using United States Environmental Protection Agency (USEPA) SW-846 Method 8240.
   - PAHs using USEPA SW-846 Method 8270.
9. Samples collected from year 2000 to present were analyzed by TestAmerica Laboratories, Inc. (TestAmerica) located in Shelton, Connecticut for:
   - BTEX using USEPA SW-846 Method 8260B.
   - PAHs using USEPA SW-846 Method 8270C.
10. All concentrations reported in dry weight parts per million (ppm), which is equivalent to milligrams per kilogram (mg/kg).
11. Field duplicate sample results are presented in brackets.
12. - - = no NAPL, sheens, staining, or odors identified.
13. Data qualifiers are defined as follows:
    < - Constituent not detected at a concentration above the reported detection limit.
    J - Indicates that the associated numerical value is an estimated concentration.
14. NA = Not Analyzed.
15. The analytical results have been validated in accordance with USEPA National Functional Guidelines of October 1999.

TABLE 3
MONITORING WELL AND PIEZOMETER CONSTRUCTION DETAILS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Location ID	Major Material Screened/ Location	Date Completed / Date Modified	Easting Coordinate	Northing Coordinate	Measuring Point Elev.	Ground Surface Elev.	Stickup Length	Well Diam.	Casing/Screen Type	Screen Slot Size	Screen Length	Depth to Screened Interval (ft. bgs)		Well Depth (Bottom of Sump)	Boring Depth	Type of Hyraulic Conductivity Slug Test		Estimated Hydraulic Conductivity (K)	Estimated Hydraulic Conductivity (K)
			ft. NAD 83	ft. NAD 83	ft. NAVD 88	ft. NAVD 88	ft. ags	in.		in.	ft.	Top	Bottom	ft. bgs	ft. bgs	In	Out	cm/sec	ft/day
MW-1S	silt and sand	8/9/1995 4/25/2008	933981.318	1112516.959	390.82 390.76	391.23 391.35	- -	2	PVC	0.01	10	18	28	30	31	- -	- -	- -	- -
MW-1D	gravel and sand	8/9/1995	933972.92	1112514.38	390.49	391.14	- -	2	PVC	0.01	10	48	58	60	61	- -	- -	- -	- -
MW-2	sand and gravel	7/26/1995 4/25/2008	934300.4021	1112430.283	391.16 391.35	391.50 391.95	- -	2	PVC	0.01	10	22	32	34	35	- -	- -	- -	- -
MW-3S	gravel	7/21/1995	934544.5871	1112288.626	395.26	395.70	- -	2	PVC	0.01	10	26	36	38	42	- -	- -	- -	- -
MW-3D	gravel, intermittent silt and sand	7/26/1995	934541.9985	1112284.313	395.68	395.70	- -	2	PVC	0.01	10	48	58	60	61	- -	- -	- -	- -
MW-4S	gravel, brick fragments, and sand	8/17/1995	933899.634	1112319.863	388.74	389.54	- -	2	PVC	0.01	10	18	28	30	31	X	X	2.50 E-02 1.13 E-02	71 32
MW-4D	sand and trace silt	6/12/1997	933888.279	1112317.588	389.12	389.47	- -	2	PVC	0.01	10	125	135	137	145	X	X	2.12 E-02 2.41 E-02	60 68
MW-6	gravel and sand	7/28/1995	934515.4938	1112113.713	400.71	398.20	- -	2	PVC	0.01	10	28	38	40	41	- -	- -	- -	- -
MW-7S	silt, sand, and gravel	8/7/1995	933931.229	1112127.993	388.22	388.41	- -	2	PVC	0.01	10	18	28	30	30	X	X	1.44 E-03 5.28 E-03	4.1 15
MW-7D	sand and gravel	6/16/1997	933916.115	1112120.659	387.98	388.32	- -	2	PVC	0.01	10	65	75	77	95	X	X	3.17 E-01 5.33 E-01	898 1,510
MW-8S	sand and gravel	8/4/1995	934008.009	1111946.163	398.06	398.41	- -	2	PVC	0.01	10	28	38	40	40	X	X	1.24 E-02 2.35 E-03	35 6.7
MW-8D	gravel	8/2/1995	934001.241	1111945.191	398.09	398.40	- -	2	PVC	0.01	10	53	63	65	65	X	X	9.04 E-04 6.30 E-04	2.6 1.8
MW-9D$_1$	gravel	6/21/1997	933864.916	1112588.422	397.92	398.32	- -	2	PVC	0.01	10	75	85	87	87	X	X	4.87 E-01 4.13 E-01	1,380 1,170
MW-9D$_2$	sand	6/20/1997	933861.654	1112576.80	398.10	398.45	- -	2	PVC	0.01	10	145	155	157	170	- -	- -	- -	- -
MW-10S	silt, caly, sand, and gravel	10/18/1997	933972.441	1112849.10	394.37	394.77	- -	2	PVC	0.01	20	18	38	40	40	- -	- -	- -	- -
MW-10D	sand and gravel	6/17/1997	933975.533	1112859.735	394.49	394.84	- -	2	PVC	0.01	10	115	125	127	155	X	X	2.04 E-01/1.67 E-01 3.17 E-01/4.06 E-01	577/474 899/1,150
MW-11D	gravel	6/18/1997	934182.785	1112723.90	394.50	392.18	2.3	2	PVC	0.01	10	80	90	92	95	X	X	2.58 E-01/2.56 E-01 4.80 E-01/1.32	732/726 1,360/3,730
MW-12D	silt, sand, and gravel	6/19/1997	933568.39	1112372.87	399.24	399.60	- -	2	PVC	0.01	10	90	100	102	102	- -	- -	- -	- -
MW-13D	clay, silt, sand, and gravel	9/20/2000	934414.121	1113019.036	399.05	397.05	2.0	2	PVC	0.01	10	38	48	50	62	X	X	1.58 E-02 1.38 E-02	45 39
MW-14D	clay, silt, and gravel	9/25/2000	933974.166	1113332.273	398.27	396.42	1.8	2	PVC	0.01	10	78	88	90	100	X	X	1.69 E-03 1.92 E-03	4.8 5.4
MW-15D	clay, silt, sand, and gravel	9/29/2000	933665.824	1112944.434	398.82	399.37	- -	2	PVC	0.01	10	80	90	94	122	X	X	1.58 E-01 2.28 E-01	449 646
MW-16D	clay, silt, sand, and gravel	10/5/2000	933308.141	1112889.647	398.80	399.30	- -	2	PVC	0.01	10	80	90	92	120	X	X	9.14 E-02 1.80 E-01	259 510

TABLE 3
MONITORING WELL AND PIEZOMETER CONSTRUCTION DETAILS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Location ID	Major Material Screened/ Location	Date Completed / Date Modified	Easting Coordinate	Northing Coordinate	Measuring Point Elev.	Ground Surface Elev.	Stickup Length	Well Diam.	Casing/Screen Type	Screen Slot Size	Screen Length	Depth to Screened Interval (ft. bgs)		Well Depth (Bottom of Sump)	Boring Depth	Type of Hyraulic Conductivity Slug Test		Estimated Hydraulic Conductivity (K)	Estimated Hydraulic Conductivity (K)
			ft. NAD 83	ft. NAD 83	ft. NAVD 88	ft. NAVD 88	ft. ags	in.		in.	ft.	Top	Bottom	ft. bgs	ft. bgs	In	Out	cm/sec	ft/day
MW-17D	sand, gravel, and silt	10/10/2000	933405.808	1113578.118	387.63	388.18	- -	2	PVC	0.01	10	80	90	92	120	X	X	1.81 E-01/1.25 E-01 1.68 E-01/1.59 E-01	514/354 477/452
MW-18D	clay, silt, sand, and gravel	9/4/2002	933063.7243	1114158.684	376.31	376.66	- -	2	PVC	0.01	10	60	70	72	94	X	X	1.07 E-03 1.42 E-03	3.0 4.0
MW-19	sand	6/9/2008	933901.758	1112417.16	390.73	391.12	- -	4	PVC	0.02	10	18	28	30	30	- -	- -	- -	- -
PZ-1	clay, silt, sand, and gravel	10/2/2000	934148.087	1112785.728	376.99	374.13	2.9	2	PVC	0.01	10	5	15	15	15	- -	- -	- -	- -
PZ-2	sand and gravel	10/2/2000	934150.981	1112770.941	378.70	376.01	2.7	2	PVC	0.01	10	5	15	15	18	- -	- -	- -	- -
PZ-3	sand and gravel	10/3/2000	934169.381	1112745.13	393.94	392.14	1.8	2	PVC	0.01	15	21	36	36	36	- -	- -	- -	- -

Notes:
1. NAVD 88 = North American Vertical Datum (NAVD) of 1988, based on NGS Station S-34, elevation 405.340 feet.
2. NAD 83 = North American Datum (NAD) of 1983, New York State Plane (Central-3102), in U.S. survey feet.
3. ags = above ground surface.
4. bgs = below ground surface.
5. Wells MW-1S and MW-2 were modified on April 25, 2008 so that the cover for each well is flush with new asphalt pavement installed in Fall 2007. Casings were extended and new curb boxes were installed. Wells were resurveyed on May 12, 2008.

TABLE 4
WATER LEVEL DATA

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Refer to Page 2 for Groundwater Elevations

Location	Reference Point Elevation	Depth to Groundwater (feet bmp)																					
		8/30/1995	11/14/1995	7/8/1997	9/8/1997	2/28/2002	3/1/2002	3/21/2002	4/16/2002	4/24/2002	5/17/2002	5/24/2002	6/14/2002	6/22/2002	7/11/2002	7/26/2002	8/1/2002	9/5/2002	11/4/2002	11/11/2002	1/17/2003	4/7/2008 4/8/2008	1/31/2013
MW-1S (thru 4/25/08)	390.82	22.91	21.93	22.12	22.58	21.61	21.66	21.78	20.77	21.32	20.55	20.99	20.61	20.95	21.81	22.08	22.09	22.32	NM	21.71	21.47	26.12	- -
MW-1S (after 4/25/08)	390.76	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	22.51
MW-1D	390.49	22.97	22.02	22.4	22.68	NM	NM	NM	NM	20.83	20.18	20.86	20.47	20.54	21.39	21.67	21.66	21.91	NM	22.13	21.06	25.65	22.12
MW-2 (thru 4/25/08)	391.16	23.13	22.16	22.68	22.94	NM	NM	NM	NM	22.03	21.29	21.68	21.99	21.65	22.54	22.79	22.78	23.04	22.89	22.84	22.19	- -	- -
MW-2 (after 4/25/08)	391.35	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	23.09
MW-3S	395.26	27.03	26.07	26.54	26.85	NM	NM	NM	NM	25.96	25.16	25.58	25.95	25.56	NM	26.66	26.68	26.89	27.19	26.73	26.10	30.78	- -
MW-3D	395.68	27.48	26.5	26.95	27.5	NM	NM	NM	NM	26.36	25.60	26.02	26.36	25.97	NM	27.09	27.10	27.37	27.89	27.18	26.52	31.18	- -
MW-4S	388.74	20.44	19.48	18.45	20.21	19.54	19.58	19.71	18.76	19.27	18.51	18.91	18.42	18.89	19.72	19.99	19.99	20.27	20.13	20.05	19.41	24.06	20.51
MW-4D	389.12	- -	- -	18.42	23.85	24.91	24.67	24.24	20.20	18.87	19.42	19.83	19.25	17.93	18.08	18.15	18.10	18.62	17.96	18.24	17.65	20.85	16.89
MW-6	400.71	32.56	31.61	31.97	32.39	NM	NM	NM	NM	24.40	30.69	31.05	30.96	31.08	31.94	32.21	32.20	32.45	32.35	32.29	31.63	36.30	32.69
MW-7S	388.22	19.94	18.98	18.13	19.71	19.05	19.16	19.20	18.24	18.73	17.98	15.75	17.35	18.39	19.26	19.34	19.52	19.78	19.68	19.57	18.90	23.47	19.87
MW-7D	387.98	- -	- -	19.25	20.09	19.37	19.38	19.50	18.49	18.99	17.98	18.36	18.41	17.97	18.80	19.08	19.06	19.31	19.20	19.22	18.56	23.33	19.65
MW-8S	398.06	29.72	28.76	28.86	29.57	28.84	28.88	28.99	28.05	28.54	27.81	28.22	28.58	28.19	29.04	29.29	29.31	29.56	29.45	29.33	28.71	33.22	29.81
MW-8D	398.09	30.13	28.79	29.12	29.66	28.86	28.92	29.02	28.08	28.59	27.80	28.20	28.57	28.19	29.09	29.30	29.31	29.56	29.45	29.37	28.80	33.41	29.95
MW-9D$_1$	397.92	- -	- -	29.95	30.21	NM	NM	NM	NM	28.53	27.77	28.25	28.50	29.24	29.80	29.22	29.25	29.49	29.61	29.61	28.75	33.50	- -
MW-9D$_2$	398.10	- -	- -	25.79	33.79	NM	NM	NM	NM	28.4	28.96	29.08	29.37	28.57	29.00	28.45	29.80	30.05	29.40	29.39	28.42	27.41	- -
MW-10S	394.37	- -	- -	25.72	25.87	25.21	25.24	25.34	21.26	21.80	24.28	24.67	24.98	24.56	22.25	25.68	25.68	25.92	25.81	25.82	25.09	29.70	- -
MW-10D	394.49	- -	- -	24.23	31	29.98	30.06	26.63	24.37	24.94	20.98	21.66	21.91	21.42	25.43	22.64	22.52	22.26	22.71	22.71	22.60	27.20	- -
MW-11D	394.50	- -	- -	25.94	27.89	27.24	27.25	27.34	26.44	26.98	26.26	26.60	26.96	26.81	27.45	27.63	27.65	27.86	27.74	NM	27.21	31.20	- -
MW-12D	399.24	- -	- -	26.7	32.05	NM	NM	NM	NM	NM	NM	NM	NM	NM	30.84	31.16	31.10	31.31	31.21	NM	30.92	34.30	- -
MW-13D	399.05	- -	- -	- -	- -	NM	NM	NM	NM	29.62	28.82	29.26	29.40	28.25	NM	30.35	30.36	30.58	30.49	NM	29.80	34.28	- -
MW-14D	398.27	- -	- -	- -	- -	NM	NM	NM	NM	24.22	23.42	23.89	24.04	NM	NM	24.97	24.81	25.32	25.58	NM	24.25	28.17	- -
MW-15D	398.82	- -	- -	- -	- -	NM	NM	NM	NM	30.55	29.81	30.20	30.52	30.19	31.02	31.28	31.38	31.61	31.41	NM	31.15	35.03	- -
MW-16D	398.80	- -	- -	- -	- -	NM	NM	NM	NM	30.51	29.78	30.24	30.50	30.15	30.99	31.21	31.45	31.62	31.48	NM	31.17	34.92	- -
MW-17D	387.63	- -	- -	- -	- -	NM	NM	NM	NM	21.30	20.59	21.00	21.15	21.02	21.77	21.98	22.04	22.26	22.14	NM	21.80	23.18	- -
MW-18	376.31	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	7.60	11.01	NM	10.47	12.35	- -
MW-19	390.73	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	21.91
PZ-1	376.99	- -	- -	- -	- -	7.73	7.74	7.83	6.55	7.44	6.54	7.07	4.77	7.09	7.96	8.21	8.22	8.48	8.34	NM	7.65	- -	- -
PZ-2	378.70	- -	- -	- -	- -	9.43	9.42	9.55	8.25	9.05	8.25	8.78	6.80	8.81	9.88	9.90	9.96	10.21	10.09	NM	9.37	- -	- -
PZ-3	393.94	- -	- -	- -	- -	24.73	24.77	24.87	23.87	24.48	23.68	24.08	24.19	24.07	24.94	25.20	25.21	25.47	25.34	NM	24.62	- -	25.55
SG-1	384.55	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
SG-2	391.26	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

TABLE 4
WATER LEVEL DATA

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Refer to Page 1 for Depths to Groundwater

Location	Reference Point Elevation	Water Level Elevation (feet NAVD 88)																					
		8/30/1995	11/14/1995	7/8/1997	9/8/1997	2/28/2002	3/1/2002	3/21/2002	4/16/2002	4/24/2002	5/17/2002	5/24/2002	6/14/2002	6/22/2002	7/11/2002	7/26/2002	8/1/2002	9/5/2002	11/4/2002	11/11/2002	1/17/2003	4/7/2008 4/8/2008	1/31/2013
MW-1S (thru 4/25/08)	390.82	367.91	368.89	368.70	368.24	369.21	369.16	369.04	370.05	369.50	370.27	369.83	370.21	369.87	369.01	368.74	368.73	368.50	- -	369.11	369.35	364.70	- -
MW-1S (after 4/25/08)	390.76	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	368.25
MW-1D	390.49	367.52	368.47	368.09	367.81	- -	- -	- -	- -	369.66	370.31	369.63	370.02	369.95	369.10	368.82	368.83	368.58	- -	368.36	369.43	364.84	368.37
MW-2 (thru 4/25/08)	391.16	368.03	369.00	368.48	368.22	- -	- -	- -	- -	369.13	369.87	369.48	369.17	369.51	368.62	368.37	368.38	368.12	368.27	368.32	368.97	- -	- -
MW-2 (after 4/25/08)	391.35	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	368.26
MW-3S	395.26	368.23	369.19	368.72	368.41	- -	- -	- -	- -	369.30	370.10	369.68	369.31	369.70	- -	368.60	368.58	368.37	368.07	368.53	369.16	364.48	- -
MW-3D	395.68	368.20	369.18	368.73	368.18		- -	- -	- -	369.32	370.08	369.66	369.32	369.71	- -	368.59	368.58	368.31	367.79	368.50	369.16	364.50	- -
MW-4S	388.74	368.30	369.26	370.29	368.53	369.20	369.16	369.03	369.98	369.47	370.23	369.83	370.32	369.85	369.02	368.75	368.75	368.47	368.61	368.69	369.33	364.68	368.23
MW-4D	389.12	- -	- -	370.70	365.27	364.21	364.45	364.88	368.92	370.25	369.70	369.29	369.87	371.19	371.04	370.97	371.02	370.50	371.16	370.88	371.47	368.27	372.23
MW-6	400.71	368.15	369.10	368.74	368.32	- -	- -	- -	- -	376.31	370.02	369.66	369.75	369.63	368.77	368.50	368.51	368.26	368.36	368.42	369.08	364.41	368.02
MW-7S	388.22	368.28	369.24	370.09	368.51	369.17	369.06	369.02	369.98	369.49	370.24	372.47	370.87	369.83	368.96	368.88	368.70	368.44	368.54	368.65	369.32	364.75	368.35
MW-7D	387.98	- -	- -	368.73	367.89	368.61	368.60	368.48	369.49	368.99	370.00	369.62	369.57	370.01	369.18	368.90	368.92	368.67	368.78	368.76	369.42	364.65	368.33
MW-8S	398.06	368.34	369.30	369.20	368.49	369.22	369.18	369.07	370.01	369.52	370.25	369.84	369.48	369.87	369.02	368.77	368.75	368.50	368.61	368.73	369.35	364.84	368.25
MW-8D	398.09	367.96	369.30	368.97	368.43	369.23	369.17	369.07	370.01	369.50	370.29	369.89	369.52	369.90	369.00	368.79	368.78	368.53	368.64	368.72	369.29	364.68	368.14
MW-9D$_1$	397.92	- -	- -	367.97	367.71	- -	- -	- -	- -	369.39	370.15	369.67	369.42	368.68	368.12	368.70	368.67	368.43	368.31	368.31	369.17	364.42	- -
MW-9D$_2$	398.10	- -	- -	372.31	364.31	- -	- -	- -	- -	369.70	369.14	369.02	368.73	369.53	369.10	369.65	368.30	368.05	368.70	368.71	369.68	370.69	- -
MW-10S	394.37	- -	- -	368.65	368.50	369.16	369.13	369.03	373.11	372.57	370.09	369.70	369.39	369.81	372.12	368.69	368.69	368.45	368.56	368.55	369.28	364.67	- -
MW-10D	394.49	- -	- -	370.26	363.49	364.51	364.43	367.86	370.12	369.55	373.51	372.83	372.58	373.07	369.06	371.85	371.97	372.23	371.78	371.78	371.89	367.29	- -
MW-11D	394.50	- -	- -	368.56	366.61	367.26	367.25	367.16	368.06	367.52	368.24	367.90	367.54	367.69	367.05	366.87	366.85	366.64	366.76	- -	367.29	363.30	- -
MW-12D	399.24	- -	- -	372.54	367.19	- -	- -	- -	- -	- -	- -	- -	- -	- -	368.40	368.08	368.14	367.93	368.03	- -	368.32	364.94	- -
MW-13D	399.05	- -	- -	- -	- -	- -	- -	- -	- -	369.43	370.23	369.79	369.65	370.80	- -	368.70	368.69	368.47	368.56	- -	369.25	364.77	- -
MW-14D	398.27	- -	- -	- -	- -	- -	- -	- -	- -	374.05	374.85	374.38	374.23	- -	- -	373.30	373.46	372.95	372.69	- -	374.02	370.10	- -
MW-15D	398.82	- -	- -	- -	- -	- -	- -	- -	- -	368.27	369.01	368.62	368.30	368.63	367.80	367.54	367.44	367.21	367.41	- -	367.67	363.79	- -
MW-16D	398.80	- -	- -	- -	- -	- -	- -	- -	- -	368.29	369.02	368.56	368.30	368.65	367.81	367.59	367.35	367.18	367.32	- -	367.63	363.88	- -
MW-17D	387.63	- -	- -	- -	- -	- -	- -	- -	- -	366.33	367.04	366.63	366.48	366.61	365.86	365.65	365.59	365.37	365.49	- -	365.83	364.45	- -
MW-18	376.31	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	368.71	365.3	- -	365.84	363.96	- -
MW-19	390.73	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	368.82
PZ-1	376.99	- -	- -	- -	- -	369.26	369.25	369.16	370.44	369.55	370.45	369.92	372.22	369.90	369.03	368.78	368.77	368.51	368.65	- -	369.34	- -	- -
PZ-2	378.70	- -	- -	- -	- -	369.27	369.28	369.15	370.45	369.65	370.45	369.92	371.90	369.89	368.82	368.80	368.74	368.49	368.61	- -	369.33	- -	- -
PZ-3	393.94	- -	- -	- -	- -	369.21	369.17	369.07	370.07	369.46	370.26	369.86	369.75	369.87	369.00	368.74	368.73	368.47	368.6	- -	369.32	- -	368.39
SG-1	384.55	- -	- -	- -	- -	NM	- -	370.63	- -	372.42	372.08	370.69	374.76	370.31	NM	NM	396.17	NM	- -	NM	NM	- -	- -
SG-2	391.26	- -	- -	- -	- -	NM	- -	396.85	371.71	370.08	371.13	370.05	373.79	369.52	NM	NM	368.47	NM	- -	NM	NM	- -	- -

TABLE 4
WATER LEVEL DATA

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Notes:

1. MW = Monitoring Well; S = Shallow Well; D = Deep Well; PZ = Piezometer.
2. All elevations are referenced to the North American Vertical Datum (NAVD) of 1988, based on United States Geologic Survey (USGS) Mon. #S-34.
3. Depth to water measurements are in feet below measuring point (bmp) (top of casing).
4. NM = Not measured.
5. - - = Data is not available.
6. Wells MW-1S and MW-2 were modified on April 25, 2008 so that the cover for each well is flush with new asphalt pavement installed in Fall 2007. Casings were extended and new curb boxes were installed. Wells were re-surveyed on May 12, 2008.

TABLE 5
GROUNDWATER QUALITY PARAMETERS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Sampling Location	Date	Temp. (°C)	pH (S.U.)	Cond. (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	Specific Gravity
MW-1S	8/30/1995	15.5	6.7	3.00	- -	- -	- -	- -
	11/20/1995	15.2	6.8	2.75	- -	- -	- -	- -
	7/10/1997	13.6	6.6	2.60	- -	- -	- -	- -
	9/9/1997	13.1	6.6	1.60	- -	- -	- -	- -
	11/8/2002	17.7	6.9	0.82	0.90	120	-52	- -
	1/29/2003	15.0	6.9	2.87	2.56	630	65	- -
	4/9/2008	11.5	7.3	6.75	3.26	0.00	58	1.00
	1/29/2013	14.0	7.0	6.23	1.19	2.76	66	1.00
MW-1D	8/30/1995	15.9	6.8	1.50	- -	- -	- -	- -
	11/20/1995	15.6	7.1	1.75	- -	- -	- -	- -
	7/10/1997	14.0	6.8	0.25	- -	- -	- -	- -
	9/9/1997	13.9	6.8	1.00	- -	- -	- -	- -
	11/8/2002	- -	7.2	11.30	0.51	>999	-339	- -
	1/29/2003	15.1	7.1	13.30	1.97	>999	-303	- -
MW-2	8/30/1995	15.0	7.4	0.75	- -	- -	- -	- -
	11/20/1995	12.7	7.0	0.76	- -	- -	- -	- -
	7/9/1997	13.9	7.3	0.80	- -	- -	- -	- -
	9/10/1997	13.0	7.1	2.30	- -	- -	- -	- -
	11/6/2002	17.8	7.4	2.40	0.87	15.0	-71	- -
	1/28/2003	16.3	7.4	3.15	2.5	737	-36	- -
	4/14/2008	11.7	7.2	2.39	7.35	1.29	96	1.00
	1/29/2013	15.0	7.8	0.81	1.17	3.31	-15	1.00
MW-3S	8/30/1995	14.3	6.8	0.70	- -	- -	- -	- -
	11/20/1995	11.8	7.4	0.88	- -	- -	- -	- -
	7/9/1997	14.3	7.5	1.50	- -	- -	- -	- -
	9/9/1997	13.0	6.8	1.60	- -	- -	- -	- -
	11/12/2002	18.4	7.3	2.88	0.96	42.4	13	- -
	1/17/2003	15.4	7.5	3.31	2.29	860	-52	- -
	4/9/2008	14.7	7.4	2.91	0.00	3.0	164	1.00
MW-3D	8/30/1995	13.6	7.2	1.40	- -	- -	- -	- -
	11/20/1995	11.8	7.4	1.25	- -	- -	- -	- -
	7/10/1997	14.1	7.3	2.00	- -	- -	- -	- -
	9/9/1997	13.2	7.8	3.3	- -	- -	- -	- -
	11/12/2002	16.7	7.1	3.62	0.59	177	-124	- -
	1/17/2003	14.8	7.3	4.39	2.82	>999	-90	- -
MW-4S	8/31/1995	16.1	6.9	1.50	- -	- -	- -	- -
	11/15/1995	13.1	7.7	1.25	- -	- -	- -	- -
	7/9/1997	15.9	7.2	2.00	- -	- -	- -	- -
	9/10/1997	13.4	7.2	3.50	- -	- -	- -	- -
	11/5/2002	15.7	7.2	3.95	0.51	0	-369	- -
	1/23/2003	14.4	7.2	7.37	1.59	907	-338	- -
	4/10/2008	13.0	6.7	7.12	0.00	1.52	-333	1.00
	1/29/2013	14.6	7.2	7.37	0.18	4.17	-334	1.00

TABLE 5
GROUNDWATER QUALITY PARAMETERS

NATIONAL GRID
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FEASIBILITY STUDY REPORT

Sampling Location	Date	Temp. (°C)	pH (S.U.)	Cond. (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	Specific Gravity
MW-4D	7/9/1997	13.9	7.2	2.00	- -	- -	- -	- -
	9/9/1997	12.8	7.3	4.00	- -	- -	- -	- -
	11/5/2002	14.1	6.7	>99.99	0.72	48.6	-177	- -
	1/23/2003	- -	- -	- -	- -	- -	- -	- -
MW-6	8/30/1995	15.1	6.6	0.70	- -	- -	- -	- -
	11/15/1995	10.1	7.4	0.79	- -	- -	- -	- -
	7/10/1997	17.1	6.6	1.30	- -	- -	- -	- -
	9/10/1997	- -	- -	- -	- -	- -	- -	- -
	11/12/2002	18.4	7.4	2.48	0.85	41.1	-137	- -
	1/23/2003	15.9	7.6	3.06	2.71	659	-102	- -
	4/9/2008	15.8	7.2	2.36	0.32	0.20	156	1.00
	1/29/2013	14.8	7.9	0.91	2.07	3.34	24	1.00
MW-7S	8/31/1995	15.9	6.7	2.10	- -	- -	- -	- -
	11/15/1995	9.9	6.8	1.22	- -	- -	- -	- -
	7/9/1997	14.4	7.3	5.00	- -	- -	- -	- -
	9/9/1997	13.0	7.5	7.00	- -	- -	- -	- -
	11/5/2002	17.9	7.1	2.70	0.54	89.7	-218	- -
	1/27/2003	14.3	7.0	18.80	2.46	>999	-138	- -
	4/10/2008	14.4	6.8	4.98	0.00	0.80	-307	1.00
	1/29/2013	14.3	7.0	10.67	0.2	4.01	-171	1.00
MW-7D	7/9/1997	13.7	7.4	4.90	- -	- -	- -	- -
	9/9/1997	13.0	7.4	5.00	- -	- -	- -	- -
	11/5/2002	14.7	6.6	61.00	0.56	55.2	-107	- -
	1/27/2003	12.3	6.9	74.10	1.33	449	-37	- -
MW-8S	8/30/1995	15.7	7.7	6.00	- -	- -	- -	- -
	11/15/1995	12.1	7.6	3.60	- -	- -	- -	- -
	7/8/1997	17.2	7.4	5.00	- -	- -	- -	- -
	9/9/1997	13.1	7.5	10.00	- -	- -	- -	- -
	11/5/2002	16.2	7.8	2.94	0.50	20.2	-261	- -
	1/28/2003	12.9	7.6	3.86	2.54	742	-219	- -
	4/9/2008	13.3	7.7	3.50	0.00	1.07	-99	1.00
	1/29/2013	13.7	7.9	2.18	0.28	3.92	-115	1.00
MW-8D	8/30/1995	15.5	7.3	3.00	- -	- -	- -	- -
	11/15/1995	11.9	7.4	1.25	- -	- -	- -	- -
	7/8/1997	18.0	7.1	1.90	- -	- -	- -	- -
	9/9/1997	13.0	7.3	2.30	- -	- -	- -	- -
	11/6/2002	15.8	7.2	4.97	0.67	76.1	-157	- -
	1/28/2003	13.9	7.1	6.90	2.42	830	-88	- -
$MW\text{-}9D_1$	7/9/1997	15.2	7.9	7.00	- -	- -	- -	- -
	9/8/1997	13.0	7.7	10.00	- -	- -	- -	- -
	11/6/2002	14.9	7.0	33.20	0.6	7.4	-345	- -
	1/21/2003	12.4	7.2	64.70	1.69	830	-247	- -
	4/10/2008	12.5	6.5	41.30	0.00	5.96	-317	1.00
	1/31/2013	11.0	7.1	16	0.39	4.55	-305	1.00

TABLE 5
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NATIONAL GRID
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Sampling Location	Date	Temp. (°C)	pH (S.U.)	Cond. (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	Specific Gravity
$MW\text{-}9D_2$	7/10/1997	13.7	6.2	5.00	- -	- -	- -	- -
	9/8/1997	12.9	6.9	6.00	- -	- -	- -	- -
	11/6/2002	13.7	6.8	>99.99	0.95	0.1	-96	- -
	1/21/2003	12.3	7.0	>99.99	1.06	384	-40	- -
MW-10S	7/9/1997	14.7	6.9	2.40	- -	- -	- -	- -
	9/8/1997	13.0	6.6	8.50	- -	- -	- -	- -
	11/7/2002	16.3	7.4	3.30	0.59	37.7	-143	- -
	1/22/2003	14.6	7.5	3.97	1.71	909	-83	- -
	4/10/2008	15.1	7.1	3.66	2.53	8.53	51	1.00
	1/28/2013	13.8	7.5	1.23	0.76	- -	82	1.00
MW-10D	7/9/1997	14.3	6.1	6.50	- -	- -	- -	- -
	9/8/1997	13.2	6.9	9.00	- -	- -	- -	- -
	11/7/2002	13.5	6.6	99.99	0.66	51.1	-134	- -
	1/22/2003	12.1	6.9	>99.99	0.6	>999	-60	- -
	4/10/2008	13.5	6.5	>99.99	0.00	15.4	-73	1.10
	1/28/2013	7.5	10.5	18.44	0.57	13.4	-3.4	1.00
MW-11D	7/8/1997	14.3	15.8	7.50	- -	- -	- -	- -
	9/10/1997	12.8	7.4	9.00	- -	- -	- -	- -
	11/7/2002	14.0	6.8	99.99	0.66	220	-350	- -
	1/16/2003	13.6	6.9	>99.99	0.9	290	-320	- -
	4/9/2008	13.9	6.8	99.99	0.00	11.2	-298	1.07
	1/31/2013	11.1	6.6	59.85	0.18	2.0	-214	1.03
MW-12D	7/8/1997	17.0	6.4	3.00	- -	- -	- -	- -
	9/8/1997	14.0	6.9	10.00	- -	- -	- -	- -
	11/7/2002	15.2	6.9	78.90	0.64	9.8	-125	- -
	1/16/2003	12.4	6.9	>99.99	1.18	268	-48	- -
	4/10/2008	13.0	6.2	>99.99	0.00	4.27	-72	1.07
	1/30/2013	12.6	7.0	63.82	1.47	109	13	1.03
MW-13D	11/7/2002	16.3	7.7	2.74	0.73	137	-290	- -
	1/22/2003	15.2	7.4	3.53	2.11	808	17	- -
	4/10/2008	10.0	7.6	3.37	2.78	2.32	126	0.99
MW-14D	11/8/2002	13.2	6.8	3.68	0.83	255	-124	- -
	1/16/2003	12.1	7.1	4.44	2.53	>999	-113	- -
	4/11/2008	12.0	6.3	3.89	0.00	44.1	-36	1.00
	1/30/2013	12.5	5.7	3.43	0.39	48.6	-397	1.00
MW-15D	11/12/2002	13.7	6.7	85.90	0.64	529	-156	- -
	1/21/2003	13.3	7.0	92.20	1.42	>999	-243	- -
	4/10/2008	13.4	7.0	>99.99	0.00	10.8	-304	1.05
	1/30/2013	13.4	7.3	57.91	0.2	32.2	-285	1.04
MW-16D	11/13/2002	15.9	6.8	69.10	0.64	0	-57	- -
	1/22/2003	14.6	7.0	56.40	1.4	649	-90	- -
	4/14/2008	13.4	6.5	>99.99	1.31	27.6	-85	1.04
	1/30/2013	14.7	7.1	33.96	0.23	49.6	-308	1.02

TABLE 5
GROUNDWATER QUALITY PARAMETERS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Sampling Location	Date	Temp. (°C)	pH (S.U.)	Cond. (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	Specific Gravity
MW-17D	11/13/2002	- -	6.7	>99.99	0.68	200	-61	- -
	1/21/2003	13.3	7.0	>99.99	0.9	>999	-86	- -
	4/11/2008	11.8	6.9	>99.99	0.00	35.6	-47	1.08
	1/30/2013	12.3	6.3	81.54	0.31	75.9	69	1.03
MW-18D	11/13/2002	9.9	6.8	>99.99	1.14	0	-69	- -
	1/23/2003	13.8	6.9	>99.99	1.41	926	-36	- -
	4/11/2008	12	6.9	>99.99	0.00	16.1	-51	1.07
	1/30/2013	13.5	8.1	97.70	0.26	323	-58	1.03

Notes:
1. Field parameters recorded immediately before groundwater samples were collected.
2. Temperature reported in degrees Celsius (°C).
3. pH reported in Standard Units (S.U.).
4. Specific Conductivity reported in milliSiemens per centimeter (mS/cm).
5. Dissolved Oxygen (DO) reported in milligrams per liter (mg/L).
6. Turbidity reported in Nephelometric Turbidity Units (NTU).
7. Oxidation/Reduction Potential (ORP) reported in millivolts (mV).
8. Specific gravity is at groundwater temperature.

TABLE 6
SOIL ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	SB-1		SB-2	SB-3		SB-4					SB-5			
Sample Depth(Feet):	Use SCOs	SCOs Commercial	30	36	30	30	36	10	20	28	42	50	8	22	44	50
Date Collected:	(bold)	(shade)	08/08/95	08/08/95	08/15/95	08/15/95	08/15/95	08/23/95	08/23/95	08/23/95	08/23/95	08/23/95	08/21/95	08/21/95	08/21/95	08/21/95
Detected VOCs																
1,1,1-Trichloroethane	0.68	500	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	<2.6 [<2.7]	NA	NA
1,1,2,2-Tetrachloroethane	- -	- -	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	<2.6 [<2.7]	NA	NA
1,1-Dichloroethane	0.27	240	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	<2.6 [<2.7]	NA	NA
1,2-Dichloroethane	0.02	30	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	**0.24 J [<2.7]**	NA	NA
1,2-Dichloropropane	- -	- -	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	<2.6 [<2.7]	NA	NA
2-Butanone	0.12	500	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	<2.6 [<2.7]	NA	NA
4-Methyl-2-pentanone	- -	- -	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	<2.6 [<2.7]	NA	NA
Acetone	0.05	500	**0.15**	NA	**0.18**	NA	**0.12 [0.048]**	NA	NA	**5.0**	NA	NA	NA	<2.6 [<2.7]	NA	NA
Benzene	0.06	44	<0.011	0.0070 J	<0.012	<0.012	<0.013 [<0.012]	**2.8**	**8.7**	**7.1**	**0.51 J**	**0.97 J**	<0.011	**2.1 J [1.1 J]**	**1.4**	0.0080 J
Bromodichloromethane	- -	- -	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	<2.6 [<2.7]	NA	NA
Bromomethane	- -	- -	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	<2.6 [<2.7]	NA	NA
Carbon Disulfide	- -	- -	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	<2.6 [<2.7]	NA	NA
Carbon Tetrachloride	0.76	22	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	**0.85 J [<2.7]**	NA	NA
Chlorobenzene	1.1	500	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	0.62 J [<2.7]	NA	NA
Chloroform	0.37	350	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	**0.50 J**	NA	NA	NA	**0.46 J [<2.7]**	NA	NA
Chloromethane	- -	- -	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	<2.6 [<2.7]	NA	NA
cis-1,3-Dichloropropene	- -	- -	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	<2.6 [<2.7]	NA	NA
Dibromochloromethane	- -	- -	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	<2.6 [<2.7]	NA	NA
Ethylbenzene	1	390	0.0020 J	0.15	<0.012	<0.012	<0.013 [<0.012]	**20**	**10**	**27**	**5.8**	**8.6**	0.0070 J	**28 [19]**	**2.1**	0.64
Isopropylbenzene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	500	0.0020 J	NA	0.0030 J	NA	0.0040 J [0.0030 J]	NA	NA	<1.4	NA	NA	NA	<2.6 [<2.7]	NA	NA
Styrene	- -	- -	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	<2.6 [<2.7]	NA	NA
Tetrachloroethene	1.3	150	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	0.45 J [<2.7]	NA	NA
Toluene	0.7	500	<0.011	<0.059	<0.012	<0.012	<0.013 [<0.012]	**0.94 J**	**11**	**8.6**	**0.78 J**	**3.2**	<0.011	**2.3 J [1.2 J]**	**2.1**	0.0050 J
trans-1,3-Dichloropropene	- -	- -	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	<2.6 [<2.7]	NA	NA
Trichloroethene	0.47	200	<0.011	NA	<0.012	NA	<0.013 [<0.012]	NA	NA	<1.4	NA	NA	NA	0.42 J [<2.7]	NA	NA
Xylenes (total)	0.26	500	0.0030 J	0.097	<0.012	<0.012	<0.013 [<0.012]	**21**	**28**	**50**	**8.6**	**18**	0.014	**43 [29]**	**2.1**	0.26
Total BTEX	- -	- -	0.0050 J	0.25 J	<0.012	<0.012	<0.013 [<0.012]	45 J	58	93	16 J	31 J	0.021 J	75 J [50 J]	7.7	0.91 J
Total VOCs	- -	- -	0.16 J	0.25 J	0.18 J	<0.012	0.12 J [0.051 J]	45 J	58	98 J	16 J	31 J	0.021 J	78 J [50 J]	7.7	0.91 J
Detected SVOCs																
2,4-Dichlorophenol	- -	- -	<0.36	NA	<0.40	NA	<0.39 [<0.37]	NA	NA	<38	NA	NA	NA	<36 [<37]	NA	NA
2,4-Dimethylphenol	- -	- -	<0.36	NA	<0.40	NA	<0.39 [<0.37]	NA	NA	<38	NA	NA	NA	<36 [<37]	NA	NA
2-Methylnaphthalene	- -	- -	<0.36	<1.8	<0.40	<0.38	<0.39 [<0.37]	1.5 J	57 J	73	22	40	0.94 J	210 [140]	6.2	11 J
2-Methylphenol	0.33	500	<0.36	NA	<0.40	NA	<0.39 [<0.37]	NA	NA	<38	NA	NA	NA	<36 [<37]	NA	NA
4,6-Dinitro-2-methylphenol	- -	- -	<0.88	NA	<0.98	NA	<0.94 [<0.89]	NA	NA	<92	NA	NA	NA	<88 [<89]	NA	NA
4-Methylphenol	0.33	500	<0.36	NA	<0.40	NA	<0.39 [<0.37]	NA	NA	<38	NA	NA	NA	<36 [<37]	NA	NA
Acenaphthene	20	500	<0.36	6.6	<0.40	<0.38	<0.39 [<0.37]	7.4 J	10 J	20 J	14	**38**	0.22 J	**75 [52]**	14	**130**
Acenaphthylene	100	500	<0.36	1.0 J	0.085 J	0.037 J	<0.39 [<0.37]	20	21 J	18 J	3.2 J	7.6 J	4.2	13 J [10 J]	2.1 J	33 J
Anthracene	100	500	0.099 J	3.3	0.018 J	<0.38	<0.39 [<0.37]	10	19 J	27 J	10	26	1.4 J	26 J [20 J]	6.5	70 J
Benzo(a)anthracene	1	5.6	0.056 J	**1.4 J**	<0.40	<0.38	<0.39 [<0.37]	**8.7**	**14 J**	**18 J**	**7.9 J**	**22**	**4.0**	**13 J [9.1 J]**	**3.0 J**	**38 J**
Benzo(a)pyrene	1	1	0.025 J	<1.8	<0.40	<0.38	<0.39 [<0.37]	**7.6 J**	**12 J**	**23 J**	**7.0 J**	**27**	**7.6**	**9.8 J [5.0 J]**	**2.6 J**	**31 J**
Benzo(b)fluoranthene	1	5.6	<0.36	0.36 J	<0.40	<0.38	<0.39 [<0.37]	**4.7 J**	**8.6 J**	**22 J**	**4.9 J**	**17 J**	**6.5**	**3.9 J [2.0 J]**	**1.1 J**	**12 J**
Benzo(g,h,i)perylene	100	500	<0.36	<1.8	<0.40	<0.38	<0.39 [<0.37]	<8.4	<75	4.7 J	1.6 J	8.2 J	0.69 J	<36 [<37]	0.52 J	5.5 J
Benzo(k)fluoranthene	0.8	56	<0.36	0.47 J	<0.40	<0.38	<0.39 [<0.37]	**7.4 J**	**10 J**	**12 J**	**5.5 J**	**22**	**7.2**	**6.5 J [3.2 J]**	**1.6 J**	**20 J**
Benzoic Acid	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl Alcohol	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Biphenyl	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	- -	- -	<0.36	NA	<0.40	NA	<0.39 [<0.37]	NA	NA	<38	NA	NA	NA	<36 [<37]	NA	NA
Butylbenzylphthalate	- -	- -	<0.36	NA	<0.40	NA	<0.39 [<0.37]	NA	NA	<38	NA	NA	NA	<36 [<37]	NA	NA
Carbazole	- -	- -	<0.36	NA	<0.40	NA	<0.39 [<0.37]	NA	NA	22 J	NA	NA	NA	2.2 J [2.3 J]	NA	NA
Chrysene	1	56	0.069 J	**1.3 J**	<0.40	0.013 J	<0.39 [<0.37]	**9.3**	**14 J**	**16 J**	**7.1 J**	**20**	**4.4**	**13 J [9.5 J]**	**2.9 J**	**37 J**
Dibenzo(a,h)anthracene	0.33	0.56	<0.36	<1.8	<0.40	<0.38	<0.39 [<0.37]	<8.4	<75	<38	<9.0	**2.7 J**	**0.50 J**	<36 [<37]	0.28 J	<74
Dibenzofuran	7	350	<0.36	NA	<0.40	NA	<0.39 [<0.37]	NA	NA	**17 J**	NA	NA	NA	4.4 J [3.0 J]	NA	NA
Diethylphthalate	- -	- -	<0.36	NA	<0.40	NA	<0.39 [<0.37]	NA	NA	<38	NA	NA	NA	<36 [<37]	NA	NA
Di-n-Butylphthalate	- -	- -	<0.36	NA	<0.40	NA	<0.39 [<0.37]	NA	NA	<38	NA	NA	NA	<36 [<37]	NA	NA
Fluoranthene	100	500	0.058 J	2.2	<0.40	<0.38	<0.39 [<0.37]	14	35 J	54	23	61	4.0	22 J [16 J]	5.7	68 J
Fluorene	30	500	<0.36	1.6 J	<0.40	<0.38	<0.39 [<0.37]	6.8 J	20 J	26 J	9.9	21	0.22 J	**42 [29 J]**	8.7	**79**
Indeno(1,2,3-cd)pyrene	0.5	5.6	<0.36	<1.8	<0.40	<0.38	<0.39 [<0.37]	<8.4	**5.0 J**	**11 J**	**3.6 J**	**15 J**	**1.9**	**2.8 J [<37]**	**0.87 J**	**8.8 J**
Naphthalene	12	500	<0.36	<1.8	<0.40	<0.38	<0.39 [<0.37]	**39**	**240**	**240**	**56**	**98**	1.8	**270 [180]**	8.3	**13 J**
Phenanthrene	100	500	0.12 J	13	<0.40	<0.38	<0.39 [<0.37]	31	67 J	82	33	84	2.0	100 [77]	22	**280**
Phenol	0.33	500	<0.36	NA	<0.40	NA	<0.39 [<0.37]	NA	NA	<38	NA	NA	NA	<36 [<37]	NA	NA
Pyrene	100	500	0.23 J	3.3	0.029 J	0.038 J	0.019 J [0.018 J]	14	38 J	39	18	53	4.6	35 J [25 J]	8.5	100
Total PAHs	- -	- -	0.66 J	35 J	0.13 J	0.088 J	0.019 J [0.018 J]	180 J	570 J	690 J	230 J	560 J	52 J	840 J [580 J]	95 J	940 J
Total SVOCs	- -	- -	0.66 J	35 J	0.13 J	0.088 J	0.019 J [0.018 J]	180 J	570 J	730 J	230 J	560 J	52 J	850 J [580 J]	95 J	940 J

TABLE 6
SOIL ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID: / Sample Depth(Feet): / Date Collected:	Unrestricted Use SCOs (bold)	Restricted Use SCOs Commercial (shade)	SB-7			SB-8				SB-9			SB-10			
			28 08/23/95	38 08/23/95	50 08/23/95	16 08/18/95	26 08/18/95	28 08/18/95	48 08/18/95	16 08/22/95	20 08/22/95	38 08/22/95	22 08/22/95	28 08/22/95	40 08/22/95	50 08/22/95
Detected VOCs																
1,1,1-Trichloroethane	0.68	500	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	0.26 J	NA	NA
1,1,2,2-Tetrachloroethane	- -	- -	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
1,1-Dichloroethane	0.27	240	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
1,2-Dichloroethane	0.02	30	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
1,2-Dichloropropane	- -	- -	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
2-Butanone	0.12	500	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
4-Methyl-2-pentanone	- -	- -	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
Acetone	0.05	500	**2.0 E**	NA	NA	NA	**0.13**	NA	NA	NA	NA	**0.69**	NA	<1.4	NA	NA
Benzene	0.06	44	<0.023	<0.012	<0.011	0.043	0.014	0.0020 J	0.0030 J	<0.013	<0.011	0.0040 J	<0.010	**0.37 J**	<0.011	<0.056
Bromodichloromethane	- -	- -	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
Bromomethane	- -	- -	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
Carbon Disulfide	- -	- -	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
Carbon Tetrachloride	0.76	22	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
Chlorobenzene	1.1	500	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
Chloroform	0.37	350	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	0.013 J	NA	<1.4	NA	NA
Chloromethane	- -	- -	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
cis-1,3-Dichloropropene	- -	- -	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
Dibromochloromethane	- -	- -	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
Ethylbenzene	1	390	<0.023	<0.012	<0.011	0.21	0.023	0.0040 J	0.0010 J	0.25	0.00050 J	0.15	<0.010	**5.4**	0.59 D	0.020 J
Isopropylbenzene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	500	0.0070 J	NA	NA	NA	0.0040 J	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
Styrene	- -	- -	<0.023	NA	NA	NA	0.0020 J	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
Tetrachloroethene	1.3	150	<0.023	NA	NA	NA	0.00080 J	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
Toluene	0.7	500	<0.023	<0.012	<0.011	0.043	0.011 J	0.0020 J	0.0010 J	0.057	0.00090 J	<0.059	<0.010	**0.81 J**	<0.011	<0.056
trans-1,3-Dichloropropene	- -	- -	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
Trichloroethene	0.47	200	<0.023	NA	NA	NA	<0.012	NA	NA	NA	NA	<0.059	NA	<1.4	NA	NA
Xylenes (total)	0.26	500	<0.023	<0.012	<0.011	**0.29**	0.040	0.0070 J	0.0020 J	**0.42 D**	0.0040 J	0.18	<0.010	**5.2**	0.21	0.014 J
Total BTEX	- -	- -	<0.023	<0.012	<0.011	0.59	0.088 J	0.015 J	0.0070 J	0.73	0.0054 J	0.33 J	<0.010	12 J	0.80	0.034 J
Total VOCs	- -	- -	2.0 J	<0.012	<0.011	0.59	0.23 J	0.015 J	0.0070 J	0.73	0.0054 J	1.0 J	<0.010	12 J	0.80	0.034 J
Detected SVOCs																
2,4-Dichlorophenol	- -	- -	<0.38	NA	NA	NA	<0.81	NA	NA	NA	NA	<19	NA	<1.5	NA	NA
2,4-Dimethylphenol	- -	- -	<0.38	NA	NA	NA	<0.81	NA	NA	NA	NA	<19	NA	<1.5	NA	NA
2-Methylnaphthalene	- -	- -	<0.38	<0.35	<0.38	0.96 J	0.50 J	0.51 J	0.14 J	21	0.22 J	4.2 J	0.093 J	1.9	1.4 J	5.5 J
2-Methylphenol	0.33	500	<0.38	NA	NA	NA	<0.81	NA	NA	NA	NA	<19	NA	<1.5	NA	NA
4,6-Dinitro-2-methylphenol	- -	- -	<0.91	NA	NA	NA	<2.0	NA	NA	NA	NA	<47	NA	<3.6	NA	NA
4-Methylphenol	0.33	500	<0.38	NA	NA	NA	<0.81	NA	NA	NA	NA	<19	NA	<1.5	NA	NA
Acenaphthene	20	500	<0.38	<0.35	<0.38	0.18 J	0.90	0.69 J	0.30 J	14 J	0.14 J	**58**	0.36 J	5.8	**51**	**26**
Acenaphthylene	100	500	0.12 J	0.011 J	0.012 J	0.19 J	0.96	0.99 J	0.31 J	17 J	0.48	10 J	2.8	0.92 J	8.8 J	9.3
Anthracene	100	500	0.041 J	0.0080 J	0.010 J	0.10 J	1.2	1.3 J	0.38	24	0.42	27	1.2	3.1	30	26
Benzo(a)anthracene	1	5.6	<0.38	0.0060 J	<0.38	<2.1	**1.4**	**1.8**	0.33 J	**26**	0.40	**12 J**	**1.8**	**1.9**	**19**	**20**
Benzo(a)pyrene	1	1	<0.38	0.018 J	<0.38	<2.1	0.94	0.92 J	0.23 J	**20 J**	0.39	**6.2 J**	**2.7**	**1.3 J**	**12 J**	**13**
Benzo(b)fluoranthene	1	5.6	0.057 J	<0.35	<0.38	<2.1	0.58 J	0.47 J	0.14 J	**12 J**	0.25 J	**2.9 J**	**2.1**	0.60 J	**6.5 J**	**6.5 J**
Benzo(g,h,i)perylene	100	500	<0.38	0.058 J	<0.38	<2.1	0.19 J	<1.5	<0.37	3.1 J	0.065 J	<19	<0.71	<1.5	2.7 J	1.8 J
Benzo(k)fluoranthene	0.8	56	0.034 J	<0.35	<0.38	<2.1	0.68 J	0.56 J	0.14 J	**20 J**	0.30 J	**3.8 J**	**1.8**	**1.1 J**	**10 J**	**10**
Benzoic Acid	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl Alcohol	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Biphenyl	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	- -	- -	<0.38	NA	NA	NA	1.1	NA	NA	NA	NA	<19	NA	<1.5	NA	NA
Butylbenzylphthalate	- -	- -	<0.38	NA	NA	NA	<0.81	NA	NA	NA	NA	<19	NA	<1.5	NA	NA
Carbazole	- -	- -	<0.38	NA	NA	NA	0.24 J	NA	NA	NA	NA	<19	NA	0.35 J	NA	NA
Chrysene	1	56	0.059 J	0.0080 J	0.011 J	<2.1	**1.4**	**1.8**	0.32 J	**22**	0.37	**13 J**	**1.8**	**1.8**	**17 J**	**18**
Dibenzo(a,h)anthracene	0.33	0.56	<0.38	<0.35	<0.38	<2.1	0.16 J	<1.5	<0.37	<21	<0.36	<19	<0.71	<1.5	<18	<8.9
Dibenzofuran	7	350	<0.38	NA	NA	NA	0.31 J	NA	NA	NA	NA	5.4 J	NA	0.79 J	NA	NA
Diethylphthalate	- -	- -	<0.38	NA	NA	NA	<0.81	NA	NA	NA	NA	<19	NA	<1.5	NA	NA
Di-n-Butylphthalate	- -	- -	<0.38	NA	NA	NA	<0.81	NA	NA	NA	NA	<19	NA	<1.5	NA	NA
Fluoranthene	100	500	0.099 J	0.015 J	0.021 J	0.21 J	3.1	3.1	0.58	55	0.82	24	2.1	4.2	42	41
Fluorene	30	500	<0.38	<0.35	<0.38	0.12 J	0.56 J	0.27 J	0.18 J	**32**	0.52	13 J	0.34 J	2.4	30	<8.9
Indeno(1,2,3-cd)pyrene	0.5	5.6	<0.38	<0.35	<0.38	<2.1	0.34 J	<1.5	<0.37	**7.4 J**	0.14 J	**1.6 J**	0.42 J	0.33 J	**4.5 J**	**3.5 J**
Naphthalene	12	500	0.094 J	0.017 J	0.030 J	12	1.2	<1.5	0.085 J	**95**	0.73	1.5 J	0.098 J	3.6	3.8 J	0.74 J
Phenanthrene	100	500	0.14 J	0.020 J	0.032 J	0.39 J	2.4	1.2 J	0.34 J	80	1.2	84	2.0	6.9	95	24
Phenol	0.33	500	<0.38	NA	NA	NA	<0.81	NA	NA	NA	NA	<19	NA	<1.5	NA	NA
Pyrene	100	500	0.13 J	0.024 J	0.024 J	0.20 J	4.4	6.2	1.1	43	0.59	32	2.6	4.5	44	47
Total PAHs	- -	- -	0.77 J	0.19 J	0.14 J	14 J	21 J	20 J	4.6 J	490 J	7.0 J	290 J	22 J	40 J	380 J	250 J
Total SVOCs	- -	- -	0.77 J	0.19 J	0.14 J	14 J	23 J	20 J	4.6 J	490 J	7.0 J	300 J	22 J	42 J	380 J	250 J

TABLE 6
SOIL ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	SB-12		SB-13		SB-14		SB-15		SB-16		SB-18		SB-21		SB-22	
Sample Depth(Feet):	Use SCOs	SCOs Commercial	12 - 14	22 - 24	8 - 10	20 - 22	8 - 10	18 - 20	14 - 16	22 - 24	12 - 14	18 - 20	4 - 6	24 - 26	14 - 16	20 - 22	0 - 16	13 - 15
Date Collected:	(bold)	(shade)	05/28/08	05/28/08	05/29/08	05/29/08	05/30/08	05/30/08	06/02/08	06/02/08	06/05/08	06/05/08	06/03/08	06/03/08	06/09/08	06/09/08	08/10/12	08/10/12
Detected VOCs																		
1,1,1-Trichloroethane	0.68	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
1,1,2,2-Tetrachloroethane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
1,1-Dichloroethane	0.27	240	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
1,2-Dichloroethane	0.02	30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
1,2-Dichloropropane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
2-Butanone	0.12	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.028
4-Methyl-2-pentanone	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.028
Acetone	0.05	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.028
Benzene	0.06	44	0.035	**430**	**0.97 J**	**9.4**	**2.5 J**	**14**	<0.0073	0.019 J	**4.4 J [2.6]**	**0.26**	<0.0059	<2.2 [<0.0054]	0.059 J	**0.23 J**	NA	<0.0057
Bromodichloromethane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
Bromomethane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
Carbon Disulfide	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
Carbon Tetrachloride	0.76	22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
Chlorobenzene	1.1	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
Chloroform	0.37	350	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
Chloromethane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
cis-1,3-Dichloropropene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
Dibromochloromethane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057 J
Ethylbenzene	1	390	0.066	**870**	**61 J**	**63**	**130**	**50**	<0.0073 J	<0.028	**36 J [5.3 J]**	0.98	<0.0059	**5.5 [0.15]**	0.71	**5.6**	NA	<0.0057
Isopropylbenzene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
Methylcyclohexane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
Methylene Chloride	0.05	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
Styrene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
Tetrachloroethene	1.3	150	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
Toluene	0.7	500	0.25	**870**	**17**	**20**	**5.5 J**	**2.2**	<0.0073	<0.028	**1.4 J [1.4]**	0.040	<0.0059	<2.2 [0.0020 J]	<0.59	0.059 J	NA	<0.0057
trans-1,3-Dichloropropene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
Trichloroethene	0.47	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0057
Xylenes (total)	0.26	500	**0.40**	**1,500**	**310 J**	**110**	**220**	**61**	<0.0073 J	0.046	**67 J [10 J]**	**1.7**	<0.0059	**5.2 [0.16]**	**0.54 J**	**7.5 J**	NA	<0.011
Total BTEX	- -	- -	0.75	3,700	390 J	200	360 J	130	<0.0073	0.065 J	110 J [19 J]	3.0	<0.0059	11 [0.31 J]	1.3 J	13 J	NA	<0.011
Total VOCs	- -	- -	0.75	3,700	390 J	200	360 J	130	<0.0073	0.065 J	110 J [19 J]	3.0	<0.0059	11 [0.31 J]	1.3 J	13 J	NA	<0.028
Detected SVOCs																		
2,4-Dichlorophenol	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	NA
2,4-Dimethylphenol	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	NA
2-Methylnaphthalene	- -	- -	7.0	870 D	200 D	25 D	150 D	21 D	0.36 J	<0.36	20 [11 D]	5.0	0.20 J	1.6 [2.1]	8.5 D	9.3 D	0.16 J	NA
2-Methylphenol	0.33	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	NA
4,6-Dinitro-2-methylphenol	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<7.0	NA
4-Methylphenol	0.33	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<7.0	NA
Acenaphthene	20	500	11 D	**190**	**30**	0.64	**39 DJ**	7.5 D	6.9	7.9 D	4.5 [3.6]	2.9	<0.39	**15 D [25 D]**	4.6	5.0	0.48 J	NA
Acenaphthylene	100	500	20 D	**190**	**110**	2.2	22 DJ	2.4	6.0	1.1	2.5 [2.2]	2.8	0.11 J	4.7 [5.2]	1.4	1.9	1.2 J	NA
Anthracene	100	500	17 D	**180**	**110 D**	1.0	22 DJ	3.8	5.6	3.9	3.1 [2.5]	2.2	0.12 J	10 D [14 D]	2.2	2.8	3.0 J	NA
Benzo(a)anthracene	1	5.6	**36 D**	**99**	**110**	0.80	**24 DJ**	**2.3**	**5.0**	**2.2**	**2.9 [2.5]**	**2.1**	0.49	**8.3 D [8.5 D]**	**1.4**	**1.7**	**7.2**	NA
Benzo(a)pyrene	1	1	**40 D**	**74**	**82**	0.61	**14 DJ**	**1.5**	**8.5 D**	**1.3**	**3.0 [2.3]**	**2.0**	0.51	**6.1 D [5.5 J]**	0.98	**1.1**	**6.9**	NA
Benzo(b)fluoranthene	1	5.6	**42 D**	**70**	**86**	0.60	**15 DJ**	**1.3**	**7.5 J**	**1.2**	**3.5 [2.5]**	**2.0**	0.59	**6.6 DJ [5.3 J]**	0.85	0.97	**9.4**	NA
Benzo(g,h,i)perylene	100	500	25 D	41	62	0.45	2.8 J	0.88	4.1 J	0.83	1.9 J [1.8]	2.0	0.40	1.6 J [1.3 J]	0.61	<0.39	2.5 J	NA
Benzo(k)fluoranthene	0.8	56	**16 D**	**29**	**35**	0.24 J	**4.3 J**	0.45	**2.2 J**	0.46	**1.4 J [0.94]**	**0.85**	0.27 J	**2.2 J [1.9 J]**	0.37 J	0.34 J	**3.7**	NA
Benzoic Acid	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl Alcohol	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Biphenyl	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	NA
bis(2-Ethylhexyl)phthalate	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	NA
Butylbenzylphthalate	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	NA
Carbazole	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.20 J	NA
Chrysene	1	56	**34 D**	**93**	**89**	0.74	**24 DJ**	**2.1**	**4.9**	**2.2**	**2.9 [2.2]**	**2.0**	0.49	**7.9 D [8.0 D]**	**1.3**	**1.6**	**7.8**	NA
Dibenzo(a,h)anthracene	0.33	0.56	**5.5**	**8.9 J**	**15**	0.11 J	**1.3 J**	0.25 J	**1.4 J**	0.23 J	**0.62 J [0.57 J]**	**0.48**	0.11 J	**0.65 J [0.57 J]**	0.18 J	<0.39	**0.98 J**	NA
Dibenzofuran	7	350	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.18 J	NA
Diethylphthalate	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	NA
Di-n-Butylphthalate	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	NA
Fluoranthene	100	500	56 D	**230**	**210 D**	1.6	37 DJ	4.4	7.0	4.0	5.0 [3.9]	3.4	0.41	15 D [16 D]	2.5	1.0	16	NA
Fluorene	30	500	11	**200**	**120**	1.3	25 DJ	4.2	4.6	2.5	4.0 [3.2]	2.5	<0.39	10 D [17 D]	2.9	3.6	0.94 J	NA
Indeno(1,2,3-cd)pyrene	0.5	5.6	**31 D**	**44**	**76**	0.49	**4.3 J**	**1.1**	**5.3 J**	**0.91**	**2.2 J [1.9]**	**2.2**	0.41	**2.2 J [1.8 J]**	**0.70**	<0.39	**2.3 J**	NA
Naphthalene	12	500	**15 D**	**2,100 D**	**700 D**	**55 D**	**450 D**	**37 D**	1.7	<0.36	**170 D [94 D]**	**26 D**	1.4	**15 D [27 D]**	**18 D**	**20 D**	<3.6	NA
Phenanthrene	100	500	41 D	**610 D**	**370 D**	3.6	69 D	13 D	11 D	3.6	11 [8.5]	5.4 D	0.31 J	27 D [40 D]	7.6 D	10 D	8.6	NA
Phenol	0.33	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	NA
Pyrene	100	500	49 D	**250**	**180 D**	1.6	41 D	5.1	11 D	5.5	5.3 [4.2]	3.7	0.58	11 D [13 D]	3.3	4.2	11	NA
Total PAHs	- -	- -	460	5,300 J	2,600	96 J	950 J	110 J	93 J	38 J	240 J [150 J]	68	6.4 J	150 J [190 J]	57 J	64 J	82 J	NA
Total SVOCs	- -	- -	460	5,300 J	2,600	96 J	950 J	110 J	93 J	38 J	240 J [150 J]	68	6.4 J	150 J [190 J]	57 J	64 J	83 J	NA

TABLE 6
SOIL ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	SB-23		SB-24		SB-25		SB-27			SS-01	SS-02	SS-03	TP-01		TP-02	
Sample Depth(Feet):	Use SCOs	SCOs Commercial	0 - 5	3 - 4	0 - 15.5	12 - 13	0 - 11	8 - 10	0 - 20	3 - 4	20 - 21.2				5	8	5	11
Date Collected:	(bold)	(shade)	08/10/12	08/10/12	08/13/12	08/13/12	08/13/12	08/13/12	08/13/12	08/13/12	08/10/12	06/27/02	06/27/02	06/27/02	08/28/95	08/28/95	08/28/95	08/28/95
Detected VOCs																		
1,1,1-Trichloroethane	0.68	500	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
1,1,2,2-Tetrachloroethane	- -	- -	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
1,1-Dichloroethane	0.27	240	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062 J	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
1,2-Dichloroethane	0.02	30	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
1,2-Dichloropropane	- -	- -	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
2-Butanone	0.12	500	NA	<0.026	NA	<0.027 [<0.028]	NA	<0.031	NA	<0.026	<6.9	<0.011	<0.012	<0.012	NA	<3.2	NA	<0.013 [<0.011]
4-Methyl-2-pentanone	- -	- -	NA	<0.026	NA	<0.027 [<0.028]	NA	<0.031	NA	<0.026	<6.9	<0.011	<0.012	<0.012	NA	<3.2	NA	<0.013 [<0.011]
Acetone	0.05	500	NA	<0.026	NA	<0.027 [<0.028]	NA	<0.031	NA	<0.026	<6.9	<0.011	<0.012	<0.012	NA	<3.2	NA	0.022 [0.023]
Benzene	0.06	44	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062 J	NA	<0.0053	**1.9**	0.0020 J	0.00090 J	<0.0060	**0.092 J**	**5.5**	<0.011	<0.013 [<0.011]
Bromodichloromethane	- -	- -	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
Bromomethane	- -	- -	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
Carbon Disulfide	- -	- -	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
Carbon Tetrachloride	0.76	22	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
Chlorobenzene	1.1	500	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062 J	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
Chloroform	0.37	350	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
Chloromethane	- -	- -	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	<1.4	0.0060 J	0.0060 J	0.0060 J	NA	<3.2	NA	<0.013 [<0.011]
cis-1,3-Dichloropropene	- -	- -	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
Dibromochloromethane	- -	- -	NA	<0.0053 J	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
Ethylbenzene	1	390	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062 J	NA	<0.0053	**24**	<0.0060	<0.0060	<0.0060	**2.7**	**66**	<0.011	<0.013 [<0.011]
Isopropylbenzene	- -	- -	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	10	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	- -	- -	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	0.99 J	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	500	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	0.0040 J [0.0030 J]
Styrene	- -	- -	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
Tetrachloroethene	1.3	150	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062 J	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
Toluene	0.7	500	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062 J	NA	<0.0053	0.43 J	0.0020 J	0.00070 J	<0.0060	<1.4	**18**	0.0030 J	<0.013 [<0.011]
trans-1,3-Dichloropropene	- -	- -	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
Trichloroethene	0.47	200	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062 J	NA	<0.0053	<1.4	<0.0060	<0.0060	<0.0060	NA	<3.2	NA	<0.013 [<0.011]
Xylenes (total)	0.26	500	NA	<0.011	NA	<0.011 [<0.011]	NA	<0.012	NA	<0.011	**5.6**	0.0020 J	<0.0060	<0.0060	**5.7**	**140**	<0.011	<0.013 [<0.011]
Total BTEX	- -	- -	NA	<0.011	NA	<0.011 [<0.011]	NA	<0.012	NA	<0.011	32 J	0.0060 J	0.0016 J	<0.0060	8.5 J	230	0.0030 J	<0.013 [<0.011]
Total VOCs	- -	- -	NA	<0.026	NA	<0.027 [<0.028]	NA	<0.031	NA	<0.026	32 J	0.012 J	0.0076 J	0.0060 J	8.5 J	230	0.0030 J	0.026 J [0.026 J]
Detected SVOCs																		
2,4-Dichlorophenol	- -	- -	<0.18	NA	<0.91 [<0.91]	NA	<0.92	NA	<2.1	NA	NA	36 J	36 J	<4.1	NA	<86	NA	<1.5 [<3.8]
2,4-Dimethylphenol	- -	- -	<0.18	NA	<0.91 [<0.91]	NA	<0.92	NA	<2.1	NA	NA	<7.3	<7.4	<4.1	NA	<86	NA	<1.5 [<3.8]
2-Methylnaphthalene	- -	- -	0.013 J	NA	0.080 J [0.29 J]	NA	0.079 J	NA	0.44 J	NA	NA	1.2 J	1.4 J	0.52 J	7.8	260	0.60 J	0.046 J [0.12 J]
2-Methylphenol	0.33	500	<0.18	NA	<0.91 [<0.91]	NA	<0.92	NA	<2.1	NA	NA	<7.3	<7.4	<4.1	NA	<86	NA	<1.5 [<3.8]
4,6-Dinitro-2-methylphenol	- -	- -	<0.36	NA	<1.8 [<1.8]	NA	<1.8	NA	<4.0	NA	NA	36 J	36 J	<20	NA	<210	NA	<3.7 [<9.1]
4-Methylphenol	0.33	500	<0.36	NA	<1.8 [<1.8]	NA	<1.8	NA	<4.0	NA	NA	<7.3	<7.4	<4.1	NA	<86	NA	<1.5 [<3.8]
Acenaphthene	20	500	0.027 J	NA	0.12 J [0.46 J]	NA	0.21 J	NA	0.27 J	NA	NA	2.1 J	0.84 J	0.66 J	2.4 J	**110**	0.62 J	0.10 J [0.12 J]
Acenaphthylene	100	500	0.035 J	NA	0.44 J [0.45 J]	NA	0.49 J	NA	1.6 J	NA	NA	12	6.8 J	5.6	7.0	28 J	2.9 J	1.3 J [2.6 J]
Anthracene	100	500	0.082 J	NA	1.6 [1.8]	NA	1.8	NA	0.90 J	NA	NA	8.7	4.3 J	4.5	4.0 J	49 J	3.9 J	0.48 J [0.90 J]
Benzo(a)anthracene	1	5.6	0.32	NA	**6.5 [7.8]**	NA	**4.8**	NA	**2.4**	NA	NA	**24**	**15**	**13**	**9.7**	**26 J**	**14**	**3.0 [5.8]**
Benzo(a)pyrene	1	1	0.43	NA	**7.0 [7.5]**	NA	**4.0**	NA	**2.6**	NA	NA	**27**	**18**	**14**	**12**	**26 J**	**26**	**6.5 [12]**
Benzo(b)fluoranthene	1	5.6	0.56	NA	**7.9 [9.7]**	NA	**5.0**	NA	**3.4**	NA	NA	**19**	**14**	**11**	**10**	**11 J**	**24**	**5.6 [9.2]**
Benzo(g,h,i)perylene	100	500	0.16 J	NA	2.7 J [2.9 J]	NA	1.7 J	NA	1.7 J	NA	NA	22	23	5.4	0.81 J	5.8 J	1.4 J	0.37 J [0.86 J]
Benzo(k)fluoranthene	0.8	56	0.18	NA	**4.5 [4.0]**	NA	**2.4**	NA	**1.7 J**	NA	NA	**20**	**15**	**13**	**13**	**14 J**	**25**	**6.5 [9.9]**
Benzoic Acid	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	<36	<36	<20	NA	NA	NA	NA
Benzyl Alcohol	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	<7.3	<7.4	<4.1	NA	NA	NA	NA
Biphenyl	- -	- -	<0.18	NA	<0.91 [0.086 J]	NA	<0.92	NA	<2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	- -	- -	0.076 J	NA	2.7 [0.71 J]	NA	<0.92	NA	<2.1	NA	NA	0.81 JB	<7.4	0.84 J	NA	<86	NA	<1.5 [<3.8]
Butylbenzylphthalate	- -	- -	<0.18	NA	<0.91 [<0.91]	NA	<0.92	NA	<2.1	NA	NA	<7.3	<7.4	<4.1	NA	<86	NA	<1.5 [<3.8]
Carbazole	- -	- -	0.034 J	NA	0.18 J [0.80 J]	NA	0.35 J	NA	0.37 J	NA	NA	1.4 J	1.1 J	0.81 J	NA	<86	NA	0.15 J [0.28 J]
Chrysene	1	56	0.34	NA	**6.4 [6.9]**	NA	**4.5**	NA	**2.4**	NA	NA	**25**	**15**	**14**	**11**	**29 J**	**14**	**3.3 [6.5]**
Dibenzo(a,h)anthracene	0.33	0.56	0.056 J	NA	<0.91 [<0.91]	NA	<0.92	NA	<2.1	NA	NA	**7.6**	**1.6 J**	**3.1 J**	**0.50 J**	**3.3 J**	**1.3 J**	**0.19 J [0.34 J]**
Dibenzofuran	7	350	0.014 J	NA	0.097 J [0.59 J]	NA	0.32 J	NA	0.32 J	NA	NA	1.1 J	0.91 J	0.46 J	NA	**7.1 J**	NA	0.090 J [0.15 J]
Diethylphthalate	- -	- -	<0.18	NA	<0.91 [<0.91]	NA	<0.92	NA	<2.1	NA	NA	<7.3	<7.4	<4.1	NA	<86	NA	<1.5 [<3.8]
Di-n-Butylphthalate	- -	- -	<0.18	NA	<0.91 [<0.91]	NA	1.5	NA	<2.1	NA	NA	<7.3	<7.4	<4.1	NA	<86	NA	<1.5 [<3.8]
Fluoranthene	100	500	0.55	NA	10 [13]	NA	9.0	NA	4.6	NA	NA	34	22	21	9.7	47 J	21	2.9 [6.9]
Fluorene	30	500	0.025 J	NA	0.24 J [0.68 J]	NA	0.62 J	NA	0.51 J	NA	NA	1.8 J	1.1 J	0.78 J	2.3 J	**62 J**	1.2 J	0.048 J [0.11 J]
Indeno(1,2,3-cd)pyrene	0.5	5.6	0.15 J	NA	**2.6 [2.8]**	NA	**1.5**	NA	**1.4 J**	NA	NA	**24**	**21**	**5.9**	**1.9 J**	**10 J**	**4.6 J**	**1.1 J [1.8 J]**
Naphthalene	12	500	0.023 J	NA	0.22 J [0.71 J]	NA	0.14 J	NA	<2.1	NA	NA	4.6 J	7.5	0.77 J	**16**	**400**	0.85 J	0.088 J [0.21 J]
Phenanthrene	100	500	0.31	NA	2.5 [7.2]	NA	5.7	NA	2.8	NA	NA	15	13	9.4	12	**160**	12	0.91 J [1.6 J]
Phenol	0.33	500	<0.18	NA	<0.91 [<0.91]	NA	<0.92	NA	<2.1	NA	NA	<7.3	<7.4	<4.1	NA	<86	NA	<1.5 [<3.8]
Pyrene	100	500	0.45	NA	8.6 [10]	NA	7.4 J	NA	4.1	NA	NA	42	30	18	17	83 J	19	4.3 [8.8]
Total PAHs	- -	- -	3.7 J	NA	61 J [76 J]	NA	49 J	NA	31 J	NA	NA	290 J	210 J	140 J	140 J	1,300 J	170 J	37 J [68 J]
Total SVOCs	- -	- -	3.8 J	NA	64 J [78 J]	NA	52 J	NA	32 J	NA	NA	370 J	280 J	140 J	140 J	1,300 J	170 J	37 J [68 J]

TABLE 6
SOIL ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	TP-2A		WB-1							WB-2				
Sample Depth(Feet):	Use SCOs	SCOs Commercial	6	10	6	14	38	44	46	78	86	6	38	52	66	88
Date Collected:	(bold)	(shade)	09/19/95	09/19/95	03/29/95	03/29/95	03/30/95	03/30/95	03/30/95	03/31/95	03/31/95	04/14/95	04/17/95	04/17/95	04/17/95	04/19/95
Detected VOCs																
1,1,1-Trichloroethane	0.68	500	<0.012	<0.012 [<0.010]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	- -	- -	<0.012	<0.012 [<0.010]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
1,1-Dichloroethane	0.27	240	<0.012	<0.012 [<0.010]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
1,2-Dichloroethane	0.02	30	<0.012	<0.012 [<0.010]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
1,2-Dichloropropane	- -	- -	<0.012	<0.012 [<0.010]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
2-Butanone	0.12	500	<0.012	<0.012 [<0.010]	<0.013	NA	NA	NA	NA	NA	NA	0.037	NA	NA	NA	NA
4-Methyl-2-pentanone	- -	- -	<0.012	<0.012 [<0.010]	<0.013	NA	NA	NA	NA	NA	NA	<0.013	NA	NA	NA	NA
Acetone	0.05	500	<0.012	<0.012 [<0.015]	<0.013	NA	NA	NA	NA	NA	NA	0.016	NA	NA	NA	NA
Benzene	0.06	44	<0.012	<0.012 [<0.010]	<0.0060	0.0030 J	0.0010 J	0.0010 J	<0.0060	<6.8	<1.3	<0.0060	0.0010 J	<1.4	**0.69**	<0.027
Bromodichloromethane	- -	- -	<0.012	<0.012 [<0.010]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
Bromomethane	- -	- -	<0.012	<0.012 [<0.010]	<0.013	NA	NA	NA	NA	NA	NA	<0.013	NA	NA	NA	NA
Carbon Disulfide	- -	- -	<0.012	0.00060 J [0.0030 J]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
Carbon Tetrachloride	0.76	22	<0.012	<0.012 [<0.010]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
Chlorobenzene	1.1	500	<0.012	<0.012 [<0.010]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
Chloroform	0.37	350	<0.012	<0.012 [<0.010]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
Chloromethane	- -	- -	<0.012	<0.012 [<0.010]	<0.013	NA	NA	NA	NA	NA	NA	<0.013	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	<0.012	<0.012 [<0.010]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
Dibromochloromethane	- -	- -	<0.012	<0.012 [<0.010]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
Ethylbenzene	1	390	<0.012	<0.012 [<0.010]	<0.0060	<0.0060	<0.0060	0.034	0.030	**20 D**	**11 D**	<0.0060	0.0050	**3.4 D**	**1.1**	**2.1**
Isopropylbenzene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	500	<0.012	<0.012 [0.0020 J]	<0.0060	NA	NA	NA	NA	NA	NA	0.0050 J	NA	NA	NA	NA
Styrene	- -	- -	<0.012	<0.012 [<0.010]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
Tetrachloroethene	1.3	150	<0.012	<0.012 [<0.010]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
Toluene	0.7	500	<0.012	0.0010 J [0.0010 J]	<0.0060	0.0020 J	<0.0060	<0.0060	<0.0060	**37 D**	<1.3	<0.0060	<0.0050	**1.9 D**	0.55 J	<0.027
trans-1,3-Dichloropropene	- -	- -	<0.012	<0.012 [<0.010]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
Trichloroethene	0.47	200	<0.012	<0.012 [<0.010]	<0.0060	NA	NA	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA
Xylenes (total)	0.26	500	<0.012	<0.012 [0.0010 J]	<0.0060	<0.0060	<0.0060	0.014	0.028	**120 D**	**70 D**	<0.0060	0.0040 J	**23 D**	**6.8**	**11**
Total BTEX	- -	- -	<0.012	0.0010 J [0.0020 J]	<0.0060	0.0050 J	0.0010 J	0.049 J	0.058	180	81	<0.0060	0.010 J	28	9.1 J	13
Total VOCs	- -	- -	<0.012	0.0016 J [0.0070 J]	<0.013	0.0050 J	0.0010 J	0.049 J	0.058	180	81	0.058 J	0.010 J	28	9.1 J	13
Detected SVOCs																
2,4-Dichlorophenol	- -	- -	<9.7	<10 [<8.0]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	- -	- -	<9.7	<10 [<8.0]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	- -	- -	<9.7	<10 [<8.0]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	0.33	500	<9.7	<10 [<8.0]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	- -	- -	<24	<24 [<20]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	0.33	500	<9.7	<10 [<8.0]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	20	500	<9.7	<10 [<8.0]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	100	500	2.3 J	2.7 J [2.0 J]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	100	500	1.6 J	2.1 J [1.3 J]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	1	5.6	**32**	**32 [22]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1	1	**34**	**38 [28]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1	5.6	**67**	**45 [31]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	100	500	6.2 J	2.6 J [2.2 J]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.8	56	**23**	**30 [19]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzoic Acid	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl Alcohol	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Biphenyl	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	- -	- -	<9.7	<10 [<8.0]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	- -	- -	<9.7	<10 [25]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	0.37 J	0.53 J [0.39 J]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	1	56	**29**	**32 [23]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.33	0.56	**4.4 J**	**2.7 J [2.1 J]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	7	350	<9.7	0.27 J [<8.0]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	- -	- -	<9.7	<10 [<8.0]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-Butylphthalate	- -	- -	<9.7	<10 [<8.0]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	100	500	23	33 [22]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	30	500	<9.7	0.19 J [<8.0]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.5	5.6	**18**	**10 [8.6]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	12	500	<9.7	0.59 J [0.27 J]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	100	500	3.6 J	4.5 J [3.0 J]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	0.33	500	<9.7	<10 [<8.0]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	100	500	34	35 [22]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PAHs	- -	- -	280 J	270 J [190 J]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total SVOCs	- -	- -	280 J	270 J [210 J]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 6
SOIL ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted Use SCOs (bold)	Restricted Use SCOs Commercial (shade)	WB-3					WB-4						WB-5			WB-6				
Sample Depth(Feet):			6	14	32	53.5	78	6	8	22	40	52	67.5	6	8	56	6	16	32	50	70
Date Collected:			04/04/95	04/04/95	04/04/95	04/05/95	04/06/95	04/12/95	04/12/95	04/12/95	04/12/95	04/12/95	04/13/95	04/10/95	04/10/95	04/11/95	04/20/95	04/20/95	04/20/95	04/21/95	04/21/95
Detected VOCs																					
1,1,1-Trichloroethane	0.68	500	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	- -	- -	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
1,1-Dichloroethane	0.27	240	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
1,2-Dichloroethane	0.02	30	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
1,2-Dichloropropane	- -	- -	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
2-Butanone	0.12	500	<0.012	NA	NA	NA	NA	<0.012	NA	NA	NA	NA	NA	<0.012	NA	NA	<0.011	NA	NA	NA	NA
4-Methyl-2-pentanone	- -	- -	<0.012	NA	NA	NA	NA	<0.012	NA	NA	NA	NA	NA	<0.012	NA	NA	<0.011	NA	NA	NA	NA
Acetone	0.05	500	<0.012	NA	NA	NA	NA	<0.012	NA	NA	NA	NA	NA	0.022	NA	NA	0.011	NA	NA	NA	NA
Benzene	0.06	44	0.0030 J	<0.030	<0.71	<1.4	<0.0050	<0.0060	<0.030	<0.76	<0.029	<0.0060	<0.0050	0.0020 J	0.0080	<0.0060	0.0020 J	**0.88 D**	**0.42 D**	0.0060	0.0070
Bromodichloromethane	- -	- -	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
Bromomethane	- -	- -	<0.012	NA	NA	NA	NA	<0.012	NA	NA	NA	NA	NA	<0.012	NA	NA	<0.011	NA	NA	NA	NA
Carbon Disulfide	- -	- -	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
Carbon Tetrachloride	0.76	22	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
Chlorobenzene	1.1	500	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
Chloroform	0.37	350	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
Chloromethane	- -	- -	<0.012	NA	NA	NA	NA	<0.012	NA	NA	NA	NA	NA	<0.012	NA	NA	<0.011	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
Dibromochloromethane	- -	- -	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
Ethylbenzene	1	390	<0.0060	<0.030	**10**	**4.7 D**	0.0050	<0.0060	0.38 D	**16**	0.046 D	0.0030 J	0.013	<0.0060	0.14	<0.0060	<0.0060	**24**	**88 D**	0.11	0.044
Isopropylbenzene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	500	<0.0060	NA	NA	NA	NA	0.016	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
Styrene	- -	- -	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
Tetrachloroethene	1.3	150	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
Toluene	0.7	500	0.0050 J	<0.030	<0.71	**3.3 D**	<0.0050	<0.0060	0.016 J	0.26 J	<0.029	<0.0060	0.014	0.0030 J	0.017	<0.0060	<0.0060	**2.1**	**17 D**	0.010	0.0080
trans-1,3-Dichloropropene	- -	- -	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
Trichloroethene	0.47	200	<0.0060	NA	NA	NA	NA	<0.0060	NA	NA	NA	NA	NA	<0.0060	NA	NA	<0.0060	NA	NA	NA	NA
Xylenes (total)	0.26	500	<0.0060	<0.030	**1.8**	**19 D**	0.013	<0.0060	**0.36 D**	**16**	0.044 D	0.0040 J	0.031	<0.0060	0.12	<0.0060	<0.0060	**40**	**140 D**	0.11	0.054
Total BTEX	- -	- -	0.0080 J	<0.030	12	27	0.018	<0.0060	0.76 J	32 J	0.090	0.0070 J	0.058	0.0050 J	0.29	<0.0060	0.0020 J	67	250	0.24	0.11
Total VOCs	- -	- -	0.0080 J	<0.030	12	27	0.018	0.016	0.76 J	32 J	0.090	0.0070 J	0.058	0.027 J	0.29	<0.0060	0.013 J	67	250	0.24	0.11
Detected SVOCs																					
2,4-Dichlorophenol	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	0.33	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	0.33	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	20	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	100	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	100	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	1	5.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1	5.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	100	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.8	56	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzoic Acid	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl Alcohol	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Biphenyl	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	1	56	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.33	0.56	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	7	350	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-Butylphthalate	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	100	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	30	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.5	5.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	12	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	100	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	0.33	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	100	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PAHs	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total SVOCs	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 6
SOIL ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-1D			MW-2	MW-3D	MW-4				MW-4D					MW-6	MW-7	
Sample Depth(Feet):	Use SCOs	SCOs Commercial	20	32	40	24	32	12	14	30	36	65 - 67	69 - 71	75 - 77	113 - 115	133 - 135	36	16	18
Date Collected:	(bold)	(shade)	08/09/95	08/09/95	08/09/95	07/27/95	07/20/95	08/17/95	08/17/95	08/17/95	08/17/95	06/11/97	06/11/97	06/11/97	06/11/97	06/12/97	07/28/95	08/07/95	08/07/95
Detected VOCs																			
1,1,1-Trichloroethane	0.68	500	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	0.24 J [<1.4]	NA
1,1,2,2-Tetrachloroethane	- -	- -	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
1,1-Dichloroethane	0.27	240	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
1,2-Dichloroethane	0.02	30	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
1,2-Dichloropropane	- -	- -	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
2-Butanone	0.12	500	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
4-Methyl-2-pentanone	- -	- -	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
Acetone	0.05	500	NA	**0.080**	NA	**0.26**	NA	<15	NA	NA	NA	NA	NA	**0.069 B**	NA	NA	<0.24	<1.7 [<1.4]	NA
Benzene	0.06	44	<0.015	0.0050 J	<0.012	<0.021	<0.058	**99**	**35**	**0.79 J**	**1.5**	<0.011	<0.011	<0.011	<0.011	<0.012	<0.056	**3.1 [2.4]**	**0.27 J**
Bromodichloromethane	- -	- -	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
Bromomethane	- -	- -	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
Carbon Disulfide	- -	- -	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
Carbon Tetrachloride	0.76	22	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
Chlorobenzene	1.1	500	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
Chloroform	0.37	350	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
Chloromethane	- -	- -	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
cis-1,3-Dichloropropene	- -	- -	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
Dibromochloromethane	- -	- -	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
Ethylbenzene	1	390	<0.015	<0.011	<0.012	<0.021	<0.058	**30**	**34**	**7.5**	**12**	0.043	0.013	0.0050 J	<0.011	<0.012	<0.056	**19 [10]**	0.70 J
Isopropylbenzene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	500	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	0.015	NA	NA	0.025 J	<1.5 [<1.4]	NA
Styrene	- -	- -	NA	<0.011	NA	<0.021	NA	27	NA	NA	NA	NA	NA	0.0060 J	NA	NA	<0.056	<1.5 [1.6]	NA
Tetrachloroethene	1.3	150	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
Toluene	0.7	500	0.0020 J	0.00090 J	<0.012	0.0030 J	<0.058	**120**	**80**	**0.95 J**	**1.8**	0.011	0.0040 J	<0.011	<0.011	<0.012	<0.056	**11 [6.0]**	0.42 J
trans-1,3-Dichloropropene	- -	- -	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
Trichloroethene	0.47	200	NA	<0.011	NA	<0.021	NA	<15	NA	NA	NA	NA	NA	<0.011	NA	NA	<0.056	<1.5 [<1.4]	NA
Xylenes (total)	0.26	500	<0.015	<0.011	<0.012	<0.021	<0.058	**220**	**180**	**10**	**16**	0.078 B	0.031 B	0.016 B	<0.011	<0.012	<0.056	**28 [14]**	**1.1 J**
Total BTEX	- -	- -	0.0020 J	0.0059 J	<0.012	0.0030 J	<0.058	470	330	19 J	31	0.13	0.048 J	0.021 J	<0.011	<0.012	<0.056	61 [32]	2.5 J
Total VOCs	- -	- -	0.0020 J	0.086 J	<0.012	0.26 J	<0.058	500	330	19 J	31	0.13	0.048 J	0.11 J	<0.011	<0.012	0.025 J	61 J [34]	2.5 J
Detected SVOCs																			
2,4-Dichlorophenol	- -	- -	NA	<0.38	NA	<0.35	NA	<1,600	NA	NA	NA	NA	NA	<0.71	NA	NA	<0.38	<39 [<100]	NA
2,4-Dimethylphenol	- -	- -	NA	<0.38	NA	<0.35	NA	260 J	NA	NA	NA	NA	NA	<0.71	NA	NA	<0.38	<39 [<100]	NA
2-Methylnaphthalene	- -	- -	0.027 J	<0.38	<0.37	0.066 J	<0.38	4,400	1,000	28	27	0.91	0.42	3.9	<0.37	<0.38	<0.38	54 [93 J]	12
2-Methylphenol	0.33	500	NA	<0.38	NA	<0.35	NA	**230 J**	NA	NA	NA	NA	NA	<0.71	NA	NA	<0.38	<39 [<100]	NA
4,6-Dinitro-2-methylphenol	- -	- -	NA	<0.91	NA	<0.86	NA	<4,000	NA	NA	NA	NA	NA	<1.8	NA	NA	<0.92	<95 [<250]	NA
4-Methylphenol	0.33	500	NA	<0.38	NA	<0.35	NA	**440 J**	NA	NA	NA	NA	NA	<0.71	NA	NA	<0.38	<39 [<100]	NA
Acenaphthene	20	500	0.067 J	0.13 J	0.084 J	<0.35	<0.38	**440 J**	**110 J**	14 J	11	0.20 J	0.066 J	0.32 J	<0.37	<0.38	<0.38	**14 J [23 J]**	3.6 J
Acenaphthylene	100	500	0.24 J	0.058 J	0.039 J	0.37	<0.38	**2,000**	**480 J**	4.0 J	3.8 J	0.58	0.21 J	1.6	<0.37	<0.38	<0.38	21 J [37 J]	5.3 J
Anthracene	100	500	0.58	0.072 J	0.034 J	0.064 J	<0.38	**2,400**	**480 J**	7.6 J	6.7 J	0.49	0.21 J	1.4	<0.37	<0.38	<0.38	15 J [26 J]	4.1 J
Benzo(a)anthracene	1	5.6	**1.5**	0.054 J	0.016 J	<0.35	<0.38	**1,600**	**340 J**	**4.1 J**	**3.3 J**	<0.37	<0.35	0.47 J	<0.37	<0.38	0.037 J	**12 J [18 J]**	**3.2 J**
Benzo(a)pyrene	1	1	0.78	<0.38	0.015 J	0.080 J	0.069 J	**1,900**	**270 J**	**2.6 J**	**2.0 J**	<0.37	<0.35	0.11 J	0.039 J	<0.38	0.037 J	**9.9 J [17 J]**	**3.1 J**
Benzo(b)fluoranthene	1	5.6	0.88	<0.38	0.012 J	<0.35	<0.38	**1,400 J**	**180 J**	**1.4 J**	<7.6	<0.37	<0.35	0.18 J	<0.37	<0.38	0.023 J	**6.7 J [10 J]**	**2.3 J**
Benzo(g,h,i)perylene	100	500	<0.48	<0.38	<0.37	0.078 J	<0.38	**600 J**	<740	<16	<7.6	<0.37	<0.35	<0.71	0.021 J	<0.38	0.0080 J	<39 [<100]	0.61 J
Benzo(k)fluoranthene	0.8	56	**0.99**	<0.38	0.0060 J	<0.35	<0.38	**1,400 J**	**240 J**	**2.3 J**	<7.6	<0.37	<0.35	0.15 J	<0.37	<0.38	0.017 J	**8.0 J [14 J]**	**2.1 J**
Benzoic Acid	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl Alcohol	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Biphenyl	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	- -	- -	NA	<0.38	NA	<0.37	NA	<1,600	NA	NA	NA	NA	NA	0.048 J	NA	NA	<0.38	<39 [<100]	NA
Butylbenzylphthalate	- -	- -	NA	<0.38	NA	<0.35	NA	<1,600	NA	NA	NA	NA	NA	<0.71	NA	NA	<0.38	<39 [<100]	NA
Carbazole	- -	- -	NA	<0.38	NA	<0.35	NA	2,400	NA	NA	NA	NA	NA	<0.71	NA	NA	<0.38	10 J [15 J]	NA
Chrysene	1	56	**1.2**	0.048 J	0.020 J	<0.35	<0.38	**1,400 J**	**300 J**	**4.0 J**	**3.4 J**	<0.37	<0.35	0.45 J	<0.37	<0.38	0.060 J	**10 J [17 J]**	**2.8 J**
Dibenzo(a,h)anthracene	0.33	0.56	<0.48	<0.38	<0.37	0.029 J	<0.38	<1,600	<740	<16	<7.6	<0.37	<0.35	0.034 J	<0.37	<0.38	<0.38	<39 [<100]	<7.8
Dibenzofuran	7	350	NA	<0.38	NA	<0.35	NA	**1,600**	NA	NA	NA	NA	NA	0.22 J	NA	NA	<0.38	**10 J [17 J]**	NA
Diethylphthalate	- -	- -	NA	<0.38	NA	<0.35	NA	<1,600	NA	NA	NA	NA	NA	<0.71	NA	NA	<0.38	<39 [7.1 J]	NA
Di-n-Butylphthalate	- -	- -	NA	<0.38	NA	<0.35	NA	<1,600	NA	NA	NA	NA	NA	0.016 JB	NA	NA	<0.38	<39 [<100]	NA
Fluoranthene	100	500	5.8 E	0.11 J	0.040 J	<0.35	<0.38	**4,400**	**920**	8.7 J	7.3 J	0.47	0.17 J	1.1	<0.37	<0.38	<0.38	33 J [54 J]	10
Fluorene	30	500	0.34 J	0.029 J	<0.37	<0.35	<0.38	**2,100**	**490 J**	12 J	5.2 J	0.48	0.18 J	1.3	<0.37	<0.38	<0.38	13 J [21 J]	3.3 J
Indeno(1,2,3-cd)pyrene	0.5	5.6	0.46 J	<0.38	<0.37	0.037 J	<0.38	**1,000 J**	**150 J**	**1.2 J**	<7.6	<0.37	<0.35	0.048 J	0.019 J	<0.38	0.0090 J	**5.9 J [10 J]**	**1.8 J**
Naphthalene	12	500	<0.48	0.018 J	<0.37	<0.35	<0.38	**12,000**	**4,200**	**61**	**49**	1.7	0.99	2.7	<0.37	<0.38	<0.38	**210 [350]**	**44**
Phenanthrene	100	500	4.9 E	0.25 J	0.066 J	<0.35	<0.38	**6,700**	**1,700**	26	22	1.5	0.71	3.7	NA	<0.38	<0.38	61 [96 J]	18
Phenol	0.33	500	NA	<0.38	NA	<0.35	NA	**200 J**	NA	NA	NA	NA	NA	<0.71	NA	NA	<0.38	<39 [<100]	NA
Pyrene	100	500	2.9	0.16 J	0.075 J	0.071 J	<0.38	**3,000**	**760**	9.2 J	6.4 J	0.45	0.17 J	1.0	0.018 J	0.053 J	0.23 J	31 J [52 J]	9.2
Total PAHs	- -	- -	21 J	0.93 J	0.41 J	0.80 J	0.069 J	47,000 J	12,000 J	190 J	150 J	6.8 J	3.1 J	19 J	0.097 J	0.053 J	0.42 J	510 J [840 J]	130 J
Total SVOCs	- -	- -	21 J	0.93 J	0.41 J	0.80 J	0.069 J	52,000 J	12,000 J	190 J	150 J	6.8 J	3.1 J	19 J	0.097 J	0.053 J	0.42 J	530 J [880 J]	130 J

TABLE 6
SOIL ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-7D			MW-8D		MW-9D2					MW-10D					
Sample Depth(Feet):	Use SCOs	SCOs Commercial	32 - 34	73 - 75	93 - 95	36	60	28 - 30	65 - 67	93 - 95	113 - 115	153 - 155	16 - 18	73 - 75	91 - 93	119 - 121	133 - 135	151 - 153
Date Collected:	(bold)	(shade)	06/16/97	06/16/97	06/16/97	07/31/95	08/01/95	06/20/97	06/20/97	06/20/97	06/20/97	06/20/97	06/17/97	06/17/97	06/17/97	06/17/97	06/17/97	06/17/97
Detected VOCs																		
1,1,1-Trichloroethane	0.68	500	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
1,1,2,2-Tetrachloroethane	- -	- -	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
1,1-Dichloroethane	0.27	240	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
1,2-Dichloroethane	0.02	30	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
1,2-Dichloropropane	- -	- -	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
2-Butanone	0.12	500	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
4-Methyl-2-pentanone	- -	- -	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
Acetone	0.05	500	**0.16 B**	NA	NA	<0.11	NA	NA	NA	**0.18**	NA	NA	NA	NA	NA	**0.051 B**	NA	NA
Benzene	0.06	44	0.046 J	0.00080 J	<0.012	<0.060	<0.0050	<0.011	<0.011	<0.053	<0.053	<0.011	<0.011 [<0.011]	<0.011	0.0070 J	<0.021	<0.011	<0.011
Bromodichloromethane	- -	- -	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
Bromomethane	- -	- -	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
Carbon Disulfide	- -	- -	<0.11	NA	NA	<0.060	NA	NA	NA	0.034 J	NA	NA	NA	NA	NA	<0.021	NA	NA
Carbon Tetrachloride	0.76	22	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
Chlorobenzene	1.1	500	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
Chloroform	0.37	350	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
Chloromethane	- -	- -	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
cis-1,3-Dichloropropene	- -	- -	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
Dibromochloromethane	- -	- -	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
Ethylbenzene	1	390	**1.2**	0.0020 J	<0.012	0.82	0.0050	<0.011	0.0050 J	0.11	<0.053	<0.011	0.0070 J [<0.011]	<0.011	0.048	0.021	<0.011	<0.011
Isopropylbenzene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	500	<0.11	NA	NA	<0.060	NA	NA	NA	0.015 J	NA	NA	NA	NA	NA	0.0040 J	NA	NA
Styrene	- -	- -	<0.11	NA	NA	0.020 J	NA	NA	NA	0.36	NA	NA	NA	NA	NA	0.094	NA	NA
Tetrachloroethene	1.3	150	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
Toluene	0.7	500	0.031 J	<0.011	<0.012	0.014 J	<0.0050	<0.011	0.0020 J	0.11	<0.053	<0.011	<0.011 [<0.011]	<0.011	0.082	0.028	<0.011	0.0010 J
trans-1,3-Dichloropropene	- -	- -	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
Trichloroethene	0.47	200	<0.11	NA	NA	<0.060	NA	NA	NA	<0.053	NA	NA	NA	NA	NA	<0.021	NA	NA
Xylenes (total)	0.26	500	**1.3**	0.0040 J	<0.012	**0.80**	0.0060 B	<0.011	<0.011	**0.64**	0.024 J	<0.011	0.011 [<0.011]	0.0050 J	0.24	0.11	<0.011	<0.011
Total BTEX	- -	- -	2.6 J	0.0068 J	<0.012	1.6 J	0.011	<0.011	0.0070 J	0.86	0.024 J	<0.011	0.018 J [<0.011]	0.0050 J	0.38 J	0.16	<0.011	0.0010 J
Total VOCs	- -	- -	2.7 J	0.0068 J	<0.012	1.7 J	0.011	<0.011	0.0070 J	1.5 J	0.024 J	<0.011	0.018 J [<0.011]	0.0050 J	0.38 J	0.31 J	<0.011	0.0010 J
Detected SVOCs																		
2,4-Dichlorophenol	- -	- -	<15	NA	NA	<7.8	NA	NA	NA	<0.35	NA	NA	NA	NA	NA	<1.4	NA	NA
2,4-Dimethylphenol	- -	- -	<15	NA	NA	<7.8	NA	NA	NA	<0.35	NA	NA	NA	NA	NA	<1.4	NA	NA
2-Methylnaphthalene	- -	- -	15	0.053 J	<0.35	<7.8	0.052 J	<0.36	0.38	2.0	2.7	<0.37	<0.37 [0.052 J]	<0.36	1.1	2.7	<0.38	<0.35
2-Methylphenol	0.33	500	<15	NA	NA	<7.8	NA	NA	NA	<0.35	NA	NA	NA	NA	NA	<1.4	NA	NA
4,6-Dinitro-2-methylphenol	- -	- -	<37	NA	NA	<19	NA	NA	NA	<0.88	NA	NA	NA	NA	NA	<3.5	NA	NA
4-Methylphenol	0.33	500	<15	NA	NA	<7.8	NA	NA	NA	<0.35	NA	NA	NA	NA	NA	<1.4	NA	NA
Acenaphthene	20	500	**23**	0.42	<0.35	15	0.46	<0.36	0.25 J	0.13 J	0.22 J	<0.37	<0.37 [0.46]	<0.36	0.072 J	0.14 J	<0.38	<0.35
Acenaphthylene	100	500	5.1 J	0.10 J	<0.35	4.3 J	0.17 J	<0.36	<0.35	0.65	1.5	<0.37	<0.37 [0.17 J]	<0.36	0.27 J	0.71 J	<0.38	<0.35
Anthracene	100	500	19	<0.35	<0.35	8.4	0.34 J	<0.36	0.60	0.40	1.0	<0.37	<0.37 [0.34 J]	<0.36	<0.35	0.0070 J	<0.38	<0.35
Benzo(a)anthracene	1	5.6	**17**	<0.35	<0.35	**3.5 J**	0.16 J	<0.36	<0.35	0.11 J	0.47 J	<0.37	<0.37 [0.16 J]	<0.36	<0.35	<1.4	<0.38	<0.35
Benzo(a)pyrene	1	1	**13 J**	<0.35	<0.35	**1.4 J**	0.074 J	<0.36	<0.35	0.050 J	0.35 J	<0.37	<0.37 [0.074 J]	0.059 J	<0.35	<1.4	<0.38	0.043 J
Benzo(b)fluoranthene	1	5.6	**13 J**	<0.35	<0.35	0.71 J	0.041 J	<0.36	<0.35	0.026 J	0.14 J	<0.37	<0.37 [0.041 J]	<0.36	<0.35	<1.4	<0.38	<0.35
Benzo(g,h,i)perylene	100	500	1.6 J	<0.35	<0.35	0.15 J	0.013 J	<0.36	<0.35	0.018 J	0.13 J	<0.37	<0.37 [0.013 J]	0.087 J	<0.35	<1.4	<0.38	0.067 J
Benzo(k)fluoranthene	0.8	56	**12 J**	<0.35	<0.35	**0.89 J**	0.039 J	<0.36	<0.35	0.033 J	0.25 J	<0.37	<0.37 [0.039 J]	<0.36	<0.35	<1.4	<0.38	<0.35
Benzoic Acid	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl Alcohol	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Biphenyl	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	- -	- -	2.3 JB	NA	NA	<7.8	NA	NA	NA	0.064 J	NA	NA	NA	NA	NA	0.21 JB	NA	NA
Butylbenzylphthalate	- -	- -	<15	NA	NA	<7.8	NA	NA	NA	<0.35	NA	NA	NA	NA	NA	<1.4	NA	NA
Carbazole	- -	- -	6.1 J	NA	NA	<7.8	NA	NA	NA	0.040 J	NA	NA	NA	NA	NA	0.11 J	NA	NA
Chrysene	1	56	**15**	<0.35	<0.35	**3.9 J**	0.18 J	<0.36	<0.35	0.10 J	0.44 J	<0.37	<0.37 [0.18 J]	<0.36	<0.35	<1.4	<0.38	<0.35
Dibenzo(a,h)anthracene	0.33	0.56	**3.7 J**	<0.35	<0.35	<7.8	0.0080 J	<0.36	<0.35	<0.35	<0.69	<0.37	<0.37 [0.0080 J]	<0.36	<0.35	<1.4	<0.38	<0.35
Dibenzofuran	7	350	**16**	NA	NA	1.4 J	NA	NA	NA	0.091 J	NA	NA	NA	NA	NA	<1.4	NA	NA
Diethylphthalate	- -	- -	<15	NA	NA	<7.8	NA	NA	NA	<0.35	NA	NA	NA	NA	NA	<1.4	NA	NA
Di-n-Butylphthalate	- -	- -	<15	NA	NA	<7.8	NA	NA	NA	<0.35	NA	NA	NA	NA	NA	<1.4	NA	NA
Fluoranthene	100	500	51	<0.35	<0.35	5.2 J	0.23 J	<0.36	0.35	0.23 J	0.98	<0.37	<0.37 [0.23 J]	<0.36	<0.35	<1.4	<0.38	<0.35
Fluorene	30	500	21	0.16 J	<0.35	5.8 J	0.12 J	<0.36	0.061 J	0.41	0.87	<0.37	<0.37 [0.12 J]	<0.36	0.12 J	<1.4	<0.38	<0.35
Indeno(1,2,3-cd)pyrene	0.5	5.6	**10 J**	<0.35	<0.35	0.33 J	0.026 J	<0.36	<0.35	<0.35	0.13 J	<0.37	<0.37 [0.026 J]	<0.36	<0.35	<1.4	<0.38	<0.35
Naphthalene	12	500	**100**	<0.35	<0.35	0.82 J	0.024 J	<0.36	0.076 J	2.8	3.5	0.010 J	<0.37 [0.024 J]	0.28 J	1.5	5.1	<0.38	<0.35
Phenanthrene	100	500	74	0.035 J	<0.35	29	1.0	<0.36	1.2	1.2	2.8	<0.37	<0.37 [1.0]	<0.36	0.26 J	0.027 J	<0.38	<0.35
Phenol	0.33	500	<15	NA	NA	<7.8	NA	NA	NA	<0.35	NA	NA	NA	NA	NA	<1.4	NA	NA
Pyrene	100	500	37	<0.35	<0.35	9.5	0.38	<0.36	0.41	0.37	1.2	<0.37	<0.37 [0.38]	0.025 J	<0.35	<1.4	0.047 J	0.023 J
Total PAHs	- -	- -	430 J	0.77 J	<0.35	89 J	3.3 J	<0.36	3.3 J	8.5 J	17 J	0.010 J	<0.37 [3.3 J]	0.45 J	3.3 J	8.7 J	0.047 J	0.13 J
Total SVOCs	- -	- -	460 J	0.77 J	<0.35	90 J	3.3 J	<0.36	3.3 J	8.7 J	17 J	0.010 J	<0.37 [3.3 J]	0.45 J	3.3 J	9.0 J	0.047 J	0.13 J

TABLE 6
SOIL ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-11D				MW-12D			MW-13		
Sample Depth(Feet):	Use SCOs	SCOs Commercial	25 - 27	55 - 57	67 - 69	83 - 85	25 - 27	65 - 67	93 - 95	30 - 32	40 - 42	50 - 52
Date Collected:	(bold)	(shade)	06/18/97	06/18/97	06/18/97	06/18/97	06/19/97	06/19/97	06/19/97	09/20/00	09/20/00	09/20/00
Detected VOCs												
1,1,1-Trichloroethane	0.68	500	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.0060	<0.0060	<0.0060 J
1,1,2,2-Tetrachloroethane	- -	- -	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.0060	0.0010 J	0.0020 J
1,1-Dichloroethane	0.27	240	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.0060	<0.0060	<0.0060 J
1,2-Dichloroethane	0.02	30	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.0060	<0.0060	<0.0060 J
1,2-Dichloropropane	- -	- -	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.0060	<0.0060	<0.0060 J
2-Butanone	0.12	500	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.012	<0.011	<0.012 J
4-Methyl-2-pentanone	- -	- -	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.012	<0.011	<0.012 J
Acetone	0.05	500	NA	NA	NA	**0.016 B [0.053 B]**	NA	NA	0.017 B	<0.010	<0.041	<0.018 J
Benzene	0.06	44	<0.013	<0.011	0.0030 J	0.0020 J [0.0020 J]	<0.012	<0.011	<0.010	<0.0060	<0.0060	<0.0060 J
Bromodichloromethane	- -	- -	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.0060	<0.0060	<0.0060 J
Bromomethane	- -	- -	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.012	<0.011	<0.012 J
Carbon Disulfide	- -	- -	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.0060	0.0010	0.00080 J
Carbon Tetrachloride	0.76	22	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.0060	<0.0060	<0.0060 J
Chlorobenzene	1.1	500	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.0060	<0.0060	<0.0060 J
Chloroform	0.37	350	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.00090	<0.0060	<0.0060 J
Chloromethane	- -	- -	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.012	<0.011	<0.012 J
cis-1,3-Dichloropropene	- -	- -	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.0060	<0.0060	<0.0060 J
Dibromochloromethane	- -	- -	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.0060	<0.0060	<0.0060 J
Ethylbenzene	1	390	<0.013	<0.011	0.014	0.030 [0.027]	<0.012	<0.011	<0.010	<0.0060	<0.0060	<0.0060 J
Isopropylbenzene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	500	NA	NA	NA	<0.012 [<0.012]	NA	NA	0.0030 J	<0.0070	<0.012	<0.013 J
Styrene	- -	- -	NA	NA	NA	0.080 [0.076]	NA	NA	<0.010	<0.0060	<0.0060	<0.0060 J
Tetrachloroethene	1.3	150	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.0060	<0.0060	<0.0060
Toluene	0.7	500	<0.013	<0.011	0.0080 J	0.052 [0.055]	<0.012	<0.011	<0.010	0.00030 J	0.00040 J	0.00060 J
trans-1,3-Dichloropropene	- -	- -	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.0060	<0.0060	<0.0060 J
Trichloroethene	0.47	200	NA	NA	NA	<0.012 [<0.012]	NA	NA	<0.010	<0.0060	<0.0060	<0.0060 J
Xylenes (total)	0.26	500	<0.013	<0.011	0.022	0.13 [0.12]	<0.012	<0.011	<0.010	<0.0060	<0.0060	<0.0060 J
Total BTEX	- -	- -	<0.013	<0.011	0.047 J	0.21 J [0.20 J]	<0.012	<0.011	<0.010	0.00030 J	0.00040 J	0.00060 J
Total VOCs	- -	- -	<0.013	<0.011	0.047 J	0.31 J [0.33 J]	<0.012	<0.011	0.020 J	0.00030 J	0.0024 J	0.0034 J
Detected SVOCs												
2,4-Dichlorophenol	- -	- -	NA	NA	NA	<0.38 [<0.75]	NA	NA	<0.40	<0.38	<0.38	<0.37
2,4-Dimethylphenol	- -	- -	NA	NA	NA	<0.38 [<0.75]	NA	NA	<0.40	<0.38	<0.38	<0.37
2-Methylnaphthalene	- -	- -	<0.44	<0.38	<0.38	1.6 [3.5]	0.014 J	<0.35	<0.40	<0.38	<0.38	<0.37
2-Methylphenol	0.33	500	NA	NA	NA	<0.38 [<0.75]	NA	NA	<0.40	<0.38	<0.38	<0.37
4,6-Dinitro-2-methylphenol	- -	- -	NA	NA	NA	<0.94 [<1.9]	NA	NA	<1.0	<1.8	<1.8	<1.8
4-Methylphenol	0.33	500	NA	NA	NA	<0.38 [<0.75]	NA	NA	<0.40	<0.38	<0.38	<0.37
Acenaphthene	20	500	<0.44	<0.38	<0.38	0.073 J [0.14 J]	0.10 J	<0.35	<0.40	<0.38	<0.38	0.0060 J
Acenaphthylene	100	500	<0.44	<0.38	<0.38	0.36 J [0.69 J]	0.066 J	<0.35	<0.40	<0.38	<0.38	0.0030 J
Anthracene	100	500	<0.44	<0.38	<0.38	<0.38 [<0.75]	<0.35	<0.35	<0.40	<0.38	<0.38	<0.37
Benzo(a)anthracene	1	5.6	<0.44	<0.38	<0.38	<0.38 [<0.75]	<0.35	<0.35	<0.40	0.0070 J	<0.38	<0.37
Benzo(a)pyrene	1	1	0.034 J	<0.38	<0.38	<0.38 [<0.75]	<0.35	<0.35	<0.40	<0.38	<0.38	<0.37
Benzo(b)fluoranthene	1	5.6	<0.44	<0.38	<0.38	<0.38 [<0.75]	<0.35	<0.35	<0.40	0.010 J	<0.38	<0.37
Benzo(g,h,i)perylene	100	500	<0.44	<0.38	<0.38	<0.38 [<0.75]	<0.35	<0.35	<0.40	<0.38	<0.38	<0.37
Benzo(k)fluoranthene	0.8	56	<0.44	<0.38	<0.38	<0.38 [<0.75]	<0.35	<0.35	<0.40	0.0060 J	<0.38	<0.37
Benzoic Acid	- -	- -	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8	<1.8
Benzyl Alcohol	- -	- -	NA	NA	NA	NA	NA	NA	NA	<0.38	<0.38	<0.37
Biphenyl	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	- -	- -	NA	NA	NA	0.072 JB [0.042 JB]	NA	NA	<0.40	1.0 B	0.74 B	0.15 B
Butylbenzylphthalate	- -	- -	NA	NA	NA	<0.38 [<0.75]	NA	NA	<0.40	<0.38	<0.38	<0.37
Carbazole	- -	- -	NA	NA	NA	0.030 J [0.061 J]	NA	NA	<0.40	<0.38	<0.38	<0.37
Chrysene	1	56	<0.44	<0.38	<0.38	<0.38 [<0.75]	<0.35	<0.35	<0.40	0.010 J	<0.38	<0.37
Dibenzo(a,h)anthracene	0.33	0.56	<0.44	<0.38	<0.38	<0.38 [<0.75]	<0.35	<0.35	<0.40	<0.38	<0.38	<0.37
Dibenzofuran	7	350	NA	NA	NA	<0.38 [<0.75]	NA	NA	<0.40	<0.38	<0.38	<0.37
Diethylphthalate	- -	- -	NA	NA	NA	<0.38 [<0.75]	NA	NA	0.017 J	<0.38	<0.38	<0.37
Di-n-Butylphthalate	- -	- -	NA	NA	NA	0.013 J [0.034 J]	NA	NA	0.029 JB	0.0050 J	0.0050 J	0.0070 J
Fluoranthene	100	500	<0.44	<0.38	<0.38	<0.38 [<0.75]	<0.35	<0.35	<0.40	0.013 J	<0.38	<0.37
Fluorene	30	500	<0.44	<0.38	<0.38	0.074 J [0.16 J]	0.028 J	<0.35	<0.40	<0.38	<0.38	<0.37
Indeno(1,2,3-cd)pyrene	0.5	5.6	<0.44	<0.38	<0.38	<0.38 [<0.75]	<0.35	<0.35	<0.40	<0.38	<0.38	<0.37
Naphthalene	12	500	<0.44	0.014 J	1.1	2.4 [4.7]	0.021 J	<0.35	<0.40	<0.38	0.0040 J	0.017 J
Phenanthrene	100	500	<0.44	<0.38	<0.38	0.015 J [0.030 J]	<0.35	<0.35	<0.40	0.0090 J	<0.38	0.0030 J
Phenol	0.33	500	NA	NA	NA	<0.38 [<0.75]	NA	NA	<0.40	<0.38	<0.38	<0.37
Pyrene	100	500	<0.44	<0.38	<0.38	<0.38 [<0.75]	<0.35	<0.35	<0.40	0.014 J	0.0030 J	0.0030 J
Total PAHs	- -	- -	0.034 J	0.014 J	1.1	4.5 J [9.2 J]	0.23 J	<0.35	<0.40	0.069 J	0.0070 J	0.032 J
Total SVOCs	- -	- -	0.034 J	0.014 J	1.1	4.6 J [9.4 J]	0.23 J	<0.35	0.046 J	1.1 J	0.75 J	0.19 J

TABLE 6
SOIL ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-14													
Sample Depth(Feet):	Use SCOs	SCOs Commercial	4 - 6	14 - 16	24 - 26	30 - 32	34 - 36	44 - 46	54 - 56	62 - 64	72 - 74	76 - 78	82 - 84	88 - 90	92 - 94	96 - 98
Date Collected:	(bold)	(shade)	09/22/00	09/22/00	09/22/00	09/22/00	09/22/00	09/22/00	09/22/00	09/22/00	09/22/00	09/22/00	09/22/00	09/25/00	09/25/00	09/25/00
Detected VOCs																
1,1,1-Trichloroethane	0.68	500	<0.0050 J	<0.0060	<0.0060	<0.0080 [<0.0080]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060	<0.0060
1,1,2,2-Tetrachloroethane	- -	- -	0.0020 J	<0.0060	0.0020 J	0.025 [0.0080]	0.00070 J	0.0020 J	<0.0050	0.00070 J	<0.0050	<0.0050	0.0040 J	<0.0060	<0.0060	0.0020 J
1,1-Dichloroethane	0.27	240	<0.0050 J	<0.0060	<0.0060	<0.0080 [<0.0080]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060	<0.0060
1,2-Dichloroethane	0.02	30	<0.0050 J	<0.0060	<0.0060	<0.0080 [<0.0080]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060	<0.0060
1,2-Dichloropropane	- -	- -	<0.0050 J	<0.0060	<0.0060	<0.0080 [<0.0080]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060	<0.0060
2-Butanone	0.12	500	0.0060 J	<0.011	<0.013	0.026 [0.027]	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.0040 J	<0.012	<0.012
4-Methyl-2-pentanone	- -	- -	<0.011 J	<0.011	<0.013	<0.015 [<0.015]	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.012	<0.012	<0.012
Acetone	0.05	500	**0.058 B**	<0.016	<0.032	**0.12 B [0.13 B]**	0.020	0.023	0.023	<0.026	0.021	0.017	<0.048	<0.017	<0.014	0.022
Benzene	0.06	44	<0.0050 J	<0.0060	<0.0060	0.00070 J [0.00060 J]	<0.0050	<0.0060	<0.0050	0.00040 J	<0.0050	<0.0050	0.0040	0.00040	<0.0060	<0.0060
Bromodichloromethane	- -	- -	<0.0050 J	<0.0060	<0.0060	<0.0080 [<0.0080]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060	<0.0060
Bromomethane	- -	- -	<0.011 J	<0.011	<0.013	<0.015 [<0.015]	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.012	<0.012	<0.012
Carbon Disulfide	- -	- -	0.0020 J	<0.0060	0.00080	0.0070 J [0.0060]	0.00060 J	<0.0060	<0.0050	0.0030 J	0.0040 J	0.0020	0.0040 J	0.0020	0.00070	0.00080 J
Carbon Tetrachloride	0.76	22	<0.0050 J	<0.0060	<0.0060	<0.0080 [<0.0080]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060	<0.0060
Chlorobenzene	1.1	500	<0.0050 J	<0.0060	<0.0060	0.00060 [0.00060 J]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060	<0.0060
Chloroform	0.37	350	<0.0050 J	<0.0060	<0.0060	<0.0080 [<0.0080]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060	<0.0060
Chloromethane	- -	- -	<0.011 J	<0.011	<0.013	<0.015 [<0.015]	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.012	<0.012	<0.012
cis-1,3-Dichloropropene	- -	- -	<0.0050 J	<0.0060	<0.0060	<0.0080 [<0.0080]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060	<0.0060
Dibromochloromethane	- -	- -	<0.0050 J	<0.0060	<0.0060	<0.0080 [<0.0080]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060	<0.0060
Ethylbenzene	1	390	<0.0050 J	<0.0060	<0.0060	0.00040 [<0.0080]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	0.0030	0.041	0.020	0.0010 J	0.00070 J
Isopropylbenzene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	500	<0.020	<0.0050	<0.011	<0.046 [<0.048]	<0.010	<0.012 J	<0.0080 J	<0.011	<0.0070 J	<0.0090 J	<0.011	<0.0040	<0.0060 J	<0.013 J
Styrene	- -	- -	<0.0050 J	<0.0060	<0.0060	<0.0080 [<0.0080]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060	<0.0060
Tetrachloroethene	1.3	150	<0.0050 J	<0.0060	<0.0060	<0.0080 [<0.0080]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060	<0.0060
Toluene	0.7	500	0.0020 J	0.00060 J	0.00050 J	0.025 [0.011]	0.00060 J	0.00060 J	<0.0050	0.0020 J	<0.0050	0.00050 J	0.0080	0.0020 J	0.0010 J	0.00050 J
trans-1,3-Dichloropropene	- -	- -	<0.0050 J	<0.0060	<0.0060	<0.0080 [<0.0080]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060	<0.0060
Trichloroethene	0.47	200	<0.0050 J	<0.0060	<0.0060	0.00050 J [<0.0080]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060	<0.0060
Xylenes (total)	0.26	500	0.00050 J	<0.0060	<0.0060	0.0010 [<0.0080]	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050	<0.0050	0.029	0.017 B	<0.00050	<0.0060
Total BTEX	- -	- -	0.0025 J	0.00060 J	0.00050 J	0.027 J [0.012 J]	0.00060 J	0.00060 J	<0.0050	0.0024 J	<0.0050	0.0035 J	0.082	0.039 J	0.0020 J	0.0012 J
Total VOCs	- -	- -	0.071 J	0.00060 J	0.0033 J	0.21 J [0.18 J]	0.022 J	0.026 J	0.023	0.0061 J	0.025 J	0.023 J	0.090 J	0.041 J	0.0027 J	0.026 J
Detected SVOCs																
2,4-Dichlorophenol	- -	- -	<0.36	<0.38	<8.1	<0.48 [<0.53]	<0.39	<0.36	<0.36	<0.35	<0.36	<0.35	<0.35	<0.40	<0.39	<0.35
2,4-Dimethylphenol	- -	- -	<0.36	<0.38	<8.1	<0.48 [<0.53]	<0.39	<0.36	<0.36	<0.35	<0.36	<0.35	<0.35	<0.40	<0.39	<0.35
2-Methylnaphthalene	- -	- -	0.11	<0.38	0.50 J	0.0080 J [0.031 J]	<0.39	<0.36	<0.36	<0.35	0.011	0.012 J	0.031 J	0.13 J	0.025 J	0.054 J
2-Methylphenol	0.33	500	<0.36	<0.38	<8.1	<0.48 [<0.53]	<0.39	<0.36	<0.36	<0.35	<0.36	<0.35	<0.35	<0.40	<0.39	<0.35
4,6-Dinitro-2-methylphenol	- -	- -	<1.8	<1.9	<41	<2.4 [<2.6]	<1.9	<1.7	<1.8	<1.7	<1.7	<1.7	<1.7	<1.9	<1.9	<1.7
4-Methylphenol	0.33	500	0.017 J	<0.38	<8.1	0.15 [0.21 J]	0.018 J	<0.36	<0.36	<0.35	<0.36	<0.35	<0.35	<0.40	<0.39	<0.35
Acenaphthene	20	500	0.11 J	<0.38	6.0 J	0.14 J [0.34 J]	0.029 J	0.056 J	0.11 J	0.045 J	0.038 J	0.042 J	0.043 J	0.092 J	0.023 J	0.020 J
Acenaphthylene	100	500	0.095 J	<0.38	1.8 J	0.032 J [0.092 J]	0.0090 J	0.016 J	0.040 J	0.022 J	0.051 J	0.062 J	0.066 J	0.15 J	0.026 J	0.047 J
Anthracene	100	500	0.42	<0.38	7.3 J	0.27 J [0.58]	0.032 J	0.018 J	0.046 J	0.013 J	0.019 J	0.028 J	0.081 J	0.28 J	0.068 J	0.092 J
Benzo(a)anthracene	1	5.6	0.99	0.0070 J	**28**	**1.0 [1.9]**	0.12 J	0.091 J	0.22 J	0.050 J	0.038 J	0.040 J	0.029 J	0.28 J	0.13 J	0.12 J
Benzo(a)pyrene	1	1	0.91	<0.38	**38**	**1.4 [2.5]**	0.17 J	0.12 J	0.34 J	0.068 J	0.053 J	0.061 J	0.035 J	0.33 J	0.16 J	0.13 J
Benzo(b)fluoranthene	1	5.6	0.56	<0.38	**23**	**0.76 [1.6]**	0.11 J	0.087 J	0.24 J	0.041 J	0.033 J	0.040 J	0.018 J	0.16 J	0.094 J	0.064 J
Benzo(g,h,i)perylene	100	500	0.43	<0.38	29	0.54 [0.97]	0.14 J	0.063 J	0.23 J	0.035 J	0.027 J	0.029 J	0.016 J	0.18 J	0.088 J	0.063 J
Benzo(k)fluoranthene	0.8	56	0.79	<0.38	**28**	**1.0 [1.6]**	0.14 J	0.10 J	0.25 J	0.064 J	0.049 J	0.052 J	0.029 J	0.21 J	0.14 J	0.096 J
Benzoic Acid	- -	- -	<1.8	<1.9	<41	0.049 J [0.21 J]	<1.9	<1.7	<1.8	<1.7	<1.7	<1.7	<1.7	<1.9	<1.9	<1.7
Benzyl Alcohol	- -	- -	<0.36	<0.38	<8.1	<0.48 [<0.53]	<0.39	<0.36	<0.36	<0.35	<0.36	<0.35	<0.35	<0.40	<0.39	<0.35
Biphenyl	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	- -	- -	0.52 B	2.4 B	0.46 B	0.37 JB [0.62 B]	0.34 B	0.49 B	<0.17 J	<0.070 J	<0.25 J	<0.084 J	<0.20 J	0.32 JB	1.6 B	0.84 B
Butylbenzylphthalate	- -	- -	<0.36	<0.38	<8.1	<0.48 [<0.53]	<0.39	<0.36	<0.36	<0.35	<0.36	<0.35	<0.35	<0.40	<0.39	<0.35
Carbazole	- -	- -	0.13 J	<0.38	2.8 J	0.094 J [0.19 J]	0.012 J	0.0070 J	0.016 J	<0.35	0.0060 J	0.0080 J	0.0050 J	0.011 J	0.0080 J	<0.35
Chrysene	1	56	0.96	0.0070 J	**24**	**0.92 [1.7]**	0.11 J	0.088 J	0.21 J	0.051 J	0.035 J	0.038 J	0.029 J	0.28 J	0.13 J	0.11 J
Dibenzo(a,h)anthracene	0.33	0.56	0.19 J	<0.38	**16**	**0.28 J [0.62]**	0.056 J	0.030 J	0.088 J	0.017 J	0.011 J	0.016 J	0.0060 J	0.052 J	0.032 J	0.025 J
Dibenzofuran	7	350	0.11 J	<0.38	1.5 J	0.036 J [0.094 J]	0.0060 J	<0.36	0.0080 J	<0.35	0.010 J	0.010 J	0.011 J	0.020 J	<0.39	0.0070 J
Diethylphthalate	- -	- -	<0.36	<0.38	<8.1	<0.48 [<0.53]	<0.39	<0.36	<0.36	<0.35	<0.36	<0.35	<0.35	<0.40	<0.39	<0.35
Di-n-Butylphthalate	- -	- -	<0.0090 J	<0.0070 J	<8.1	<0.48 [<0.0080 J]	<0.39	<0.36	<0.0050 J	<0.35	<0.0080 J	<0.35	<0.35	<0.0080 J	<0.0080 J	0.0060 J
Fluoranthene	100	500	1.4	0.013 J	29	0.89 [1.8]	0.13 J	0.091 J	0.22 J	0.054 J	0.045 J	0.052 J	0.065 J	0.46	0.17 J	0.19 J
Fluorene	30	500	0.14 J	<0.38	2.6 J	0.064 J [0.17 J]	0.010 J	<0.36	0.014 J	<0.35	0.010 J	0.010 J	0.022 J	0.18 J	0.036 J	0.056 J
Indeno(1,2,3-cd)pyrene	0.5	5.6	**0.51**	<0.38	**31**	**0.74 [1.3]**	0.14 J	0.067 J	0.21 J	0.038 J	0.028 J	0.031 J	0.016 J	0.13 J	0.083 J	0.053 J
Naphthalene	12	500	0.14 J	<0.38	1.0 J	0.017 J [0.056 J]	<0.39	0.0050 J	0.012 J	0.013 J	0.060 J	0.040 J	0.28 J	0.23 J	0.039 J	<0.11 J
Phenanthrene	100	500	1.3	0.010	15	0.60 [1.2]	0.077 J	0.040 J	0.10 J	0.030 J	0.028 J	0.064 J	0.30 J	1.1	0.27 J	0.40
Phenol	0.33	500	0.0070 J	<0.38	<8.1	0.016 J [0.030 J]	<0.39	<0.36	<0.36	<0.35	<0.36	<0.35	<0.35	<0.40	<0.39	<0.35
Pyrene	100	500	1.7	0.012 J	27	1.1 [1.8]	0.14 J	0.077 J	0.19 J	0.046 J	0.037 J	0.044 J	0.092 J	0.79	0.24 J	0.26 J
Total PAHs	- -	- -	11 J	0.049 J	310 J	9.8 J [18 J]	1.4 J	0.95 J	2.5 J	0.59 J	0.57 J	0.66 J	1.2 J	5.0 J	1.8 J	1.8 J
Total SVOCs	- -	- -	12 J	2.5 J	310 J	11 J [20 J]	1.8 J	1.5 J	2.5 J	0.59 J	0.59 J	0.68 J	1.2 J	5.4 J	3.4 J	2.6 J

TABLE 6
SOIL ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-15							MW-15B							
Sample Depth(Feet):	Use SCOs	SCOs Commercial	8 - 10	18 - 20	32 - 34	40 - 42	48 - 50	58 - 60	60 - 62	70 - 72	76 - 78	82 - 84	88 - 90	94 - 96	102 - 104	108 - 110	120 - 122
Date Collected:	(bold)	(shade)	09/26/00	09/26/00	09/26/00	09/26/00	09/27/00	09/27/00	10/04/00	09/28/00	09/28/00	09/28/00	09/28/00	09/28/00	09/28/00	09/28/00	09/28/00
Detected VOCs																	
1,1,1-Trichloroethane	0.68	500	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050 [<0.0050]	<0.0060	<0.0060
1,1,2,2-Tetrachloroethane	- -	- -	0.0030 J	0.0040 J	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	0.0020 J	<0.0050	0.0040 J	<0.0050	0.0060	<0.0050 [0.0010 J]	<0.0060	<0.0060
1,1-Dichloroethane	0.27	240	0.00080 J	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050 [<0.0050]	<0.0060	<0.0060
1,2-Dichloroethane	0.02	30	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050 [<0.0050]	<0.0060	<0.0060
1,2-Dichloropropane	- -	- -	0.00090 J	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050 [<0.0050]	<0.0060	<0.0060
2-Butanone	0.12	500	<0.011	<0.011	<0.011	<0.011	<0.012	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011 [<0.011]	<0.012	<0.011
4-Methyl-2-pentanone	- -	- -	<0.011	<0.011	<0.011	<0.011	<0.012	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011 [<0.011]	<0.012	<0.011
Acetone	0.05	500	0.012	0.039	0.018	0.013	<0.012	0.014	0.015	0.025	0.014	0.018	<0.011	0.024	<0.011 [<0.011]	<0.012	<0.011
Benzene	0.06	44	0.00080 J	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	0.00060 J	<0.0060	0.0040 J	<0.0060	0.00070 J	0.00050 J	<0.0050 [<0.0050]	<0.0060	<0.0060
Bromodichloromethane	- -	- -	0.00080 J	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050 [<0.0050]	<0.0060	<0.0060
Bromomethane	- -	- -	<0.011	<0.011	<0.011	<0.011	<0.012	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011 [<0.011]	<0.012	<0.011
Carbon Disulfide	- -	- -	0.00070 J	<0.0060	<0.0060	<0.0060	<0.0060	0.0010 J	<0.0050	0.00070	0.0030 J	0.0040 J	0.0020 J	0.0010 J	<0.0050 [0.00050 J]	<0.0060	<0.0060
Carbon Tetrachloride	0.76	22	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050 [<0.0050]	<0.0060	<0.0060
Chlorobenzene	1.1	500	0.00070 J	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050 [<0.0050]	<0.0060	<0.0060
Chloroform	0.37	350	0.00090 J	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050 [<0.0050]	<0.0060	<0.0060
Chloromethane	- -	- -	<0.011	<0.011	<0.011	<0.011	<0.012	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011 [<0.011]	<0.012	<0.011
cis-1,3-Dichloropropene	- -	- -	0.00070 J	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050 [<0.0050]	<0.0060	<0.0060
Dibromochloromethane	- -	- -	0.00080 J	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050 [<0.0050]	<0.0060	<0.0060
Ethylbenzene	1	390	0.00050 J	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	0.023	0.045	0.058	0.027	0.022 [0.026]	<0.0060	<0.0060
Isopropylbenzene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	500	<0.0070	<0.0070	<0.0040	<0.0060	<0.0040	<0.0040	<0.0080	<0.0080	<0.0060	<0.0090	<0.0050	<0.011	<0.0030 [<0.0070]	<0.0030	<0.0030
Styrene	- -	- -	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	<0.0050	0.13	0.18	0.090	0.073 [0.096]	<0.0060	<0.0060
Tetrachloroethene	1.3	150	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050 [<0.0050]	<0.0060	<0.0060
Toluene	0.7	500	0.0010 J	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	0.00070 J	0.050	0.026	0.012	0.0080 [0.0080]	<0.0060	<0.0060
trans-1,3-Dichloropropene	- -	- -	0.00070 J	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050 [<0.0050]	<0.0060	<0.0060
Trichloroethene	0.47	200	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	<0.0050	<0.0060	<0.0050	<0.0050	<0.0050 [<0.0050]	<0.0060	<0.0060
Xylenes (total)	0.26	500	0.00090 J	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	0.0050	0.25	**0.32**	0.14	0.12 [0.16]	<0.0060	<0.0060
Total BTEX	- -	- -	0.0032 J	<0.0060	<0.0060	<0.0060	<0.0060	<0.0050	0.00060 J	<0.0060	0.033 J	0.35	0.41 J	0.18 J	0.15 [0.19]	<0.0060	<0.0060
Total VOCs	- -	- -	0.025 J	0.043 J	0.018	0.013	<0.012	0.015 J	0.016 J	0.028 J	0.050 J	0.50 J	0.59 J	0.30 J	0.22 [0.29 J]	<0.012	<0.011
Detected SVOCs																	
2,4-Dichlorophenol	- -	- -	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
2,4-Dimethylphenol	- -	- -	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
2-Methylnaphthalene	- -	- -	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	0.073 J	0.60 J	1.6	0.22 J [1.4]	0.25 J	<0.37
2-Methylphenol	0.33	500	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
4,6-Dinitro-2-methylphenol	- -	- -	<2.0	<1.9	<1.8	<1.7	<1.7	<1.7	NA	<1.6	<1.7	<3.6	<3.5	<3.4	<3.3 [<1.7]	<1.8	<1.8
4-Methylphenol	0.33	500	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Acenaphthene	20	500	<0.40	<0.40	<0.38	0.016 J	0.031 J	0.099 J	NA	<0.34	<0.35	0.68 J	0.83	0.71	<0.69 [0.16 J]	0.059 J	<0.37
Acenaphthylene	100	500	<0.40	<0.40	<0.38	<0.36	0.014 J	0.032 J	NA	<0.34	0.042 J	1.8	1.5	1.2	0.24 J [0.63]	0.18 J	<0.37
Anthracene	100	500	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Benzo(a)anthracene	1	5.6	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Benzo(a)pyrene	1	1	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Benzo(b)fluoranthene	1	5.6	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Benzo(g,h,i)perylene	100	500	<0.40	<0.40	<0.38	<0.36 J	<0.36 J	<0.36 J	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Benzo(k)fluoranthene	0.8	56	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Benzoic Acid	- -	- -	<2.0	<1.9	<1.8	<1.7	<1.7	<1.7	NA	<1.6	<1.7	<3.6	<3.5	<3.4	<3.3 [<1.7]	<1.8	<1.8
Benzyl Alcohol	- -	- -	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Biphenyl	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	- -	- -	<0.11 J	<0.68	0.93 B	0.17 J	0.29 J	0.048 J	NA	1.0 B	<0.35	<0.66 J	<0.12 J	<0.34 J	<0.093 J [<0.16 J]	<0.60 J	<0.20 J
Butylbenzylphthalate	- -	- -	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Carbazole	- -	- -	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	0.17 J	0.33 J	0.29 J	<0.69 [0.056 J]	0.023 J	<0.37
Chrysene	1	56	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Dibenzo(a,h)anthracene	0.33	0.56	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Dibenzofuran	7	350	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	0.024 J	0.028 J	<0.71	<0.69 [<0.35]	<0.36	<0.37
Diethylphthalate	- -	- -	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	0.095 J	<0.69 [<0.35]	0.043 J	<0.37
Di-n-Butylphthalate	- -	- -	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Fluoranthene	100	500	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Fluorene	30	500	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	0.19 J	0.21 J	0.059 J	<0.69 [0.026 J]	<0.36	<0.37
Indeno(1,2,3-cd)pyrene	0.5	5.6	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Naphthalene	12	500	<0.40	<0.40	0.018 J	0.035 J	0.020 J	0.033 J	NA	0.016 J	0.15 J	4.7	4.5	4.4	5.2 [2.5]	1.5	0.054 J
Phenanthrene	100	500	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Phenol	0.33	500	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Pyrene	100	500	<0.40	<0.40	<0.38	<0.36	<0.36	<0.36	NA	<0.34	<0.35	<0.73	<0.72	<0.71	<0.69 [<0.35]	<0.36	<0.37
Total PAHs	- -	- -	<0.40	<0.40	0.018 J	0.051 J	0.065 J	0.16 J	NA	0.016 J	0.19 J	7.4 J	7.6 J	8.0 J	5.7 J [4.7 J]	2.0 J	0.054 J
Total SVOCs	- -	- -	<2.0	<1.9	0.95 J	0.22 J	0.36 J	0.21 J	NA	1.0 J	0.19 J	7.6 J	8.0 J	8.4 J	5.7 J [4.8 J]	2.1 J	0.054 J

TABLE 6
SOIL ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-16											
Sample Depth(Feet):	Use SCOs	SCOs Commercial	10 - 12	22 - 24	30 - 32	40 - 42	50 - 52	60 - 62	70 - 72	80 - 82	90 - 92	100 - 102	110 - 112	118 - 120
Date Collected:	(bold)	(shade)	10/04/00	10/04/00	10/04/00	10/04/00	10/04/00	10/04/00	10/04/00	10/04/00	10/05/00	10/05/00	10/05/00	10/05/00
Detected VOCs														
1,1,1-Trichloroethane	0.68	500	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
1,1,2,2-Tetrachloroethane	- -	- -	0.0040 J	0.0080	0.0030 J	<0.0050	<0.0060	NA	0.0020 J	<0.0050	<0.0050	<0.0060	<0.0060	0.0040 J
1,1-Dichloroethane	0.27	240	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
1,2-Dichloroethane	0.02	30	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
1,2-Dichloropropane	- -	- -	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
2-Butanone	0.12	500	<0.012	<0.012	<0.011	<0.011	<0.011	NA	<0.011	<0.011	<0.011	<0.012	<0.011	<0.012
4-Methyl-2-pentanone	- -	- -	<0.012	<0.012	<0.011	<0.011	<0.011	NA	<0.011	<0.011	<0.011	<0.012	<0.011	<0.012
Acetone	0.05	500	0.017	0.020	0.014	0.013	0.016	NA	0.021	0.013	<0.011	<0.012	<0.011	0.024
Benzene	0.06	44	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	0.0010 J	0.00090 J	<0.0050	<0.0060	<0.0060	<0.0060
Bromodichloromethane	- -	- -	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
Bromomethane	- -	- -	<0.012	<0.012	<0.011	<0.011	<0.011	NA	<0.011	<0.011	<0.011	<0.012	<0.011	<0.012
Carbon Disulfide	- -	- -	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	0.0020 J	0.00090 J	<0.0050	<0.0060	0.0010 J	<0.0060
Carbon Tetrachloride	0.76	22	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
Chlorobenzene	1.1	500	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
Chloroform	0.37	350	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
Chloromethane	- -	- -	<0.012	<0.012	<0.011	<0.011	<0.011	NA	<0.011	<0.011	<0.011	<0.012	<0.011	<0.012
cis-1,3-Dichloropropene	- -	- -	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
Dibromochloromethane	- -	- -	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
Ethylbenzene	1	390	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
Isopropylbenzene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	500	<0.013	<0.016	<0.017	<0.0050	<0.012	NA	<0.032	<0.012	<0.0060	<0.0060	<0.017	<0.032
Styrene	- -	- -	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
Tetrachloroethene	1.3	150	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
Toluene	0.7	500	<0.00050 J	0.00060 J	0.00070 J	<0.0050	<0.0060	NA	0.00050 J	<0.0050	<0.0050	<0.00060 J	<0.00080 J	<0.0020 J
trans-1,3-Dichloropropene	- -	- -	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
Trichloroethene	0.47	200	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
Xylenes (total)	0.26	500	<0.0060	<0.0060	<0.0050	<0.0050	<0.0060	NA	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0060
Total BTEX	- -	- -	<0.0060	0.00060 J	0.00070 J	<0.0050	<0.0060	NA	0.0015 J	0.00090 J	<0.0050	<0.0060	<0.0060	<0.0060
Total VOCs	- -	- -	0.021 J	0.029 J	0.018 J	0.013	0.016	NA	0.027 J	0.015 J	<0.011	<0.012	0.0010 J	0.028 J
Detected SVOCs														
2,4-Dichlorophenol	- -	- -	<0.38	<0.40	<0.37	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
2,4-Dimethylphenol	- -	- -	<0.38	<0.40	<0.37	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
2-Methylnaphthalene	- -	- -	<0.38	<0.40	0.052 J	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
2-Methylphenol	0.33	500	<0.38	<0.40	<0.37	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
4,6-Dinitro-2-methylphenol	- -	- -	<1.8	<1.9	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.7	<1.8	<1.8	<1.8
4-Methylphenol	0.33	500	<0.38	<0.40	<0.37	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Acenaphthene	20	500	<0.38	<0.40	0.015 J	0.032 J	0.048 J	0.15 J	0.44	0.40	0.052 J	0.039 J	<0.37	0.033 J
Acenaphthylene	100	500	<0.38	<0.40	0.031 J	0.010 J	0.012 J	0.035 J	1.0	1.4	0.26 J	0.18 J	<0.37	0.086 J
Anthracene	100	500	<0.38	<0.40	<0.37	0.014 J	0.023 J	0.012 J	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Benzo(a)anthracene	1	5.6	<0.38	<0.40	0.016 J	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Benzo(a)pyrene	1	1	<0.38	<0.40	0.017 J	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Benzo(b)fluoranthene	1	5.6	<0.38	<0.40	0.013 J	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Benzo(g,h,i)perylene	100	500	<0.38	<0.40	<0.37	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Benzo(k)fluoranthene	0.8	56	<0.38	<0.40	0.015 J	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Benzoic Acid	- -	- -	<1.8	<1.9	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.7	<1.8	<1.8	<1.8
Benzyl Alcohol	- -	- -	<0.38	<0.40	<0.37	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Biphenyl	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	- -	- -	0.16 J	0.45	2.2	0.12 J	0.085 J	0.46	1.3	0.25 J	0.18 J	0.12 J	0.12 J	0.18 J
Butylbenzylphthalate	- -	- -	<0.38	<0.40	<0.37	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Carbazole	- -	- -	<0.38	<0.40	<0.37	<0.37	<0.37	<0.36	0.038 J	0.20 J	0.028 J	0.026 J	<0.37	<0.38
Chrysene	1	56	<0.38	<0.40	0.015 J	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Dibenzo(a,h)anthracene	0.33	0.56	<0.38	<0.40	<0.37	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Dibenzofuran	7	350	<0.38	<0.40	<0.37	<0.37	<0.37	0.0090 J	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Diethylphthalate	- -	- -	<0.11 J	<0.40	<0.022 J	<0.028 J	<0.076 J	<0.056 J	<0.044 J	<0.034 J	<0.36	<0.37	<0.37	<0.38
Di-n-Butylphthalate	- -	- -	0.29 JB	<0.40	<0.37	<0.37	<0.16 J	<0.049 J	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Fluoranthene	100	500	<0.38	<0.40	0.021 J	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Fluorene	30	500	<0.38	<0.40	<0.37	<0.37	<0.37	0.018 J	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Indeno(1,2,3-cd)pyrene	0.5	5.6	<0.38	<0.40	<0.37	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Naphthalene	12	500	<0.38	<0.40	0.16 J	0.022 J	0.017 J	0.021 J	0.17 J	0.39	0.078 J	0.12 J	<0.37	0.031 J
Phenanthrene	100	500	<0.38	<0.40	0.026 J	0.013 J	0.018 J	0.012 J	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Phenol	0.33	500	<0.38	<0.40	<0.37	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Pyrene	100	500	<0.38	<0.40	0.031 J	<0.37	<0.37	<0.36	<0.36	<0.37	<0.36	<0.37	<0.37	<0.38
Total PAHs	- -	- -	<0.38	<0.40	0.41 J	0.091 J	0.12 J	0.25 J	1.6 J	2.2	0.39 J	0.34 J	<0.37	0.15 J
Total SVOCs	- -	- -	0.45 J	0.45	2.6 J	0.21 J	0.20 J	0.72 J	3.0 J	2.6 J	0.60 J	0.49 J	0.12 J	0.33 J

TABLE 6
SOIL ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-17B													
Sample Depth(Feet):	Use SCOs	SCOs Commercial	10 - 12	20 - 22	30 - 32	40 - 42	50 - 52	60 - 62	68 - 70	74 - 76	80 - 82	86 - 88	92 - 94	98 - 100	108 - 110	118 - 120
Date Collected:	(bold)	(shade)	10/06/00	10/09/00	10/09/00	10/09/00	10/09/00	10/09/00	10/09/00	10/09/00	10/09/00	10/10/00	10/10/00	10/10/00	10/10/00	10/10/00
Detected VOCs																
1,1,1-Trichloroethane	0.68	500	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	<0.0050	<0.027	<0.027 [<0.0060]	<0.0050	<0.0050	<0.0060	<0.0060 J	<0.0060
1,1,2,2-Tetrachloroethane	- -	- -	<0.0060	<0.0070	<0.0050	0.00090 J	<0.0060	<0.0060	0.0050	<0.027	<0.027 [<0.0060]	0.0020 J	<0.0050	<0.0060	<0.0060 J	<0.0060
1,1-Dichloroethane	0.27	240	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	<0.0050	<0.027	<0.027 [<0.0060]	<0.0050	<0.0050	<0.0060	<0.0060 J	<0.0060
1,2-Dichloroethane	0.02	30	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	<0.0050	<0.027	<0.027 [<0.0060]	<0.0050	<0.0050	<0.0060	<0.0060 J	<0.0060
1,2-Dichloropropane	- -	- -	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	<0.0050	<0.027	<0.027 [<0.0060]	<0.0050	<0.0050	<0.0060	<0.0060 J	<0.0060
2-Butanone	0.12	500	<0.011	<0.014	<0.011	<0.011	<0.011	<0.013	<0.011	<0.055	<0.054 [<0.011]	<0.011	<0.011	<0.011	<0.012 J	<0.012
4-Methyl-2-pentanone	- -	- -	<0.011	<0.014	<0.011	<0.011	<0.011	<0.013	0.094	<0.055	<0.054 [<0.011]	<0.011	<0.011	<0.011	<0.012 J	<0.012
Acetone	0.05	500	0.013	0.050	0.012	0.037	0.042	<0.013	0.045	<0.055	**0.051 J [0.036]**	0.015	0.014	<0.011	0.014 J	0.013
Benzene	0.06	44	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	<0.0050	0.0010 J	0.0050 J [<0.0060]	<0.0050	0.012	0.049	<0.0060 J	<0.0060
Bromodichloromethane	- -	- -	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	<0.0050	<0.027	<0.027 [<0.0060]	<0.0050	<0.0050	<0.0060	<0.0060 J	<0.0060
Bromomethane	- -	- -	<0.011	<0.014	<0.011	<0.011	<0.011	<0.013	<0.011	<0.055	<0.054 [<0.011]	<0.011 J	<0.011 J	0.011 J	<0.012 J	<0.012 J
Carbon Disulfide	- -	- -	<0.0060	0.0020 J	<0.0050	<0.0050	0.0010 J	0.0010 J	<0.0050	0.0020 J	0.0020 J [<0.0060]	<0.0050	<0.0050	<0.0060	0.0010 J	<0.0060
Carbon Tetrachloride	0.76	22	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	<0.0050	<0.027	<0.027 [<0.0060]	<0.0050	<0.0050	<0.0060	<0.0060 J	<0.0060
Chlorobenzene	1.1	500	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	<0.0050	<0.027	<0.027 [<0.0060]	<0.0050	<0.0050	<0.0060	<0.0060 J	<0.0060
Chloroform	0.37	350	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	<0.0050	<0.027	<0.027 [<0.0060]	<0.0050	<0.0050	<0.0060	<0.0060 J	<0.0060
Chloromethane	- -	- -	<0.011	<0.014	<0.011	<0.011	<0.011	<0.013	<0.011	<0.055	<0.054 [<0.011]	<0.011	<0.011	<0.011	<0.012 J	<0.012
cis-1,3-Dichloropropene	- -	- -	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	<0.0050	<0.027	<0.027 [<0.0060]	<0.0050	<0.0050	<0.0060	<0.0060 J	<0.0060
Dibromochloromethane	- -	- -	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	<0.0050	<0.027	<0.027 [<0.0060]	<0.0050	<0.0050	<0.0060	<0.0060 J	<0.0060
Ethylbenzene	1	390	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	0.085	0.40	0.64 [<0.0060]	0.055	0.00050 J	0.012	<0.0060 J	<0.0060
Isopropylbenzene	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	500	<0.0090	<0.011	<0.010	<0.0080	<0.0050	<0.0050	<0.011	<0.020	<0.031 [<0.0060 J]	<0.0090 J	<0.012 J	<0.0080	<0.014 J	<0.010 J
Styrene	- -	- -	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	<0.0050	0.0070 J	0.56 [<0.0060]	0.22	0.0020 J	0.087	<0.0060 J	<0.0060
Tetrachloroethene	1.3	150	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	<0.0050	<0.027	<0.027 [<0.0060]	<0.0050	<0.0050	<0.0060	<0.0060 J	<0.0060
Toluene	0.7	500	<0.00050	0.0020 J	0.0010 J	0.00080 J	<0.0060	<0.0060	0.0040 J	0.034	0.12 [<0.0060]	0.021	0.010	0.014	<0.0010 J	<0.0060
trans-1,3-Dichloropropene	- -	- -	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	<0.0050	<0.027	<0.027 [<0.0060]	<0.0050	<0.0050	<0.0060	<0.0060 J	<0.0060
Trichloroethene	0.47	200	<0.0060	<0.0070	<0.0050	<0.0050	0.00080 J	<0.0060	<0.0050	<0.027	<0.027 [0.00080 J]	<0.0050	<0.0050	<0.0060	<0.0060 J	<0.0060
Xylenes (total)	0.26	500	<0.0060	<0.0070	<0.0050	<0.0050	<0.0060	<0.0060	0.065	0.20	**0.73 [<0.0060]**	**0.33**	0.0050	0.071	<0.0060 J	<0.0060
Total BTEX	- -	- -	<0.0060	0.0020 J	0.0010 J	0.00080 J	<0.0060	<0.0060	0.15 J	0.64 J	1.5 J [<0.0060]	0.41	0.028 J	0.15	<0.0060	<0.0060
Total VOCs	- -	- -	0.013	0.054 J	0.013 J	0.039 J	0.044 J	0.0010 J	0.30 J	0.64 J	2.1 J [0.037 J]	0.64 J	0.044 J	0.24 J	0.015 J	0.013
Detected SVOCs																
2,4-Dichlorophenol	- -	- -	<0.37	<0.46	<0.37	<0.36	<0.36	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
2,4-Dimethylphenol	- -	- -	<0.37	<0.46	<0.37	<0.36	<0.36	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
2-Methylnaphthalene	- -	- -	0.13 J	<0.46	<0.37	<0.36	<0.36	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
2-Methylphenol	0.33	500	<0.37	<0.46	<0.37	<0.36	<0.36	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
4,6-Dinitro-2-methylphenol	- -	- -	<1.8	<2.2	<1.8	<1.8	<1.8	<1.8	<1.7	<1.7	<1.8 [<1.8]	<7.6	<1.8	<1.7	<1.7	<1.8
4-Methylphenol	0.33	500	<0.37	<0.46	<0.37	<0.36	<0.36	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
Acenaphthene	20	500	0.052 J	<0.46	<0.37	<0.36	0.072 J	0.062 J	0.079 J	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
Acenaphthylene	100	500	0.14 J	<0.46	<0.37	<0.36	<0.36	0.011 J	0.050 J	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
Anthracene	100	500	0.37	<0.46	<0.37	<0.36	<0.36	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
Benzo(a)anthracene	1	5.6	**1.3**	<0.46	<0.37	<0.36	0.030 J	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	0.019 J	<0.35	<0.37
Benzo(a)pyrene	1	1	**1.2**	<0.46	<0.37	<0.36	0.021 J	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	0.016 J	<0.35	<0.37
Benzo(b)fluoranthene	1	5.6	1.0	<0.46	<0.37	<0.36	0.020 J	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	0.014 J	<0.35	<0.37
Benzo(g,h,i)perylene	100	500	1.0	<0.46	<0.37	<0.36	<0.36	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
Benzo(k)fluoranthene	0.8	56	0.74	<0.46	<0.37	<0.36	0.023 J	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	0.017 J	<0.35	<0.37
Benzoic Acid	- -	- -	<1.8	<2.2	<1.8	<1.8	<1.8	<1.8	<1.7	<1.7	<1.8 [<1.8]	<7.6	<1.8	<1.7	<1.7	<1.8
Benzyl Alcohol	- -	- -	<0.37	<0.46	<0.37	<0.36	<0.36	<0.38 J	<0.35	<0.36	<0.36 [<0.37 J]	<1.6 J	<0.37	<0.36	<0.35	0.37 J
Biphenyl	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	- -	- -	1.8	0.088 J	0.24 J	0.10 J	0.44	0.064 J	0.16 J	0.11 J	0.19 J [0.10 J]	<1.6	0.055 J	0.14 J	0.073 J	0.086 J
Butylbenzylphthalate	- -	- -	<0.37	<0.46	<0.37	<0.36	<0.36	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
Carbazole	- -	- -	0.099 J	<0.46	<0.37	<0.36	<0.36	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
Chrysene	1	56	**1.2**	<0.46	<0.37	<0.36	0.030 J	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	0.021 J	<0.35	<0.37
Dibenzo(a,h)anthracene	0.33	0.56	**0.40**	<0.46	<0.37	<0.36	<0.36	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
Dibenzofuran	7	350	0.095 J	<0.46	<0.37	<0.36	<0.36	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
Diethylphthalate	- -	- -	<0.37	0.11 J	0.10 J	<0.36	<0.36	<0.38	0.020 J	<0.36	0.015 J [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
Di-n-Butylphthalate	- -	- -	<0.37	<0.46	<0.37	<0.36	<0.36	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
Fluoranthene	100	500	1.7	<0.46	<0.37	<0.36	0.044 J	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	0.030 J	<0.35	<0.37
Fluorene	30	500	0.075 J	<0.46	<0.37	<0.36	<0.36	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
Indeno(1,2,3-cd)pyrene	0.5	5.6	**1.2**	<0.46	<0.37	<0.36	<0.36	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
Naphthalene	12	500	0.16 J	0.015 J	0.015 J	<0.36	0.037 J	0.016 J	0.13 J	0.12 J	0.16 J [<0.37]	10	0.019 J	0.33 J	<0.35	0.013 J
Phenanthrene	100	500	1.1	<0.46	<0.37	<0.36	0.011 J	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
Phenol	0.33	500	<0.37	<0.46	<0.37	<0.36	<0.36	<0.38	<0.35	<0.36	<0.36 [<0.37]	<1.6	<0.37	<0.36	<0.35	<0.37
Pyrene	100	500	1.7	<0.46	<0.37	<0.36	0.036 J	<0.38	<0.35	0.010 J	<0.36 [<0.37]	<1.6	<0.37	0.020 J	<0.35	<0.37
Total PAHs	- -	- -	14 J	0.015 J	0.015 J	<0.36	0.32 J	0.089 J	0.26 J	0.13 J	0.16 J [<0.37]	10	0.019 J	0.47 J	<0.35	0.013 J
Total SVOCs	- -	- -	16 J	0.21 J	0.36 J	0.10 J	0.76 J	0.15 J	0.44 J	0.24 J	0.37 J [0.10 J]	10	0.074 J	0.61 J	0.073 J	0.47 J

TABLE 6
SOIL ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-18		
Sample Depth(Feet):	Use SCOs	SCOs Commercial	10 - 12	64 - 66	88 - 90
Date Collected:	(bold)	(shade)	09/03/02	09/04/02	09/04/02
Detected VOCs					
1,1,1-Trichloroethane	0.68	500	<0.0070	<0.0060	<0.0060 [<0.0060]
1,1,2,2-Tetrachloroethane	- -	- -	<0.0070	<0.0060	<0.0060 [<0.0060]
1,1-Dichloroethane	0.27	240	<0.0070	<0.0060	<0.0060 [<0.0060]
1,2-Dichloroethane	0.02	30	<0.0070	<0.0060	<0.0060 [<0.0060]
1,2-Dichloropropane	- -	- -	<0.0070	<0.0060	<0.0060 [<0.0060]
2-Butanone	0.12	500	<0.015	<0.011	<0.012 [<0.012]
4-Methyl-2-pentanone	- -	- -	<0.015	<0.011	<0.012 [<0.012]
Acetone	0.05	500	0.020	<0.011	<0.012 [<0.012]
Benzene	0.06	44	<0.0070	0.038	<0.0060 [<0.0060]
Bromodichloromethane	- -	- -	<0.0070	<0.0060	<0.0060 [<0.0060]
Bromomethane	- -	- -	<0.0070	<0.0060	<0.0060 [<0.0060]
Carbon Disulfide	- -	- -	<0.0070	<0.0060	<0.0060 [<0.0060]
Carbon Tetrachloride	0.76	22	<0.0070	<0.0060	<0.0060 [<0.0060]
Chlorobenzene	1.1	500	<0.0070	<0.0060	<0.0060 [<0.0060]
Chloroform	0.37	350	<0.0070	<0.0060	<0.0060 [<0.0060]
Chloromethane	- -	- -	<0.0070	<0.0060	<0.0060 [<0.0060]
cis-1,3-Dichloropropene	- -	- -	<0.0070	<0.0060	<0.0060 [<0.0060]
Dibromochloromethane	- -	- -	<0.0070	<0.0060	<0.0060 [<0.0060]
Ethylbenzene	1	390	<0.0070	0.010	<0.0060 [<0.0060]
Isopropylbenzene	- -	- -	NA	NA	NA
Methylcyclohexane	- -	- -	NA	NA	NA
Methylene Chloride	0.05	500	<0.0070	<0.0060	<0.0060 [<0.0060]
Styrene	- -	- -	<0.0070	<0.0060	<0.0060 [<0.0060]
Tetrachloroethene	1.3	150	<0.0070	<0.0060	<0.0060 [<0.0060]
Toluene	0.7	500	<0.0070	0.028	<0.0060 [<0.0060]
trans-1,3-Dichloropropene	- -	- -	<0.0070	<0.0060	<0.0060 [<0.0060]
Trichloroethene	0.47	200	<0.0070	<0.0060	<0.0060 [<0.0060]
Xylenes (total)	0.26	500	<0.0070	0.0070	<0.0060 [<0.0060]
Total BTEX	- -	- -	<0.0070	0.083	<0.0060 [<0.0060]
Total VOCs	- -	- -	0.020	0.083	<0.012 [<0.012]
Detected SVOCs					
2,4-Dichlorophenol	- -	- -	<0.48	<0.37	<0.40 [<0.39]
2,4-Dimethylphenol	- -	- -	<0.48	<0.37	<0.40 [<0.39]
2-Methylnaphthalene	- -	- -	<0.48	<0.37	<0.40 [<0.39]
2-Methylphenol	0.33	500	<0.48	<0.37	<0.40 [<0.39]
4,6-Dinitro-2-methylphenol	- -	- -	<2.3	<1.8	<1.9 [<1.9]
4-Methylphenol	0.33	500	<0.48	<0.37	<0.40 [<0.39]
Acenaphthene	20	500	<0.48	<0.37	<0.40 [<0.39]
Acenaphthylene	100	500	<0.48	<0.37	<0.40 [<0.39]
Anthracene	100	500	<0.48	<0.37	<0.40 [<0.39]
Benzo(a)anthracene	1	5.6	<0.48	<0.37	<0.40 [<0.39]
Benzo(a)pyrene	1	1	<0.48	<0.37	<0.40 [<0.39]
Benzo(b)fluoranthene	1	5.6	<0.48	<0.37	<0.40 [<0.39]
Benzo(g,h,i)perylene	100	500	<0.48	<0.37	<0.40 [<0.39]
Benzo(k)fluoranthene	0.8	56	<0.48	<0.37	<0.40 [<0.39]
Benzoic Acid	- -	- -	<2.3	<1.8	<1.9 [<1.9]
Benzyl Alcohol	- -	- -	<0.48	<0.37	<0.40 [<0.39]
Biphenyl	- -	- -	NA	NA	NA
bis(2-Ethylhexyl)phthalate	- -	- -	0.20 B	0.21 B	0.46 B [0.20 B]
Butylbenzylphthalate	- -	- -	<0.48	<0.37	<0.40 [<0.39]
Carbazole	- -	- -	<0.48	<0.37	<0.40 [<0.39]
Chrysene	1	56	<0.48	<0.37	<0.40 [<0.39]
Dibenzo(a,h)anthracene	0.33	0.56	<0.48	<0.37	<0.40 [<0.39]
Dibenzofuran	7	350	<0.48	<0.37	<0.40 [<0.39]
Diethylphthalate	- -	- -	<0.48	<0.37	<0.40 [<0.39]
Di-n-Butylphthalate	- -	- -	<0.48	<0.37	<0.40 [<0.39]
Fluoranthene	100	500	<0.48	<0.37	<0.40 [<0.39]
Fluorene	30	500	<0.48	<0.37	<0.40 [<0.39]
Indeno(1,2,3-cd)pyrene	0.5	5.6	<0.48	<0.37	<0.40 [<0.39]
Naphthalene	12	500	<0.48	0.047	<0.40 [<0.39]
Phenanthrene	100	500	<0.48	<0.37	<0.40 [<0.39]
Phenol	0.33	500	<0.48	<0.37	<0.40 [<0.39]
Pyrene	100	500	<0.48	<0.37	<0.40 [<0.39]
Total PAHs	- -	- -	<0.48	0.047	<0.40 [<0.39]
Total SVOCs	- -	- -	0.20	0.26	0.46 [0.20]

TABLE 6
SOIL ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Notes:

1. Samples were collected by the following:
   - Engineering-Science from March 1995 to April 1995.
   - ARCADIS from August 1995 to present.
2. VOCs = Target Compound List (TCL) Volatile Organic Compounds.
3. BTEX = Benzene, toluene, ethylbenzene and xylenes.
4. SVOCs = TCL Semi-Volatile Organic Compounds.
5. PAHs = Polycyclic aromatic hydrocarbons.
6. Samples collected from year 2000 to present were analyzed by TestAmerica Laboratories, Inc. (TestAmerica) located in Shelton, Connecticut and Buffalo, New York for:
   - VOCs/BTEX using United States Environmental Protection Agency (USEPA) SW-846 Method 8260B.
   - SVOCs/PAHs using USEPA SW-846 Method 8270C.
7. Samples collected between the years 1995 to 1999 were analyzed by Galson Laboratories, Inc. of East Syracuse, New York or Industrial and Environmental Analysts, Inc. (IEA) of Monroe, Connecticut for:
   - TCL VOCs/BTEX using USEPA SW-846 Method 8240.
   - TCL SVOCs/PAHs using USEPA SW-846 Method 8270.
8. Only those constituents detected in one or more samples are summarized.
9. All concentrations reported in dry weight parts per million (ppm), which is equivalent to milligrams per kilogram
10. Field duplicate sample results are presented in brackets.
11. Data qualifiers are defined as follows:
    < - Constituent not detected at a concentration above the reported detection limit.
    B (Organic) - Compound was found in blank.
    D - Compound quantitated using a secondary dilution. Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis.
    E - Indicates the linear range of exceedence of instrument.
    J - Indicates that the associated numerical value is an estimated concentration.
    R - Indicates the reported value was rejected.
    * - LCS or LCSD exceeds the control limits.
12. 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs) are from Title 6 of the Official Compilation of Codes, Rules, and Regulations of the State of New York (6 NYCRR) Part 375-6.8(a) and (b), effective December 14,2006.
13. Bold font indicates that the result exceeds the 6 NYCRR Part 375 Unrestricted Use SCO.
14. Shading indicates that the result exceeds the 6 NYCRR Part 375 Commercial Use SCO.
15. - = Analytical results are available for selected soil samples from the wall borings (samples designated by the prefix "WB-") and are presented on the CD included with this report.
16. - - = No 6 NYCRR Part 375 SCO listed.
17. NA = Not Analyzed.
18. The data has been validated in accordance with USEPA National Functional Guidelines of October 1999.

TABLE 7
SOIL ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, and PESTICIDES (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	SB-1		SB-2	SB-3		SB-4					SB-5			
Sample Depth(Feet):	Use SCOs	SCOs Commercial	30	36	30	30	36	10	20	28	42	50	8	22	44	50
Date Collected:	(bold)	(shade)	08/08/95	08/08/95	08/15/95	08/15/95	08/15/95	08/23/95	08/23/95	08/23/95	08/23/95	08/23/95	08/21/95	08/21/95	08/21/95	08/21/95
Detected Inorganics																
Aluminum	- -	- -	6,860	NA	9,500	NA	4,820 [6,840]	NA	NA	7,870	NA	NA	NA	8,030 [9,450]	NA	NA
Antimony	- -	- -	<7.40	NA	<0.590	NA	<0.610 [<0.470]	NA	NA	<6.40	NA	NA	NA	<5.40 [5.50 B]	NA	NA
Arsenic	13	16	5.00	NA	3.60	NA	1.80 B [2.80]	NA	NA	1.30 B	NA	NA	NA	1.90 [5.10]	NA	NA
Barium	350	400	31.5 B	NA	23.0 B	NA	63.2 [56.7]	NA	NA	34.2 B	NA	NA	NA	32.7 [64.4]	NA	NA
Beryllium	7.2	590	0.420 B	NA	0.440 B	NA	0.260 B [0.360 B]	NA	NA	0.390 B	NA	NA	NA	0.410 B [0.460 B]	NA	NA
Cadmium	2.5	9.3	<0.680	NA	<0.200	NA	<0.200 [<0.160]	NA	NA	<0.190	NA	NA	NA	<0.160 [<0.160]	NA	NA
Calcium	- -	- -	102,000	NA	84,400	NA	118,000 [118,000]	NA	NA	83,300	NA	NA	NA	68,300 [55,400]	NA	NA
Chromium	- -	- -	14.5 E	NA	19.0	NA	11.1 [17.7]	NA	NA	14.2	NA	NA	NA	13.8 [15.1]	NA	NA
Cobalt	- -	- -	6.50 B	NA	7.00 B	NA	3.10 B [4.80 B]	NA	NA	7.00 B	NA	NA	NA	5.90 B [8.20]	NA	NA
Copper	50	270	18.1	NA	14.5	NA	<9.30 [16.5]	NA	NA	16.6	NA	NA	NA	11.2 [16.4]	NA	NA
Cyanide	27	27	<1.10	<1.00	<2.90 J	<1.60 J	<2.90 J [<1.50 J]	5.00	23.4	20.6	<1.10	6.00	<1.10	<1.10 [<1.10]	<1.20	<1.20
Iron	- -	- -	14,400	NA	15,200	NA	8,920 [12,800]	NA	NA	13,100	NA	NA	NA	13,300 [17,500]	NA	NA
Lead	63	1,000	8.90	NA	5.30	NA	3.00 [3.90]	NA	NA	7.70	NA	NA	NA	5.50 [12.2]	NA	NA
Magnesium	- -	- -	58,200	NA	56,700	NA	76,400 [74,000]	NA	NA	43,300	NA	NA	NA	43,200 [29,700]	NA	NA
Manganese	1,600	10,000	337	NA	381	NA	250 [327]	NA	NA	519	NA	NA	NA	293 [338]	NA	NA
Mercury	0.18	2.8	<0.0970	NA	<0.0870	NA	<0.0940 [<0.0910]	NA	NA	**0.780 N**	NA	NA	NA	<0.0940 [<0.0990]	NA	NA
Nickel	30	310	16.5	NA	17.5	NA	8.60 [12.6]	NA	NA	15.8	NA	NA	NA	16.2 [19.9]	NA	NA
Potassium	- -	- -	1,320	NA	3,760	NA	2,240 [2,870]	NA	NA	2,770	NA	NA	NA	2,650 [2,310]	NA	NA
Selenium	3.9	1,500	1.00 B	NA	0.930 B	NA	0.840 B [0.890]	NA	NA	1.40	NA	NA	NA	1.20 [1.60]	NA	NA
Silver	2	1,500	<0.450	NA	<0.200	NA	<0.200 [<0.160]	NA	NA	<0.190	NA	NA	NA	<0.160 [<0.160]	NA	NA
Sodium	- -	- -	360	NA	470	NA	379 [461]	NA	NA	467	NA	NA	NA	298 [311]	NA	NA
Thallium	- -	- -	<0.900	NA	<0.780	NA	<0.810 [<0.630]	NA	NA	<0.770	NA	NA	NA	<0.650 [<0.620]	NA	NA
Vanadium	- -	- -	12.2	NA	14.6	NA	8.10 B [13.7]	NA	NA	11.5	NA	NA	NA	12.4 [14.8]	NA	NA
Zinc	109	10,000	<37.8	NA	<27.7	NA	<15.0 [<25.5]	NA	NA	<31.9	NA	NA	NA	<26.8 [<33.2]	NA	NA
Detected PCBs																
Aroclor-1254	- -	- -	<0.036	NA	<0.038	NA	<0.038 [<0.038]	NA	NA	<0.38	NA	NA	NA	<0.18 [<0.18]	NA	NA
Aroclor-1260	- -	- -	<0.036	NA	<0.038	NA	<0.038 [<0.038]	NA	NA	<0.38	NA	NA	NA	<0.18 [<0.18]	NA	NA
Total PCBs	0.1	1	<0.074	NA	<0.077	NA	<0.075 [<0.078]	NA	NA	<0.77	NA	NA	NA	<0.36 [<0.38]	NA	NA
Detected Pesticides																
4,4'-DDD	0.0033	92	<0.0036	NA	<0.0038	NA	<0.0037 [<0.0038]	NA	NA	<0.038	NA	NA	NA	<0.018 [<0.018]	NA	NA
4,4'-DDE	0.0033	62	<0.0036	NA	<0.0038	NA	0.00024 JP [0.00027 JP]	NA	NA	<0.038	NA	NA	NA	<0.018 [<0.018]	NA	NA
4,4'-DDT	0.0033	47	<0.0036	NA	<0.0038	NA	<0.0037 [<0.0038]	NA	NA	<0.038	NA	NA	NA	<0.018 [<0.018]	NA	NA
Alpha-BHC	0.02	3.4	<0.0019	NA	<0.0020	NA	<0.0019 [<0.0020]	NA	NA	<0.020	NA	NA	NA	<0.0092 [<0.0096]	NA	NA
Alpha-Chlordane	0.094	24	<0.0019	NA	<0.0020	NA	<0.0019 [<0.0020]	NA	NA	<0.020	NA	NA	NA	<0.0092 [<0.0096]	NA	NA
Delta-BHC	0.04	500	<0.0019	NA	<0.0020	NA	<0.0019 [<0.0020]	NA	NA	<0.020	NA	NA	NA	<0.0092 [<0.0096]	NA	NA
Dieldrin	0.005	1.4	<0.0036	NA	0.00057 J	NA	0.0013 JP [0.00024 J]	NA	NA	<0.038	NA	NA	NA	<0.018 [<0.018]	NA	NA
Endosulfan Sulfate	2.4	200	<0.0036	NA	<0.0038	NA	<0.0037 [<0.0038]	NA	NA	<0.038	NA	NA	NA	<0.018 [<0.018]	NA	NA
Endrin	0.014	89	<0.0036	NA	<0.0038	NA	<0.0037 [<0.0038]	NA	NA	<0.038	NA	NA	NA	<0.018 [<0.018]	NA	NA
Endrin Aldehyde	- -	- -	<0.0036	NA	<0.0038	NA	<0.0037 [<0.0038]	NA	NA	<0.038	NA	NA	NA	<0.018 [<0.018]	NA	NA
Endrin Ketone	- -	- -	<0.0036	NA	<0.0038	NA	<0.0037 [<0.0038]	NA	NA	<0.038	NA	NA	NA	<0.018 [<0.018]	NA	NA
Gamma-Chlordane	- -	- -	<0.0019	NA	<0.0020	NA	<0.0019 [<0.0020]	NA	NA	0.023 P	NA	NA	NA	<0.0092 [<0.0096]	NA	NA
Heptachlor	0.042	15	<0.0019	NA	<0.0020	NA	<0.0019 [<0.0020]	NA	NA	<0.020	NA	NA	NA	<0.0092 [<0.0096]	NA	NA
Heptachlor Epoxide	- -	- -	<0.0019	NA	<0.0020	NA	<0.0019 [<0.0020]	NA	NA	<0.020	NA	NA	NA	<0.0092 [0.012 P]	NA	NA
Methoxychlor	- -	- -	<0.019	NA	<0.020	NA	<0.019 [<0.020]	NA	NA	<0.20	NA	NA	NA	<0.092 [<0.096]	NA	NA

TABLE 7
SOIL ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, and PESTICIDES (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	SB-7			SB-8				SB-9			SB-10			
Sample Depth(Feet):	Use SCOs	SCOs Commercial	28	38	50	16	26	28	48	16	20	38	22	28	40	50
Date Collected:	(bold)	(shade)	08/23/95	08/23/95	08/23/95	08/18/95	08/18/95	08/18/95	08/18/95	08/22/95	08/22/95	08/22/95	08/22/95	08/22/95	08/22/95	08/22/95
Detected Inorganics																
Aluminum	- -	- -	6,320	NA	NA	NA	7,000	NA	NA	NA	NA	6,640	NA	9,460	NA	NA
Antimony	- -	- -	9.80 B	NA	NA	NA	<0.520	NA	NA	NA	NA	<6.20	NA	7.50 B	NA	NA
Arsenic	13	16	2.40	NA	NA	NA	2.40	NA	NA	NA	NA	2.50	NA	4.10	NA	NA
Barium	350	400	**404**	NA	NA	NA	22.7 B	NA	NA	NA	NA	25.2 B	NA	85.6	NA	NA
Beryllium	7.2	590	<0.200	NA	NA	NA	0.330 B	NA	NA	NA	NA	0.350 B	NA	0.450 B	NA	NA
Cadmium	2.5	9.3	<0.600	NA	NA	NA	<0.170	NA	NA	NA	NA	<0.190	NA	<0.200	NA	NA
Calcium	- -	- -	162,000	NA	NA	NA	85,000	NA	NA	NA	NA	104,000	NA	93,600	NA	NA
Chromium	- -	- -	10.8	NA	NA	NA	13.2	NA	NA	NA	NA	13.0	NA	17.0	NA	NA
Cobalt	- -	- -	4.40 B	NA	NA	NA	5.00 B	NA	NA	NA	NA	4.60 B	NA	6.70 B	NA	NA
Copper	50	270	<19.0	NA	NA	NA	<12.0	NA	NA	NA	NA	11.7	NA	15.5	NA	NA
Cyanide	27	27	<1.00	<1.10	<2.80	<0.590	1.30	<1.20	<1.10	0.960	<1.10	<2.90	<2.60	1.20	<1.10	<1.10
Iron	- -	- -	10,000	NA	NA	NA	12,300	NA	NA	NA	NA	12,200	NA	16,700	NA	NA
Lead	63	1,000	3.80	NA	NA	NA	4.80	NA	NA	NA	NA	4.50	NA	10.2	NA	NA
Magnesium	- -	- -	54,200	NA	NA	NA	50,700	NA	NA	NA	NA	60,000	NA	57,700	NA	NA
Manganese	1,600	10,000	246	NA	NA	NA	277	NA	NA	NA	NA	303	NA	368	NA	NA
Mercury	0.18	2.8	<0.100	NA	NA	NA	<0.100	NA	NA	NA	NA	<0.0880	NA	<0.120	NA	NA
Nickel	30	310	12.6	NA	NA	NA	14.3	NA	NA	NA	NA	12.9	NA	18.9	NA	NA
Potassium	- -	- -	1,750	NA	NA	NA	2,490	NA	NA	NA	NA	2,480	NA	3,370	NA	NA
Selenium	3.9	1,500	<0.400	NA	NA	NA	0.950	NA	NA	NA	NA	0.950	NA	1.60	NA	NA
Silver	2	1,500	<0.400	NA	NA	NA	<0.170	NA	NA	NA	NA	<0.190	NA	<0.200	NA	NA
Sodium	- -	- -	220	NA	NA	NA	378	NA	NA	NA	NA	794	NA	700	NA	NA
Thallium	- -	- -	<0.800	NA	NA	NA	<0.690	NA	NA	NA	NA	<0.750	NA	<0.800	NA	NA
Vanadium	- -	- -	10.1	NA	NA	NA	11.4	NA	NA	NA	NA	10.7	NA	14.2	NA	NA
Zinc	109	10,000	<22.2	NA	NA	NA	<23.5	NA	NA	NA	NA	<21.4	NA	<29.2	NA	NA
Detected PCBs																
Aroclor-1254	- -	- -	<0.037	NA	NA	NA	<0.040	NA	NA	NA	NA	<0.19	NA	<0.075	NA	NA
Aroclor-1260	- -	- -	<0.037	NA	NA	NA	<0.040	NA	NA	NA	NA	<0.19	NA	<0.075	NA	NA
Total PCBs	0.1	1	<0.074	NA	NA	NA	<0.081	NA	NA	NA	NA	<0.39	NA	<0.15	NA	NA
Detected Pesticides																
4,4'-DDD	0.0033	92	<0.0037	NA	NA	NA	<0.0040	NA	NA	NA	NA	<0.019	NA	<0.0075	NA	NA
4,4'-DDE	0.0033	62	<0.0037	NA	NA	NA	0.0024 JP	NA	NA	NA	NA	<0.019	NA	<0.0075	NA	NA
4,4'-DDT	0.0033	47	<0.0037	NA	NA	NA	<0.0040	NA	NA	NA	NA	<0.019	NA	<0.0075	NA	NA
Alpha-BHC	0.02	3.4	<0.0019	NA	NA	NA	<0.0020	NA	NA	NA	NA	<0.010	NA	<0.0039	NA	NA
Alpha-Chlordane	0.094	24	<0.0019	NA	NA	NA	<0.0020	NA	NA	NA	NA	<0.010	NA	<0.0039	NA	NA
Delta-BHC	0.04	500	<0.0019	NA	NA	NA	<0.0020	NA	NA	NA	NA	<0.010	NA	<0.0039	NA	NA
Dieldrin	0.005	1.4	<0.0037	NA	NA	NA	<0.0040	NA	NA	NA	NA	<0.019	NA	<0.0075	NA	NA
Endosulfan Sulfate	2.4	200	<0.0037	NA	NA	NA	<0.0040	NA	NA	NA	NA	<0.019	NA	<0.0075	NA	NA
Endrin	0.014	89	<0.0037	NA	NA	NA	<0.0040	NA	NA	NA	NA	<0.019	NA	<0.0075	NA	NA
Endrin Aldehyde	- -	- -	<0.0037	NA	NA	NA	<0.0040	NA	NA	NA	NA	<0.019	NA	<0.0075	NA	NA
Endrin Ketone	- -	- -	<0.0037	NA	NA	NA	<0.0040	NA	NA	NA	NA	<0.019	NA	<0.0075	NA	NA
Gamma-Chlordane	- -	- -	<0.0019	NA	NA	NA	0.0014 J	NA	NA	NA	NA	<0.010	NA	<0.0039	NA	NA
Heptachlor	0.042	15	<0.0019	NA	NA	NA	<0.0020	NA	NA	NA	NA	<0.010	NA	<0.0039	NA	NA
Heptachlor Epoxide	- -	- -	<0.0019	NA	NA	NA	<0.0020	NA	NA	NA	NA	0.011 P	NA	0.0054 P	NA	NA
Methoxychlor	- -	- -	<0.019	NA	NA	NA	<0.020	NA	NA	NA	NA	<0.10	NA	<0.039	NA	NA

TABLE 7
SOIL ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, and PESTICIDES (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	SB-12		SB-13		SB-14		SB-15	SB-16		SB-21		SB-22	SB-23	SB-24	SB-25
Sample Depth(Feet):	Use SCOs	SCOs Commercial	12 - 14	22 - 24	8 - 10	20 - 22	8 - 10	18 - 20	22 - 24	12 - 14	18 - 20	14 - 16	20 - 22	0 - 16	0 - 5	0 - 15.5	0 - 11
Date Collected:	(bold)	(shade)	05/28/08	05/28/08	05/29/08	05/29/08	05/30/08	05/30/08	06/02/08	06/05/08	06/05/08	06/09/08	06/09/08	08/10/12	08/10/12	08/13/12	08/13/12
Detected Inorganics																	
Aluminum	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6,070 J	7,020 J	7,600 J [6,260 J]	5,590 J
Antimony	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<16.5	<17.3	<15.8 [<16.4]	<17.4
Arsenic	13	16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.90	6.40	7.00 J [6.60 J]	**20.4 J**
Barium	350	400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	53.0	149	108 [109]	**441**
Beryllium	7.2	590	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.300	0.420	0.470 [0.390]	0.650
Cadmium	2.5	9.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.310 J	0.390 J	0.310 [0.330]	0.310
Calcium	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	101,000 J	38,900	26,100 [40,500]	19,200
Chromium	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12.8	11.2	13.7 [12.6]	13.6
Cobalt	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.70 J	6.60	7.40 [6.40]	4.70
Copper	50	270	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31.9 J	24.5 J	42.2 J [39.5 J]	**60.4 J**
Cyanide	27	27	7.30	**33.6**	17.0	14.1	0.180 J	0.790	0.530 J	23.0 J [8.20 J]	4.60 J	2.80 J	12.4 J	0.910 J	<0.810 J	<1.10 J [0.520 J]	<1.10 J
Iron	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15,400	13,800	17,000 [14,700]	13,600
Lead	63	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	35.8	53.0	**294 [341]**	**872**
Magnesium	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	21,800	15,300	8,770 [13,900]	4,910
Manganese	1,600	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	448	255	302 [265]	177
Mercury	0.18	2.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.140 J	**0.190 J**	**0.350 J [0.350 J]**	0.160 J
Nickel	30	310	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	16.5	18.5	18.8 [16.4]	12.7
Potassium	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,200 J	1,040 J	987 J [1,140 J]	852 J
Selenium	3.9	1,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.650 J	0.810 J	<4.20 [0.920 J]	1.40 J
Silver	2	1,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.550	<0.580	<0.530 [<0.550]	<0.580
Sodium	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	175	91.6 J	93.9 J [102 J]	163
Thallium	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<6.60	<6.90	<6.30 [<6.60]	<7.00
Vanadium	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13.3	14.5	16.7 [13.6]	15.1
Zinc	109	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50.0	72.4	**261 [171]**	**747**
Detected PCBs																	
Aroclor-1254	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.25	<0.24	<0.23 [<0.21]	<0.25
Aroclor-1260	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.3	<0.24	<0.23 [<0.21]	<0.25
Total PCBs	0.1	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.3**	<0.24	<0.23 [<0.21]	<0.25
Detected Pesticides																	
4,4'-DDD	0.0033	92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	0.0033	62	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	0.0033	47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alpha-BHC	0.02	3.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alpha-Chlordane	0.094	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Delta-BHC	0.04	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	0.005	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan Sulfate	2.4	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	0.014	89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin Aldehyde	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin Ketone	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gamma-Chlordane	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	0.042	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor Epoxide	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 7
SOIL ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, and PESTICIDES (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted Use SCOs (bold)	Restricted Use SCOs Commercial (shade)	SB-27	SS-01	SS-02	SS-03	TP-01		TP-02		TP-2A		WB-1	WB-2	WB-3	WB-4
Sample Depth(Feet):			0 - 20				5	8	5	11	6	10	6	6	6	6
Date Collected:			08/13/12	06/27/02	06/27/02	06/27/02	08/28/95	08/28/95	08/28/95	08/28/95	09/19/95	09/19/95	03/29/95	04/14/95	04/04/95	04/12/95
Detected Inorganics																
Aluminum	- -	- -	8,460 J	5,030 J	4,600 J	6,540 J	NA	8,380	NA	10,200 [5,580]	5,720	6,400 [6,080]	NA	NA	NA	NA
Antimony	- -	- -	<17.1	10.2 J	12.5 J	10.8 J	NA	<5.80	NA	<5.30 [10.4 B]	<0.720	1.30 B [<0.720]	NA	NA	NA	NA
Arsenic	13	16	10.9 J	6.50 B	6.80 B	7.20 B	NA	7.30	NA	5.40 [4.50]	9.40	8.90 [10.8]	NA	NA	NA	NA
Barium	350	400	50.5	64.5	102	141	NA	57.3	NA	83.0 [60.4]	73.8	51.9 [55.4]	NA	NA	NA	NA
Beryllium	7.2	590	0.550	<1.70	<1.70	<1.70	NA	<0.180	NA	<0.160 [<0.200]	0.650 B	0.630 B [0.580 B]	NA	NA	NA	NA
Cadmium	2.5	9.3	0.150 J	**2.60 J**	**3.20 J**	**2.80 J**	NA	<0.530	NA	<0.480 [<0.590]	<0.240	<0.240 [<0.240]	NA	NA	NA	NA
Calcium	- -	- -	85,200	96,100	133,000	62,900	NA	44,600	NA	22,100 [34,200]	78,100	83,800 [66,600]	NA	NA	NA	NA
Chromium	- -	- -	16.3	22.4	20.2	21.3	NA	13.8	NA	13.1 [8.10]	9.20	10.0 [10.3]	NA	NA	NA	NA
Cobalt	- -	- -	7.50	4.90	5.40	6.10	NA	7.50 B	NA	7.20 B [5.10 B]	7.60 B	5.20 B [6.30 B]	NA	NA	NA	NA
Copper	50	270	21.7 J	46.1 J	49.6 J	**75.5 J**	NA	<30.4	NA	<30.7 [<16.2]	31.9	19.3 [19.7]	NA	NA	NA	NA
Cyanide	27	27	**27.4 J**	0.540 J	8.54 J	1.67 J	1.60	1.40	13.4	0.630 [0.980]	10.9	6.30 [<0.590]	NA	NA	NA	NA
Iron	- -	- -	19,000	12,700	17,100	21,500	NA	19,500	NA	15,600 [11,500]	27,800	13,500 [20,000]	NA	NA	NA	NA
Lead	63	1,000	22.6	**209 J**	**534 J**	**213 J**	NA	**120**	NA	40.3 [45.2]	**177**	**87.4 [67.8]**	NA	NA	NA	NA
Magnesium	- -	- -	15,300	22,100 J	30,700 J	12,400 J	NA	9,720	NA	10,400 [10,300]	9,200	15,400 [18,400]	NA	NA	NA	NA
Manganese	1,600	10,000	290	297	417	446	NA	454	NA	316 [252]	1,090	326 [393]	NA	NA	NA	NA
Mercury	0.18	2.8	0.0650 J	**0.630 B**	**1.20 B**	**0.490 B**	NA	**0.320**	NA	**0.150 [0.200]**	**0.380**	**0.210 [0.390]**	NA	NA	NA	NA
Nickel	30	310	18.3	16.3	15.9	20.6	NA	21.0	NA	17.7 [12.5]	17.6	14.8 [16.8]	NA	NA	NA	NA
Potassium	- -	- -	1,120 J	1,410	1,450	1,560	NA	1,400	NA	1,460 [763]	764	859 [817]	NA	NA	NA	NA
Selenium	3.9	1,500	0.920 J	<13.9	<13.9	<13.9	NA	1.10	NA	0.500 B [0.720 B]	2.30	1.20 B [2.00]	NA	NA	NA	NA
Silver	2	1,500	<0.570	0.490 B	<3.20	0.930 B	NA	<0.350	NA	<0.320 [<0.390]	<0.240	<0.240 [<0.240]	NA	NA	NA	NA
Sodium	- -	- -	1,760	196 J	235 J	169 J	NA	402	NA	258 [179 B]	459	263 [233 B]	NA	NA	NA	NA
Thallium	- -	- -	<6.80	<19.1	<19.1	<19.1	NA	<0.700	NA	<0.640 [<0.790]	<0.960	<0.980 [<0.960]	NA	NA	NA	NA
Vanadium	- -	- -	24.7	16.1	14.4	15.6	NA	16.8	NA	16.4 [11.0]	13.6	10.6 B [12.0 B]	NA	NA	NA	NA
Zinc	109	10,000	42.3	**195**	**127**	**178**	NA	81.1	NA	67.0 [47.0]	87.6	47.1 [48.2]	NA	NA	NA	NA
Detected PCBs																
Aroclor-1254	- -	- -	<0.23	NA	NA	NA	NA	<0.43	NA	<0.19 [<0.19]	<0.78	NA	<0.042	<0.043	0.17 P	<0.041
Aroclor-1260	- -	- -	<0.23	NA	NA	NA	NA	<0.43	NA	<0.19 [<0.19]	<0.78	NA	<0.042	0.046 P	0.059 P	<0.041
Total PCBs	0.1	1	<0.23	NA	NA	NA	NA	<0.87	NA	<0.38 [<0.38]	<1.6	NA	<0.084	0.046	**0.23**	<0.082
Detected Pesticides																
4,4'-DDD	0.0033	92	NA	<0.018	<0.038	<0.020	NA	<0.043	NA	<0.019 [<0.019]	<0.078	NA	**0.0047 P**	0.0015 JP	<0.0039	<0.0041
4,4'-DDE	0.0033	62	NA	**0.061 J**	**0.051 J**	**0.055 J**	NA	<0.043	NA	<0.019 [<0.019]	<0.078	NA	**0.0042 P**	0.0014 JP	<0.0039	<0.0041
4,4'-DDT	0.0033	47	NA	**0.048**	**0.040 J**	**0.055 J**	NA	<0.043	NA	<0.019 [<0.019]	<0.078	NA	0.0024 JP	**0.0087 P**	**0.014 P**	**0.020 P**
Alpha-BHC	0.02	3.4	NA	<0.0095	<0.019	<0.010	NA	<0.022	NA	<0.0098 [<0.0096]	<0.040	NA	<0.0021	<0.0021	<0.0019	0.0035 P
Alpha-Chlordane	0.094	24	NA	0.011 J	0.020 J	0.0082 J	NA	<0.022	NA	<0.0098 [<0.0096]	<0.040	NA	<0.0021	<0.0021	<0.0019	<0.0020
Delta-BHC	0.04	500	NA	<0.0095	<0.019	<0.010	NA	<0.022	NA	<0.0098 [<0.0096]	<0.040	NA	<0.0021	<0.0021	<0.0019	0.011 P
Dieldrin	0.005	1.4	NA	0.0026 J	**0.061 J**	**0.044**	NA	<0.043	NA	<0.019 [<0.019]	<0.078	NA	<0.0042	<0.0043	0.00082 JP	<0.0041
Endosulfan Sulfate	2.4	200	NA	<0.018	0.13 J	<0.020	NA	<0.043	NA	<0.019 [<0.019]	<0.078	NA	<0.0042	<0.0043	<0.0039	<0.0041
Endrin	0.014	89	NA	**0.16 J**	<0.057	<0.030	NA	<0.043	NA	<0.019 [<0.019]	<0.078	NA	<0.0042	<0.0043	<0.0025	<0.0041
Endrin Aldehyde	- -	- -	NA	<0.018	0.057 J	0.024 J	NA	<0.043	NA	<0.019 [<0.019]	<0.078	NA	<0.0042	<0.0043	<0.0039	0.0041
Endrin Ketone	- -	- -	NA	0.12 J	<0.038	<0.020	NA	<0.043	NA	<0.019 [<0.019]	<0.078	NA	<0.0042	<0.0043	<0.0039	0.018 P
Gamma-Chlordane	- -	- -	NA	0.017 J	<0.019	<0.010	NA	<2.2	NA	<0.0098 [<0.0096]	<0.040	NA	<0.0021	<0.0021	<0.0019	<0.0020
Heptachlor	0.042	15	NA	<0.0095	<0.019	<0.010	NA	<0.022	NA	<0.0098 [<0.0096]	<0.040	NA	<0.0021	<0.0021	<0.0019	<0.0020
Heptachlor Epoxide	- -	- -	NA	<0.0095	<0.019	<0.010	NA	0.023 P	NA	0.0073 JP [0.013 P]	<0.040	NA	<0.0021	<0.0021	<0.0019	<0.0020
Methoxychlor	- -	- -	NA	<0.095	<0.19	<0.10	NA	<0.22	NA	<0.098 [<0.096]	<0.40	NA	<0.021	<0.021	<0.019	<0.020

TABLE 7
SOIL ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, and PESTICIDES (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	WB-5	WB-6	MW-1D			MW-2	MW-3D	MW-4			
Sample Depth(Feet):	Use SCOs	SCOs Commercial	6	6	20	32	40	24	32	12	14	30	36
Date Collected:	(bold)	(shade)	04/10/95	04/20/95	08/09/95	08/09/95	08/09/95	07/27/95	07/20/95	08/17/95	08/17/95	08/17/95	08/17/95
Detected Inorganics													
Aluminum	- -	- -	NA	NA	NA	7,690	NA	8,060	NA	5,090	NA	NA	NA
Antimony	- -	- -	NA	NA	NA	8.90 B	NA	<7.00	NA	<0.640	NA	NA	NA
Arsenic	13	16	NA	NA	NA	3.30	NA	3.20	NA	6.20	NA	NA	NA
Barium	350	400	NA	NA	NA	54.7	NA	18.2 B	NA	59.8	NA	NA	NA
Beryllium	7.2	590	NA	NA	NA	<0.210	NA	<0.210	NA	0.260 B	NA	NA	NA
Cadmium	2.5	9.3	NA	NA	NA	<0.630	NA	2.40	NA	<0.210	NA	NA	NA
Calcium	- -	- -	NA	NA	NA	97,700	NA	116,000	NA	37,800	NA	NA	NA
Chromium	- -	- -	NA	NA	NA	13.2	NA	14.3	NA	8.60	NA	NA	NA
Cobalt	- -	- -	NA	NA	NA	7.00 B	NA	5.60 B	NA	3.80 B	NA	NA	NA
Copper	50	270	NA	NA	NA	15.2	NA	14.2	NA	21.9	NA	NA	NA
Cyanide	27	27	NA	NA	<0.720	<2.70	<1.20	<1.10	<1.10	11.6	0.950	<1.10	<1.20
Iron	- -	- -	NA	NA	NA	14,100	NA	12,800	NA	9,250	NA	NA	NA
Lead	63	1,000	NA	NA	NA	5.00	NA	4.80	NA	**193**	NA	NA	NA
Magnesium	- -	- -	NA	NA	NA	59,200	NA	61,800	NA	8,340	NA	NA	NA
Manganese	1,600	10,000	NA	NA	NA	251	NA	325	NA	170	NA	NA	NA
Mercury	0.18	2.8	NA	NA	NA	<0.110	NA	<0.0940	NA	**0.350**	NA	NA	NA
Nickel	30	310	NA	NA	NA	17.4	NA	14.0	NA	9.80	NA	NA	NA
Potassium	- -	- -	NA	NA	NA	1,490	NA	2,090	NA	757	NA	NA	NA
Selenium	3.9	1,500	NA	NA	NA	0.950 B	NA	0.620 B	NA	3.30	NA	NA	NA
Silver	2	1,500	NA	NA	NA	<0.420	NA	<0.420	NA	<0.210	NA	NA	NA
Sodium	- -	- -	NA	NA	NA	254	NA	229	NA	248	NA	NA	NA
Thallium	- -	- -	NA	NA	NA	<0.840	NA	<0.850	NA	<0.850	NA	NA	NA
Vanadium	- -	- -	NA	NA	NA	11.9	NA	14.8	NA	10.6 B	NA	NA	NA
Zinc	109	10,000	NA	NA	NA	<24.9	NA	<36.1	NA	<53.1	NA	NA	NA
Detected PCBs													
Aroclor-1254	- -	- -	<0.039	<0.037	NA	<0.038	NA	<0.035	NA	<3.9	NA	NA	NA
Aroclor-1260	- -	- -	0.024 JP	<0.037	NA	<0.038	NA	<0.035	NA	<3.9	NA	NA	NA
Total PCBs	0.1	1	0.024 J	<0.075	NA	<0.076	NA	<0.072	NA	<8.0	NA	NA	NA
Detected Pesticides													
4,4'-DDD	0.0033	92	<0.0039	<0.0037	NA	<0.0038	NA	<0.0035	NA	<0.39	NA	NA	NA
4,4'-DDE	0.0033	62	<0.0039	<0.0037	NA	0.00076 JP	NA	0.00036 JP	NA	<0.39	NA	NA	NA
4,4'-DDT	0.0033	47	**0.0037 JP**	<0.0037	NA	<0.0038	NA	<0.0035	NA	<0.39	NA	NA	NA
Alpha-BHC	0.02	3.4	<0.0019	<0.0019	NA	<0.0019	NA	<0.0018	NA	<0.20	NA	NA	NA
Alpha-Chlordane	0.094	24	<0.0019	<0.0019	NA	<0.0019	NA	<0.0018	NA	<0.20	NA	NA	NA
Delta-BHC	0.04	500	<0.0019	<0.0019	NA	<0.0019	NA	<0.0018	NA	<0.20	NA	NA	NA
Dieldrin	0.005	1.4	<0.0039	<0.0037	NA	<0.0038	NA	<0.0035	NA	<0.39	NA	NA	NA
Endosulfan Sulfate	2.4	200	<0.0039	<0.0037	NA	<0.0038	NA	<0.0035	NA	<0.39	NA	NA	NA
Endrin	0.014	89	<0.0039	<0.0037	NA	<0.0038	NA	<0.0035	NA	<0.39	NA	NA	NA
Endrin Aldehyde	- -	- -	<0.0039	<0.0037	NA	<0.0038	NA	<0.0035	NA	<0.39	NA	NA	NA
Endrin Ketone	- -	- -	<0.0039	<0.0037	NA	<0.0038	NA	<0.0035	NA	<0.39	NA	NA	NA
Gamma-Chlordane	- -	- -	<0.0019	<0.0019	NA	<0.0019	NA	<0.0018	NA	<0.20	NA	NA	NA
Heptachlor	0.042	15	<0.0019	<0.0019	NA	<0.0019	NA	<0.0018	NA	<0.20	NA	NA	NA
Heptachlor Epoxide	- -	- -	<0.0019	<0.0019	NA	<0.0019	NA	<0.0018	NA	<0.20	NA	NA	NA
Methoxychlor	- -	- -	<0.019	<0.019	NA	<0.019	NA	<0.018	NA	<2.0	NA	NA	NA

TABLE 7
SOIL ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, and PESTICIDES (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-4D					MW-6	MW-7		MW-7D			MW-8D	
Sample Depth(Feet):	Use SCOs	SCOs Commercial	65 - 67	69 - 71	75 - 77	113 - 115	133 - 135	36	16	18	32 - 34	73 - 75	93 - 95	36	60
Date Collected:	(bold)	(shade)	06/11/97	06/11/97	06/11/97	06/11/97	06/11/97	07/28/95	08/07/95	08/07/95	06/16/97	06/16/97	06/16/97	07/31/95	08/01/95
Detected Inorganics															
Aluminum	- -	- -	NA	NA	7,310	NA	NA	7,290	7,270 [8,060]	NA	7,470	NA	NA	9,250	NA
Antimony	- -	- -	NA	NA	<0.590	NA	NA	<7.50	<7.40 [<7.80]	NA	<0.540	NA	NA	<7.80	NA
Arsenic	13	16	NA	NA	8.60	NA	NA	2.30	5.70 [6.50]	NA	3.40	NA	NA	4.40	NA
Barium	350	400	NA	NA	25.9 B	NA	NA	27.4 B	42.3 B [45.6 B]	NA	27.2 B	NA	NA	59.7	NA
Beryllium	7.2	590	NA	NA	0.240 B	NA	NA	<0.230	0.430 B [0.400 B]	NA	0.210 B	NA	NA	<0.240	NA
Cadmium	2.5	9.3	NA	NA	<0.200	NA	NA	0.900 B	<0.680 [<0.710]	NA	<0.180	NA	NA	<0.700	NA
Calcium	- -	- -	NA	NA	94,200 E	NA	NA	120,000	2,920 [2,110]	NA	38,700 E	NA	NA	72,900	NA
Chromium	- -	- -	NA	NA	14.5	NA	NA	14.4	10.9 [12.0]	NA	12.5	NA	NA	14.6	NA
Cobalt	- -	- -	NA	NA	5.10 B	NA	NA	4.40 B	6.70 B [8.10 B]	NA	6.90 B	NA	NA	7.30 B	NA
Copper	50	270	NA	NA	8.30	NA	NA	13.2	<10.2 [<11.6]	NA	30.8	NA	NA	21.0	NA
Cyanide	27	27	<1.17	<1.11	<1.00	<0.540	<0.610	<1.20	<0.570 [<0.590]	<0.580	<0.980	<1.08	<1.11	<1.20	<1.10
Iron	- -	- -	NA	NA	14,200 E	NA	NA	10,600	17,200 [18,100]	NA	12,700 E	NA	NA	15,800	NA
Lead	63	1,000	NA	NA	3.40	NA	NA	3.60	7.60 [8.90]	NA	4.90	NA	NA	6.70	NA
Magnesium	- -	- -	NA	NA	53,900 E	NA	NA	68,200	2,840 [3,020]	NA	38,500 E	NA	NA	39,100	NA
Manganese	1,600	10,000	NA	NA	286 E	NA	NA	283	644 [673]	NA	524 E	NA	NA	388	NA
Mercury	0.18	2.8	NA	NA	<0.0820	NA	NA	<0.100	<0.110 [<0.120]	NA	<0.0990 N	NA	NA	<0.110	NA
Nickel	30	310	NA	NA	15.8	NA	NA	11.2	16.7 [17.9]	NA	17.2	NA	NA	20.4	NA
Potassium	- -	- -	NA	NA	2,770 E	NA	NA	2,360	659 [759]	NA	2,390 E	NA	NA	2,150	NA
Selenium	3.9	1,500	NA	NA	<0.590	NA	NA	<0.460	1.60 [2.20]	NA	<0.540	NA	NA	1.20	NA
Silver	2	1,500	NA	NA	<0.200	NA	NA	<0.460	<0.450 [<0.470]	NA	<0.180	NA	NA	<0.470	NA
Sodium	- -	- -	NA	NA	4,680	NA	NA	325	126 B [144 B]	NA	504 B	NA	NA	1,210	NA
Thallium	- -	- -	NA	NA	<0.590	NA	NA	<0.910	<0.900 [<0.950]	NA	<0.540	NA	NA	<0.940	NA
Vanadium	- -	- -	NA	NA	11.3	NA	NA	13.2	12.3 [14.2]	NA	11.3	NA	NA	14.1	NA
Zinc	109	10,000	NA	NA	24.0	NA	NA	22.6	29.8 [31.3]	NA	26.9	NA	NA	35.1	NA
Detected PCBs															
Aroclor-1254	- -	- -	NA	NA	<0.035	NA	NA	<0.039	<0.078 [<0.081]	NA	<0.073	NA	NA	<0.037	NA
Aroclor-1260	- -	- -	NA	NA	<0.035	NA	NA	<0.039	<0.078 [<0.081]	NA	<0.073	NA	NA	<0.037	NA
Total PCBs	0.1	1	NA	NA	<0.072	NA	NA	<0.080	<0.16 [<0.16]	NA	<0.15	NA	NA	<0.074	NA
Detected Pesticides															
4,4'-DDD	0.0033	92	NA	NA	0.00043 JP	NA	NA	<0.0039	<0.0078 [<0.0081]	NA	**0.0042 JP**	NA	NA	<0.0037	NA
4,4'-DDE	0.0033	62	NA	NA	<0.0035	NA	NA	<0.0039	<0.0078 [<0.0081]	NA	<0.0073	NA	NA	<0.0037	NA
4,4'-DDT	0.0033	47	NA	NA	<0.0035	NA	NA	<0.0039	<0.0078 [<0.0081]	NA	<0.0073	NA	NA	<0.0037	NA
Alpha-BHC	0.02	3.4	NA	NA	<0.0018	NA	NA	<0.0020	<0.0040 [<0.0042]	NA	<0.0038	NA	NA	<0.0019	NA
Alpha-Chlordane	0.094	24	NA	NA	<0.0018	NA	NA	<0.0020	<0.0040 [<0.0042]	NA	<0.0038	NA	NA	<0.0019	NA
Delta-BHC	0.04	500	NA	NA	0.00035 JP	NA	NA	<0.0020	<0.0040 [<0.0042]	NA	<0.0038	NA	NA	<0.0019	NA
Dieldrin	0.005	1.4	NA	NA	<0.0035	NA	NA	0.00096 J	<0.0078 [<0.0081]	NA	0.00075 JP	NA	NA	<0.0037	NA
Endosulfan Sulfate	2.4	200	NA	NA	0.00049 JP	NA	NA	<0.0039	<0.0078 [<0.0081]	NA	0.051 P	NA	NA	<0.0037	NA
Endrin	0.014	89	NA	NA	<0.0035	NA	NA	<0.0039	<0.0078 [<0.0081]	NA	<0.0073	NA	NA	<0.0037	NA
Endrin Aldehyde	- -	- -	NA	NA	<0.0035	NA	NA	<0.0039	<0.0078 [<0.0081]	NA	<0.0073	NA	NA	<0.0037	NA
Endrin Ketone	- -	- -	NA	NA	<0.0035	NA	NA	<0.0039	<0.0078 [<0.0081]	NA	<0.0073	NA	NA	<0.0037	NA
Gamma-Chlordane	- -	- -	NA	NA	0.00090 J	NA	NA	<0.0020	<0.0040 [<0.0042]	NA	<0.0038	NA	NA	<0.0019	NA
Heptachlor	0.042	15	NA	NA	<0.0018	NA	NA	<0.0020	<0.0040 [<0.0042]	NA	<0.0038	NA	NA	<0.0019	NA
Heptachlor Epoxide	- -	- -	NA	NA	<0.0018	NA	NA	<0.0020	<0.0040 [<0.0042]	NA	<0.0038	NA	NA	<0.0019	NA
Methoxychlor	- -	- -	NA	NA	<0.018	NA	NA	<0.020	<0.040 [<0.042]	NA	0.13 P	NA	NA	<0.019	NA

TABLE 7
SOIL ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, and PESTICIDES (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-9D2					MW-10D					
Sample Depth(Feet):	Use SCOs	SCOs Commercial	28 - 30	65 - 67	93 - 95	113 - 115	153 - 155	16 - 18	73 - 75	91 - 93	119 - 121	133 - 135	151 - 153
Date Collected:	(bold)	(shade)	06/20/97	06/20/97	06/20/97	06/20/97	06/20/97	06/17/97	06/17/97	06/17/97	06/17/97	06/17/97	06/17/97
Detected Inorganics													
Aluminum	- -	- -	NA	NA	6,780	NA	NA	NA	NA	NA	5,420	NA	NA
Antimony	- -	- -	NA	NA	<0.540	NA	NA	NA	NA	NA	<0.490 N	NA	NA
Arsenic	13	16	NA	NA	3.20	NA	NA	NA	NA	NA	2.50	NA	NA
Barium	350	400	NA	NA	18.3 B	NA	NA	NA	NA	NA	20.9 B	NA	NA
Beryllium	7.2	590	NA	NA	0.270 B	NA	NA	NA	NA	NA	0.290 B	NA	NA
Cadmium	2.5	9.3	NA	NA	<0.180	NA	NA	NA	NA	NA	0.250 B	NA	NA
Calcium	- -	- -	NA	NA	79,700 E	NA	NA	NA	NA	NA	92,600 E	NA	NA
Chromium	- -	- -	NA	NA	12.0 *N	NA	NA	NA	NA	NA	10.4	NA	NA
Cobalt	- -	- -	NA	NA	4.90 B	NA	NA	NA	NA	NA	4.00 B	NA	NA
Copper	50	270	NA	NA	14.1 N	NA	NA	NA	NA	NA	7.30	NA	NA
Cyanide	27	27	4.98	6.64	6.47	3.26	<0.530	<0.960 [<0.530]	<1.13	<1.08	<1.07	<0.530	<0.570
Iron	- -	- -	NA	NA	13,300	NA	NA	NA	NA	NA	9,840 E	NA	NA
Lead	63	1,000	NA	NA	3.70 *	NA	NA	NA	NA	NA	4.60	NA	NA
Magnesium	- -	- -	NA	NA	49,600	NA	NA	NA	NA	NA	56,500 E	NA	NA
Manganese	1,600	10,000	NA	NA	280	NA	NA	NA	NA	NA	247 E	NA	NA
Mercury	0.18	2.8	NA	NA	<0.0900	NA	NA	NA	NA	NA	<0.0910 N	NA	NA
Nickel	30	310	NA	NA	14.7	NA	NA	NA	NA	NA	11.6	NA	NA
Potassium	- -	- -	NA	NA	2,150 E	NA	NA	NA	NA	NA	2,340 E	NA	NA
Selenium	3.9	1,500	NA	NA	<0.540	NA	NA	NA	NA	NA	<0.490	NA	NA
Silver	2	1,500	NA	NA	<0.180	NA	NA	NA	NA	NA	<0.160	NA	NA
Sodium	- -	- -	NA	NA	4,080	NA	NA	NA	NA	NA	4,990	NA	NA
Thallium	- -	- -	NA	NA	<0.540	NA	NA	NA	NA	NA	<0.490	NA	NA
Vanadium	- -	- -	NA	NA	10.6	NA	NA	NA	NA	NA	8.80	NA	NA
Zinc	109	10,000	NA	NA	19.6	NA	NA	NA	NA	NA	16.0	NA	NA
Detected PCBs													
Aroclor-1254	- -	- -	NA	NA	<0.035	NA	NA	NA	NA	NA	<0.035	NA	NA
Aroclor-1260	- -	- -	NA	NA	<0.035	NA	NA	NA	NA	NA	<0.035	NA	NA
Total PCBs	0.1	1	NA	NA	<0.071	NA	NA	NA	NA	NA	<0.071	NA	NA
Detected Pesticides													
4,4'-DDD	0.0033	92	NA	NA	<0.0035	NA	NA	NA	NA	NA	<0.0035	NA	NA
4,4'-DDE	0.0033	62	NA	NA	<0.0035	NA	NA	NA	NA	NA	<0.0035	NA	NA
4,4'-DDT	0.0033	47	NA	NA	<0.0035	NA	NA	NA	NA	NA	<0.0035	NA	NA
Alpha-BHC	0.02	3.4	NA	NA	<0.0018	NA	NA	NA	NA	NA	0.00062 J	NA	NA
Alpha-Chlordane	0.094	24	NA	NA	<0.0018	NA	NA	NA	NA	NA	<0.0018	NA	NA
Delta-BHC	0.04	500	NA	NA	<0.0018	NA	NA	NA	NA	NA	<0.0018	NA	NA
Dieldrin	0.005	1.4	NA	NA	<0.0035	NA	NA	NA	NA	NA	<0.0035	NA	NA
Endosulfan Sulfate	2.4	200	NA	NA	<0.0035	NA	NA	NA	NA	NA	<0.0035	NA	NA
Endrin	0.014	89	NA	NA	<0.0035	NA	NA	NA	NA	NA	<0.0035	NA	NA
Endrin Aldehyde	- -	- -	NA	NA	<0.0035	NA	NA	NA	NA	NA	<0.0035	NA	NA
Endrin Ketone	- -	- -	NA	NA	<0.0035	NA	NA	NA	NA	NA	<0.0035	NA	NA
Gamma-Chlordane	- -	- -	NA	NA	<0.0018	NA	NA	NA	NA	NA	<0.0018	NA	NA
Heptachlor	0.042	15	NA	NA	0.000039 JP	NA	NA	NA	NA	NA	<0.0018	NA	NA
Heptachlor Epoxide	- -	- -	NA	NA	<0.0018	NA	NA	NA	NA	NA	<0.0018	NA	NA
Methoxychlor	- -	- -	NA	NA	<0.018	NA	NA	NA	NA	NA	<0.018	NA	NA

TABLE 7
SOIL ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, and PESTICIDES (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-11D				MW-12D			MW-13		
Sample Depth(Feet):	Use SCOs	SCOs Commercial	25 - 27	55 - 57	67 - 69	83 - 85	25 - 27	65 - 67	93 - 95	30 - 32	40 - 42	50 - 52
Date Collected:	(bold)	(shade)	06/18/97	06/18/97	06/18/97	06/18/97	06/19/97	06/19/97	06/19/97	09/20/00	09/20/00	09/20/00
Detected Inorganics												
Aluminum	- -	- -	NA	NA	NA	7,870 [7,870]	NA	NA	5,260	8,900	5,850	4,850
Antimony	- -	- -	NA	NA	NA	<6.40 [<6.40]	NA	NA	<0.570	0.730 J	0.660 J	0.800 J
Arsenic	13	16	NA	NA	NA	1.30 B [1.30 B]	NA	NA	5.40	6.10	2.60	2.10
Barium	350	400	NA	NA	NA	34.2 B [34.2 B]	NA	NA	153	70.0	13.2 B	18.9 B
Beryllium	7.2	590	NA	NA	NA	0.390 B [0.390 B]	NA	NA	0.250 B	0.430 B	0.260 B	0.190 B
Cadmium	2.5	9.3	NA	NA	NA	<0.190 [<0.190]	NA	NA	<0.190	0.0730 J	0.0660 J	0.0800 J
Calcium	- -	- -	NA	NA	NA	83,300 [83,300]	NA	NA	108,000 E	81,700	119,000	126,000
Chromium	- -	- -	NA	NA	NA	14.2 [14.2]	NA	NA	9.80 *N	16.8	11.4	7.80
Cobalt	- -	- -	NA	NA	NA	7.00 B [7.00 B]	NA	NA	4.30 B	12.5	3.60 B	3.00 B
Copper	50	270	NA	NA	NA	16.6 [16.6]	NA	NA	13.4 N	19.4	10.8	8.20
Cyanide	27	27	<0.680	3.46	4.93	<0.570 [2.94]	3.00	3.73	<0.600	R	R	R
Iron	- -	- -	NA	NA	NA	13,100 [13,100]	NA	NA	11,400	18,000	9,950	9,220
Lead	63	1,000	NA	NA	NA	7.70 [7.70]	NA	NA	3.30 *	8.70	4.10	2.60
Magnesium	- -	- -	NA	NA	NA	43,300 [43,300]	NA	NA	43,600	53,100	84,600	86,600
Manganese	1,600	10,000	NA	NA	NA	519 [519]	NA	NA	264	**1,720 J**	228 J	354 J
Mercury	0.18	2.8	NA	NA	NA	**0.780 N [0.780 N]**	NA	NA	<0.0760	0.0640	0.0210	0.00660
Nickel	30	310	NA	NA	NA	15.8 [15.8]	NA	NA	12.2	23.4	11.8	9.40
Potassium	- -	- -	NA	NA	NA	2,770 [2,770]	NA	NA	1,610 E	3,220 J	2,530 J	1,960 J
Selenium	3.9	1,500	NA	NA	NA	1.40 [1.40]	NA	NA	<0.570	1.30 J	0.800 J	0.970 J
Silver	2	1,500	NA	NA	NA	<0.190 [<0.190]	NA	NA	<0.190	0.190 B	<0.130	<0.160
Sodium	- -	- -	NA	NA	NA	467 [467]	NA	NA	5,020	351 B	360 B	351 B
Thallium	- -	- -	NA	NA	NA	<0.770 [<0.770]	NA	NA	<0.570	2.70	<0.930	1.40 B
Vanadium	- -	- -	NA	NA	NA	11.5 [11.5]	NA	NA	8.10 B	13.7	10.9	7.80 B
Zinc	109	10,000	NA	NA	NA	<31.9 [<31.9]	NA	NA	15.9	32.0	22.4	19.8
Detected PCBs												
Aroclor-1254	- -	- -	NA	NA	NA	<0.038 [<0.038]	NA	NA	<0.040	NA	NA	NA
Aroclor-1260	- -	- -	NA	NA	NA	<0.038 [<0.038]	NA	NA	<0.040	NA	NA	NA
Total PCBs	0.1	1	NA	NA	NA	<0.076 [<0.077]	NA	NA	<0.081	NA	NA	NA
Detected Pesticides												
4,4'-DDD	0.0033	92	NA	NA	NA	<0.0038 [<0.0038]	NA	NA	<0.0040	<0.0039 J	<0.0036 J	<0.0037 J
4,4'-DDE	0.0033	62	NA	NA	NA	<0.0038 [<0.0038]	NA	NA	<0.0040	<0.0039	<0.0036	<0.0037
4,4'-DDT	0.0033	47	NA	NA	NA	<0.0038 [<0.0038]	NA	NA	<0.0040	<0.0039 J	<0.0036 J	<0.0037 J
Alpha-BHC	0.02	3.4	NA	NA	NA	<0.0019 [<0.0020]	NA	NA	<0.0020	<0.0020	<0.0018	<0.0019
Alpha-Chlordane	0.094	24	NA	NA	NA	<0.0019 [<0.0020]	NA	NA	<0.0020	<0.0020	<0.0018	<0.0019
Delta-BHC	0.04	500	NA	NA	NA	<0.0019 [<0.0020]	NA	NA	<0.0020	<0.0020 J	<0.0018 J	<0.0019 J
Dieldrin	0.005	1.4	NA	NA	NA	<0.0038 [<0.0038]	NA	NA	<0.0040	<0.0039	<0.0036	<0.0037
Endosulfan Sulfate	2.4	200	NA	NA	NA	<0.0038 [<0.0038]	NA	NA	<0.0040	<0.0039	<0.0036	<0.0037
Endrin	0.014	89	NA	NA	NA	<0.0038 [<0.0038]	NA	NA	<0.0040	<0.0039	<0.0036	<0.0037
Endrin Aldehyde	- -	- -	NA	NA	NA	<0.0038 [<0.0038]	NA	NA	<0.0040	<0.0046	<0.0042	<0.0043
Endrin Ketone	- -	- -	NA	NA	NA	<0.0038 [<0.0038]	NA	NA	<0.0040	<0.0039	<0.0036	<0.0037
Gamma-Chlordane	- -	- -	NA	NA	NA	<0.0019 [<0.0020]	NA	NA	<0.0020	<0.0020	<0.0018	<0.0019
Heptachlor	0.042	15	NA	NA	NA	<0.0019 [<0.0020]	NA	NA	<0.0020	<0.0020 J	<0.0018 J	<0.0019 J
Heptachlor Epoxide	- -	- -	NA	NA	NA	<0.0019 [<0.0020]	NA	NA	<0.0020	<0.0020	<0.0018	<0.0019
Methoxychlor	- -	- -	NA	NA	NA	<0.019 [<0.020]	NA	NA	<0.020	<0.020 J	<0.018 J	<0.019 J

TABLE 7
SOIL ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, and PESTICIDES (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-14													
Sample Depth(Feet):	Use SCOs	SCOs Commercial	4 - 6	14 - 16	24 - 26	30 - 32	34 - 36	44 - 46	54 - 56	62 - 64	72 - 74	76 - 78	82 - 84	88 - 90	92 - 94	96 - 98
Date Collected:	(bold)	(shade)	09/22/00	09/22/00	09/22/00	09/22/00	09/22/00	09/22/00	09/22/00	09/22/00	09/22/00	09/22/00	09/22/00	09/25/00	09/25/00	09/25/00
Detected Inorganics																
Aluminum	- -	- -	5,400	8,800	8,060	9,680 [5,240]	6,640	8,720	7,130	6,140	8,730	5,820	6,210	17,800	20,500	17,900
Antimony	- -	- -	0.890 J	0.970 J	1.30 JB	1.40 J [1.40 J]	0.790 J	0.670 J	0.930 J	0.750 J	0.690 J	0.560 J	0.860 J	0.920 J	0.990 J	0.710 J
Arsenic	13	16	4.60	5.70	10.9	3.00 [2.00 B]	2.60	3.50	2.50	3.60	4.80	2.50	5.40	1.90	1.00 B	2.30
Barium	350	400	72.9	33.5 B	110	66.3 J [32.2 JB]	26.3 B	27.8	24.5 B	16.4 B	24.9 B	13.9 B	66.1	18.5 B	9.40 B	15.5 B
Beryllium	7.2	590	0.280 B	0.390 B	0.430 B	0.520 B [0.420 B]	0.320 B	0.400 B	0.330 B	0.250 B	0.390 B	0.280 B	0.320 B	0.600 B	0.680 B	0.540 B
Cadmium	2.5	9.3	0.0890 J	0.0970 J	0.0930 J	0.140 J [0.290 JB]	0.0790 J	0.0670 J	0.0930 J	0.0750 J	0.0690 J	0.0560 J	0.0860 J	0.0920 J	0.0990 J	0.0710 J
Calcium	- -	- -	97,300	38,600	30,900	6,690 [9,020]	66,600	95,600	109,000	132,000	88,000	121,000	95,700	33,800	13,300	42,400
Chromium	- -	- -	8.70	11.7	11.5	16.7 [9.70]	9.70	14.1	15.7	9.80	14.3	10.2	10.4	28.6	30.6	27.0
Cobalt	- -	- -	5.10 B	7.90 B	10.7	4.80 B [5.20 B]	4.30 B	6.20 B	5.30 B	3.70 B	5.90 B	3.70 B	5.50 B	6.90 B	7.40 B	13.7
Copper	50	270	**53.1**	**56.4**	**65.5**	19.5 [28.8]	14.9	13.6	18.6	8.00	20.9	9.60	**58.4**	7.10	6.10	8.50
Cyanide	27	27	R	R	R	R [R]	R	R	R	R	R	R	R	R	R	R
Iron	- -	- -	12,800	19,200	30,600	15,500 J [11,600 J]	11,800	14,400	12,400	9,780	16,000	9,760	14,500	34,000	32,800	24,400
Lead	63	1,000	**151**	7.80	**120**	9.10 [7.90]	5.50	5.40	5.70	2.50	4.50	3.10	**114**	1.80	<0.400	1.00
Magnesium	- -	- -	40,300	18,500	15,600	4,000 J [2,350 J]	39,700	59,200	71,200	87,100	58,900	65,200	49,200	29,800	23,100	39,400
Manganese	1,600	10,000	527 J	641 J	493 J	131 J [85.4 J]	233 J	276 J	246 J	214 J	334 J	263 J	369 J	261 J	240 J	303 J
Mercury	0.18	2.8	**0.380**	0.0290	0.0570	0.0160 [0.0390]	0.0150	0.0250	0.0150	0.0200	0.0210	0.0240	0.0300	0.0110	0.0110	0.0120
Nickel	30	310	13.8	16.5	25.4	20.7 [19.3]	14.5	17.7	15.0	10.9	17.0	10.9	14.5	29.0	**32.8**	**49.5**
Potassium	- -	- -	1,490	1,310 J	1,060 J	1,530 J [890 JB]	1,750 J	3,170 J	2,620 J	2,560 J	3,310 J	2,550 J	1,680 J	4,350 J	4,800 J	3,930 J
Selenium	3.9	1,500	1.10 J	1.20 J	2.30 J	1.90 J [2.70 J]	0.950 J	0.810 J	1.10 J	0.900 J	0.820 J	0.670 J	1.00 J	1.60 J	1.40 J	1.10 J
Silver	2	1,500	0.370 B	<0.190	<0.190	<0.270 [<0.280]	<0.160	<0.130	<0.180	<0.150	<0.140	<0.110	<0.170	<0.180	<0.200	<0.140
Sodium	- -	- -	378 B	100 B	375 B	983 B [1,050 B]	1,220	789	540 B	403 B	1,260	1,730	449 B	924	230 B	367 B
Thallium	- -	- -	1.90	1.70 B	3.00	<1.90 [<2.00]	<1.10	1.00 B	<1.30	<1.00	1.20 B	1.00 B	<1.20	1.90	<1.40	1.20 B
Vanadium	- -	- -	11.3	15.1	19.4	16.2 [11.4 B]	10.4	12.9	11.2	10.0	13.6	9.70	12.3	29.0	29.4	21.8
Zinc	109	10,000	105	39.9	86.4	65.8 [83.4]	33.8	27.6	24.3	17.4	29.8	20.9	91.0	35.0	38.7	35.6
Detected PCBs																
Aroclor-1254	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	0.1	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Detected Pesticides																
4,4'-DDD	0.0033	92	<0.0036 J	<0.0038 J	<0.0040 J	<0.010 J	<0.0039 J	<0.0036 J	<0.0037 J	<0.0034 J [<0.010 J]	<0.0036 J	<0.0034 J	<0.0035 J	<0.0040 J	<0.0038 J	<0.0039 J
4,4'-DDE	0.0033	62	<0.0036	<0.0038	<0.0040	<0.010	<0.0039	<0.0036	<0.0037	<0.0034 [<0.010]	<0.0036	<0.0034	<0.0035	<0.0040	<0.0038	<0.0039
4,4'-DDT	0.0033	47	<0.0036 J	<0.0038 J	<0.0040 J	<0.010 J	<0.0039 J	<0.0036 J	<0.0037 J	<0.0034 J [<0.010 J]	<0.0036 J	<0.0034 J	<0.0035 J	<0.0040 J	<0.0038 J	<0.0039 J
Alpha-BHC	0.02	3.4	<0.0019	<0.0020	<0.0020	<0.0051	<0.0020	<0.0018	<0.000088 J	<0.0018 [<0.0053]	<0.0018	<0.0018	<0.0018	<0.0020	<0.0019	<0.0020
Alpha-Chlordane	0.094	24	<0.0019	<0.0020	<0.0020	<0.0051	<0.0020	<0.0018	<0.0019	<0.0018 [<0.0053]	<0.0018	<0.0018	<0.0018	<0.0020	<0.0019	<0.0020
Delta-BHC	0.04	500	<0.0019 J	<0.0020 J	<0.0020 J	<0.0051 J	<0.0020 J	<0.0018 J	<0.0019 J	<0.0018 J [<0.0053 J]	<0.0018 J	<0.0018 J	<0.0018 J	<0.0020 J	<0.0019 J	<0.0020 J
Dieldrin	0.005	1.4	<0.0036	<0.0038	<0.0040	<0.010	<0.0039	<0.0036	<0.0037	<0.0034 [<0.010]	<0.0036	<0.0034	<0.0035	<0.0040	<0.0038	<0.0039
Endosulfan Sulfate	2.4	200	<0.0036	<0.0038	<0.0040	<0.010	<0.0039	<0.0036	<0.0037	<0.0034 [<0.010]	<0.0036	<0.0034	<0.0035	<0.0040	<0.0038	<0.0039
Endrin	0.014	89	<0.0036	<0.0038	<0.0040	<0.010	<0.0039	<0.0036	<0.0037	<0.0034 [<0.010]	<0.0036	<0.0034	<0.0035	<0.0040	<0.0038	<0.0039
Endrin Aldehyde	- -	- -	<0.0043	<0.0045	<0.0047	<0.012	<0.0046	<0.0042	<0.0044	<0.0041 [<0.012]	<0.0042	<0.0041	<0.0041	<0.0047	<0.0045	<0.0046
Endrin Ketone	- -	- -	<0.0036	<0.0038	<0.0080	<0.0084 J	<0.0039	<0.0036	<0.0037	<0.0034 [<0.010]	<0.0036	<0.0034	<0.0035	<0.0040	<0.0038	<0.0039
Gamma-Chlordane	- -	- -	<0.0019	<0.0020	<0.0020	<0.0051	<0.0020	<0.0018	<0.0019	<0.0018 [<0.0053]	<0.0018	<0.0018	<0.0018	<0.0020	<0.0019	<0.0020
Heptachlor	0.042	15	<0.0019 J	<0.0020 J	<0.0020 J	<0.0051 J	<0.0020 J	<0.0018 J	<0.0019 J	<0.0018 J [<0.0053 J]	<0.0018 J	<0.0018 J	<0.0018 J	<0.0020 J	<0.0019 J	<0.0020 J
Heptachlor Epoxide	- -	- -	<0.0019	<0.0020	<0.0020	<0.0051	<0.0020	<0.0018	<0.0019	<0.0018 [<0.0053]	<0.0018	<0.0018	<0.0018	<0.0020	<0.0019	<0.0020
Methoxychlor	- -	- -	<0.019 J	<0.020 J	<0.020 J	<0.051 J	<0.020 J	<0.018 J	<0.019 J	<0.018 J [<0.053 J]	<0.018 J	<0.018 J	<0.018 J	<0.020 J	<0.019 J	<0.020 J

TABLE 7
SOIL ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, and PESTICIDES (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-15						MW-15B							
Sample Depth(Feet):	Use SCOs	SCOs Commercial	8 - 10	18 - 20	32 - 34	40 - 42	48 - 50	58 - 60	70 - 72	76 - 78	82 - 84	88 - 90	94 - 96	102 - 104	108 - 110	120 - 122
Date Collected:	(bold)	(shade)	09/26/00	09/26/00	09/26/00	09/26/00	09/27/00	09/27/00	09/28/00	09/28/00	09/28/00	09/28/00	09/28/00	09/28/00	09/28/00	09/28/00
Detected Inorganics																
Aluminum	- -	- -	9,940	8,320	5,870	7,560	7,310	5,740	6,900	5,960	5,890	5,950	5,890	6,640 [5,970]	7,400	2,770
Antimony	- -	- -	1.00 J	0.940 J	0.900 J	0.960 J	1.10 J	0.830 J	0.910 J	0.840 J	1.00 J	0.940 J	0.970 J	0.970 J [0.750 J]	0.870 J	0.820 J
Arsenic	13	16	4.40	4.40	3.10	2.90	3.60	1.60 B	2.80	2.80	3.40	3.60	5.10	2.60 [2.60]	3.20	1.70
Barium	350	400	34.4 B	36.5 B	45.9	48.1	51.6	18.9 B	24.8 B	35.5	190	43.4	25.6 B	30.6 B [28.8 B]	68.1	53.9
Beryllium	7.2	590	0.450 B	0.460 B	0.290 B	0.390 B	0.380 B	0.280 B	0.320 B	0.280 B	0.280 B	0.280 B	0.260 B	0.310 B [0.280 B]	0.340 B	0.160 B
Cadmium	2.5	9.3	<0.100	<0.0940	0.400 B	0.420 B	0.340 B	0.390 JB	0.0910 J	0.260 B	0.360 B	0.360 B	0.300 B	0.460 B [0.410 B]	0.370 B	0.160 B
Calcium	- -	- -	3,200 J	5,860 J	112,000 J	94,300 J	112,000 J	133,000	105,000	115,000 J	139,000 J	117,000 J	119,000 J	104,000 J [110,000 J]	112,000 J	59,300 J
Chromium	- -	- -	13.8 J	11.9 J	10.9 J	13.4 J	17.7 J	9.40 J	12.4	13.6 J	10.5 J	20.2 J	15.0 J	11.7 J [24.9 J]	14.9 J	5.00 J
Cobalt	- -	- -	8.00 B	7.70 B	6.20 B	5.40 B	5.30 B	3.70 B	3.90 B	4.40 B	5.40 B	4.80 B	5.50 B	5.60 B [4.40 B]	5.40 B	4.40 B
Copper	50	270	16.4	18.6	14.2	16.2	16.9	10.1	10.4	8.80	15.5	17.4	11.5	11.6 [11.9]	14.6	15.2
Cyanide	27	27	<0.600	<0.536	<2.74	<2.69	<2.92	<2.66	R	<2.69	<2.70	<2.62	<2.69	<2.66 [<2.53]	<2.92	<0.563
Iron	- -	- -	18,800	17,300	11,600	13,600	13,400	10,600	11,200	11,600	12,900	14,000	12,800	11,900 [11,600]	13,200	6,880
Lead	63	1,000	8.60 J	8.30 J	6.20 J	5.40 J	6.10 J	3.70 J	2.50	4.10 J	5.10 J	4.80 J	7.70 J	6.20 J [4.70 J]	6.00 J	3.40 J
Magnesium	- -	- -	4,570	5,710	66,000	55,400	66,400	61,300	70,400	56,600	43,200	51,400	60,000	58,500 [50,900]	50,100	18,100
Manganese	1,600	10,000	367 J	569 J	722 J	317 J	315 J	365 J	267 J	348 J	554 J	408 J	342 J	276 J [377 J]	319 J	216 J
Mercury	0.18	2.8	0.0150	0.0300	0.0310	0.0260	0.0360	0.0200	0.0340	0.0340	0.0240	0.0130	0.00710 B	0.0480 [0.0160]	0.0340	0.0230
Nickel	30	310	18.6	17.8	14.6	16.0	15.2	11.7	12.8	12.9	14.4	13.7	13.1	15.8 [12.6]	16.5	9.30
Potassium	- -	- -	1,030	1,060	1,920	2,670	2,740	2,120	2,860 J	2,280	2,300	2,410	2,220	2,360 [2,400]	2,570	970
Selenium	3.9	1,500	1.00 J	0.940 J	0.900 J	0.960 J	1.10 J	0.830 J	1.10 J	<0.840	1.00 J	0.940 J	0.970 J	0.970 J [0.750 J]	0.870 J	0.820 J
Silver	2	1,500	<0.210	<0.190	<0.180	<0.190	<0.220	<0.160	<0.180	<0.170	<0.210	<0.190	<0.190	<0.190 [<0.150]	<0.170	<0.160
Sodium	- -	- -	88.6 J	118 JB	1,130 J	524 JB	460 JB	382 JB	394	1,480 J	3,800 J	4,690 J	5,090 J	6,560 J [3,850 J]	5,970 J	9,900 J
Thallium	- -	- -	1.30 J	1.80 JB	2.70 JB	1.60 JB	2.40 JB	1.10 JB	1.30	1.80 JB	2.90 JB	2.20 JB	1.50 JB	1.20 J [1.30 JB]	1.60 JB	1.60 JB
Vanadium	- -	- -	16.5	14.8	10.2	12.6	12.7	10.1	11.2	10.3	10.4 B	10.8	10.6	10.8 [9.90]	11.6	5.30 B
Zinc	109	10,000	41.4	36.4	21.7	26.6	25.9	19.4	25.1	18.6	18.5	20.0	21.4	23.5 [17.6]	25.2	17.3
Detected PCBs																
Aroclor-1254	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	0.1	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Detected Pesticides																
4,4'-DDD	0.0033	92	<0.0040	<0.0040	<0.0037	<0.0035	<0.0036	<0.0035	<0.0034 J	<0.0034	<0.0036	<0.0035	<0.0035	<0.0034 [<0.0035]	<0.0035	<0.0036
4,4'-DDE	0.0033	62	<0.0040	<0.0040	<0.0036	<0.0035	<0.0036	<0.0035	<0.0034	<0.0034	<0.0036	<0.0035	<0.0035	<0.0034 [<0.0035]	<0.0035	<0.0036
4,4'-DDT	0.0033	47	<0.0040	<0.0040	<0.0037	<0.0035	<0.0036	<0.0035	<0.0034 J	<0.0034	<0.0036	<0.0035	<0.0035	<0.0034 [<0.0035]	<0.0035	<0.0036
Alpha-BHC	0.02	3.4	<0.0021 J	<0.0021 J	<0.0019 J	<0.0018 J	<0.0018 J	<0.0018 J	<0.0018	<0.0018 J	<0.0019 J	<0.0018 J	<0.0018 J	<0.0018 J [<0.0018 J]	<0.0021 J	<0.0019 J
Alpha-Chlordane	0.094	24	<0.0021	<0.0021	<0.0019	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0019	<0.0018	<0.0018	<0.0018 [<0.0018]	<0.0018	<0.0019
Delta-BHC	0.04	500	<0.0021 J	<0.0021 J	<0.0019 J	<0.0018 J	<0.0018 J	<0.0018 J	<0.0018 J	<0.0018 J	<0.0019 J	<0.0018 J	<0.0018 J	<0.0018 J [<0.0018 J]	<0.0018 J	<0.0019 J
Dieldrin	0.005	1.4	<0.0040	<0.0040	<0.0037	<0.0035	<0.0036	<0.0035	<0.0034	<0.0034	<0.0036	<0.00038 J	<0.0035	<0.0034 [<0.0035]	<0.0035	<0.0036
Endosulfan Sulfate	2.4	200	<0.0040	<0.0040	<0.0037	<0.0035	<0.0036	<0.0035	<0.0034	<0.0034	<0.0036	<0.0035	<0.0035	<0.0034 [<0.0035]	<0.0035	<0.0036
Endrin	0.014	89	<0.0040	<0.0040	<0.0037	<0.0035	<0.0036	<0.0035	<0.0034	<0.0034	<0.0036	<0.0035	<0.0035	<0.0034 [<0.0016 J]	<0.0035	<0.0036
Endrin Aldehyde	- -	- -	<0.0047	<0.0048	<0.0044	<0.0042	<0.0042	<0.0042	<0.0040	<0.0041	<0.0043	<0.0042	<0.0041	<0.0040 [<0.0041]	<0.0041	<0.0043
Endrin Ketone	- -	- -	<0.0040 J	<0.0040 J	<0.0037 J	<0.0035 J	<0.0036 J	<0.0035 J	<0.0034	<0.0034 J	<0.0036 J	<0.0035 J	<0.0035 J	<0.0034 J [<0.0035 J]	<0.0035 J	<0.0036 J
Gamma-Chlordane	- -	- -	<0.0021	<0.0021	<0.0019	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0019	<0.0018	<0.0018	<0.0018 [<0.0018]	<0.0018	<0.0019
Heptachlor	0.042	15	<0.0021	<0.0021	<0.0019	<0.0018	<0.0018	<0.0018	<0.0018 J	<0.0018	<0.0019	<0.0018	<0.0018	<0.0018 [<0.0018]	<0.0018	<0.0019
Heptachlor Epoxide	- -	- -	<0.0021	<0.0021	<0.0019	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0019	<0.0018	<0.0018	<0.0018 [<0.0018]	<0.0018	<0.0019
Methoxychlor	- -	- -	<0.021 J	<0.021 J	<0.019 J	<0.018 J	<0.018 J	<0.018 J	<0.018 J	<0.018 J	<0.019 J	<0.018 J	<0.018 J	<0.018 J [<0.018 J]	<0.018 J	<0.019 J

TABLE 7
SOIL ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, and PESTICIDES (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-16											
Sample Depth(Feet):	Use SCOs	SCOs Commercial	10 - 12	22 - 24	30 - 32	40 - 42	50 - 52	60 - 62	70 - 72	80 - 82	90 - 92	100 - 102	110 - 112	118 - 120
Date Collected:	(bold)	(shade)	10/04/00	10/04/00	10/04/00	10/04/00	10/04/00	10/04/00	10/04/00	10/04/00	10/05/00	10/05/00	10/05/00	10/05/00
Detected Inorganics														
Aluminum	- -	- -	6,780	3,760	7,310	4,500	5,980	4,880	6,740	7,160	6,810	3,570	2,600	2,910
Antimony	- -	- -	1.20 J	1.00 J	1.00 J	0.780 J	0.910 J	0.970 J	1.00 J	0.980 J	1.00 J	1.10 J	1.00 J	1.00 J
Arsenic	13	16	2.70	7.00	3.50	4.40	5.10	2.30	4.30	5.20	4.90	2.90	2.10	2.10
Barium	350	400	48.7	28.7 B	79.1	20.5 B	34.4 B	20.0 B	91.2	20.0 B	18.4 B	61.5	87.9	59.4
Beryllium	7.2	590	0.340 B	0.210 B	0.380 B	0.250 B	0.310 B	0.250 B	0.290 B	0.320 B	0.300 B	0.160 B	0.130 B	0.140 B
Cadmium	2.5	9.3	<0.120	0.140 B	0.450 B	0.340 B	0.370 B	0.300 B	<0.100	<0.0980	<0.100	<0.110	<0.100	<0.100
Calcium	- -	- -	55,700	47,200 J	101,000 J	130,000 J	101,000 J	112,000 J	126,000	102,000	119,000	66,400	51,800	54,300
Chromium	- -	- -	10.9	6.60 J	14.2 J	7.30 J	10.1 J	8.20 J	11.0	12.8	13.8	7.00	4.60	6.00
Cobalt	- -	- -	6.30 B	4.60 B	6.40 B	3.30 B	4.60 B	3.20 B	5.60 B	5.50 B	4.90 B	3.60 B	3.40 B	3.30 B
Copper	50	270	14.3	13.6	29.4	8.50	21.0	22.8	7.70	9.00	13.5	9.30	33.6	17.0
Cyanide	27	27	<0.567	<0.575	<1.09	<1.05	<2.75	<2.64	<1.10	<2.64	<1.01	<1.20	<0.552	<0.582
Iron	- -	- -	14,900	9,560	13,300	9,300	12,200	9,030	11,800	12,700	13,700	9,490	7,170	7,540
Lead	63	1,000	4.70 J	4.00 J	5.90 J	4.70 J	5.90 J	3.30 J	3.00 J	3.60 J	3.90 J	3.30 J	2.10 J	2.30 J
Magnesium	- -	- -	19,900	18,600	56,800	66,200	57,200	59,300	65,400	56,300	61,500	25,000	12,900	16,600
Manganese	1,600	10,000	460	406 J	544 J	258 J	272 J	191 J	364	330	291	235	224	221
Mercury	0.18	2.8	0.00630 JB	0.00500 B	0.0180	0.00560 B	0.0110	0.0150	0.0100 J	0.0120 J	0.0120 J	0.0540 JB	0.00460 J	0.0110 J
Nickel	30	310	15.6	8.10 B	15.7	10.0	14.0	9.80	15.4	16.2	15.1	10.1	8.80	8.20
Potassium	- -	- -	1,500	1,110	2,810	1,480	1,710	1,880	2,590	2,760	2,570	1,270	941 B	1,060
Selenium	3.9	1,500	<1.40	1.00 J	1.00 J	0.780 J	0.910 J	0.970 J	<1.20	<1.20	<1.20	<1.30	<1.20	<1.20
Silver	2	1,500	<0.240	<0.210	<0.200	<0.160	<0.180	<0.190	<0.210	<0.200	<0.210	<0.210	<0.200	<0.200
Sodium	- -	- -	390 B	658 JB	405 JB	477 JB	478 JB	469 JB	889 B	1,890	3,140	6,680	8,110	6,560
Thallium	- -	- -	<1.60	1.20 J	1.60 JB	0.940 J	1.20 JB	1.20 J	<1.40	<1.40	<1.40	<1.50	<1.40	<1.40
Vanadium	- -	- -	16.3	8.00 B	12.2	8.00	10.2	8.20 B	10.7	11.1	10.2 B	6.80 B	6.10 B	5.90 B
Zinc	109	10,000	34.1	21.0	25.3	16.0	29.2	15.7	17.3	19.2	17.8	18.9	15.9	15.1
Detected PCBs														
Aroclor-1254	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	0.1	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Detected Pesticides														
4,4'-DDD	0.0033	92	<0.0038	<0.0040	<0.0037	<0.0036 J	<0.0036	<0.0036	<0.0036	<0.0036	<0.0035	<0.0036	<0.0038	<0.0037
4,4'-DDE	0.0033	62	<0.0038	<0.0040	<0.0037	<0.0036 J	<0.0036	<0.0036	<0.0036	<0.0036	<0.0035	<0.0036	<0.0038	<0.0037
4,4'-DDT	0.0033	47	<0.0038	<0.0040	<0.0037	<0.0036 J	<0.0036	<0.0036	<0.0036	<0.0036	<0.0035	<0.0036	<0.0038	<0.0037
Alpha-BHC	0.02	3.4	<0.0020	<0.0020 J	<0.0019 J	<0.0019 J	<0.0019 J	<0.0019 J	<0.0018	<0.0019	<0.0018	<0.0019	<0.0019	<0.0019
Alpha-Chlordane	0.094	24	<0.0020	<0.0020	<0.0019	<0.0019 J	<0.0019	<0.0019	<0.0018	<0.0019	<0.0018	<0.0019	<0.0019	<0.0019
Delta-BHC	0.04	500	<0.0020	<0.0020 J	<0.0019 J	<0.0019 J	<0.0019 J	<0.0019 J	<0.0018	<0.0019	<0.0018	<0.0019	<0.0019	<0.0019
Dieldrin	0.005	1.4	<0.0038	<0.0040	<0.0037	<0.0036 J	<0.0037	<0.0036	<0.0036	<0.0036	<0.0035	<0.0036	<0.0038	<0.0037
Endosulfan Sulfate	2.4	200	<0.0038	<0.0040	<0.0037	<0.0036 J	<0.0036	<0.0036	<0.0036	<0.0036	<0.0035	<0.0036	<0.0038	<0.0037
Endrin	0.014	89	<0.0038	<0.0040	<0.0037	<0.0036 J	<0.0036	<0.0036	<0.0036	<0.0036	<0.0035	<0.0036	<0.0038	<0.0037
Endrin Aldehyde	- -	- -	<0.0045	<0.0047	<0.0043	<0.0043 J	<0.0043	<0.0043	<0.0043	<0.0043	<0.0042	<0.0043	<0.0044	<0.0044
Endrin Ketone	- -	- -	<0.0038	<0.0040 J	<0.0037 J	<0.0036 J	<0.0036 J	<0.0036 J	<0.0036	<0.0036	<0.0035	<0.0036	<0.0038	<0.0037
Gamma-Chlordane	- -	- -	<0.0020	<0.0020	<0.0019	<0.0019 J	<0.0019	<0.0019	<0.0018	<0.0019	<0.0018	<0.0019	<0.0019	<0.0019
Heptachlor	0.042	15	<0.0020	<0.0020	<0.0019	<0.00051 J	<0.0019	<0.0019	<0.0018	<0.0019	<0.0018	<0.0019	<0.0019	<0.0019
Heptachlor Epoxide	- -	- -	<0.0020	<0.0020	<0.0019	<0.0019 J	<0.0019	<0.0019	<0.0018	<0.0019	<0.0018	<0.0019	<0.0019	<0.0019
Methoxychlor	- -	- -	<0.020	0.020 J	<0.019 J	<0.019 J	<0.019 J	<0.019 J	<0.018	<0.019	<0.018	<0.019	<0.019	<0.019

TABLE 7
SOIL ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, and PESTICIDES (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-17B													
Sample Depth(Feet):	Use SCOs	SCOs Commercial	10 - 12	20 - 22	30 - 32	40 - 42	50 - 52	60 - 62	68 - 70	74 - 76	80 - 82	86 - 88	92 - 94	98 - 100	108 - 110	118 - 120
Date Collected:	(bold)	(shade)	10/06/00	10/09/00	10/09/00	10/09/00	10/09/00	10/09/00	10/09/00	10/09/00	10/09/00	10/10/00	10/10/00	10/10/00	10/10/00	10/10/00
Detected Inorganics																
Aluminum	- -	- -	6,340	6,220	7,770	7,380	8,840	7,290	7,420	8,370	7,580 [5,420]	6,930	6,170	4,930	2,550	4,300
Antimony	- -	- -	4.30 JB	1.30 J	0.980 J	1.10 J	1.00 J	1.20 J	1.00 J	0.930 J	0.940 J [0.950 J]	0.880 J	0.860 J	0.930 J	0.940 J	1.00 J
Arsenic	13	16	**15.0**	2.50 B	3.00	3.20	9.70	4.40	4.00	3.00	2.90 [2.20]	2.30	2.30	2.00	3.60	1.90 B
Barium	350	400	98.9	19.8 B	24.8 B	41.5 B	33.1 B	65.6 J	29.1 B	40.0	14.4 B [56.0 J]	26.2 JB	30.9 JB	40.9 J	70.6 J	77.3 J
Beryllium	7.2	590	0.480 B	0.370 B	0.340 B	0.320 B	0.410 B	0.330 B	0.330 B	0.340 B	0.340 B [0.230 B]	0.300 B	0.270 B	0.220 B	0.110 B	0.160 B
Cadmium	2.5	9.3	<0.110	<0.130	<0.0980	<0.110	<0.100	<0.120	<0.100	<0.0930	<0.0940 [<0.0950]	<0.0880	<0.0860	<0.0930	<0.0940	<0.100
Calcium	- -	- -	85,100	22,700	99,700	106,000	98,600	117,000	129,000	112,000	113,000 [97,700]	85,600	108,000	108,000	57,800	102,000
Chromium	- -	- -	16.8	11.1	13.0	12.7	17.1	12.5	12.6	14.1	12.9 [9.20]	13.2	10.4	9.10	4.60	6.70
Cobalt	- -	- -	7.80 B	6.20 B	6.90 B	5.80 B	9.20 B	4.60 B	4.40 B	5.20 B	6.10 B [4.10 B]	5.80 B	4.70 B	3.80 B	3.70 B	4.40 B
Copper	50	270	**96.8**	12.6	16.3	14.4	18.7	14.7 J	17.6	13.8	26.7 [10.7 J]	11.0 J	9.30	12.5 J	20.8 J	15.0 J
Cyanide	27	27	<1.09	<0.653	<1.04	<2.70	<2.77	<1.27	<1.09	<1.09	<1.03 [<1.09]	<1.09	<1.04	<1.06	<0.550	<1.18
Iron	- -	- -	27,700	14,400	13,500	13,300	17,200	13,700	12,500	14,600	13,200 [10,100]	12,200	11,000	9,020	6,530	9,260
Lead	63	1,000	**112 J**	5.40 J	5.70 J	4.00 J	5.20 J	5.40 J	4.90 J	5.00 J	3.80 J [3.30 J]	5.50 J	3.80 J	3.40 J	2.80 J	3.10 J
Magnesium	- -	- -	14,900	8,400	49,200	60,800	53,800	52,200	58,900	50,500	53,600 [54,400]	44,900	57,800	54,000	13,900	27,400
Manganese	1,600	10,000	559	204	482	249	442	368	305	332	343 [259]	291	279	263	219	310
Mercury	0.18	2.8	**0.190 J**	0.0190 J	0.0250 J	0.0270 J	0.0220 J	0.0260 J	0.0180 J	0.0190 J	0.0190 J [0.0300 J]	0.0190 J	0.0370 J	0.0300 J	0.0120 J	0.0200 J
Nickel	30	310	20.2	15.8	17.7	17.1	22.0	15.9	14.6	17.3	17.8 [12.3]	15.7	13.9	11.6	8.50	10.5
Potassium	- -	- -	1,210	1,060 B	2,400	2,400	2,920	2,770	2,850	2,610	2,550 [2,000]	2,590	2,540	1,840	1,050	1,360
Selenium	3.9	1,500	2.80	<1.60	1.20	<1.30	<1.20	<1.20	<1.20	<1.10	<1.10 [<0.950]	<0.880	<0.860	<0.930	<0.940	<1.00
Silver	2	1,500	0.660 B	<0.270	<0.200	<0.220	<0.210	<0.230	<0.210	<0.190	<0.190 [<0.190]	<0.180	<0.170	<0.190	<0.190	<0.200
Sodium	- -	- -	757 B	437 B	468 B	469 B	506 B	1,630 J	2,560	4,020	4,090 [938 JB]	5,830 J	5,820 J	5,040 J	8,700 J	7,280 J
Thallium	- -	- -	4.20	<1.90	<1.40	<1.50	<1.40	<1.60	<1.50	<1.30	<1.30 [<1.30]	<1.20	<1.20	<1.30	<1.30	<1.40
Vanadium	- -	- -	20.3	11.6 B	11.7	11.1	15.5	11.8	11.6	11.7	11.2 [8.90 B]	10.5	9.60	8.20	6.10 B	6.60 B
Zinc	109	10,000	86.2	38.5	29.2	24.1	30.7	26.5	24.2	24.9	21.1 [19.2]	23.2	18.0	19.4	32.2	26.0
Detected PCBs																
Aroclor-1254	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	0.1	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Detected Pesticides																
4,4'-DDD	0.0033	92	<0.0037	<0.0047	<0.0036	<0.0036	<0.0036	<0.0038	<0.0036	<0.0036	<0.0036 [<0.0036]	<0.0038	<0.0036	<0.0035	<0.0035	<0.0036
4,4'-DDE	0.0033	62	<0.0037	<0.0047	<0.0036	<0.0036	<0.0036	<0.0038	<0.0036	<0.0036	<0.0036 [<0.0036]	<0.0038	<0.0036	<0.0035	<0.0035	<0.0036
4,4'-DDT	0.0033	47	<0.0037	<0.0047	<0.0036	<0.0036	<0.0036	<0.0038 J	<0.0036	<0.0036	<0.0036 [<0.0036 J]	<0.0038 J	<0.0036 J	<0.0035 J	<0.0035 J	<0.0036 J
Alpha-BHC	0.02	3.4	<0.0019	<0.0024	<0.0019	<0.0019	<0.0019	<0.0019 J	<0.0018	<0.0019	<0.0018 [<0.0019 J]	<0.0020 J	<0.0019 J	<0.0018 J	<0.0018 J	<0.0018 J
Alpha-Chlordane	0.094	24	<0.0019	<0.0024	<0.0019	<0.0019	<0.0019	<0.0019	<0.0018	<0.0019	<0.0018 [<0.0019]	<0.0020	<0.0019	<0.0018	<0.0018	<0.0018
Delta-BHC	0.04	500	<0.0019	<0.0024	<0.0019	<0.0019	<0.0019	<0.0019 J	<0.0018	<0.0019	<0.0018 [<0.0019 J]	<0.0020 J	<0.0019 J	<0.0018 J	<0.0018 J	<0.0018 J
Dieldrin	0.005	1.4	<0.0037	<0.0047	<0.0036	<0.0036	<0.0036	<0.0038	<0.0036	<0.0036	<0.0036 [<0.0036]	<0.0038	<0.0036	<0.0035	<0.0035	<0.0036
Endosulfan Sulfate	2.4	200	<0.0037	<0.0047	<0.0036	<0.0036	<0.0036	<0.0038	<0.0036	<0.0036	<0.0036 [<0.0036]	<0.0038	<0.0036	<0.0035	<0.0035	<0.0036
Endrin	0.014	89	<0.0037	<0.0047	<0.0036	<0.0036	<0.0036	<0.0038 J	<0.0036	<0.0036	<0.0036 [<0.0036 J]	<0.0038 J	<0.0036 J	<0.0035 J	<0.0035 J	<0.0036 J
Endrin Aldehyde	- -	- -	<0.0044	<0.0055	<0.0043	<0.0043	<0.0043	<0.0045	<0.0043	<0.0043	<0.0042 [<0.0043]	<0.0046	<0.0043	<0.0041	<0.0041	<0.0042
Endrin Ketone	- -	- -	<0.0037	<0.0047	<0.0036	<0.0036	<0.0036	<0.0038	<0.0036	<0.0036	<0.0036 [<0.0036]	<0.0038	<0.0036	<0.0035	<0.0035	<0.0036
Gamma-Chlordane	- -	- -	<0.0019	<0.0024	<0.0019	<0.0019	<0.0019	<0.0019	<0.0018	<0.0019	<0.0018 [<0.0019]	<0.0020	<0.0019	<0.0018	<0.0018	<0.0018
Heptachlor	0.042	15	<0.0019	<0.0024	<0.0019	<0.0019	<0.0019	<0.0019	<0.0018	<0.0019	<0.0018 [<0.0019]	<0.0020	<0.0019	<0.0018	<0.0018	<0.0018
Heptachlor Epoxide	- -	- -	<0.0019	<0.0024	<0.0019	<0.0019	<0.0019	<0.0019	<0.0018	<0.0019	<0.0018 [<0.0019]	<0.0020	<0.0019	<0.0018	<0.0018	<0.0018
Methoxychlor	- -	- -	<0.019	<0.0011 J	<0.019	<0.019	<0.019	<0.019 J	<0.018	<0.019	<0.018 [<0.019 J]	<0.020 J	<0.019 J	<0.018 J	<0.018 J	<0.018 J

TABLE 7
SOIL ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, and PESTICIDES (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	Unrestricted	Restricted Use	MW-18		
Sample Depth(Feet):	Use SCOs	SCOs Commercial	10 - 12	64 - 66	88 - 90
Date Collected:	(bold)	(shade)	09/03/02	09/04/02	09/04/02
Detected Inorganics					
Aluminum	- -	- -	4,650	6,790	2,270 [2,400]
Antimony	- -	- -	<14.4	<9.20	<11.1 [<9.30]
Arsenic	13	16	3.00 B	3.00 B	2.20 B [2.30 B]
Barium	350	400	39.7	15.2	58.4 [63.7]
Beryllium	7.2	590	<2.50	<1.60	<1.90 [<1.60]
Cadmium	2.5	9.3	<3.70	<2.40	<2.80 [<2.40]
Calcium	- -	- -	67,700	87,400	40,600 [43,200]
Chromium	- -	- -	7.50	13.4	4.40 [4.40]
Cobalt	- -	- -	4.50	3.70	2.70 [4.20]
Copper	50	270	8.40	8.70	26.1 [20.1]
Cyanide	27	27	<0.710	1.20	<0.610 [<0.560]
Iron	- -	- -	13,700	10,500	5,840 [6,320]
Lead	63	1,000	3.90 B	3.90 B	1.80 B [2.70 B]
Magnesium	- -	- -	8,230	49,700	9,640 [10,500]
Manganese	1,600	10,000	277	255	162 [173]
Mercury	0.18	2.8	<11.8	<8.40	<10.4 [<9.10]
Nickel	30	310	11.4	11.1	6.50 [7.70]
Potassium	- -	- -	1,270	3,710	981 [1,020]
Selenium	3.9	1,500	<19.7	<12.6	<15.1 [<12.7]
Silver	2	1,500	<3.70	<2.40	<2.80 [<2.40]
Sodium	- -	- -	415	3,380	6,230 [6,880]
Thallium	- -	- -	<27.1	<17.3	<20.8 [<17.5]
Vanadium	- -	- -	8.30	10.2	4.90 [5.40]
Zinc	109	10,000	30.2	19.4 J	21.9 [16.6]
Detected PCBs					
Aroclor-1254	- -	- -	NA	NA	NA
Aroclor-1260	- -	- -	NA	NA	NA
Total PCBs	0.1	1	NA	NA	NA
Detected Pesticides					
4,4'-DDD	0.0033	92	<0.0048	<0.0036	<0.0039 [<0.0038]
4,4'-DDE	0.0033	62	<0.0048	<0.0036	<0.0039 [<0.0038]
4,4'-DDT	0.0033	47	<0.0048	<0.0036	<0.0039 [<0.0038]
Alpha-BHC	0.02	3.4	<0.0024	<0.0018	<0.0020 [<0.0020]
Alpha-Chlordane	0.094	24	<0.0024	<0.0018	<0.0020 [<0.0020]
Delta-BHC	0.04	500	<0.0024	<0.0018	<0.0020 [<0.0020]
Dieldrin	0.005	1.4	<0.0048	<0.0036	<0.0039 [<0.0038]
Endosulfan Sulfate	2.4	200	<0.0048	<0.0036	<0.0039 [<0.0038]
Endrin	0.014	89	<0.0072	<0.0054	<0.0060 [<0.0058]
Endrin Aldehyde	- -	- -	<0.0048	<0.0036	<0.0039 [<0.0038]
Endrin Ketone	- -	- -	<0.0048	<0.0036	<0.0039 [<0.0038]
Gamma-Chlordane	- -	- -	<0.0024	<0.0018	<0.0020 [<0.0020]
Heptachlor	0.042	15	<0.0024	<0.0018	<0.0020 [<0.0020]
Heptachlor Epoxide	- -	- -	<0.0024	<0.0018	<0.0020 [<0.0020]
Methoxychlor	- -	- -	<0.024	<0.018	<0.020 [<0.020]

TABLE 7
SOIL ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, and PESTICIDES (ppm)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Notes:

1. Samples were collected by the following:
   - Engineering-Science from March 1995 to April 1995.
   - ARCADIS from August 1995 to present.
2. PCBs = Polychlorinated Biphenyls.
3. Inorganics = Resource Conservation Recovery Act (RCRA) Metals and Cyanide.
4. Samples collected from year 2000 to present were analyzed by TestAmerica Laboratories, Inc. (TestAmerica) located in Shelton, Connecticut and Buffalo, New York for:
   - Inorganics using USEPA SW-846 Methods 6010, 7471 and 9012A.
   - PCBs using USEPA SW-846 Method 8082.
5. Samples collected between the years 1995 to 1999 were analyzed by Galson Laboratories, Inc. of East Syracuse, New York or Industrial and Environmental Analysts, Inc. (IEA) of Monroe, Connecticut for:
   - TAL Metals using USEPA SW-846 Methods 6010 and 7471.
   - Cyanide using USEPA Method 335.4.
   - Pesticides using USEPA Method 8080.
   - PCBs using USEPA SW-846 Method 8082.
6. Only those constituents detected in one or more samples are summarized.
7. All concentrations reported in dry weight parts per million (ppm), which is equivalent to milligrams per kilogram (mg/kg).
8. Field duplicate sample results are presented in brackets.
9. Data qualifiers are defined as follows:
   < - Constituent not detected at a concentration above the reported detection limit.
   B (Inorganic) - Indicates an estimated value between the instrument detection limit and the Reporting Limit (RL).
   E - Indicates the linear range of exceedence of instrument.
   J - Indicates that the associated numerical value is an estimated concentration.
   N - The spike recovery exceeded the upper or lower control limits.
   P - There was a greater than 25 percent difference for detected concentrations between the two GC columns.
   R - Indicates the reported value was rejected.
   * - LCS or LCSD exceeds the control limits.
10. 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs) are from Title 6 of the Official Compilation of Codes, Rules, and Regulations of the State of New York (6 NYCRR) Part 375-6.8(a) and (b), effective December 14,2006.
11. Bold font indicates that the result exceeds the 6 NYCRR Part 375 Unrestricted Use SCO.
12. Shading indicates that the result exceeds the 6 NYCRR Part 375 Commercial Use SCO.
13. - - = No 6 NYCRR Part 375 SCO listed.
14. NA = Not Analyzed.
15. The data has been validated in accordance with USEPA National Functional Guidelines of October 1999.
16. - = Analytical results are available for selected soil samples from the wall borings (samples designated by the prefix "WB-") presented on the CD included with this report.

TABLE 8
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-1S								MW-1D					
Date Collected:		08/30/95	11/20/95	07/10/97	09/09/97	11/08/02	01/29/03	04/09/08	01/29/13	08/30/95	11/20/95	07/10/97	09/09/97	11/08/02	01/23/03
Detected VOCs															
1,1,1-Trichloroethane	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
1,1,2,2-Tetrachloroethane	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	0.40 J	<5.0
1,1-Dichloroethane	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
1,2-Dichloroethane	0.6	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	1.0 J	<10	<5.0	<5.0
1,2-Dichloroethene (total)	- -	<10	<10	<10	<10	NA	NA	NA	NA	<10	<10	2.0 J	<10	NA	NA
2-Butanone	- -	<10	<10	<10	<10	<10	<10	NA	NA	<10	<10	<10	<10	<10	<10
2-Hexanone	50	<10	<10	<10	<10	<10	<10	NA	NA	<10	<10	<10	<10	<10	<10
4-Methyl-2-pentanone	- -	<10	<10	<10	<10	<10	<10 J	NA	NA	<10	<10	<10	<10	<10	<10 J
Acetone	50	<10	<10	12 B	<10	<5.0 J	<10	NA	NA	140	<10	140	<10	<10 J	<10
Benzene	1	<10	<10	<10	<10	<5.0	<5.0	<1.0	<0.50	2.0 J	<10	<10	<10	1.0 J	<5.0
Bromodichloromethane	50	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
Bromoform	50	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
Carbon Disulfide	- -	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
Chloroform	7	<10	<10	2.0 J	8.0 J	<5.0	<5.0	NA	NA	<10	<10	21 B	<10	<5.0	<5.0
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	<5.0	<5.0	NA	NA	NA	NA	NA	NA	<5.0	<5.0
Dibromochloromethane	50	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
Ethylbenzene	5	<10	<10	<10	<10	<5.0	<5.0	<5.0	<1.0	<10	<10	<10	<10	12	11
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	5.0 J	<10	5.0 J	<10	<5.0	<5.0
Styrene	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
Tetrachloroethene	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
Toluene	5	<10	<10	<10	<10	<5.0	<5.0	<5.0	<1.0	<10	<10	<10	<10	0.50 J	<5.0
Trichloroethene	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
Xylenes (total)	5	<10	<10	<10	<10	<5.0	<5.0	<5.0	<1.0	<10	<10	<10	<10	5.0 J	4.0 J
Total BTEX	- -	<10	<10	<10	<10	<5.0	<5.0	<5.0	<1.0	2.0 J	<10	<10	<10	19 J	15 J
Total VOCs	- -	<10	<10	14 J	8.0 J	<10	<10	<5.0	<1.0	150 J	<10	170 J	<10	19 J	15 J
Detected SVOCs															
2,4-Dimethylphenol	50	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
2-Methylnaphthalene	- -	<10	<10	<10	<10	<10	<15	<10	<2.0	<10	<10	<10	<10	<11	<10
2-Methylphenol	- -	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
4-Chloro-3-Methylphenol	- -	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
4-Chloroaniline	5	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
4-Methylphenol	- -	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
Acenaphthene	20	1.0 J	<10	<10	<10	<10	<15	<10	<2.0	6.0 J	1.0 J	<10	0.50 J	24	14
Acenaphthylene	- -	0.90 J	0.70 J	0.20 J	<10	<10	<15	<10	<2.0	1.0 J	<10	0.090 J	<10	66	30
Anthracene	50	<10	0.20 J	<10	<10	<10	<15	<10	<2.0	1.0 J	<10	<10	<10	1.0 J	0.80 J
Benzo(a)anthracene	0.002	<10	<10	<10	<10	<10	<15	<10	<2.0	<10	<10	<10	<10	<11	<10
Benzo(a)pyrene	0	<10	0.50 J	<10	<10	<10	<15	<10	<2.0 J	<10	<10	<10	<10	<11	<10
Benzo(b)fluoranthene	0.002	<10	0.20 J	<10	<10	<10	<15	<10	<2.0	<10	<10	<10	<10	<11	<10
Benzo(g,h,i)perylene	- -	<10	0.30 J	<10	<10	<10	<15	<10	<2.0	<10	<10	<10	<10	<11	<10
Benzo(k)fluoranthene	0.002	<10	0.20 J	<10	<10	<10	<15	<10	<2.0	<10	<10	<10	<10	<11	<10
bis(2-Ethylhexyl)phthalate	5	<10	<10	0.90 JB	0.90 JB	<10	<15	NA	NA	<10	<10	0.40 JB	2.0 JB	<11 J	<10
Butylbenzylphthalate	50	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
Carbazole	- -	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	2.0 J	1.0 J
Chrysene	0.002	<10	<10	<10	<10	<10	<15	<10	<2.0	<10	<10	<10	<10	<11	<10
Dibenzo(a,h)anthracene	- -	<10	<10	<10	<10	<10	<15	<10	<2.0 J	<10	<10	<10	<10	<11	<10
Dibenzofuran	- -	<10	<10	<10	<10	<10	<15	NA	NA	0.40 J	<10	<10	<10	3.0 J	2.0 J
Diethylphthalate	50	<10	<10	0.40 JB	0.40 JB	<10	<15	NA	NA	<10	<10	0.50 JB	0.50 JB	<11	<10
Dimethylphthalate	50	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
Di-n-Butylphthalate	50	0.70 J	<10	<10	0.20 JB	<10	<15	NA	NA	<10	<10	0.20 JB	0.30 JB	<11	<10
Di-n-Octylphthalate	50	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	0.20 J	<10	<11	<10
Fluoranthene	50	<10	<10	<10	<10	<10	<15	<10	<2.0	0.70 J	<10	<10	<10	<11	<10
Fluorene	50	<10	<10	<10	<10	<10	<15	<10	<2.0	4.0 J	<10	4.0 J	<10	<11	1.0 J
Indeno(1,2,3-cd)pyrene	0.002	<10	<10	<10	<10	<10	<15	<10	<2.0 J	<10	<10	<10	<10	<11	<10
Naphthalene	10	<10	<10	<10	<10	<10	<15	<10	<2.0	1.0 J	<10	<10	<10	2.0 J	1.0 J
N-Nitrosodiphenylamine	50	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
Phenanthrene	50	<10	<10	<10	<10	<10	<15	<10	<2.0	4.0 J	<10	<10	<10	12	7.0 J
Phenol	1	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
Pyrene	50	<10	0.20 J	<10	<10	<10	<15	<10	<2.0	1.0 J	0.30 J	0.10 J	<10	<11	<10
Total PAHs	- -	1.9 J	2.3 J	0.20 J	<10	<10	<15	<10	<2.0	19 J	1.3 J	4.2 J	0.50 J	110 J	54 J
Total SVOCs	- -	2.6 J	2.3 J	1.5 J	1.5 J	<50	<75	<10	<2.0	19 J	1.3 J	5.5 J	3.3 J	110 J	57 J

TABLE 8
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-2								MW-3S							MW-3D					
Date Collected:	Guidance Values	08/30/95	11/20/95	07/09/97	09/10/97	11/06/02	01/28/03	04/14/08	01/29/13	08/30/95	11/20/95	07/09/97	09/09/97	11/12/02	01/17/03	04/09/08	08/30/95	11/20/95	07/10/97	09/09/97	11/12/02	01/17/03
Detected VOCs																						
1,1,1-Trichloroethane	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0 J	<5.0	NA	<10	<10	<10	<10	<5.0 J	<5.0
1,1,2,2-Tetrachloroethane	5	<10	<10	0.80 J	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
1,1-Dichloroethane	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
1,2-Dichloroethane	0.6	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
1,2-Dichloroethene (total)	- -	<10	<10	<10	<10	NA	NA	NA	NA	<10	<10	<10	<10	NA	NA	NA	<10	<10	<10	<10	NA	NA
2-Butanone	- -	<10	<10	<10	<10	<10	<10	NA	NA	<10	<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
2-Hexanone	50	<10	<10	<10	<10	<10	<10	NA	NA	<10	<10	<10	<10	<10 J	<10	NA	<10	<10	<10	<10	<10	<10
4-Methyl-2-pentanone	- -	<10	<10	<10	<10	<10	<10	NA	NA	<10	<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Acetone	50	<10	<10	<10	<10	<10	<10	NA	NA	<10	<10	<10	<10	<10	<10	NA	24	<10	<10	<10	<10	<10
Benzene	1	<10	<10	<10	<10	<5.0	<5.0	<1.0	0.76	<10	<10	<10	<10	<5.0	<5.0	<1.0	<10	<10	<10	<10	<5.0	<5.0
Bromodichloromethane	50	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
Bromoform	50	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0 J	<5.0	NA	<10	<10	<10	<10	<5.0 J	<5.0
Carbon Disulfide	- -	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
Chloroform	7	<10	<10	2.0 J	8.0 J	<5.0	<5.0	NA	NA	<10	<10	<10	<10	0.50 J	0.30 J	NA	<10	<10	<10	<10	<5.0	<5.0
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	<5.0	<5.0	NA	NA	NA	NA	NA	NA	<5.0	<5.0	NA	NA	NA	NA	NA	<5.0	<5.0
Dibromochloromethane	50	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
Ethylbenzene	5	<10	<10	<10	<10	<5.0	<5.0	<5.0	1.1	<10	<10	<10	<10	<5.0	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	3.0 JB	<10	<5.0	<5.0	NA	<10	<10	<10	1.0 JB	<5.0 J	<5.0
Styrene	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
Tetrachloroethene	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
Toluene	5	<10	<10	<10	<10	<5.0	<5.0	0.19 J	<1.0	<10	<10	0.30 J	<10	<5.0	1.0 J	<5.0	<10	<10	<10	<10	<5.0	0.70 J
Trichloroethene	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
Xylenes (total)	5	<10	<10	<10	<10	<5.0	<5.0	<5.0	<1.0	<10	<10	<10	<10	<5.0	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0
Total BTEX	- -	<10	<10	<10	<10	<5.0	<5.0	0.19 J	1.9	<10	<10	0.30 J	<10	<5.0	1.0 J	<5.0	<10	<10	<10	<10	<5.0	0.70 J
Total VOCs	- -	<10	<10	2.8 J	8.0 J	<10	<10	0.19 J	1.9	<10	<10	3.3 J	<10	0.50 J	1.3 J	<5.0	24	<10	<10	1.0 J	<10	0.70 J
Detected SVOCs																						
2,4-Dimethylphenol	50	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
2-Methylnaphthalene	- -	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
2-Methylphenol	- -	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	0.30 J	<10	<10	<15
4-Chloro-3-Methylphenol	- -	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
4-Chloroaniline	5	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
4-Methylphenol	- -	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
Acenaphthene	20	<10	<11	<10	NA	<11	<11	<11	0.39 J	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Acenaphthylene	- -	<10	<11	0.10 J	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Anthracene	50	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Benzo(a)anthracene	0.002	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Benzo(a)pyrene	0	<10	<11	<10	NA	<11	<11	<11	<2.2 J	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Benzo(b)fluoranthene	0.002	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Benzo(g,h,i)perylene	- -	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Benzo(k)fluoranthene	0.002	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
bis(2-Ethylhexyl)phthalate	5	<10	<11	0.80 JB	NA	<11	<11	NA	NA	<10	<10	0.50 JB	1.0 JB	<11	<11	NA	<10	<15	0.90 JB	33 B	10	<15
Butylbenzylphthalate	50	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
Carbazole	- -	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
Chrysene	0.002	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Dibenzo(a,h)anthracene	- -	<10	<11	<10	NA	<11	<11	<11	<2.2 J	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Dibenzofuran	- -	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
Diethylphthalate	50	<10	<11	0.30 JB	NA	<11	<11	NA	NA	<10	<10	0.20 JB	0.40 JB	<11	<11	NA	<10	<10	<10	0.30 JB	<10	<15
Dimethylphthalate	50	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	0.90 JB	<10	<10	<15
Di-n-Butylphthalate	50	0.60 J	<11	0.40 JB	NA	<11	<11	NA	NA	0.50 J	<10	0.20 JB	0.20 JB	<11	<11	NA	0.60 J	<10	0.90 JB	0.30 JB	<10	<15
Di-n-Octylphthalate	50	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
Fluoranthene	50	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Fluorene	50	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Indeno(1,2,3-cd)pyrene	0.002	<10	<11	<10	NA	<11	<11	<11	<2.2 J	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Naphthalene	10	<10	<11	<10	NA	<11	3.0 J	<11	2.4	<10	<10	<10	<10	<11	<11	<10	3.0 J	<10	<10	0.50 J	<10	<15
N-Nitrosodiphenylamine	50	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
Phenanthrene	50	<10	<11	<10	NA	<11	<11	<11	0.38 J	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Phenol	1	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
Pyrene	50	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Total PAHs	- -	<10	<11	0.10 J	NA	<11	3.0 J	<11	3.2 J	<10	<10	<10	<10	<11	<11	<10	3.0 J	<10	<10	0.50 J	<10	<15
Total SVOCs	- -	0.60 J	<28	1.6 J	NA	<53	3.0 J	<11	3.2 J	0.50 J	<25	0.90 J	1.6 J	<54	<56	<10	3.6 J	<25	3.0 J	34 J	10	<74

TABLE 8
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-4S								MW-4D				MW-6						
Date Collected:		08/31/95	11/15/95	07/09/97	09/08/97	11/05/02	01/23/03	04/10/08	01/29/13	07/09/97	09/09/97	11/05/02	01/23/03	08/30/95	11/15/95	07/10/97	11/12/02	01/23/03	04/09/08	01/29/13
Detected VOCs																				
1,1,1-Trichloroethane	5	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	<10 [<10]	<10	<5.0	<5.0	<10	<10	<10	<5.0 J	<5.0	NA	NA
1,1,2,2-Tetrachloroethane	5	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	2.0 J [<10]	2.0 J	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
1,1-Dichloroethane	5	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	<10 [<10]	<10	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
1,2-Dichloroethane	0.6	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	<10 [<10]	<10	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
1,2-Dichloroethene (total)	- -	<1,000 [<500]	<500	<10	<10	NA	NA	NA	NA	<10 [<10]	<10	NA	NA	<10	<10	<10	NA	NA	NA	NA
2-Butanone	- -	<1,000 [<500]	<500	<10	<10	<500	<1,000	NA	NA	<10 [<10]	2.0 JB	<10	<10	<10	<10	<10	<10	<10	NA	NA
2-Hexanone	50	<1,000 [<500]	<500	<10	<10	<500	<1,000	NA	NA	4.0 J [<10]	4.0 J	<10	<10	<10	<10	<10	<10 J	<10	NA	NA
4-Methyl-2-pentanone	- -	<1,000 [<500]	<500	<10	<10	<500	<1,000	NA	NA	4.0 J [<10]	4.0 J	<10	<10	<10	<10	<10	<10	<10	NA	NA
Acetone	50	<1,000 [<500]	<500	1,500 B	<10	1,400	<1,000	NA	NA	<10 [<10]	10 B	<10	<10	<10	<10	14 B	<10	<10	NA	NA
Benzene	1	7,500 [8,100]	5,900	9,500	5,500	5,400	12,000	9,500 [8,600]	8,000 D [9,800 D]	2.0 J [1.0 J]	3.0 J	1.0 J	15	<10	<10	<10	<5.0	<5.0	<1.0	<0.50
Bromodichloromethane	50	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	0.90 J [0.80 J]	0.90 J	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
Bromoform	50	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	0.90 J [<10]	0.90 J	<5.0	<5.0	<10	<10	<10	<5.0 J	<5.0	NA	NA
Carbon Disulfide	- -	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	2.0 J [1.0 J]	68	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
Chloroform	7	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	6.0 J [5.0 J]	6.0 J	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	<250	<500	NA	NA	NA	NA	<5.0	<5.0	NA	NA	NA	<5.0	<5.0	NA	NA
Dibromochloromethane	50	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	0.50 J [<10]	0.50 J	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
Ethylbenzene	5	2,700 [2,800]	<500	<10	1,200	1,900	2,200	1,200 [1,100]	1,100 [1,200]	3.0 J [3.0 J]	4.0 J	1.0 J	8.0	<10	<10	<10	<5.0	<5.0	<5.0	<1.0
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<1,000 [<500]	<500	160 JB	170 J	310 B	<500	NA	NA	2.0 JB [2.0 JB]	<10	<5.0	<5.0	<10	<10	1.0 J	<5.0	<5.0	NA	NA
Styrene	5	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	<10 [0.30 J]	2.0 J	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
Tetrachloroethene	5	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	<10 [<10]	<10	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
Toluene	5	1,600 [1,700]	1,000	530	460 J	270	1,300	580 [540]	690 [720]	5.0 J [3.0 J]	4.0 J	<5.0	3.0 J	<10	<10	<10	<5.0	<5.0	<5.0	<1.0
Trichloroethene	5	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	0.60 J [<10]	0.60 J	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
Xylenes (total)	5	4,000 [4,200]	4,100	3,100	2,500	2,100	3,300	1,600 [1,400]	1,600 [1,800]	6.0 J [3.0 J]	9.0 JB	2.0 J	13	<10	<10	<10	<5.0	<5.0	<5.0	<1.0
Total BTEX	- -	16,000 [17,000]	11,000	13,000	9,700 J	9,700	19,000	13,000 [12,000]	12,000 [13,000]	16 J [10 J]	20 J	4.0 J	39 J	<10	<10	<10	<5.0	<5.0	<5.0	<1.0
Total VOCs	- -	16,000 [17,000]	11,000	15,000 J	9,800 J	11,000	19,000	13,000 [12,000]	12,000 [13,000]	39 J [19 J]	120 J	4.0 J	39 J	<10	<10	15 J	<10	<10	<5.0	<1.0
Detected SVOCs																				
2,4-Dimethylphenol	50	1,400 J [1,100 J]	370 J	820	510 J	310 J	1,700	NA	NA	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
2-Methylnaphthalene	- -	2,000 J [1,800 J]	830 J	490	720 J	61 J	110 J	<400 [<200]	31 [25]	0.70 J [0.60 J]	2.0 J	0.60 J	1.0 J	<10	<10	<10	<10	<11	<10	<2.0
2-Methylphenol	- -	<2,500 [<2,500]	<2,000	1,400	360 J	540 J	4,000	NA	NA	<10 [<10]	<10	<11	0.60 J	<10	<10	<10	<10	<11	NA	NA
4-Chloro-3-Methylphenol	- -	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
4-Chloroaniline	5	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
4-Methylphenol	- -	400 J [310 J]	<2,000	1,000	150 J	<1,000	1,600	NA	NA	<10 [0.30 J]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
Acenaphthene	20	370 J [360 J]	140 J	140 J	200 J	100 J	200 J	67 J [53 J]	93 [82]	0.60 J [0.50 J]	2.0 J	1.0 J	2.0 J	<10	<10	<10	<10	<11	<10	<2.0
Acenaphthylene	- -	<2,500 [160 J]	59 J	58 J	94 J	<1,000	120 J	20 J [18 J]	25 [21]	2.0 J [1.0 J]	3.0 J	1.0 J	2.0 J	<10	<10	<10	<10	<11	<10	<2.0
Anthracene	50	55 J [88 J]	12 J	46 J	66 J	<1,000	<1,100	<400 [<200]	4.9 [4.6]	0.060 J [0.060 J]	<10	0.70 J	1.0 J	<10	<10	<10	<10	<11	<10	<2.0
Benzo(a)anthracene	0.002	<2,500 [<2,500]	<2,000	25 J	44 J	<1,000	<1,100	<400 [<200]	0.82 J [0.71 J]	<10 [<10]	<10	<11	0.60 J	<10	<10	<10	<10	<11	<10	<2.0
Benzo(a)pyrene	0	<2,500 [<2,500]	<2,000	16 J	<10	<1,000	<1,100	<400 [<200]	<2.0 J [<2.0 J]	<10 [<10]	<10	<11	0.60 J	<10	<10	<10	<10	<11	<10	<2.0 J
Benzo(b)fluoranthene	0.002	<2,500 [<2,500]	<2,000	11 J	<10	<1,000	<1,100	<400 [<200]	<2.0 [<2.0]	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	<10	<2.0
Benzo(g,h,i)perylene	- -	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	<400 [<200]	<2.0 [<2.0]	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	<10	<2.0
Benzo(k)fluoranthene	0.002	<2,500 [<2,500]	<2,000	13 J	<10	<1,000	<1,100	<400 [<200]	<2.0 [<2.0]	<10 [<10]	<10	<11	0.60 J	<10	<10	<10	<10	<11	<10	<2.0
bis(2-Ethylhexyl)phthalate	5	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	4.0 JB [7.0 JB]	34 B	<11	<12	<10	<10	0.50 JB	<10	<11	NA	NA
Butylbenzylphthalate	50	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
Carbazole	- -	350 J [330 J]	290 J	96 J	81 J	<1,000	210 J	NA	NA	0.60 J [0.70 J]	0.40 J	<11	0.60 J	<10	<10	<10	<10	<11	NA	NA
Chrysene	0.002	<2,500 [<2,500]	<2,000	24 J	36 J	<1,000	<1,100	<400 [<200]	<2.0 [<2.0]	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	<10	<2.0
Dibenzo(a,h)anthracene	- -	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	<400 [<200]	<2.0 J [<2.0 J]	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	<10	<2.0 J
Dibenzofuran	- -	<2,500 [68 J]	<2,000	31 J	38 J	<1,000	<1,100	NA	NA	<10 [<10]	0.30 J	<11	0.60 J	<10	<10	<10	<10	<11	NA	NA
Diethylphthalate	50	<2,500 [270 J]	<2,000	<10	<10	<1,000	<1,100	NA	NA	5.0 JB [5.0 JB]	0.40 JB	<11	<12	<10	<10	0.40 JB	<10	<11	NA	NA
Dimethylphthalate	50	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	<10 [0.50 J]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
Di-n-Butylphthalate	50	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	0.80 JB [0.80 JB]	0.30 JB	<11	<12	0.50 J	<10	<10	<10	<11	NA	NA
Di-n-Octylphthalate	50	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	0.80 JB [2.0 J]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
Fluoranthene	50	50 J [97 J]	<2,000	59 J	80 J	<1,000	69 J	<400 [<200]	3.5 [3.2]	<10 [0.10 J]	<10	1.0 J	2.0 J	<10	<10	<10	<10	<11	<10	<2.0
Fluorene	50	<2,500 [170 J]	48 J	62 J	73 J	<1,000	110 J	25 J [23 J]	41 [36]	0.20 J [0.20 J]	0.70 J	<11	2.0 J	<10	<10	<10	<10	<11	<10	<2.0
Indeno(1,2,3-cd)pyrene	0.002	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	<400 [<200]	<2.0 J [<2.0 J]	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	<10	<2.0 J
Naphthalene	10	12,000 [10,000]	6,700	2,700	4,400	4,600	8,500	1,100 [920]	2,800 D [2,500 D]	18 [14]	36	13	25	<10	<10	<10	<10	1.0 J	<10	0.50 J
N-Nitrosodiphenylamine	50	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
Phenanthrene	50	230 J [360 J]	56 J	180 J	230 J	<1,000	200 J	24 J [22 J]	37 [33]	0.30 J [0.30 J]	0.80 J	3.0 J	5.0 J	<10	<10	<10	<10	<11	<10	<2.0
Phenol	1	240 J [<2,500]	<2,000	630	76 J	<1,000	600 J	NA	NA	<10 [5.0 J]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
Pyrene	50	56 J [110 J]	<2,000	56 J	86 J	<1,000	66 J	<400 [<200]	2.9 [2.9]	<10 [0.10 J]	<10	2.0 J	2.0 J	<10	0.30 J	<10	<10	<11	<10	<2.0
Total PAHs	- -	15,000 J [13,000 J]	7,900 J	3,900 J	6,000 J	4,800 J	9,400 J	1,200 J [1,000 J]	3,000 J [2,700 J]	22 J [17 J]	45 J	22 J	44 J	<10	0.30 J	<10	<10	1.0 J	<10	0.50 J
Total SVOCs	- -	17,000 J [15,000 J]	8,500 J	7,900 J	7,200 J	5,600 J	18,000 J	1,200 J [1,000 J]	3,000 J [2,700 J]	33 J [38 J]	80 J	22 J	46 J	0.50 J	0.30 J	0.90 J	<50	1.0 J	<10	0.50 J

TABLE 8
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-7S								MW-7D				MW-8S							
Date Collected:	Guidance Values	08/31/95	11/15/95	07/09/97	09/09/97	11/05/02	01/27/03	04/10/08	01/29/13	07/09/97	09/09/97	11/05/02	01/27/03	08/30/95	11/15/95	07/08/97	09/09/97	11/05/02	01/28/03	04/09/08	01/29/13
Detected VOCs																					
1,1,1-Trichloroethane	5	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
1,1,2,2-Tetrachloroethane	5	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
1,1-Dichloroethane	5	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
1,2-Dichloroethane	0.6	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
1,2-Dichloroethene (total)	- -	<200	<200	<10	<10	NA	NA	NA	NA	<10	<10	NA	NA	<10	<10	<10	<10	NA	NA	NA	NA
2-Butanone	- -	<200	<200	<10	<10	<40 [<50]	<200	NA	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA	NA
2-Hexanone	50	<200	<200	<10	<10	<40 [<50]	<200	NA	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA	NA
4-Methyl-2-pentanone	- -	<200	<200	<10	<10	<40 [<50]	<200 J	NA	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA	NA
Acetone	50	<200	<200	<10	<10	<40 [<50]	<200	NA	NA	23 B	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA	NA
Benzene	1	1,800	2,800	2,000	1,600	300 [260]	1,500	490	600	<10	<10	<5.0	1.0 J	<10	<10	<10	<10	0.40 J	<5.0	0.38 J	<0.50
Bromodichloromethane	50	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	1.0 J	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Bromoform	50	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Carbon Disulfide	- -	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Chloroform	7	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	8.0 J	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	<20 [<25]	<100	NA	NA	NA	NA	<5.0	<5.0	NA	NA	NA	NA	<5.0	<5.0	NA	NA
Dibromochloromethane	50	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	0.50 J	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Ethylbenzene	5	1,700	320	1,400	1,300	340 [280]	920	490	660	<10	0.60 J	<5.0	3.0 J	<10	<10	<10	2.0 J	38	23	22	39
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<200	<200	62 JB	<10	<20 [26 B]	<100	NA	NA	2.0 JB	1.0 JB	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Styrene	5	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Tetrachloroethene	5	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	0.40 J	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Toluene	5	120 J	530	97 J	87 J	10 J [9.0 J]	320	24 J	9.9	1.0 J	<10	<5.0	<5.0	<10	<10	<10	<10	1.0 J	<5.0	1.0 J	<1.0
Trichloroethene	5	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Xylenes (total)	5	1,400	1,500	1,000	1,000	190 [190]	970	220	260	<10	2.0 JB	<5.0	3.0 J	14	120	48	54	34	27	35	26
Total BTEX	- -	5,000 J	5,200	4,500 J	4,000 J	840 J [740 J]	3,700	1,200 J	1,500	1.0 J	2.6 J	<5.0	7.0 J	14	120	48	56 J	73 J	50	58 J	66
Total VOCs	- -	5,000 J	5,200	4,600 J	4,000 J	840 J [770 J]	3,700	1,200 J	1,500	36 J	3.6 J	<10	7.0 J	14	120	48	56 J	73 J	50	58 J	66
Detected SVOCs																					
2,4-Dimethylphenol	50	170 J	<2,000	210 J	<10	<270 [<270]	250 J	NA	NA	<10	<10	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
2-Methylnaphthalene	- -	1,100 J	400 J	870 J	1,100 J	17 J [18 J]	370 J	24 J	26	<10	<10	<11	1.0 J	30 J	18 J	<10	<10	<20	<10	<20	<2.0
2-Methylphenol	- -	<2,500	<2,000	<10	<10	<270 [<270]	100 J	NA	NA	<10	<10	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
4-Chloro-3-Methylphenol	- -	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	<10	<10	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
4-Chloroaniline	5	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	<10	<10	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
4-Methylphenol	- -	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	0.30 J	<10	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
Acenaphthene	20	580 J	210 J	910 J	1,400 J	79 J [76 J]	110 J	170 J	240 D	<10	<10	0.60 J	0.50 J	420	290	450	360	110	62	88	58
Acenaphthylene	- -	<2,500	36 J	120 J	140 J	<270 [<270]	<1,100	<200	3.7	<10	<10	<11	<11	120	50 J	95 J	70 J	23	16	17 J	8.4
Anthracene	50	150 J	17 J	230 J	390 J	<270 [<270]	<1,100	<200	7.3	<10	<10	<11	<11	170	78 J	220	140	10 J	8.0 J	5.9 J	2.4
Benzo(a)anthracene	0.002	84 J	<2,000	150 J	270 J	<270 [<270]	<1,100	<200	0.42 J	<10	<10	<11	<11	65 J	29 J	84 J	55 J	2.0 J	2.0 J	<20	<2.0
Benzo(a)pyrene	0	<2,500	<2,000	130 J	200 J	<270 [<270]	<1,100	<200	<2.0 J	<10	<10	<11	<11	29 J	11 J	37 J	24 J	<20	1.0 J	<20	<2.0 J
Benzo(b)fluoranthene	0.002	<2,500	<2,000	82 J	130 J	<270 [<270]	<1,100	<200	<2.0	<10	<10	<11	<11	12 J	4.0 J	20 J	12 J	<20	<10	<20	<2.0
Benzo(g,h,i)perylene	- -	<2,500	<2,000	<10	120 J	<270 [<270]	<1,100	<200	<2.0	<10	<10	<11	<11	8.0 J	2.0 J	10 J	7.0 J	<20	<10	<20	<2.0
Benzo(k)fluoranthene	0.002	<2,500	<2,000	110 J	200 J	<270 [<270]	<1,100	<200	<2.0	<10	<10	<11	<11	19 J	6.0 J	21 J	15 J	<20	0.70 J	<20	<2.0
bis(2-Ethylhexyl)phthalate	5	<2,500	<2,000	<10	0.50 JB	<270 [<270]	<1,100	NA	NA	9.0 JB	4.0 JB	<11	<11	<100	<100	<10	18 JB	<20	<10	NA	NA
Butylbenzylphthalate	50	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	<10	<10	<11	0.60 J	<100	<100	<10	<10	<20	<10	NA	NA
Carbazole	- -	600 J	550 J	480 J	420 J	35 J [36 J]	240 J	NA	NA	0.40 J	<10	<11	0.60 J	<100	<100	<10	<10	<20	2.0 J	NA	NA
Chrysene	0.002	69 J	<2,000	130 J	240 J	<270 [<270]	<1,100	<200	<2.0	<10	<10	<11	<11	69 J	29 J	98 J	61 J	2.0 J	2.0 J	<20	<2.0
Dibenzo(a,h)anthracene	- -	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	<200 J	<2.0 J	<10	<10	<11	<11	<100	<100	5.0 J	<10	<20	<10	<20	<2.0 J
Dibenzofuran	- -	150 J	45 J	260 J	380 J	12 J [12 J]	<1,100	NA	NA	<10	<10	<11	<11	<100	14 J	<10	16 J	7.0 J	4.0 J	NA	NA
Diethylphthalate	50	54 J	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	0.90 JB	0.40 JB	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
Dimethylphthalate	50	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	0.30 J	<10	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
Di-n-Butylphthalate	50	<2,500	<2,000	0.50 J	<10	<270 [<270]	<1,100	NA	NA	0.20 JB	0.40 JB	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
Di-n-Octylphthalate	50	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	2.0 J	<10	<11	0.60 J	<100	<100	<10	<10	<20	<10	NA	NA
Fluoranthene	50	240 J	<2,000	420 J	750 J	<270 [<270]	<1,100	<200	4.0	0.20 J	<10	1.0 J	0.70 J	98 J	35 J	140	78 J	4.0 J	4.0 J	2.2 J	1.1 J
Fluorene	50	<2,500	53 J	300 J	520 J	<270 [<270]	<1,100	26 J	32	<10	<10	<11	<11	150	71 J	130	110	11 J	15	13 J	9.0
Indeno(1,2,3-cd)pyrene	0.002	<2,500	<2,000	<10	100 J	<270 [<270]	<1,100	<200 J	<2.0 J	<10	<10	<11	<11	<100	2.0 J	10 J	8.0 J	<20	<10	<20	<2.0 J
Naphthalene	10	14,000	7,900	14,000	15,000	1,300 [1,300]	8,700	1,100	1,900 D	<10	<10	5.0 J	18	280	300	100	42 J	11 J	13	7.3 J	2.1
N-Nitrosodiphenylamine	50	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	<10	<10	<11	<11	<100	9.0 J	<10	<10	<20	<10	NA	NA
Phenanthrene	50	600 J	80 J	900 J	1,500 J	<270 [<270]	<1,100	29 J	47	0.10 J	<10	1.0 J	0.60 J	540	330	620	390	14 J	10	8.0 J	0.67 J
Phenol	1	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	<10	<10	<11	<11	24 J	<100	<10	<10	<20	<10	NA	NA
Pyrene	50	<2,500	<2,000	370 J	660 J	<270 [<270]	<1,100	<200	2.7	0.20 J	<10	1.0 J	0.70 J	150	100	200	130	7.0 J	6.0 J	3.4 J	1.5 J
Total PAHs	- -	17,000 J	8,700 J	19,000 J	23,000 J	1,400 J [1,400 J]	9,200 J	1,400 J	2,200 J	0.50 J	<10	8.6 J	22 J	2,200 J	1,400 J	2,200 J	1,500 J	190 J	140 J	150 J	83 J
Total SVOCs	- -	18,000 J	9,300 J	20,000 J	24,000 J	1,400 J [1,400 J]	9,800 J	1,400 J	2,200 J	14 J	4.8 J	8.6 J	23 J	2,200 J	1,400 J	2,200 J	1,500 J	200 J	150 J	150 J	83 J

TABLE 8
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-8D						MW-9D1						MW-9D2			
Date Collected:		08/30/95	11/15/95	07/08/97	09/09/97	11/06/02	01/28/03	07/09/97	09/08/97	11/06/02	01/21/03	04/10/08	01/31/13	07/10/97	09/08/97	11/06/02	01/21/03
Detected VOCs																	
1,1,1-Trichloroethane	5	<50	<10 [42]	<10	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
1,1,2,2-Tetrachloroethane	5	<50	<10 [6.0 J]	0.80 J	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
1,1-Dichloroethane	5	<50	<10 [13]	<10	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
1,2-Dichloroethane	0.6	<50	<10 [<10]	<10	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
1,2-Dichloroethene (total)	- -	<50	<10 [37]	1.0 J	<10	NA	NA	<10	<10	NA	NA	NA	NA	<10	<10	NA	NA
2-Butanone	- -	<50	<10 [<10]	<10	<10	<10	<10 [<10]	<10	<10	<100	<100	NA	NA	<10	<10	<10	<10
2-Hexanone	50	<50	<10 [<10]	<10	<10	<10	<10 [<10]	<10	<10	<100	<100	NA	NA	<10	<10	<10	<10
4-Methyl-2-pentanone	- -	<50	<10 [<10]	<10	<10	<10	<10 [<10]	<10	<10	<100	<100	NA	NA	<10	<10	<10	<10
Acetone	50	600	<14 [<10]	<10	<10	<10	<10 [<10]	<10	23 JB	<100	<100	NA	NA	<10	7.0 JB	12	<10
Benzene	1	19 J	2.0 J [<10]	0.70 J	2.0 J	<5.0	<5.0 [<5.0]	8.0 J	<10	<50	4.0 J	1.8	<0.50	<10	<10	<5.0	<5.0
Bromodichloromethane	50	<50	<10 [<10]	<10	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	0.70 J	0.70 J	<5.0	<5.0
Bromoform	50	<50	<10 [<10]	0.40 J	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
Carbon Disulfide	- -	<50	<10 [<10]	0.80 J	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
Chloroform	7	<50	<10 [<10]	<10	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	3.0 J	<10	<5.0	<5.0
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	<5.0	<5.0 [<5.0]	NA	NA	<50	<50	NA	NA	NA	NA	<5.0	<5.0
Dibromochloromethane	50	<50	<10 [<10]	<10	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
Ethylbenzene	5	48 J	3.0 J [<10]	<10	1.0 J	<5.0	<5.0 [<5.0]	100	200	200	350	110	25	<10	3.0 J	<5.0	0.40 J
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<50	<10 [<10]	2.0 JB	<10	<5.0	<5.0 [<5.0]	<10	9.0 JB	19 JB	5.0 J	NA	NA	<10	<10	<5.0	<5.0
Styrene	5	<50	<10 [<10]	<10	<10	<5.0	<5.0 [<5.0]	100	440	130	1,400	NA	NA	<10	2.0 J	<5.0	1.0 J
Tetrachloroethene	5	<50	<10 [17]	<10	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
Toluene	5	<50	2.0 J [<10]	<10	<10	<5.0	<5.0 [<5.0]	110	200	39 J	1,400	31	<1.0	8.0 J	8.0 J	<5.0	3.0 J
Trichloroethene	5	<50	<10 [16]	0.80 J	0.80 J	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
Xylenes (total)	5	70	8.0 J [<10]	2.0 J	3.0 J	<5.0	<5.0 [<5.0]	400	1,100 B	780	1,300	430	19	<10	20 B	<5.0	3.0 J
Total BTEX	- -	140 J	15 J [<10]	2.7 J	6.0 J	<5.0	<5.0 [<5.0]	620 J	1,500	1,000 J	3,100 J	570	43	8.0 J	31 J	<5.0	6.4 J
Total VOCs	- -	740 J	15 J [130 J]	8.5 J	6.8 J	<10	<10 [<10]	720 J	2,000 J	1,200 J	4,500 J	570	43	12 J	41 J	12	7.4 J
Detected SVOCs																	
2,4-Dimethylphenol	50	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
2-Methylnaphthalene	- -	<10	<13 [0.60 J]	<10	<10	<11	<10 [<11]	160 J	420 J	230 J	590	290 J	<2.0	1.0 J	13	<11	<11
2-Methylphenol	- -	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
4-Chloro-3-Methylphenol	- -	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
4-Chloroaniline	5	<10	3.0 J [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
4-Methylphenol	- -	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
Acenaphthene	20	48	22 [24]	43	45	24	15 [17]	15 J	35 J	<500	22 J	17 J	26	<10	0.60 J	<11	<11
Acenaphthylene	- -	14	5.0 J [5.0 J]	11	11	3.0 J	2.0 J [2.0 J]	100 J	270 J	190 J	230 J	140 J	110	0.50 J	3.0 J	<11	<11
Anthracene	50	6.0 J	2.0 J [2.0 J]	6.0 J	5.0 J	3.0 J	2.0 J [2.0 J]	2.0 J	9.0 J	<500	<560	<400	3.6	0.10 J	<10	<11	<11
Benzo(a)anthracene	0.002	<10	0.40 J [0.40 J]	0.90 J	2.0 J	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0	<10	<10	<11	<11
Benzo(a)pyrene	0	<10	0.20 J [0.30 J]	0.50 J	1.0 J	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0 J	<10	<10	<11	<11
Benzo(b)fluoranthene	0.002	<10	<13 [<12]	0.40 J	1.0 J	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0	<10	<10	<11	<11
Benzo(g,h,i)perylene	- -	<10	<13 [<12]	0.30 J	1.0 J	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0	<10	<10	<11	<11
Benzo(k)fluoranthene	0.002	<10	<13 [<12]	0.40 J	1.0 J	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0	<10	<10	<11	<11
bis(2-Ethylhexyl)phthalate	5	<10	<13 [<12]	4.0 JB	14 B	<11	<10 [<11]	23 JB	<10	<500	<560	NA	NA	6.0 JB	10 B	<11	<11
Butylbenzylphthalate	50	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
Carbazole	- -	2.0 J	<13 [<12]	1.0 J	0.70 J	<11	<10 [<11]	5.0 J	<10	<500	<560	NA	NA	<10	<10	<11	<11
Chrysene	0.002	0.50 J	0.40 J [0.50 J]	1.0 J	2.0 J	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0	<10	<10	<11	<11
Dibenzo(a,h)anthracene	- -	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0 J	<10	<10	<11	<11
Dibenzofuran	- -	3.0 J	0.90 J [1.0 J]	2.0 J	3.0 J	<11	0.90 J [1.0 J]	4.0 J	<10	<500	<560	NA	NA	<10	<10	<11	<11
Diethylphthalate	50	<10	<13 [<12]	0.80 JB	1.0 JB	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	0.60 JB	1.0 JB	<11	<11
Dimethylphthalate	50	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	0.40 J	0.40 J	<11	<11
Di-n-Butylphthalate	50	<10	<13 [<12]	0.30 JB	0.30 JB	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	0.30 JB	1.0 JB	<11	<11
Di-n-Octylphthalate	50	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
Fluoranthene	50	2.0 J	0.70 J [0.80 J]	3.0 J	5.0 J	1.0 J	1.0 J [1.0 J]	<10	<10	<500	<560	<400	<2.0	0.10 J	<10	<11	<11
Fluorene	50	28	3.0 J [3.0 J]	11	11	6.0 J	3.0 J [4.0 J]	33 J	55 J	<500	43 J	33 J	<2.0	1.0 J	<10	<11	<11
Indeno(1,2,3-cd)pyrene	0.002	<10	<13 [<12]	0.20 J	1.0 J	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0 J	<10	<10	<11	<11
Naphthalene	10	14	4.0 J [4.0 J]	<10	1.0 J	<11	4.0 J [5.0 J]	1,100	2,700	3,000	4,200	2,600	21	5.0 JB	61	<11	1.0 J
N-Nitrosodiphenylamine	50	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
Phenanthrene	50	17	8.0 J [10 J]	20	6.0 J	0.90 J	0.40 J [0.50 J]	19 J	54 J	<500	39 J	30 J	27	0.60 J	0.40 J	<11	<11
Phenol	1	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
Pyrene	50	2.0 J	2.0 J [2.0 J]	4.0 J	8.0 J	2.0 J	1.0 J [2.0 J]	<10	<10	<500	<560	<400	0.43 J	0.20 J	<10	<11	<11
Total PAHs	- -	130 J	48 J [53 J]	100 J	100 J	40 J	28 J [34 J]	1,400 J	3,500 J	3,400 J	5,100 J	3,100 J	190 J	8.5 J	78 J	<11	1.0 J
Total SVOCs	- -	140 J	52 J [54 J]	110 J	120 J	40 J	29 J [35 J]	1,500 J	3,500 J	3,400 J	5,100 J	3,100 J	190 J	16 J	90 J	<54	1.0 J

TABLE 8
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-10S						MW-10D						MW-11D					
Date Collected:	Guidance Values	07/09/97	09/08/97	11/07/02	01/22/03	04/10/08	01/28/13	07/09/97	09/08/97	11/07/02	01/22/03	04/10/08	01/28/13	07/08/97	09/10/97	11/07/02	01/16/03	04/09/08	01/31/13
Detected VOCs																			
1,1,1-Trichloroethane	5	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	NA	NA	<10	<10	<5.0	<5.0	NA	NA
1,1,2,2-Tetrachloroethane	5	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	NA	NA	<10	<10	<5.0	<5.0	NA	NA
1,1-Dichloroethane	5	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	NA	NA	<10	<10	<5.0	<5.0	NA	NA
1,2-Dichloroethane	0.6	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	NA	NA	<10	<10	<5.0	<5.0	NA	NA
1,2-Dichloroethene (total)	- -	<10	<10	NA	NA	NA	NA	<10	<10	NA	NA	NA	NA	<10	<10	NA	NA	NA	NA
2-Butanone	- -	<10	<10	<10	<10	NA	NA	<10	3.0 JB	<20	<20	NA	NA	<10	<10	<10	<10	NA	NA
2-Hexanone	50	<10	<10	<10	<10	NA	NA	<10	<10	<20	<20	NA	NA	<10	<10	<10	<10	NA	NA
4-Methyl-2-pentanone	- -	<10	<10	<10	<10	NA	NA	<10	<10	<20	<20	NA	NA	<10	<10	<10	<10	NA	NA
Acetone	50	<10	<10	<10	<10	NA	NA	6.0 JB	17 JB	<20	<20	NA	NA	7.0 JB	<10	<10	<10	NA	NA
Benzene	1	<10	<10	<5.0	0.50 J	<1.0	<0.50	19	74	48	48	22	<0.50	<10	<10	13	19	27	1.7
Bromodichloromethane	50	<10	<10	<5.0	<5.0	NA	NA	3.0 J	<10	<10	<10	NA	NA	3.0 J	<10	<5.0	<5.0	NA	NA
Bromoform	50	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	NA	NA	<10	<10	<5.0	<5.0	NA	NA
Carbon Disulfide	- -	<10	<10	<5.0	<5.0	NA	NA	<10	2.0 J	<10	<10	NA	NA	<10	<10	<5.0	5.0 J	NA	NA
Chloroform	7	<10	<10	<5.0	<5.0	NA	NA	13	<10	<10	<10	NA	NA	13	7.0 J	<5.0	<5.0	NA	NA
cis-1,2-Dichloroethene	5	NA	NA	<5.0	<5.0	NA	NA	NA	NA	<10	<10	NA	NA	NA	NA	<5.0	<5.0	NA	NA
Dibromochloromethane	50	<10	<10	<5.0	<5.0	NA	NA	0.90 J	0.90 J	<10	<10	NA	NA	0.90 J	<10	<5.0	<5.0	NA	NA
Ethylbenzene	5	<10	<10	<5.0	1.0 J	0.41 J	<1.0	5.0 J	41	80	93	83	1.3	<10	2.0 J	12	12	20	1.5
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<10	<10	<5.0	<5.0	NA	NA	<10	3.0 JB	<10	1.0 J	NA	NA	<10	<10	<5.0	<5.0	NA	NA
Styrene	5	<10	<10	<5.0	7.0	NA	NA	15	200	380	400	NA	NA	<10	<10	14	30	NA	NA
Tetrachloroethene	5	2.0 J	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	NA	NA	<10	<10	<5.0	<5.0	NA	NA
Toluene	5	<10	<10	<5.0	5.0	0.28 J	<1.0	28	140	270	260	100	<1.0	<10	13	48	48	89	<1.0
Trichloroethene	5	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	NA	NA	<10	<10	<5.0	<5.0	NA	NA
Xylenes (total)	5	<10	1.0 JB	<5.0	9.0	1.6 J	<1.0	18	220 B	420	310	450	6.4	<10	10	77	75	110	1.2
Total BTEX	- -	<10	1.0 J	<5.0	16 J	2.3 J	<1.0	70 J	480	820	710	660	7.7	<10	25 J	150	150	250	4.4
Total VOCs	- -	2.0 J	1.0 J	<10	23 J	2.3 J	<1.0	110 J	700 J	1,200	1,100 J	660	7.7	24 J	32 J	160	190 J	250	4.4
Detected SVOCs																			
2,4-Dimethylphenol	50	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
2-Methylnaphthalene	- -	<10	<10	1.0 J	0.70 J	<10	<2.0	34 J	100	110 J	150 J	79 J	1.3 J	<10	22 J	67	48	11 J	5.4
2-Methylphenol	- -	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	0.80 J	<10	<45	<29	NA	NA
4-Chloro-3-Methylphenol	- -	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	3.0 J	<10	<45	<29	NA	NA
4-Chloroaniline	5	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
4-Methylphenol	- -	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	0.30 J	<10	<45	<29	NA	NA
Acenaphthene	20	<10	<10	<11	<11	<10	<2.0	0.90 J	<10	<220	<270	<200	<2.0	15 J	<10	<45	2.0 J	<40	<2.0
Acenaphthylene	- -	<10	<10	<11	<11	<10	<2.0	14 J	42 J	46 J	51 J	32 J	0.56 J	<10	6.0 J	15 J	10 J	3.2 J	1.5 J
Anthracene	50	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Benzo(a)anthracene	0.002	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Benzo(a)pyrene	0	<10	<10	<11	<11	<10	<2.0 J	<10	<10	<220	<270	<200	<2.0 J	<10	<10	<45	<29	<40	<2.0 J
Benzo(b)fluoranthene	0.002	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Benzo(g,h,i)perylene	- -	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	10 J	<10	<45	<29	<40	<2.0
Benzo(k)fluoranthene	0.002	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
bis(2-Ethylhexyl)phthalate	5	1.0 JB	2.0 JB	<11	<11	NA	NA	6.0 JB	4.0 JB	<220	<270	NA	NA	5.0 JB	3.0 JB	<45	<29	NA	NA
Butylbenzylphthalate	50	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
Carbazole	- -	<10	<10	<11	<11	NA	NA	2.0 J	6.0 J	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
Chrysene	0.002	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Dibenzo(a,h)anthracene	- -	<10	<10	<11	<11	<10	<2.0 J	<10	<10	<220	<270	<200	<2.0 J	<10	<10	<45	<29	<40	<2.0 J
Dibenzofuran	- -	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
Diethylphthalate	50	0.50 JB	0.70 JB	<11	<11	NA	NA	2.0 JB	<10	<220	<270	NA	NA	0.90 JB	<10	<45	<29	NA	NA
Dimethylphthalate	50	<10	<10	<11	<11	NA	NA	1.0 J	<10	<220	<270	NA	NA	0.20 J	<10	<45	<29	NA	NA
Di-n-Butylphthalate	50	0.30 JB	0.60 JB	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	0.70 JB	<10	<45	<29	NA	NA
Di-n-Octylphthalate	50	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
Fluoranthene	50	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Fluorene	50	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Indeno(1,2,3-cd)pyrene	0.002	<10	<10	<11	<11	<10	<2.0 J	<10	<10	<220	<270	<200	<2.0 J	<10	<10	<45	<29	<40	<2.0 J
Naphthalene	10	<10	<10	5.0 J	16	1.1 J	<2.0	220	780	1,200	1,500	920	9.0	100	230	270	170	110	65
N-Nitrosodiphenylamine	50	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
Phenanthrene	50	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Phenol	1	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
Pyrene	50	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Total PAHs	- -	<10	<10	6.0 J	17 J	1.1 J	<2.0	270 J	920 J	1,400 J	1,700 J	1,000 J	11 J	130 J	260 J	350 J	230 J	120 J	72 J
Total SVOCs	- -	1.8 J	3.3 J	6.0 J	17 J	1.1 J	<2.0	280 J	930 J	1,400 J	1,700 J	1,000 J	11 J	140 J	260 J	350 J	230 J	120 J	72 J

TABLE 8
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-12D						MW-13D			MW-14D				MW-15D			
Date Collected:	Guidance Values	07/08/97	09/08/97	11/07/02	01/16/03	04/10/08	01/30/13	11/07/02	01/22/03	04/10/08	11/08/02	01/16/03	04/11/08	01/30/13	11/12/02	01/21/03	04/10/08	01/30/13
Detected VOCs																		
1,1,1-Trichloroethane	5	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10 J	<10	NA	NA
1,1,2,2-Tetrachloroethane	5	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	0.40 J	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
1,1-Dichloroethane	5	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
1,2-Dichloroethane	0.6	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
1,2-Dichloroethene (total)	- -	<10	<10 [<10]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	- -	<10	<10 [<10]	<10	<10 [<10]	NA	NA	<10	<10	NA	<10	<10	NA	NA	5.0 J	<20	NA	NA
2-Hexanone	50	<10	<10 [<10]	<10	<10 [<10]	NA	NA	<10	<10	NA	<10	<10	NA	NA	<20 J	<20	NA	NA
4-Methyl-2-pentanone	- -	<10	<10 [<10]	<10	<10 [<10]	NA	NA	<10	<10	NA	<10	<10	NA	NA	<20	<20	NA	NA
Acetone	50	<10	3.0 JB [2.0 JB]	<10	<10 [<10]	NA	NA	<10	<10	NA	<10	<10	NA	NA	<20	<20	NA	NA
Benzene	1	<10	<10 [<10]	<5.0	<5.0 [<5.0]	0.63 J	0.81	<5.0	<5.0	<1.0	<5.0	<5.0	<1.0	<0.50	2.0 J	3.0 J	1.7	1.0
Bromodichloromethane	50	2.0 J	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
Bromoform	50	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10 J	<10	NA	NA
Carbon Disulfide	- -	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
Chloroform	7	10	<10 [1.0 J]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	0.20 J	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
cis-1,2-Dichloroethene	5	NA	NA	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
Dibromochloromethane	50	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
Ethylbenzene	5	<10	<10 [<10]	<5.0	<5.0 [<5.0]	0.57 J	0.55 J	<5.0	<5.0	<5.0	<5.0	0.60 J	<5.0	<1.0	72	110	49	30
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<10	<10 [0.90 JB]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	0.80 J	NA	NA
Styrene	5	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	1.0 J	NA	NA	240	300	NA	NA
Tetrachloroethene	5	0.80 J	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
Toluene	5	<10	<10 [<10]	<5.0	<5.0 [<5.0]	0.13 J	<1.0	<5.0	1.0 J	<5.0	<5.0	2.0 J	<5.0	<1.0	48	92	19	26
Trichloroethene	5	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
Xylenes (total)	5	<10	<10 [1.0 JB]	<5.0	<5.0 [<5.0]	<5.0	0.69 J	<5.0	<5.0	<5.0	<5.0	3.0 J	<5.0	<1.0	400	570	110	81
Total BTEX	- -	<10	<10 [1.0 J]	<5.0	<5.0 [<5.0]	1.3 J	2.1 J	<5.0	1.0 J	<5.0	<5.0	5.6 J	<5.0	<1.0	520 J	780 J	180	140
Total VOCs	- -	13 J	3.0 J [4.9 J]	<10	<10 [<10]	1.3 J	2.1 J	<10	1.6 J	<5.0	<10	6.6 J	<5.0	<1.0	770 J	1,100 J	180	140
Detected SVOCs																		
2,4-Dimethylphenol	50	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
2-Methylnaphthalene	- -	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	0.60 J	<11	<10	<11	<10	<10	<2.0	71 J	54 J	95 J	97
2-Methylphenol	- -	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
4-Chloro-3-Methylphenol	- -	1.0 J	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
4-Chloroaniline	5	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
4-Methylphenol	- -	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Acenaphthene	20	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	43 J	35 J	32 J	24
Acenaphthylene	- -	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	110 J	95 J	87 J	86
Anthracene	50	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Benzo(a)anthracene	0.002	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Benzo(a)pyrene	0	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0 J	<12	<11	<10	<11	<10	<10	<2.0 J	<260	<270	<400	<2.0 J
Benzo(b)fluoranthene	0.002	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Benzo(g,h,i)perylene	- -	0.30 J	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Benzo(k)fluoranthene	0.002	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
bis(2-Ethylhexyl)phthalate	5	6.0 JB	3.0 JB [4.0 JB]	<10	10 J [<11]	NA	NA	<12	1.0 J	NA	<11	<10	NA	NA	<260	<270	NA	NA
Butylbenzylphthalate	50	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Carbazole	- -	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	22 J	20 J	NA	NA
Chrysene	0.002	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Dibenzo(a,h)anthracene	- -	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0 J	<12	<11	<10	<11	<10	<10	<2.0 J	<260	<270	<400	<2.0 J
Dibenzofuran	- -	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Diethylphthalate	50	1.0 JB	1.0 JB [0.50 JB]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Dimethylphthalate	50	0.20 J	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Di-n-Butylphthalate	50	0.40 JB	1.0 JB [0.60 JB]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Di-n-Octylphthalate	50	0.70 J	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Fluoranthene	50	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Fluorene	50	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	9.5
Indeno(1,2,3-cd)pyrene	0.002	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0 J	<12	<11	<10	<11	<10	<10	<2.0 J	<260	<270	<400	<2.0 J
Naphthalene	10	0.20 J	0.80 J [0.60 J]	<10	<11 [<11]	0.63 J	1.1 J	<12	<11	0.52 J	<11	<10	<10	0.27 J	1,800	1,700	2,300	2,600 D
N-Nitrosodiphenylamine	50	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Phenanthrene	50	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Phenol	1	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Pyrene	50	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Total PAHs	- -	0.50 J	0.80 J [0.60 J]	<10	<11 [<11]	0.63 J	1.1 J	0.60 J	<11	0.52 J	<11	<10	<10	0.27 J	2,000 J	1,900 J	2,500 J	2,900
Total SVOCs	- -	9.8 J	5.8 J [5.7 J]	<50	10 J [<54]	0.63 J	1.1 J	0.60 J	1.0 J	0.52 J	<56	<50	<10	0.27 J	2,100 J	1,900 J	2,500 J	2,900

TABLE 8
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-16D				MW-17D					MW-18			
Date Collected:	Guidance Values	11/13/02	01/22/03	04/14/08	01/30/13	11/13/02	11/13/02	01/21/03	04/11/08	01/30/13	11/13/02	01/23/03	04/11/08	01/30/13
Detected VOCs														
1,1,1-Trichloroethane	5	<5.0 J	<5.0	NA	NA	<25 J [<25]	<25	<25	NA	NA	<5.0 J	<5.0	NA	NA
1,1,2,2-Tetrachloroethane	5	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
1,1-Dichloroethane	5	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
1,2-Dichloroethane	0.6	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	- -	<10	<10	NA	NA	12 J [11 J]	12 J	<50	NA	NA	<10	<10	NA	NA
2-Hexanone	50	<10	<10	NA	NA	<50 [<50]	<50	<50	NA	NA	<10	<10	NA	NA
4-Methyl-2-pentanone	- -	<10	<10	NA	NA	<50 [<50]	<50	<50	NA	NA	<10	<10	NA	NA
Acetone	50	<10 J	<10	NA	NA	<50 J [11 J]	<50	<50	NA	NA	<10 J	<10	NA	NA
Benzene	1	<5.0	<5.0	<1.0	<0.50	6.0 J [6.0 J]	6.0 J	10 J	3.1	5.4	0.70 J	<5.0	0.72 J	<0.50
Bromodichloromethane	50	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
Bromoform	50	<5.0 J	<5.0	NA	NA	<25 J [<25]	<25	<25	NA	NA	<5.0 J	<5.0	NA	NA
Carbon Disulfide	- -	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
Chloroform	7	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
cis-1,2-Dichloroethene	5	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
Dibromochloromethane	50	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
Ethylbenzene	5	<5.0	<5.0	<5.0	<1.0	160 [160]	160	250	22	35	<5.0	<5.0	<5.0	<1.0
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<5.0	<5.0	NA	NA	<25 [6.0 J]	10 J	3.0 J	NA	NA	0.60 J	<5.0	NA	NA
Styrene	5	<5.0	<5.0	NA	NA	490 [500]	470	720	NA	NA	0.30 J	<5.0	NA	NA
Tetrachloroethene	5	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
Toluene	5	<5.0	<5.0	<5.0	<1.0	260 [250]	270	480	26	27	1.0 J	<5.0	0.20 J	<1.0
Trichloroethene	5	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
Xylenes (total)	5	<5.0	<5.0	<5.0	<1.0	810 [820]	790	850	78	120 J	1.0 J	<5.0	<5.0	<1.0
Total BTEX	- -	<5.0	<5.0	<5.0	<1.0	1,200 J [1,200 J]	1,200 J	1,600 J	130	180	2.7 J	<5.0	0.92 J	<1.0
Total VOCs	- -	<10	<10	<5.0	<1.0	1,700 J [1,800 J]	1,700 J	2,300 J	130	180	3.6 J	<10	0.92 J	<1.0
Detected SVOCs														
2,4-Dimethylphenol	50	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
2-Methylnaphthalene	- -	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
2-Methylphenol	- -	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
4-Chloro-3-Methylphenol	- -	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
4-Chloroaniline	5	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
4-Methylphenol	- -	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Acenaphthene	20	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Acenaphthylene	- -	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Anthracene	50	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Benzo(a)anthracene	0.002	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Benzo(a)pyrene	0	<10	<11	<11	<2.0 J	<110 [<220]	NA	<220	<220	<2.2 J	<11	<14	<10	<2.0 J
Benzo(b)fluoranthene	0.002	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Benzo(g,h,i)perylene	- -	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Benzo(k)fluoranthene	0.002	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
bis(2-Ethylhexyl)phthalate	5	<10 J	0.60 J	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Butylbenzylphthalate	50	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Carbazole	- -	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Chrysene	0.002	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Dibenzo(a,h)anthracene	- -	<10	<11	<11	<2.0 J	<110 [<220]	NA	<220	<220	<2.2 J	<11	<14	<10	<2.0 J
Dibenzofuran	- -	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Diethylphthalate	50	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Dimethylphthalate	50	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Di-n-Butylphthalate	50	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Di-n-Octylphthalate	50	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Fluoranthene	50	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Fluorene	50	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Indeno(1,2,3-cd)pyrene	0.002	<10	<11	<11	<2.0 J	<110 [<220]	NA	<220	<220	<2.2 J	<11	<14	<10	<2.0 J
Naphthalene	10	3.0 J	3.0 J	<11	1.4 J	710 J [1,600 J]	NA	1,700	990	80	3.0 J	0.80 J	<10	<2.0
N-Nitrosodiphenylamine	50	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Phenanthrene	50	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Phenol	1	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Pyrene	50	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Total PAHs	- -	3.0 J	3.0 J	<11	1.4 J	710 J [1,600 J]	NA	1,700	990	80	3.0 J	0.80 J	<10	<2.0
Total SVOCs	- -	3.0 J	3.6 J	<11	1.4 J	710 J [1,600 J]	NA	1,700	990	80	3.0 J	0.80 J	<10	<2.0

TABLE 8

GROUNDWATER ANALYTICAL RESULTS FOR DETECTED VOCs AND SVOCs (ppb)

NATIONAL GRID

ERIE BOULEVARD FORMER MGP

FEASIBILITY STUDY REPORT

Notes:

1. Samples were collected by the following:
   - Engineering-Science from March 1995 to April 1995.
   - ARCADIS from August 1995 to present.
2. VOCs = Target Compound List (TCL) Volatile Organic Compounds.
3. BTEX = Benzene, toluene, ethylbenzene and xylenes.
4. SVOCs = TCL Semi-Volatile Organic Compounds.
5. Samples collected between 1995 and 1999 were analyzed by Industrial and Environmental Analysts, Inc. (IEA) of Monroe, Connecticut. Samples collected between 2000 and 2008 were analyzed by TestAmerica Laboratories, Inc. (TestAmerica) located in Shelton, Connecticut. Samples collected in 2013 were analyzed by Accutest Laboratories (Accutest) located in
   - VOCs using United States Environmental Protection Agency (USEPA) SW-846 Method 8240 or 8260.
   - SVOCs using USEPA SW-846 Method 8270.
6. Only those constituents detected in one or more samples are summarized.
7. Concentrations reported in parts per billion (ppb), which is equivalent to micrograms per liter (µg/L).
8. Field duplicate sample results are presented in brackets.
9. Data qualifiers are defined as follows:
   - < - Constituent not detected at a concentration above the reported detection limit.
   - B (Organic) - Compound was found in blank.
   - D - Compound quantitated using a secondary dilution. Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis.
   - E (Organic) - Result exceeded calibration range; a secondary dilution required.
   - J - Indicates that the associated numerical value is an estimated concentration.
   - * - LCS or LCSD exceeds the control limits.
10. NYSDEC groundwater standards/guidance values are from the NYSDEC Division of Water, Technical and Operational Guidance Series (TOGS) document titled "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (TOGS 1.1.1) dated June 1998, revised April 2000 and June 2004.
11. - - = No TOGS 1.1.1 Water Quality Standard/Guidance Value listed.
12. NA = Not Analyzed.
13. The samples collected July 9, 1997 from wells MW-3S and MW-7S appear to have been inadvertently switched during the preliminary site assessment. Results for wells have been switched (corrected) for this table.
14. The data has been validated in accordance with USEPA National Functional Guidelines of October 1999.

TABLE 9
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, PESTICIDES, and BIOGEOCHEMICAL PARAMETERS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-1S								MW-1D					
Date Collected:	Guidance Values	08/30/95	11/20/95	07/10/97	09/09/97	11/08/02	01/29/03	04/09/08	01/29/13	08/30/95	11/20/95	07/10/97	09/09/97	11/08/02	01/23/03
Detected Inorganics															
Aluminum	- -	141,000	1,590	39,500	52,200 *	<2,500 J	<2,500	NA	NA	1,260	<33.7	2,390	1,270 B*	1,810 JB	3,790 B
Antimony	3	<3.00	<27.0	<8.00	<80.0	<100	<100	NA	NA	<3.00	<27.0	<8.00	<80.0	<100	<500
Arsenic	25	88.3	<2.00	27.6	53.2 B	<200	<200	NA	NA	<3.00	<2.00	<3.00	<30.0	<200	<1,000
Available Cyanide	- -	NA	NA	NA	NA	NA	2.00	<2.00	16 J	NA	NA	NA	NA	NA	<2.00
Barium	1,000	1,160	88.4 B	235 N	411 B	78.8	70.6	NA	NA	62.1 B	54.6 B	61.2 BN	80.4 B	58.7	106 B
Beryllium	- -	7.30	1.30 B	1.20 B	<10.0	<25.0	<25.0	NA	NA	<1.00	<1.00	<1.00	<10.0	<25.0	<125
Cadmium	5	<1.00	<2.00	<1.00 N	<10.0 N	<50.0	<50.0	NA	NA	<1.00	<2.00	2.20 BN	18.1 BN	<50.0	<250
Calcium	- -	1,070,000	415,000	276,000 E	561,000 E	150,000	235,000	NA	NA	155,000	112,000	69,900 E	197,000 E	755,000	775,000
Chloride	250,000	NA	NA	NA	NA	320,000	450,000	NA	NA	NA	NA	NA	NA	4,400,000	4,300,000
Chromium	50	211	4.60 B	83.2	93.2 B	13.1 B	<50.0	NA	NA	2.80 B	<3.00	9.20 B	14.0 B	<50.0	<250
Cobalt	- -	141	7.80 B	44.3 BN	65.5 B	<50.0	<50.0	NA	NA	1.70 B	<4.00	<9.00 N	<10.0	<50.0	<250
Copper	200	1,640	183	403	904	14.6 B	29.8 B	NA	NA	13.0 B	<8.10	6.10 B	33.4 B	<50.0	94.0 B
Cyanide	200	96.2	151	0.158	0.0610	111	271	15.0	41	11.3	11.0	<0.0100	<0.0100	<10.0	3.40 B
Iron	300	228,000	2,970	72,600 NE	111,000	952 B	859 B	NA	NA	2,080	324	4,480 NE	2,680	3,390	9,560
Lead	25	306	52.3	126 N	212	<50.0 J	<50.0	NA	NA	2.10 B	<2.00	20.1 N	18.9 B	<50.0 J	<250
Magnesium	- -	518,000	136,000	106,000 E	232,000 E	32,500	58,400	NA	NA	35,000	28,100	14,900 E	41,300 BE	102,000	112,000
Manganese	300	16,700	2,280	3,670 E	6,500	48.9 B	20.6 B	NA	NA	625	786	278 NE	513	884	1,210
Mercury	0.7	1.20 B	0.290 B	0.800	0.670 N	<0.200	<0.200	NA	NA	<0.200	<0.200	<0.200	<0.200 N	<0.200	<0.200
Nickel	100	307	<11.0	89.6 N	130 B	<50.0	<50.0	NA	NA	<4.40	<11.0	6.80 BN	43.8 B	<50.0	<250
Nitrate Nitrogen	10,000	NA	NA	NA	NA	1,000	110	NA	NA	NA	NA	NA	NA	<2,500	<100
Potassium	- -	80,500	17,900	32,300	35,400 BE	15,100	24,800	NA	NA	11,700	7,240	1,710 B	8,690 BE	29,800	21,100
Selenium	10	<2.00	3.80 B	8.30	<30.0 N	<150 J	<150	NA	NA	<2.00	<2.00	<3.00	<30.0 N	<150 J	<750
Silver	50	2.00 B	<3.00	<1.00	<10.0	<30.0	<30.0	NA	NA	<1.00	<3.00	<1.00	<10.0	<30.0	<150
Sodium	- -	220,000	452,000	24,400	361,000 E	218,000	235,000	NA	NA	201,000	335,000	24,400	411,000 E	2,180,000	2,310,000
Sulfate	250,000	NA	NA	NA	NA	180,000	420,000	NA	NA	NA	NA	NA	NA	1,800,000	1,700,000
Sulfide	50	NA	NA	NA	NA	<1,000	<1,000	NA	NA	NA	NA	NA	NA	7,400	7,000
Thallium	- -	<4.00	<2.00	<3.00 N	<30.0	<200 J	<200	NA	NA	<4.00	<2.00	<3.00 N	<30.0	<200 J	<1,000
Vanadium	- -	209	<4.00	6.70 BN	88.8 B	<30.0	<30.0	NA	NA	1.10 B	<4.00	6.70 BN	<10.0	<30.0	<150
Zinc	2,000	948	90.6	148	427	<250	<250	NA	NA	<22.0	<27.6	148	75.6 B	<250	<1,250
Detected Inorganics-Filtered															
Iron	300	NA	NA	NA	NA	<200	<1,000	NA	NA	NA	NA	NA	NA	105 B	<1,000
Manganese	300	NA	NA	NA	NA	6.70 B	7.60 B	NA	NA	NA	NA	NA	NA	476	7.60 B
Detected PCBs															
None Detected	- -	- -	- -	- -	- -	NA	NA	NA	NA	- -	- -	- -	- -	NA	NA
Detected Organochlorine Pesticides															
4,4'-DDD	0.3	<0.10	<0.10	<0.10	<0.10	<0.17	<0.27	NA	NA	<0.10	<0.10	<0.10	<0.10	<0.16	<0.16
4,4'-DDE	0.2	<0.10	<0.10	<0.10	<0.10	<0.11	0.070 J	NA	NA	<0.10	<0.10	<0.10	<0.10	<0.11	<0.11
4,4'-DDT	0.2	<0.10	<0.10	<0.10	<0.10	<0.11	0.041 J	NA	NA	<0.10	<0.10	<0.10	<0.10	<0.11	<0.11
Aldrin	0	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Alpha-BHC	0.01	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Alpha-Chlordane	0.05	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Beta-BHC	- -	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Delta-BHC	- -	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	0.0084 J	0.012 J
Dieldrin	0.004	<0.10	<0.10	<0.10	<0.10	<0.11	<0.18	NA	NA	<0.10	<0.10	<0.10	<0.10	<0.11	<0.11
Endosulfan I	- -	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Endosulfan II	- -	<0.10	<0.10	<0.10	<0.10	<0.11	<0.18	NA	NA	<0.10	<0.10	<0.10	<0.10	<0.11	<0.11
Endosulfan Sulfate	- -	<0.10	<0.10	<0.10	<0.10	<0.11	<0.18	NA	NA	<0.10	<0.10	<0.10	<0.10	<0.11	<0.11
Endrin	0	<0.10	<0.10	<0.10	<0.10	<0.11	<0.18	NA	NA	<0.10	<0.10	<0.10	<0.10	<0.11	<0.11
Gamma-BHC (Lindane)	0.05	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Gamma-Chlordane	0.05	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Heptachlor	0.04	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	0.058
Heptachlor Epoxide	0.03	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Methoxychlor	35	<0.52	<0.50	<0.50	<0.50	<0.56	<0.89	NA	NA	<0.52	<0.50	<0.50	<0.50	<0.54	<0.54
Detected Miscellaneous															
BOD (5 Day)	- -	7,000	6,810	4,000	NA	1,300 B	<2,000	NA	NA	4,000	6,810	3,000	3,000	8,600	7,700
CO2 by Headspace	- -	NA	NA	NA	NA	42,000	53,000	NA	NA	NA	NA	NA	NA	33,000	29,000
Carbon monoxide	- -	NA	NA	NA	NA	<400	<400	NA	NA	NA	NA	NA	NA	<400	<400
COD	- -	<72,900	<34,700	27,100	NA	13,400	35,700	NA	NA	<203,000	<21,300	<10,000	<10,000	69,500	53,800
Chloride	250,000	1,720,000	870,000	878,000	NA	NA	NA	NA	NA	897,000	758,000	88,200	88,200	NA	NA
DOC	- -	NA	NA	NA	NA	690 B	1,600	NA	NA	NA	NA	NA	NA	710 B	370 B
Hardness, Ca/CO3	- -	2,920,000	2,040,000	1,050,000	NA	NA	NA	NA	NA	601,000	443,000	234,000	234,000	NA	NA
Methane	- -	NA	NA	NA	NA	1	19,000	NA	NA	NA	NA	NA	NA	44	47
Nitrate Nitrogen	10,000	260	790	1,590	NA	NA	NA	NA	NA	<100	<100	540	540	NA	NA
Nitrite Nitrogen	1,000	14	48	NA	NA	NA	NA	NA	NA	<5	8	NA	NA	NA	NA
Oil and Grease	- -	<1,000	<1,000	<1,000	NA	NA	NA	NA	NA	<1,000	<1,000	<1,000	<1,000	NA	NA
pH, Standard Units	- -	6.78	6.85	7.57	NA	NA	NA	NA	NA	7.28	7.39	8.07	8.01	NA	NA
Sulfate	250,000	318,000	510,000	232,000	NA	NA	NA	NA	NA	295,000	251,000	31,300	31,300	NA	NA
Sulfide	50	<1,000	<1,000	<1,000	NA	NA	NA	NA	NA	<1,000	<1,000	<1,000	<1,000	NA	NA
Total Organic Carbon	- -	NA	NA	NA	NA	2,500	4,400	NA	NA	NA	NA	NA	NA	510 B	460 B
Total Dissolved Solids	1,000,000	3,030,000	2,470,000	2,181,000	NA	NA	NA	NA	NA	901,000	1,550,000	266,000	266,000	NA	NA

TABLE 9
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, PESTICIDES, and BIOGEOCHEMICAL PARAMETERS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-2								MW-3S							MW-3D					
Date Collected:	Guidance Values	08/30/95	11/20/95	07/09/97	09/10/97	11/06/02	01/28/03	04/14/08	01/29/13	08/30/95	11/20/95	07/09/97	09/09/97	11/12/02	01/17/03	04/09/08	08/30/95	11/20/95	07/10/97	09/09/97	11/12/02	01/17/03
Detected Inorganics																						
Aluminum	- -	17,000	1,050	45,600	NA	<2,500 J	<2,500	NA	NA	4,480	4,150	67,800	53,100 *	<2,500	<2,500	NA	224	<37.4	904	5,830 *	<2,500 J	<2,500
Antimony	3	<3.00	<27.0	<8.00	NA	<100	<100	NA	NA	<3.00	<27.0	<8.00	<80.0	<100	<100	NA	<3.00	<27.0	<8.00	<80.0	<100	<100
Arsenic	25	7.90 B	<2.00	20.1	NA	<200	<200	NA	NA	<3.00	<2.00	41.0	<30.0	<200	<200	NA	<3.00	<2.00	<3.00	<30.0	<200	<200
Available Cyanide	- -	NA	NA	NA	NA	NA	<2.00	NA	NA	NA	NA	NA	NA	NA	<2.00	NA	NA	NA	NA	NA	NA	<2.00
Barium	1,000	118 B	63.3 B	255 N	NA	123	154	NA	NA	64.3 B	150 B	389 N	281 B	98.7	106	NA	58.8 B	45.0 B	56.8 BN	82.0 B	52.8	50.0
Beryllium	- -	1.50 B	<1.00	1.60 B	NA	<25.0	<25.0	NA	NA	1.00 B	<1.00	4.40 B	<10.0	<25.0	<25.0	NA	<1.00	<1.00	<1.00	<10.0	<25.0	<25.0
Cadmium	5	<1.00	<2.00	<1.00 N	NA	<50.0	<50.0	NA	NA	<1.00	<2.00	5.00 N	<10.0 N	<50.0	<50.0	NA	<1.00	<2.00	1.80 BN	11.0 BN	<50.0	<50.0
Calcium	- -	220,000	98,200	275,000 E	NA	122,000	128,000	NA	NA	111,000	517,000	937,000 E	787,000 E	138,000	151,000	NA	126,000	116,000	232,000 E	298,000 E	297,000	287,000
Chloride	250,000	NA	NA	NA	NA	660,000	650,000	NA	NA	NA	NA	NA	NA	710,000	740,000	NA	NA	NA	NA	NA	930,000	960,000
Chromium	50	33.5	11.9	84.2	NA	<50.0	18.3 B	NA	NA	11.2	15.9	173	130	<50.0	<50.0	NA	1.30 B	<3.00	<6.00	15.6 B	<50.0	<50.0
Cobalt	- -	13.6 B	<4.00	42.9 BN	NA	<50.0	<50.0	NA	NA	4.50 B	18.2 B	70.2 N	50.0 B	<50.0	<50.0	NA	<1.00	<4.00	<9.00 N	<10.0	<50.0	<50.0
Copper	200	36.1	<11.0	109	NA	<50.0	21.5 B	NA	NA	10.8 B	<42.3	222	161 B	<50.0	<50.0	NA	3.10 B	<11.5	<1.00	22.5 B	<50.0	<50.0
Cyanide	200	<10.0	<10.0	<0.0100	NA	<10.0	3.80 B	NA	NA	<10.0	<10.0	<0.0100	<0.0100	1.20 B	<10.0	NA	<10.0	<10.0	<0.0100	<0.0100	<10.0	<10.0
Iron	300	24,400	1,940	72,100 E	NA	905 B	999 B	NA	NA	7,340	10,900	119,000 NE	103,000	<1,000	<1,000	NA	400	97.4 B	1,290 NE	9,150	940 B	495 JB
Lead	25	14.6	<4.90	51.2 N	NA	<50.0 J	<50.0	NA	NA	4.80	23.5	76.9 N	55.1	<50.0	<50.0	NA	2.40 B	<11.6	4.60 N	15.6 B	<150 J	<50.0
Magnesium	- -	109,000	30,400	133,000 E	NA	33,800	36,300	NA	NA	44,300	234,000	397,000 E	392,000 E	30,400	33,000	NA	27,500	27,200	37,200 E	76,000 E	50,000	45,700
Manganese	300	955	178	2,170 E	NA	306	667	NA	NA	301	1,380	3,440 NE	2,300	171	139	NA	68.1	38.9	74.0 NE	228	71.0 B	46.4 B
Mercury	0.7	<0.200	<0.200	0.290	NA	<0.200	<0.200	NA	NA	<0.200	0.290 B	0.940	0.300 N	<0.200	<0.200	NA	<0.200	<0.200	<0.200	<0.200 N	<0.200	<0.200
Nickel	100	33.4 B	<11.0	96.5 N	NA	<50.0	10.0 B	NA	NA	12.0 B	18.2 B	155 N	122 B	<50.0	<50.0	NA	2.70 B	<11.0	3.40 BN	16.4 B	<50.0	<50.0
Nitrate Nitrogen	10,000	NA	NA	NA	NA	100	700	NA	NA	NA	NA	NA	NA	540	850	NA	NA	NA	NA	NA	<100	<100
Potassium	- -	13,100	4,710	16,800	NA	10,900	10,100	NA	NA	9,440	9,520	24,900	21,800 BE	9,920	10,800	NA	15,900	13,800	10,500	11,100 BE	11,500	11,400
Selenium	10	<2.00	<2.00	<3.00	NA	<150 J	<150	NA	NA	<2.00	<2.00	<3.00	<30.0 N	<150	<150	NA	<2.00	<2.00	<3.00	<30.0 N	<150	<150
Silver	50	<1.00	<3.00	<1.00	NA	<30.0	<30.0	NA	NA	<1.00	<3.00	<1.00	<10.0	<30.0	<30.0	NA	<1.00	<3.00	<1.00	<10.0	<30.0	<30.0
Sodium	- -	129,000	136,000	27,700	NA	340,000	351,000	NA	NA	110,000	156,000	246,000	261,000 E	377,000	389,000	NA	179,000	296,000	330,000	398,000 E	450,000	443,000
Sulfate	250,000	NA	NA	NA	NA	120,000	130,000	NA	NA	NA	NA	NA	NA	170,000	160,000	NA	NA	NA	NA	NA	530,000	470,000
Sulfide	50	NA	NA	NA	NA	<1,000	<1,000	NA	NA	NA	NA	NA	NA	<1,000	200 B	NA	NA	NA	NA	NA	<1,000	400 B
Thallium	- -	<4.00	<2.00	<3.00 N	NA	<200 J	<200	NA	NA	<4.00	<2.00	<3.00 N	<30.0	<200	<200	NA	<4.00	<2.00	<3.00 N	<30.0	<200 J	<200
Vanadium	- -	27.2 B	<4.00	72.8 N	NA	<30.0	<30.0	NA	NA	6.80 B	15.4 B	109 N	89.6 B	<30.0	<30.0	NA	<1.00	<4.00	<1.00 N	<10.0	<30.0	<30.0
Zinc	2,000	71.6	<37.5	206	NA	<250	<250	NA	NA	24.9	<57.3	354	243	<250	<250	NA	<22.5	<20.2	13.1 B	86.8	<250	<250
Detected Inorganics-Filtered																						
Iron	300	NA	NA	NA	NA	<200	<1,000	NA	NA	NA	NA	NA	NA	<1,000	<1,000	NA	NA	NA	NA	NA	<1,000	<1,000
Manganese	300	NA	NA	NA	NA	87.9	154	NA	NA	NA	NA	NA	NA	118	117	NA	NA	NA	NA	NA	38.8 B	35.1 B
Detected PCBs																						
None Detected	- -	- -	- -	- -	NA	NA	NA	NA	NA	- -	- -	- -	- -	NA	NA	NA	- -	- -	- -	- -	NA	NA
Detected Organochlorine Pesticides																						
4,4'-DDD	0.3	<0.11	<0.10	<0.10	NA	<0.15	<0.17	NA	NA	<0.11	<0.10	<0.10	<0.10	<0.16	<0.17	NA	<0.11	<0.10	<0.10	<0.10	<0.15	<0.24
4,4'-DDE	0.2	<0.11	<0.10	<0.10	NA	<0.10	<0.11	NA	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.11	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.16
4,4'-DDT	0.2	<0.11	<0.10	<0.10	NA	<0.10	<0.11	NA	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.11	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.16
Aldrin	0	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Alpha-BHC	0.01	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Alpha-Chlordane	0.05	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Beta-BHC	- -	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Delta-BHC	- -	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Dieldrin	0.004	<0.11	<0.10	<0.10	NA	<0.10	<0.11	NA	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.11	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.16
Endosulfan I	- -	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Endosulfan II	- -	<0.11	<0.10	<0.10	NA	<0.10	<0.11	NA	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.11	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.16
Endosulfan Sulfate	- -	<0.11	<0.10	<0.10	NA	<0.10	<0.11	NA	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.11	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.16
Endrin	0	<0.11	<0.10	<0.10	NA	<0.10	<0.11	NA	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.11	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.16
Gamma-BHC (Lindane)	0.05	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Gamma-Chlordane	0.05	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Heptachlor	0.04	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Heptachlor Epoxide	0.03	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Methoxychlor	35	<0.54	<0.50	<0.50	NA	<0.50	<0.56	NA	NA	<0.56	<0.50	<0.50	<0.50	<0.52	<0.57	NA	<0.56	<0.50	<0.50	<0.50	<0.50	<0.79
Detected Miscellaneous																						
BOD (5 Day)	- -	2,000	5,310	<1,680	NA	330 B	1,500 B	NA	NA	<2,000	4,710	<1,380	NA	840 B	1,400 B	NA	3,000	5,010	1,000	NA	1,400 B	2,000
CO2 by Headspace	- -	NA	NA	NA	NA	13,000	13,000	NA	NA	NA	NA	NA	NA	10,000	12,000	NA	NA	NA	NA	NA	18,000	19,000
Carbon monoxide	- -	NA	NA	NA	NA	<400	<400	NA	NA	NA	NA	NA	NA	<400	<400	NA	NA	NA	NA	NA	<400	<400
COD	- -	<39,200	<16,800	<10,000	NA	7,490 B	8,820 B	NA	NA	<39,200	<21,300	14,000	NA	<10,000	<10,000	NA	<32,500	<23,500	19,100	NA	9,770 B	<10,000
Chloride	250,000	344,000	242,000	46,000	NA	NA	NA	NA	NA	269,000	367,000	452,000	NA	NA	NA	NA	688,000	565,000	661,000	NA	NA	NA
DOC	- -	NA	NA	NA	NA	610 B	390 B	NA	NA	NA	NA	NA	NA	340 B	620 B	NA	NA	NA	NA	NA	440 B	700 B
Hardness, Ca/CO3	- -	869,000	451,000	1,170,000	NA	NA	NA	NA	NA	501,000	2,700,000	3,360,000	NA	NA	NA	NA	490,000	458,000	684,000	NA	NA	NA
Methane	- -	NA	NA	NA	NA	1.5	2,200	NA	NA	NA	NA	NA	NA	8.5	1.1	NA	NA	NA	NA	NA	2.8	0.78
Nitrate Nitrogen	10,000	120	270	270	NA	NA	NA	NA	NA	2,900	330	970	NA	NA	NA	NA	<100	<100	<100	NA	NA	NA
Nitrite Nitrogen	1,000	<5	77	NA	NA	NA	NA	NA	NA	34	94	NA	NA	NA	NA	NA	8	9	NA	NA	NA	NA
Oil and Grease	- -	<1,000	<1,000	1,800 N	NA	NA	NA	NA	NA	<1,000	<1,000	<1,000	NA	NA	NA	NA	<1,000	<1,000	<1,000	NA	NA	NA
pH, Standard Units	- -	7.36	7.45	7.86	NA	NA	NA	NA	NA	7.26	7.38	7.71	NA	NA	NA	NA	7.49	7.61	7.46	NA	NA	NA
Sulfate	250,000	79,800	121,000	60,800	NA	NA	NA	NA	NA	84,800	151,000	109,000	NA	NA	NA	NA	298,000	333,000	419,000	NA	NA	NA
Sulfide	50	<1,000	<1,000	<2,500	NA	NA	NA	NA	NA	<1,000	<1,000	<5,000	NA	NA	NA	NA	<1,000	<1,000	<1,000	NA	NA	NA
Total Organic Carbon	- -	NA	NA	NA	NA	290 B	660 B	NA	NA	NA	NA	NA	NA	250 B	740 B	NA	NA	NA	NA	NA	200 B	230 B
Total Dissolved Solids	1,000,000	815,000	769,000	273,000	NA	NA	NA	NA	NA	1,430,000	942,000	1,210,000	NA	NA	NA	NA	1,500,000	1,450,000	1,920,000	NA	NA	NA

TABLE 9
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, PESTICIDES, and BIOGEOCHEMICAL PARAMETERS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-4S								MW-4D				MW-6						
Date Collected:	Guidance Values	08/31/95	11/15/95	07/09/97	09/08/97	11/05/02	01/23/03	04/10/08	01/29/13	07/09/97	09/09/97	11/05/02	01/23/03	08/30/95	11/15/95	07/10/97	11/12/02	01/23/03	04/09/08	01/29/13
Detected Inorganics																				
Aluminum	- -	65,400 [51,100]	944	13,200	8,570 *	<2,500 J	532 B	NA	NA	506 [553]	324 B*	<12,500 J	<12,500	105,000	1,320	111,000	<2,500 J	<2,500	NA	NA
Antimony	3	<3.00 [<3.00]	<27.0	<8.00	<80.0	<100	<100	NA	NA	<8.00 [<8.00]	<80.0	<500	<500	<3.00	32.0 B	<8.00	<100	<100	NA	NA
Arsenic	25	48.0 [45.5]	8.30 B	108	45.2	<200	<200	NA	NA	<3.00 [<3.00]	<30.0	<1,000	<1,000	58.6	<2.00	65.2	<200	<200	NA	NA
Available Cyanide	- -	NA	NA	NA	NA	NA	6.00	100 J [50.0 J]	160 [180]	NA	NA	NA	2.00	NA	NA	NA	NA	<2.00	NA	NA
Barium	1,000	452 [373]	107 B	314 N	374 B	128	142	NA	NA	83.6 BN [82.7 BN]	161 B	48.3 B	51.5 B	692	142 B	448 N	118	127	NA	NA
Beryllium	- -	3.40 B [2.60 B]	<1.00	<1.00	<10.0	<25.0	<25.0	NA	NA	<1.00 [<1.00]	<10.0	<125	<125	6.20	1.50 B	4.30 B	<25.0	<25.0	NA	NA
Cadmium	5	<1.00 [<1.00]	<2.00	19.3 N	36.2 BN	<50.0	<50.0	NA	NA	3.40 BN [4.40 BN]	<10.0 N	<250	<250	<1.00	<2.00	6.90 N	<50.0	<50.0	NA	NA
Calcium	- -	540,000 [473,000]	75,600	274,000 E	312,000 E	182,000	411,000	NA	NA	907,000 E [652,000 E]	1,040,000 E	1,930,000	1,920,000	1,210,000	473,000	1,690,000 E	124,000	131,000	NA	NA
Chloride	250,000	NA	NA	NA	NA	1,000,000	1,200,000	NA	NA	NA	NA	93,000,000	100,000,000	NA	NA	NA	640,000	750,000	NA	NA
Chromium	50	99.1 [81.7]	<3.00	20.4	12.8 B	<50.0	<50.0	NA	NA	10.7 [7.80 B]	<10.0	<250	<250	215	4.70 B	265	<50.0	10.4 B	NA	NA
Cobalt	- -	72.7 [58.7]	<4.00	16.0 BN	14.3 B	<50.0	9.10 B	NA	NA	<9.00 N [<9.00 N]	<10.0	<250	<250	106	6.40 B	99.8 N	<50.0	<50.0	NA	NA
Copper	200	231 [214]	<12.9	60.5	52.8 B	<50.0	12.4 B	NA	NA	14.0 B [18.7 B]	24.7 B	<250	64.7 B	257	<14.3	298	<50.0	11.2 B	NA	NA
Cyanide	200	576 [416]	477	2.96	1.57	1,970	5,960	2,100 [1,800]	1,800 [1,800]	<0.0100	<0.0100	<10.0	8.90 B	<20.0	<10.0	<0.0100	5.00 B	31.4	NA	NA
Iron	300	119,000 [96,400]	4,300	222,000 NE	18,800	1,240	4,170	NA	NA	962 NE [949 NE]	682 B	8,160	7,840	162,000	4,860	189,000 NE	456 B	<1,000	NA	NA
Lead	25	73.5 [61.8]	<2.00	17.4 N	24.7 B	<50.0 J	<50.0	NA	NA	<1.00 N [5.00 N]	<10.0	<250 J	<250	68.2	<2.00	83.2 N	<50.0 J	<50.0	NA	NA
Magnesium	- -	304,000 [269,000]	61,300	218,000 E	245,000 E	153,000	374,000	NA	NA	51,700 E [49,900 E]	166,000 E	296,000	297,000	851,000	204,000	689,000 E	32,300	38,800	NA	NA
Manganese	300	2,190 [1,770]	99.6	524 NE	664	171	488	NA	NA	129 NE [127 NE]	287	881	830	8,720	1,510	4,490 NE	218	200	NA	NA
Mercury	0.7	0.480 B [0.370 B]	<0.200	0.230	0.260 N	<0.200	<0.200	NA	NA	<0.200 [<0.200]	<0.200 N	<0.200	<0.200	0.530 B	<0.200	0.960	<0.200	<0.200	NA	NA
Nickel	100	149 [118]	<11.0	28.6 BN	25.2 B	<50.0	<50.0	NA	NA	4.30 BN [4.60 BN]	<10.0	<250	<250	212	<11.0	226 N	<50.0	<50.0	NA	NA
Nitrate Nitrogen	10,000	NA	NA	NA	NA	<100	<100	NA	NA	NA	NA	<5,000	<5,000	NA	NA	NA	390	1,500	NA	NA
Potassium	- -	30,000 [26,500]	7,170	25,000	45,100 BE	19,400	37,800 J	NA	NA	60,200 [60,700]	317,000 E	449,000	441,000	53,700	7,970	44,800	10,600	17,100	NA	NA
Selenium	10	2.90 B [3.20 B]	<2.00	3.40 B	<30.0 N	<150	<150	NA	NA	<3.00 [<3.00]	<30.0 N	<750 J	<750	<2.00	<2.00	<3.00	<150 J	<150	NA	NA
Silver	50	<1.00 [<1.00]	<3.00	<1.00	<10.0	<30.0 J	<30.0	NA	NA	<1.00 [<1.00]	<10.0	<150	<150	<1.00	<3.00	<1.00	<30.0	<30.0	NA	NA
Sodium	- -	188,000 [186,000]	347,000	888,000	626,000 E	408,000	494,000	NA	NA	23,000,000 [23,300,000]	588,000 E	8,470,000 E	9,570,000	132,000	170,000	300,000 B	350,000	374,000	NA	NA
Sulfate	250,000	NA	NA	NA	NA	160,000	910,000	NA	NA	NA	NA	4,400,000	5,000,000	NA	NA	NA	140,000	130,000	NA	NA
Sulfide	50	NA	NA	NA	NA	7,500	8,000	NA	NA	NA	NA	<1,000	<1,000	NA	NA	NA	<1,000	<1,000	NA	NA
Thallium	- -	<4.00 [<4.00]	<2.00	<3.00 N	<30.0	<200 J	<200	NA	NA	<3.00 N [<3.00 N]	<30.0	<1,000 J	<1,000	<4.00	<2.00	6.40 BN	<200 J	<200	NA	NA
Vanadium	- -	99.2 [79.2]	<4.00	16.3 BN	13.0 B	<30.0	<30.0	NA	NA	<1.00 N [<1.00 N]	<10.0	<150	<150	163	14.7 B	177 N	<30.0	<30.0	NA	NA
Zinc	2,000	364 [298]	<54.2	4,640	2,820	<250	390	NA	NA	42.5 [63.7]	<60.0	<1,250	<1,250	395	<22.9	479	<250	<250	NA	NA
Detected Inorganics-Filtered																				
Iron	300	NA	NA	NA	NA	802	1,840	NA	NA	NA	NA	2,900	4,350	NA	NA	NA	<1,000	<1,000	NA	NA
Manganese	300	NA	NA	NA	NA	143	346	NA	NA	NA	NA	408	634	NA	NA	NA	190	171	NA	NA
Detected PCBs																				
None Detected	- -	- - [- -]	- -	- -	- -	NA	NA	NA	NA	- - [- -]	- -	NA	NA	- -	- -	- -	NA	NA	NA	NA
Detected Organochlorine Pesticides																				
4,4'-DDD	0.3	<0.50 [<0.50]	<0.10	<0.10	<0.10	<0.30	<0.16	NA	NA	<0.10 [<0.10]	<0.10	<0.16	<0.17	<0.11	<0.10	<0.10	<0.15	<0.18	NA	NA
4,4'-DDE	0.2	<0.50 [<0.50]	<0.10	0.090 JP	<0.050	<0.20	0.17	NA	NA	<0.10 [<0.10]	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10	<0.10	<0.12	NA	NA
4,4'-DDT	0.2	<0.50 [<0.50]	<0.10	0.0060 JP	<0.10	<0.20	<0.11	NA	NA	<0.10 [<0.10]	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10	<0.10	<0.12	NA	NA
Aldrin	0	<0.25 [<0.25]	<0.050	<0.050	<0.050	<0.10	<0.055	NA	NA	<0.050 [<0.050]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Alpha-BHC	0.01	<0.25 [<0.25]	<0.050	0.045 JP	<0.050	<0.10	<0.055	NA	NA	<0.050 [0.34]	<0.050	<0.054	0.026 J	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Alpha-Chlordane	0.05	<0.25 [<0.25]	<0.050	<0.050	<0.050	<0.10	<0.055	NA	NA	<0.050 [<0.050]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Beta-BHC	- -	<0.25 [<0.25]	<0.050	<0.050	<0.050	<0.10	0.046 J	NA	NA	0.0083 JP [0.074 P]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Delta-BHC	- -	<0.25 [<0.25]	<0.050	0.030 JP	<0.050	<0.10	<0.055	NA	NA	<0.050 [0.025 JP]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Dieldrin	0.004	<0.50 [<0.50]	<0.10	<0.10	<0.10	<0.20	<0.11	NA	NA	<0.10 [<0.10]	<0.10	<0.11	<0.11	<0.11	0.0096 J	<0.10	<0.10	<0.12	NA	NA
Endosulfan I	- -	<0.25 [<0.25]	<0.050	<0.050	<0.050	0.094 J	<0.055	NA	NA	<0.050 [<0.050]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Endosulfan II	- -	<0.50 [<0.50]	<0.10	<0.10	<0.10	<0.20	<0.11	NA	NA	<0.10 [<0.10]	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10	<0.10	<0.12	NA	NA
Endosulfan Sulfate	- -	<0.50 [<0.50]	<0.10	0.20 P	0.043 JP	0.052 J	<0.11	NA	NA	<0.10 [<0.10]	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10	<0.10	<0.12	NA	NA
Endrin	0	<0.50 [<0.50]	<0.10	<0.10	<0.10	<0.20	<0.11	NA	NA	<0.10 [<0.10]	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10	<0.10	<0.12	NA	NA
Gamma-BHC (Lindane)	0.05	<0.25 [<0.25]	<0.050	<0.050	<0.050	<0.10	<0.055	NA	NA	<0.050 [0.067]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Gamma-Chlordane	0.05	<0.25 [<0.25]	<0.050	0.094 JP	<0.050	<0.10	<0.055	NA	NA	<0.050 [<0.050]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Heptachlor	0.04	<0.25 [<0.25]	<0.050	<0.050	<0.050	<0.10	0.15	NA	NA	<0.050 [<0.050]	<0.050	<0.054	0.013 J	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Heptachlor Epoxide	0.03	0.040 JP [0.040 JP]	<0.050	<0.050	<0.050	0.083 J	0.17	NA	NA	0.030 JP [0.028 J]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Methoxychlor	35	<2.5 [<2.5]	<0.50	0.46 JP	<0.50	<1.0	<0.55	NA	NA	<0.50 [<0.50]	<0.50	<0.54	<0.56	<0.56	<0.50	<0.50	<0.50	<0.59	NA	NA
Detected Miscellaneous																				
BOD (5 Day)	- -	>87,000 [>82,000]	178,000	31,000	NA	35,000	46,000	NA	NA	100 [5,000]	NA	540 B	2,200	<2,000	19,200	3,000	9,400	1,600 B	NA	NA
CO2 by Headspace	- -	NA	NA	NA	NA	67,000	92,000	NA	NA	NA	NA	17,000	14,000	NA	NA	NA	12,000	9,000	NA	NA
Carbon monoxide	- -	NA	NA	NA	NA	<400	<400	NA	NA	NA	NA	<400	<400	NA	NA	NA	<400	<400	NA	NA
COD	- -	<133,000 [<203,000]	<136,000	184,000	NA	170,000	339,000	NA	NA	709,000 [505,000]	NA	934,000	998,000	<32,500	<10,000	35,300	4,880 B	9,470 B	NA	NA
Chloride	250,000	757,000 [692,000]	652,000	1,890,000	NA	NA	NA	NA	NA	16,900,000 [8,220,000]	NA	NA	NA	267,000	344,000	555,000	NA	NA	NA	NA
DOC	- -	NA	NA	NA	NA	40,000	85,000	NA	NA	NA	NA	650 B	450 B	NA	NA	NA	750 B	1,600	NA	NA
Hardness, Ca/CO3	- -	2,830,000 [1,970,000]	490,000	1,440,000	NA	NA	NA	NA	NA	964,000 [920,000]	NA	NA	NA	4,560,000	2,320,000	5,040,000	NA	NA	NA	NA
Methane	- -	NA	NA	NA	NA	890	970,000	NA	NA	NA	NA	50	30,000	NA	NA	NA	17	9,300	NA	NA
Nitrate Nitrogen	10,000	<100 [<100]	<100	<100	NA	NA	NA	NA	NA	190 [290]	NA	NA	NA	<100	<100	640	NA	NA	NA	NA
Nitrite Nitrogen	1,000	69 [71]	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA
Oil and Grease	- -	2,000 [4,400]	3,000	4,900 N	NA	NA	NA	NA	NA	<1,000 N [<1,000 N]	NA	NA	NA	<1,000	<1,000	2,000 N	NA	NA	NA	NA
pH, Standard Units	- -	7.33 [7.33]	7.5	7.39	NA	NA	NA	NA	NA	7.36 [10.8]	NA	NA	NA	7.55	7.29	7.62	NA	NA	NA	NA
Sulfate	250,000	12,300 [<10,000]	<10,000	229,000	NA	NA	NA	NA	NA	17,800 [52,700]	NA	NA	NA	103,000	119,000	86,000	NA	NA	NA	NA
Sulfide	50	<1,000 [<1,000]	<1,000	1,900	NA	NA	NA	NA	NA	<1,000 [<1,000]	NA	NA	NA	<1,000	<1,000	<1,000	NA	NA	NA	NA
Total Organic Carbon	- -	NA	NA	NA	NA	48,000	110,000	NA	NA	NA	NA	330 B	290 B	NA	NA	NA	480 B	3,400	NA	NA
Total Dissolved Solids	1,000,000	1,500,000 [1,550,000]	1,420,000	4,650,000	NA	NA	NA	NA	NA	68,000,000 [49,500,000]	NA	NA	NA	759,000	862,000	1,290,000	NA	NA	NA	NA

TABLE 9
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, PESTICIDES, and BIOGEOCHEMICAL PARAMETERS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-7S								MW-7D				MW-8S							
Date Collected:		08/31/95	11/15/95	07/09/97	09/09/97	11/05/02	01/27/03	04/10/08	01/29/13	07/09/97	09/09/97	11/05/02	01/27/03	08/30/95	11/15/95	07/08/97	09/09/97	11/05/02	01/28/03	04/09/08	01/29/13
Detected Inorganics																					
Aluminum	- -	125,000	7,250	111,000	170,000 *	394 JB [218 JB]	551 B	NA	NA	117 B	373 B*	<12,500 J	2,320 B	226,000	1,430	250,000	271,000 *	379 JB	951 JB	NA	NA
Antimony	3	<3.00	<27.0	<8.00	<80.0	<20.0 [<20.0]	<100	NA	NA	<8.00	<80.0	<500	<500	<3.00	<27.0	<8.00	<80.0	<20.0	<100	NA	NA
Arsenic	25	65.3	<2.00	97.3	141	<40.0 [<40.0]	<200	NA	NA	<3.00	<30.0	<1,000	<1,000	96.1	<2.00	97.7	103	<40.0	<200	NA	NA
Available Cyanide	- -	NA	NA	NA	NA	NA	4.00	8.40 J	7.3	NA	NA	NA	<2.00	NA	NA	NA	NA	NA	4.00	NA	NA
Barium	1,000	1,800	822	1,610 N	2,310	405 [410]	440	NA	NA	20.3 BN	41.9 B	<125	44.6 B	1,650	396	1,660 N	1,910 B	110	131	NA	NA
Beryllium	- -	6.80	<1.00	8.60	<10.0	<5.00 [<5.00]	<25.0	NA	NA	<1.00	<10.0	<125	<125	10.3	1.40 B	17.8	<10.0	<5.00	<25.0	NA	NA
Cadmium	5	<1.00	2.90 B	22.3 N	<10.0 N	<10.0 [<10.0]	<50.0	NA	NA	<1.00 N	<10.0 N	<250	<250	3.00 B	<2.00	26.8 N	<10.0 N	<10.0	<50.0	NA	NA
Calcium	- -	922,000	410,000	1,410,000	1,530,000 E	169,000 [167,000]	253,000	NA	NA	592,000 E	823,000 E	1,090,000	1,210,000	1,040,000	292,000	1,830,000 E	1,770,000 E	43,600	56,100	NA	NA
Chloride	250,000	NA	NA	NA	NA	710,000 [730,000]	4,500,000	NA	NA	NA	NA	30,000,000	33,000,000	NA	NA	NA	NA	800,000	820,000	NA	NA
Chromium	50	230	12.1	234	288	14.3 J [5.40 JB]	26.1 B	NA	NA	<6.00	<10.0	<250	45.3 B	386	3.20 B	493	493	2.90 B	9.30 B	NA	NA
Cobalt	- -	108	7.60 B	120 N	178 B	<10.0 [<10.0]	7.50 B	NA	NA	<9.00 N	<10.0	<250	<250	186	4.40 B	240 N	261 B	<10.0	<50.0	NA	NA
Copper	200	322	<19.1	355	579	5.10 JB [2.20 JB]	28.1 B	NA	NA	4.40 B	12.8 B	<250	143 B	670	<8.00	888	858	5.90 B	18.6 B	NA	NA
Cyanide	200	244	59.5	1.52	0.414	120 J [98.3 J]	367	140	110	<0.0100	<0.0100	<10.0	3.40 B	<20.0	<10.0	0.0630	0.0130	<10.0	4.00 B	NA	NA
Iron	300	216,000	16,600	194,000 NE	323,000	7,230 [6,460]	3,740	NA	NA	1,300 NE	1,320	4,050 B	14,100	330,000	6,010	365,000 NE	488,000	729	2,060	NA	NA
Lead	25	130	<9.30	126 N	199	10.7 [4.30 JB]	23.1 B	NA	NA	<1.00 N	<10.0	<250 J	91.8 B	217	<4.60	259 N	326	<10.0 J	<50.0	NA	NA
Magnesium	- -	530,000	151,000	436,000 E	713,000 E	61,600 [60,700]	116,000	NA	NA	87,800 E	184,000 E	215,000	244,000	598,000	61,900	556,000 E	812,000 E	11,500	14,100	NA	NA
Manganese	300	7,060	1,650	5,740 NE	8,260	320 [298]	321	NA	NA	112 NE	229	265 B	441	9,780	1,580	7,710 NE	10,600	62.2	112	NA	NA
Mercury	0.7	0.530 B	0.290 B	1.30	0.930 N	<0.200 [<0.200]	<0.200	NA	NA	<0.200	<0.200 N	<0.200	<0.200	0.640 B	<0.200	1.20	1.00 N	<0.200	<0.200	NA	NA
Nickel	100	258	<11.0	260 N	423	9.30 JB [3.60 JB]	13.3 B	NA	NA	<1.00 N	<10.0	<250	<250	464	15.7 B	511 N	670	3.00 B	<50.0	NA	NA
Nitrate Nitrogen	10,000	NA	NA	NA	NA	<100 [<100]	<100	NA	NA	NA	NA	<5,000	<5,000	NA	NA	NA	NA	<100	<100	NA	NA
Potassium	- -	47,700	10,200	40,600	63,600 E	18,600 [17,500]	63,400	NA	NA	22,700	76,400 E	122,000	136,000 B	88,300	7,670	59,500	70,100 E	12,300	11,400 J	NA	NA
Selenium	10	<2.00	<2.00	<3.00	<30.0 N	<30.0 J [30.0 JB]	<150	NA	NA	<3.00	<30.0 N	<750 J	<750	<2.00	<2.00	<3.00	<30.0 N	<30.0 J	<150	NA	NA
Silver	50	<1.00	<3.00	<1.00	<10.0	<6.00 [<6.00]	<30.0	NA	NA	<1.00	<10.0	<150	<150	<1.00	<3.00	<1.00	<10.0	<6.00	<30.0	NA	NA
Sodium	- -	186,000	276,000	950,000	728,000 E	195,000 [220,000 E]	1,480,000	NA	NA	9,550,000	1,410,000 E	7,830,000	8,720,000	172,000	5,460,000	1,050,000	782,000 E	310,000	529,000	NA	NA
Sulfate	250,000	NA	NA	NA	NA	15,000 [13,000]	80,000	NA	NA	NA	NA	2,700,000	3,200,000	NA	NA	NA	NA	60,000	79,000	NA	NA
Sulfide	50	NA	NA	NA	NA	<1,000 [<1,000]	600 B	NA	NA	NA	NA	<1,000	<1,000	NA	NA	NA	NA	<1,000	200 B	NA	NA
Thallium	- -	<4.00	<2.00	<3.00 N	<30.0	<40.0 J [<40.0 J]	<200	NA	NA	5.00 BN	<30.0	<1,000 J	<1,000	<4.00	<2.00	5.20 BN	<30.0	<40.0 J	<200	NA	NA
Vanadium	- -	202	20.8 B	174 N	264 B	2.00 B [2.00 B]	<30.0	NA	NA	<1.00 N	<10.0	<150	<150	322	9.10 B	344 N	403 B	<6.00	<30.0	NA	NA
Zinc	2,000	570	112	944	1,080	28.1 J [<50.0]	<250	NA	NA	<6.00	<60.0	<1,250	<1,250	1,070	<24.1	1,530	1,560	<50.0	<250	NA	NA
Detected Inorganics-Filtered																					
Iron	300	NA	NA	NA	NA	4,210 [4,880]	4,440	NA	NA	NA	NA	1,970	2,440	NA	NA	NA	NA	248	<1,000	NA	NA
Manganese	300	NA	NA	NA	NA	220 [246]	292	NA	NA	NA	NA	162	214	NA	NA	NA	NA	48.9	85.2	NA	NA
Detected PCBs																					
None Detected	- -	- -	- -	- -	- -	NA	NA	NA	NA	- -	- -	NA	NA	- -	- -	- -	- -	NA	NA	NA	NA
Detected Organochlorine Pesticides																					
4,4'-DDD	0.3	<0.50	<0.10	<0.10	0.043 JP	<0.15 [<0.15]	<0.16	NA	NA	<0.10	<0.10	<0.17	<0.16	<0.50	<0.10	<0.10	0.094 JP	<0.16	<0.15	NA	NA
4,4'-DDE	0.2	<0.50	<0.10	0.034 J	0.040 JP	<0.10 [<0.10]	0.13	NA	NA	<0.10	<0.10	<0.11	<0.11	<0.50	<0.10	0.26 J	<0.10	0.14	0.031 J	NA	NA
4,4'-DDT	0.2	<0.50	<0.10	0.034 JP	0.019 JP	<0.10 [<0.10]	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	<0.50	<0.10	0.082 JP	<0.10	<0.11	<0.10	NA	NA
Aldrin	0	<0.25	<0.050	<0.050	<0.050	<0.050 [<0.050]	<0.055	NA	NA	<0.050	<0.050	<0.056	<0.054	<0.25	<0.050	0.024 JP	<0.050	<0.054	<0.050	NA	NA
Alpha-BHC	0.01	<0.25	<0.050	0.010 JP	<0.050	<0.050 [<0.050]	<0.055	NA	NA	<0.050	<0.050	<0.056	<0.054	<0.25	<0.050	<0.050	<0.050	0.0088 J	0.072	NA	NA
Alpha-Chlordane	0.05	<0.25	<0.050	<0.050	<0.050	<0.050 [<0.050]	0.038 J	NA	NA	<0.050	<0.050	<0.056	<0.054	<0.25	<0.050	<0.050	<0.050	<0.054	<0.050	NA	NA
Beta-BHC	- -	<0.25	<0.050	<0.050	<0.050	0.014 J [0.015 J]	<0.055	NA	NA	<0.050	<0.050	<0.056	<0.054	<0.25	<0.050	0.079 JP	0.093 JP	<0.054	<0.050	NA	NA
Delta-BHC	- -	<0.25	<0.050	0.038 JP	0.028 JP	<0.050 [<0.050]	<0.055	NA	NA	<0.050	<0.050	<0.056	0.021 J	<0.25	<0.050	0.31 P	0.17	<0.054	<0.050	NA	NA
Dieldrin	0.004	<0.50	<0.10	<0.10	<0.10	<0.10 [<0.10]	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	<0.50	<0.10	<0.10	<0.10	<0.11	<0.10	NA	NA
Endosulfan I	- -	<0.25	<0.050	<0.050	<0.050	<0.050 [<0.050]	<0.055	NA	NA	<0.050	<0.050	<0.056	<0.054	<0.25	<0.050	<0.050	<0.050	0.028 J	0.045 J	NA	NA
Endosulfan II	- -	<0.50	<0.10	<0.10	<0.10	0.026 J [0.021 J]	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	<0.50	<0.10	<0.10	<0.10	<0.11	<0.10	NA	NA
Endosulfan Sulfate	- -	<0.50	<0.10	0.088 JP	<0.10	<0.10 [<0.10]	<0.11	NA	NA	<0.10	<0.10	<0.11	<2.0	<0.50	<0.10	0.21 JP	0.20 P	0.027 J	<0.10	NA	NA
Endrin	0	<0.50	<0.10	<0.10	<0.10	<0.10 [<0.10]	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	<0.50	<0.10	<0.10	<0.10	<0.11	<0.10	NA	NA
Gamma-BHC (Lindane)	0.05	<0.25	<0.050	<0.050	<0.050	<0.050 [<0.050]	<0.055	NA	NA	<0.050	<0.050	<0.056	<0.054	0.090 JP	0.072 P	<0.050	<0.050	<0.054	<0.050	NA	NA
Gamma-Chlordane	0.05	<0.25	<0.050	0.033 JP	0.035 J	<0.050 [<0.050]	0.039 J	NA	NA	<0.050	<0.050	<0.056	<0.054	<0.25	0.38 P	0.40	0.23	<0.054	<0.050	NA	NA
Heptachlor	0.04	<0.25	<0.050	<0.050	<0.050	<0.050 [<0.050]	0.25	NA	NA	<0.050	<0.050	<0.056	<0.054	<0.25	<0.050	<0.050	<0.050	0.085	0.32	NA	NA
Heptachlor Epoxide	0.03	0.060 JP	<0.050	<0.050	<0.050	<0.050 [<0.050]	0.22	NA	NA	<0.050	<0.050	<0.056	<0.054	0.16 JP	<0.050	<0.050	<0.050	<0.054	<0.050	NA	NA
Methoxychlor	35	<2.5	<0.50	1.0 P	<0.50	<0.50 [<0.50]	<0.55	NA	NA	<0.50	<0.50	<0.56	<0.54	<2.5	<0.50	<0.50	<0.50	<0.54	<0.50	NA	NA
Detected Miscellaneous																					
BOD (5 Day)	- -	>92,000	33,600	15,000	NA	10,000 [9,500]	22,000	NA	NA	4,920	NA	<2,000	570 B	58,000	337,000	80,000	NA	3,200	4,900	NA	NA
CO2 by Headspace	- -	NA	NA	NA	NA	84,000 [85,000]	120,000	NA	NA	NA	NA	36,000	34,000	NA	NA	NA	NA	13,000	12,000	NA	NA
Carbon monoxide	- -	NA	NA	NA	NA	<400 [<400]	<400	NA	NA	NA	NA	<400	<400	NA	NA	NA	NA	<400	<400	NA	NA
COD	- -	950,000	<174,000	139,000	NA	68,400 J [53,700 J]	115,000	NA	NA	116,000	NA	133,000	461,000	838,000	<172,000	71,400	NA	13,600	15,300	NA	NA
Chloride	250,000	884,000	595,000	479,000	NA	NA	NA	NA	NA	2,170,000	NA	NA	NA	4,490,000	3,530,000	1,420,000	NA	NA	NA	NA	NA
DOC	- -	NA	NA	NA	NA	7,700 [7,500]	7,700	NA	NA	NA	NA	460 B	500	NA	NA	NA	NA	510 B	1,300	NA	NA
Hardness, Ca/CO3	- -	3,900,000	1,700,000	3,670,000	NA	NA	NA	NA	NA	1,220,000	NA	NA	NA	2,180,000	1,030,000	4,440,000	NA	NA	NA	NA	NA
Methane	- -	NA	NA	NA	NA	2,600 [2,700]	3,000,000	NA	NA	NA	NA	30	35,000	NA	NA	NA	NA	310	270,000	NA	NA
Nitrate Nitrogen	10,000	<100	120	<100	NA	NA	NA	NA	NA	566	NA	NA	NA	<100	110	<100	NA	NA	NA	NA	NA
Nitrite Nitrogen	1,000	35	25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA
Oil and Grease	- -	8,600	2,700	7,800 N	NA	NA	NA	NA	NA	<1,000 N	NA	NA	NA	5,900	3,300	73,400 N	NA	NA	NA	NA	NA
pH, Standard Units	- -	6.83	7	7.04	NA	NA	NA	NA	NA	10.8	NA	NA	NA	7.5	7.82	7.79	NA	NA	NA	NA	NA
Sulfate	250,000	20,600	82,300	119,000	NA	NA	NA	NA	NA	197,000	NA	NA	NA	153,000	384,000	138,000	NA	NA	NA	NA	NA
Sulfide	50	<1,000	<1,000	<5,000	NA	NA	NA	NA	NA	<1,000	NA	NA	NA	1,000	<1,000	<5,000	NA	NA	NA	NA	NA
Total Organic Carbon	- -	NA	NA	NA	NA	12,000 [12,000]	37,000	NA	NA	NA	NA	420 B	740 B	NA	NA	NA	NA	470 B	3,400	NA	NA
Total Dissolved Solids	1,000,000	1,970,000	887,000	4,670,000	NA	NA	NA	NA	NA	4,250,000	NA	NA	NA	5,470,000	5,230,000	2,990,000	NA	NA	NA	NA	NA

TABLE 9
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, PESTICIDES, and BIOGEOCHEMICAL PARAMETERS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-8D						MW-9D1						MW-9D2			
Date Collected:	Guidance Values	08/30/95	11/15/95	07/08/97	09/09/97	11/06/02	01/28/03	07/09/97	09/08/97	11/06/02	01/21/03	04/10/08	01/31/13	07/10/97	09/08/97	11/06/02	01/21/03
Detected Inorganics																	
Aluminum	- -	3,310	634 [2,430]	144,000	2,800 *	427 JB	1,860 B [1,230 B]	330	532 B	<2,500 J	<12,500	NA	NA	547	<320 *	<12,500 J	<12,500
Antimony	3	<3.00	<27.0 [<27.0]	<8.00	<80.0	<100	<100 [<100]	<8.00	<80.0	<100	<500	NA	NA	<8.00	<80.0	<500	<500
Arsenic	25	<3.00	<2.00 [<2.00]	91.0	<30.0	<200	<200 [<200]	<3.00	<30.0	<200	<1,000	NA	NA	<3.00	<30.0	<1,000	<1,000
Available Cyanide	- -	NA	NA	NA	NA	NA	<2.00 [<2.00]	NA	NA	NA	<2.00	NA	NA	NA	NA	NA	<2.00
Barium	1,000	120 B	106 B [174 B]	993 N	88.2 B	121	127 [124]	54.6 B	26.6 B	25.3	32.2 B	NA	NA	40.7 BN	190 B	42.4 B	45.4 B
Beryllium	- -	<1.00	<1.00 [2.20 B]	7.30	<10.0	<25.0	<25.0 [<25.0]	<1.00	<10.0	<25.0	<125	NA	NA	<1.00 N	15.8 B	<125	<125
Cadmium	5	<1.00	<2.00 [<2.00]	34.3	<10.0 N	<50.0	<50.0 [<50.0]	<1.00	<10.0 N	<50.0	<250	NA	NA	1.20 BN	<10.0 N	<250	<250
Calcium	- -	149,000	320,000 [656,000]	2,690,000 E	200,000 E	308,000	367,000 [309,000]	481,000 E	985,000 E	1,070,000	1,310,000	NA	NA	1,550,000 E	1,640,000 E	1,910,000	1,970,000
Chloride	250,000	NA	NA	NA	NA	1,500,000	1,700,000 [1,700,000]	NA	NA	16,000,000	92,000,000	NA	NA	NA	NA	97,000,000	27,000,000
Chromium	50	7.30 B	3.80 B [6.30 B]	426	<10.0	<50.0	18.5 B [10.3 B]	26.3	<10.0	<50.0	<250	NA	NA	7.80 B	11.0 B	<250	<250
Cobalt	- -	4.00 B	<4.00 [9.30 B]	144 N	<10.0	<50.0	<50.0 [<50.0]	<9.00	<10.0	<50.0	<250	NA	NA	<9.00 N	<10.0	<250	<250
Copper	200	8.40 B	<20.2 [<33.6]	356	16.1 B	<50.0	18.3 B [20.9 B]	1.50 B	96.2 B	<50.0	<250	NA	NA	17.2 B	120 B	<250	86.9 B
Cyanide	200	<10.0	<20.0 [<50.0]	<0.0100	<0.0100	<10.0	3.40 B [3.40 B]	<0.0100	<0.0100	<10.0	<10.0	NA	NA	<0.0100	<0.0100	<10.0	<10.0
Iron	300	5,200	3,340 [6,530]	240,000 NE	6,060	1,960	5,060 [3,410]	328	513 B	<1,000	<5,000	NA	NA	1,940 NE	3,810	7,000	7,060
Lead	25	10.1	<8.40 [15.3]	138 N	<10.0	<50.0 J	<50.0 [<50.0]	2.10 B	<10.0	<50.0 J	<250	NA	NA	3.10 N	<10.0	<250 J	<250
Magnesium	- -	49,500	105,000 [236,000]	904,000 E	54,400 E	64,400	80,900 [68,000]	35,000 E	140,000 E	135,000	217,000	NA	NA	64,500 E	142,000 E	290,000	303,000
Manganese	300	494	1,150 [2,580]	7,460 NE	272	172	251 [191]	26.3	100 B	121	171 B	NA	NA	220 NE	215	879	757
Mercury	0.7	<0.200	<0.200 [<0.200]	0.740	<0.200 N	<0.200	<0.200 [<0.200]	<0.200	<0.200 N	<0.200	<0.200	NA	NA	<0.200	<0.200 N	<0.200	<0.200
Nickel	100	9.20 B	14.3 B [13.4 B]	293 N	<10.0	<50.0	11.5 B [<50.0]	1.40 B	<10.0	<50.0	<250	NA	NA	1.20 BN	<10.0	<250	<250
Nitrate Nitrogen	10,000	NA	NA	NA	NA	<100	67.0 B [69.0 B]	NA	NA	<500	<5,000	NA	NA	NA	NA	<5,000	<5,000
Potassium	- -	15,200	7,460 [8,160]	40,200	8,560 BE	13,600	15,900 [13,500]	72,300 E	66,500 E	78,600	111,000	NA	NA	99,200	724,000 E	443,000	417,000
Selenium	10	<2.00	<2.00 [<2.00]	<3.00	<30.0 N	<150 J	<150 [<150]	<3.00	<30.0 N	<150	<750	NA	NA	<3.00	<30.0 N	<750 J	<750
Silver	50	<1.00	<3.00 [<3.00]	<1.00	<10.0	<30.0	<30.0 [<30.0]	<1.00	<10.0	<30.0 J	<150	NA	NA	<1.00	<10.0	<150	<150
Sodium	- -	211,000	529,000 [518,000]	635,000	435,000 E	624,000	702,000 [685,000]	8,890,000	1,350,000 E	1,640,000	8,240,000	NA	NA	41,600,000	112,000 E	8,330,000 E	9,590,000
Sulfate	250,000	NA	NA	NA	NA	510,000	590,000 [590,000]	NA	NA	2,800,000	4,900,000	NA	NA	NA	NA	4,600,000	3,500,000
Sulfide	50	NA	NA	NA	NA	<1,000	<1,000 [<1,000]	NA	NA	8,600	<1,000	NA	NA	NA	NA	<1,000	2,000
Thallium	- -	<4.00	<2.00 [<2.00]	<3.00 N	<30.0	<200 J	<200 [<200]	<3.00 N	<30.0	<200 J	<1,000	NA	NA	<3.00 N	<30.0	<1,000 J	<1,000
Vanadium	- -	4.30 B	7.40 B [7.80 B]	222 N	<10.0	<30.0	<30.0 [<30.0]	<9.00	<10.0	<30.0	<150	NA	NA	<1.00 N	<10.0	<150	<150
Zinc	2,000	<32.4	<22.1 [102]	690	<60.0	<250	<250 [<250]	19.3 B	<60.0	<250	<1,250	NA	NA	25.4	70.6 B	<1,250	<1,250
Detected Inorganics-Filtered																	
Iron	300	NA	NA	NA	NA	885	756 [720]	NA	NA	<200	<1,000	NA	NA	NA	NA	2,900	4,900
Manganese	300	NA	NA	NA	NA	125	127 [124]	NA	NA	83.9	141	NA	NA	NA	NA	412	562
Detected PCBs																	
None Detected	- -	- -	- - [- -]	- -	- -	NA	NA	- -	- -	NA	NA	NA	NA	- -	- -	NA	NA
Detected Organochlorine Pesticides																	
4,4'-DDD	0.3	<0.10	<0.10 [<0.11]	<0.10	<0.10	<0.17	<0.15 [<0.16]	<0.10	<0.10	<0.15	<0.15	NA	NA	<0.10	<0.10	<0.15	<0.17
4,4'-DDE	0.2	0.030 JP	<0.10 [<0.11]	0.011 JP	0.016 JP	0.026 J	<0.10 [<0.11]	<0.10	<0.10	<0.10	<0.10	NA	NA	<0.10	<0.10	<0.10	<0.11
4,4'-DDT	0.2	<0.10	<0.10 [<0.11]	<0.10	<0.10	<0.11	<0.10 [<0.11]	0.019 JP	<0.10	<0.10	<0.10	NA	NA	<0.10	<0.10	<0.10	<0.11
Aldrin	0	<0.050	<0.050 [<0.060]	<0.050	<0.050	<0.056	<0.050 [<0.054]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Alpha-BHC	0.01	<0.050	<0.050 [<0.060]	0.0033 JP	<0.050	<0.056	0.063 J [0.062]	<0.050	0.021 JP	0.014 J	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Alpha-Chlordane	0.05	<0.050	<0.050 [<0.060]	<0.050	<0.050	<0.056	<0.050 [<0.054]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Beta-BHC	- -	<0.050	<0.050 [<0.060]	<0.050	<0.050	<0.056	<0.050 [<0.054]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Delta-BHC	- -	<0.050	<0.050 [<0.060]	0.0053 JP	0.025 JP	0.011 J	<0.050 [<0.054]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Dieldrin	0.004	0.0060 JP	<0.10 [<0.11]	<0.10	<0.10	<0.11	<0.10 [<0.11]	<0.10	<0.10	<0.10	<0.10	NA	NA	<0.10	<0.10	<0.10	<0.11
Endosulfan I	- -	<0.050	<0.050 [<0.060]	<0.050	<0.050	<0.056	<0.050 [<0.054]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Endosulfan II	- -	<0.10	<0.10 [<0.11]	<0.10	<0.10	<0.11	<0.10 [<0.11]	<0.10	<0.10	<0.10	<0.10	NA	NA	<0.10	<0.10	<0.10	<0.11
Endosulfan Sulfate	- -	<0.10	<0.10 [<0.11]	<0.10	0.013 JP	<0.11	<0.10 [<0.11]	<0.10	<0.10	<0.10	<0.10	NA	NA	<0.10	<0.10	<0.10	<0.11
Endrin	0	<0.10	<0.10 [<0.11]	<0.10	<0.10	<0.11	<0.10 [<0.11]	<0.10	<0.10	0.25	<0.10	NA	NA	<0.10	<0.10	<0.10	<0.11
Gamma-BHC (Lindane)	0.05	<0.050	<0.050 [<0.060]	<0.050	<0.050	<0.056	0.039 J [0.038 J]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Gamma-Chlordane	0.05	<0.050	<0.050 [<0.060]	<0.050	<0.050	<0.056	<0.050 [<0.054]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Heptachlor	0.04	<0.050	<0.050 [<0.060]	<0.050	<0.050	0.036 J	0.027 J [0.037 J]	<0.050	<0.050	0.045 J	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Heptachlor Epoxide	0.03	<0.050	<0.050 [<0.060]	<0.050	<0.050	0.052 J	<0.050 [<0.054]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Methoxychlor	35	<0.50	<0.50 [<0.56]	<0.50	<0.50	<0.56	<0.50 [<0.54]	<0.50	<0.50	<0.50	<0.50	NA	NA	<0.50	<0.50	<0.50	<0.56
Detected Miscellaneous																	
BOD (5 Day)	- -	3,000	6,000 [27,000]	29,000	NA	660 B	870 B [1,500 B]	3,000	NA	9,400	<2,000	NA	NA	5,000	NA	<2,000	4,800
CO2 by Headspace	- -	NA	NA	NA	NA	22,000	20,000	NA	NA	33,000	22,000	NA	NA	NA	NA	21,000	14,000
Carbon monoxide	- -	NA	NA	NA	NA	<400	<400	NA	NA	<400	<400	NA	NA	NA	NA	<400	<400
COD	- -	<61,600	<81,800 [<183,000]	36,500	NA	7,490 B	13,400 [12,700]	70,700	NA	101,000	920,000	NA	NA	502,000	NA	767,000	296,000
Chloride	250,000	1,100,000	931,000 [1,050,000]	999,000	NA	NA	NA	12,400,000	NA	NA	NA	NA	NA	63,200,000	NA	NA	NA
DOC	- -	NA	NA	NA	NA	440 B	670 B [400 B]	NA	NA	2,200	460	NA	NA	NA	NA	390 B	4,300
Hardness, Ca/CO3	- -	669,000	1,260,000 [2,880,000]	6,340,000	NA	NA	NA	1,350,000	NA	NA	NA	NA	NA	1,210,000	NA	NA	NA
Methane	- -	NA	NA	NA	NA	4	3,400	NA	NA	100	180,000	NA	NA	NA	NA	36	53,000
Nitrate Nitrogen	10,000	<100	<100 [<100]	<100	NA	NA	NA	<100	NA	NA	NA	NA	NA	210	NA	NA	NA
Nitrite Nitrogen	1,000	<5	9 [<5]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oil and Grease	- -	<1,000	<1,000 [<1,000]	3,200 N	NA	NA	NA	1,500	NA	NA	NA	NA	NA	<1,000 N	NA	NA	NA
pH, Standard Units	- -	7.4	7.72 [7.53]	7.76	NA	NA	NA	11.1	NA	NA	NA	NA	NA	6.82	NA	NA	NA
Sulfate	250,000	370,000	319,000 [461,000]	414,000	NA	NA	NA	53,600	NA	NA	NA	NA	NA	20,300	NA	NA	NA
Sulfide	50	<1,000	1,200 [<1,000]	<5,000	NA	NA	NA	<1,000	NA	NA	NA	NA	NA	<1,000	NA	NA	NA
Total Organic Carbon	- -	NA	NA	NA	NA	790 B	740 B [550 B]	NA	NA	2,300	270 B	NA	NA	NA	NA	<1,000	4,500
Total Dissolved Solids	1,000,000	157,000	2,010,000 [2,270,000]	2,920,000	NA	NA	NA	25,300,000	NA	NA	NA	NA	NA	110,000,000	NA	NA	NA

TABLE 9
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, PESTICIDES, and BIOGEOCHEMICAL PARAMETERS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-10S						MW-10D						MW-11D					
Date Collected:	Guidance Values	07/09/97	09/08/97	11/07/02	01/22/03	04/10/08	01/28/13	07/09/97	09/08/97	11/07/02	01/22/03	04/10/08	01/28/13	07/08/97	09/10/97	11/07/02	01/16/03	04/09/08	01/31/13
Detected Inorganics																			
Aluminum	- -	9,900	35,500 *	<2,500 J	<2,500	NA	NA	598	<320 *	<12,500 J	4,550 B	NA	NA	238	<320 *	<12,500 J	<12,500	NA	NA
Antimony	3	<8.00	<80.0	<100	<100	NA	NA	<8.00	<80.0	<500	<500	NA	NA	<8.00	<80.0	<500	<500	NA	NA
Arsenic	25	4.60 B	<30.0	<200	<200	NA	NA	<3.00	<30.0	<1,000	<1,000	NA	NA	<3.00	<30.0	<1,000	<1,000	NA	NA
Available Cyanide	- -	NA	NA	NA	<2.00	NA	NA	NA	NA	NA	<2.00	NA	NA	NA	NA	NA	<2.00	NA	NA
Barium	1,000	158 BN	380 B	108	112	NA	NA	30.6 BN	42.9 B	42.6 B	53.5 B	NA	NA	18.2 B	30.3 B	40.2 B	41.0 B	NA	NA
Beryllium	- -	<1.00	<10.0	<25.0	<25.0	NA	NA	<1.00	<10.0	<125	<125	NA	NA	<1.00	<10.0	<125	<125	NA	NA
Cadmium	5	<1.00 N	<10.0 N	<50.0	<50.0	NA	NA	3.40 BN	<10.0 N	<250	<250	NA	NA	1.30 B	<10.0 N	<250	<250	NA	NA
Calcium	- -	166,000 E	263,000 E	207,000	210,000	NA	NA	243,000 E	1,440,000 E	1,940,000	1,690,000	NA	NA	111,000 E	986,000 E	1,700,000	1,730,000	NA	NA
Chloride	250,000	NA	NA	940,000	900,000	NA	NA	NA	NA	94,000,000	91,000,000	NA	NA	NA	NA	54,000,000	67,000,000	NA	NA
Chromium	50	14.6	45.0 B	<50.0	<50.0	NA	NA	9.00 B	13.8 B	<250	66.9 B	NA	NA	5.80 B	<10.0	<250	<250	NA	NA
Cobalt	- -	<9.00 N	39.6 B	<50.0	<50.0	NA	NA	<9.00 N	<10.0	<250	<250	NA	NA	<9.00	<10.0	<250	<250	NA	NA
Copper	200	21.6 B	101 B	<50.0	<50.0	NA	NA	10.9 B	26.8 B	<250	58.7 B	NA	NA	<1.00	14.8 B	<250	<250	NA	NA
Cyanide	200	<0.0100	<0.0100	<10.0	<10.0	NA	NA	<0.0100	<0.0100	<10.0	<10.0	NA	NA	<0.0100	<0.0100	<10.0	<10.0	NA	NA
Iron	300	16,700 NE	58,900	<1,000	<1,000	NA	NA	715 NE	3,210	7,850	13,300	NA	NA	259	<100	2,900 B	<5,000	NA	NA
Lead	25	9.60 N	40.2	<50.0 J	<50.0	NA	NA	25.9 N	<10.0	<250 J	<250	NA	NA	2.90 B	<10.0	<250 J	<250	NA	NA
Magnesium	- -	49,600 E	103,000 E	41,100	42,000	NA	NA	29,500 E	217,000 E	298,000	307,000	NA	NA	19,300 E	157,000 E	269,000	271,000	NA	NA
Manganese	300	1,730 NE	4,910	96.5	118	NA	NA	70.3 NE	385	803	797	NA	NA	10.0 B	151	331 B	250 B	NA	NA
Mercury	0.7	<0.200	0.250 N	<0.200	<0.200	NA	NA	<0.200	<0.200 N	<0.200	<0.200	NA	NA	<0.200	<0.200 N	<0.200	<0.200	NA	NA
Nickel	100	25.4 BN	85.1 B	<50.0	<50.0	NA	NA	3.70 BN	<10.0	<250	<250	NA	NA	2.50 B	<10.0	<250	<250	NA	NA
Nitrate Nitrogen	10,000	NA	NA	<100	<100	NA	NA	NA	NA	<5,000	<5,000	NA	NA	NA	NA	<5,000	<2,500	NA	NA
Potassium	- -	8,580	16,700 BE	12,800	12,500	NA	NA	17,700	392,000 E	439,000	410,000	NA	NA	30,500 E	148,000 E	323,000	308,000	NA	NA
Selenium	10	<3.00	<30.0 N	<150 J	<150	NA	NA	<3.00	<30.0 N	<750 J	<750	NA	NA	<3.00	<30.0 N	<750 J	<750	NA	NA
Silver	50	<1.00	<10.0	<30.0	<30.0	NA	NA	<1.00	<10.0	<150	<150	NA	NA	<1.00	<10.0	<150	<150	NA	NA
Sodium	- -	364,000	342,000 E	403,000	414,000	NA	NA	6,670,000	266,000 E	8,270,000 E	9,540,000	NA	NA	3,110,000	1,160,000 E	8,360,000 E	9,560,000	NA	NA
Sulfate	250,000	NA	NA	320,000	350,000	NA	NA	NA	NA	4,600,000	4,800,000	NA	NA	NA	NA	4,600,000	4,200,000	NA	NA
Sulfide	50	NA	NA	<1,000	<1,000	NA	NA	NA	NA	<1,000	<1,000	NA	NA	NA	NA	9,800	8,600	NA	NA
Thallium	- -	<3.00 N	<30.0	<200 J	<200	NA	NA	<3.00 N	<30.0	<1,000 J	<1,000	NA	NA	<3.00	<30.0	<1,000 J	<1,000	NA	NA
Vanadium	- -	15.6 BN	50.5 B	<30.0	<30.0	NA	NA	<1.00 N	<10.0	<150	<150	NA	NA	<9.00	<10.0	<150	<150	NA	NA
Zinc	2,000	75.4	205	<250	<250	NA	NA	51.2	<60.0	<1,250	<1,250	NA	NA	23.4	<60.0	<1,250	<1,250	NA	NA
Detected Inorganics-Filtered																			
Iron	300	NA	NA	1,350	<1,000	NA	NA	NA	NA	2,510	3,920	NA	NA	NA	NA	<200	<1,000	NA	NA
Manganese	300	NA	NA	283	89.7	NA	NA	NA	NA	363	490	NA	NA	NA	NA	128	152	NA	NA
Detected PCBs																			
None Detected	- -	- -	NA	NA	NA	NA	NA	- -	- -	NA	NA	NA	NA	- -	- -	NA	NA	NA	NA
Detected Organochlorine Pesticides																			
4,4'-DDD	0.3	<0.10	NA	<0.15	<0.17	NA	NA	<0.10	<0.10	<0.17	<0.17	NA	NA	<0.10	<0.10	<0.16	<0.20	NA	NA
4,4'-DDE	0.2	<0.10	NA	<0.10	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	NA	NA	<0.10	0.0013 JP	<0.11	<0.14	NA	NA
4,4'-DDT	0.2	<0.10	NA	<0.10	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	NA	NA	<0.10	0.028 JP	<0.11	<0.14	NA	NA
Aldrin	0	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	0.058	0.024 J	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Alpha-BHC	0.01	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Alpha-Chlordane	0.05	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Beta-BHC	- -	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Delta-BHC	- -	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Dieldrin	0.004	<0.10	NA	<0.10	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.14	NA	NA
Endosulfan I	- -	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Endosulfan II	- -	<0.10	NA	<0.10	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.14	NA	NA
Endosulfan Sulfate	- -	<0.10	NA	<0.10	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	NA	NA	0.019 J	<0.10	<0.11	<0.14	NA	NA
Endrin	0	<0.10	NA	<0.10	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.14	NA	NA
Gamma-BHC (Lindane)	0.05	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	0.034 J	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Gamma-Chlordane	0.05	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Heptachlor	0.04	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Heptachlor Epoxide	0.03	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Methoxychlor	35	<0.50	NA	<0.50	<0.56	NA	NA	<0.50	<0.50	<0.56	<0.56	NA	NA	<0.50	<0.50	<0.54	<0.68	NA	NA
Detected Miscellaneous																			
BOD (5 Day)	- -	2,000	NA	<2,000	330 B	NA	NA	6,000	NA	360 B	1,800 B	NA	NA	4,000	NA	13,000	5,500	NA	NA
CO2 by Headspace	- -	NA	NA	16,000	14,000	NA	NA	NA	NA	17,000	15,000	NA	NA	NA	NA	13,000	11,000	NA	NA
Carbon monoxide	- -	NA	NA	<400	<400	NA	NA	NA	NA	<400	<400	NA	NA	NA	NA	<400	<400	NA	NA
COD	- -	12,800	NA	7,810 B	7,850 B	NA	NA	158,000	NA	889,000	1,090,000	NA	NA	43,800	NA	620,000	925,000	NA	NA
Chloride	250,000	715,000	NA	NA	NA	NA	NA	13,500,000	NA	NA	NA	NA	NA	4,860,000	NA	NA	NA	NA	NA
DOC	- -	NA	NA	550 B	470 B	NA	NA	NA	NA	1,300	280 B	NA	NA	NA	NA	490 B	640 B	NA	NA
Hardness, Ca/CO3	- -	630,000	NA	NA	NA	NA	NA	584,000	NA	NA	NA	NA	NA	357,000	NA	NA	NA	NA	NA
Methane	- -	NA	NA	2.3	4,200	NA	NA	NA	NA	33	55,000	NA	NA	NA	NA	120	90,000	NA	NA
Nitrate Nitrogen	10,000	<100	NA	NA	NA	NA	NA	540	NA	NA	NA	NA	NA	640	NA	NA	NA	NA	NA
Nitrite Nitrogen	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oil and Grease	- -	<1,000 N	NA	NA	NA	NA	NA	<1,000 N	NA	NA	NA	NA	NA	<1,000	NA	NA	NA	NA	NA
pH, Standard Units	- -	7.49	NA	NA	NA	NA	NA	7.84	NA	NA	NA	NA	NA	8.25	NA	NA	NA	NA	NA
Sulfate	250,000	138,000	NA	NA	NA	NA	NA	21,700	NA	NA	NA	NA	NA	127,000	NA	NA	NA	NA	NA
Sulfide	50	<1,000	NA	NA	NA	NA	NA	<1,000	NA	NA	NA	NA	NA	<1,000	NA	NA	NA	NA	NA
Total Organic Carbon	- -	NA	NA	300 B	220 B	NA	NA	NA	NA	1,900	840 B	NA	NA	NA	NA	750 B	510 B	NA	NA
Total Dissolved Solids	1,000,000	2,820,000	NA	NA	NA	NA	NA	24,600,000	NA	NA	NA	NA	NA	8,970,000	NA	NA	NA	NA	NA

TABLE 9
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, PESTICIDES, and BIOGEOCHEMICAL PARAMETERS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-12D						MW-13D			MW-14D				MW-15D			
Date Collected:	Guidance Values	07/08/97	09/08/97	11/07/02	01/16/03	04/10/08	01/30/13	11/07/02	01/22/03	04/10/08	11/08/02	01/16/03	04/11/08	01/30/13	11/12/02	01/21/03	04/10/08	01/30/13
Detected Inorganics																		
Aluminum	- -	309	579 B* [610 B*]	<12,500 J	<12,500 [<12,500]	NA	NA	612 JB	1,610 B	NA	508 JB	681 B	NA	NA	4,090 JB	2,660 B	NA	NA
Antimony	3	<8.00	<80.0 [<80.0]	<500	<500 [<500]	NA	NA	<100	<100	NA	<100	<100	NA	NA	<500	<500	NA	NA
Arsenic	25	<3.00	<30.0 [<30.0]	<1,000	<1,000 [<1,000]	NA	NA	<200	<200	NA	<200	<200	NA	NA	<1,000	<1,000	NA	NA
Available Cyanide	- -	NA	NA	NA	<2.00 [<2.00]	NA	NA	NA	<2.00	NA	NA	3.00	NA	NA	NA	<2.00	NA	NA
Barium	1,000	33.0 BN	54.2 B [53.0 B]	<125	29.4 B [30.0 B]	NA	NA	81.8	102	NA	15.4 B	13.9 B	NA	NA	56.1 B	44.8 B	NA	NA
Beryllium	- -	<1.00	<10.0 [<10.0]	<125	<125 [<125]	NA	NA	<25.0	<25.0	NA	<25.0	<25.0	NA	NA	<125	<125	NA	NA
Cadmium	5	21.7 N	10.5 BN [<10.0 N]	<250	<250 [<250]	NA	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	NA	<250	<250	NA	NA
Calcium	- -	389,000 E	826,000 E [806,000 E]	1,310,000	1,730,000 [1,770,000]	NA	NA	228,000	235,000	NA	649,000	646,000	NA	NA	1,480,000	1,440,000	NA	NA
Chloride	250,000	NA	NA	42,000,000	67,000,000	NA	NA	600,000	700,000	NA	550,000	520,000	NA	NA	47,000,000	47,000,000	NA	NA
Chromium	50	11.4	<10.0 [<10.0]	<250	<250 [<250]	NA	NA	<50.0	8.10 B	NA	<50.0	<50.0	NA	NA	<250	<250	NA	NA
Cobalt	- -	<9.00 N	<10.0 [<10.0]	<250	<250 [<250]	NA	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	NA	<250	<250	NA	NA
Copper	200	20.6 BN	90.1 B [59.2 B]	<250	79.5 B [42.0 B]	NA	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	NA	65.5 B	<250	NA	NA
Cyanide	200	<0.0100	<0.0100 [<0.0100]	<10.0	<10.0 [<10.0]	NA	NA	<10.0	<10.0	NA	<10.0	<10.0	NA	NA	<10.0	<10.0	NA	NA
Iron	300	526 NE	1,840 [1,840]	5,140	6,800 [6,960]	NA	NA	1,780	2,900	NA	2,570	2,850	NA	NA	8,750	5,350	NA	NA
Lead	25	3.50 N	<10.0 [<10.0]	<250 J	<250 [<250]	NA	NA	<50.0 J	<50.0	NA	50.0 JB	<50.0	NA	NA	<250 J	<250	NA	NA
Magnesium	- -	39,000 E	34,400 BE [32,600 BE]	217,000	273,000 [284,000]	NA	NA	57,900	55,000	NA	65,400	64,500	NA	NA	285,000	267,000	NA	NA
Manganese	300	49.2 NE	70.2 B [67.1 B]	360 B	494 [440]	NA	NA	312	197	NA	105	94.3	NA	NA	429	325 B	NA	NA
Mercury	0.7	<0.200	<0.200 N [<0.200 N]	<0.200	<0.200 [<0.200]	NA	NA	<0.200	<0.200	NA	<0.200	<0.200	NA	NA	<0.200	<0.200	NA	NA
Nickel	100	5.60 BN	<10.0 [<10.0]	<250	<250 [<250]	NA	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	NA	<250	<250	NA	NA
Nitrate Nitrogen	10,000	NA	NA	<5,000	<2,500	NA	NA	940	1,100	NA	<100	<100	NA	NA	<5,000	<5,000	NA	NA
Potassium	- -	29,600	118,000 E [113,000 E]	181,000	295,000 [298,000]	NA	NA	12,300	13,300	NA	8,240	8,050	NA	NA	209,000	196,000	NA	NA
Selenium	10	<3.00	<30.0 N [<30.0 N]	<750 J	<750 [<750]	NA	NA	<150 J	<150	NA	<150 J	<150	NA	NA	<750 J	<750	NA	NA
Silver	50	<1.00	<10.0 [<10.0]	<150	<150 [<150]	NA	NA	<30.0	<30.0	NA	<30.0	<30.0	NA	NA	<150	<150	NA	NA
Sodium	- -	94,600	1,460,000 E [1,440,000 E]	8,140,000 E	9,590,000 [9,510,000]	NA	NA	338,000	353,000	NA	265,000	266,000	NA	NA	8,990,000	9,320,000	NA	NA
Sulfate	250,000	NA	NA	3,700,000	4,500,000	NA	NA	420,000	360,000	NA	1,500,000	1,300,000	NA	NA	3,700,000	3,900,000	NA	NA
Sulfide	50	NA	NA	<1,000	<1,000	NA	NA	<1,000	<1,000	NA	2,700	<1,000	NA	NA	400 B	200 B	NA	NA
Thallium	- -	<3.00 N	<30.0 N [<30.0 N]	<100 J	<1,000 [<1,000]	NA	NA	<200 J	<200	NA	<200 J	<200	NA	NA	<1,000 J	<1,000	NA	NA
Vanadium	- -	<1.00 N	<10.0 [<10.0]	<150	<150 [<150]	NA	NA	<30.0	<30.0	NA	<30.0	<30.0	NA	NA	<150	<150	NA	NA
Zinc	2,000	26.9	<60.0 [<60.0]	<1,250	<1,250 [<1,250]	NA	NA	<250	<250	NA	<250	<250	NA	NA	<1,250	<1,250	NA	NA
Detected Inorganics-Filtered																		
Iron	300	NA	NA	3,600	4,570 [4,550]	NA	NA	<200	<1,000	NA	1,400	1,450	NA	NA	<1,000	<1,000	NA	NA
Manganese	300	NA	NA	288	331 [346]	NA	NA	92.5	101	NA	71.2	67.3 B	NA	NA	144	139	NA	NA
Detected PCBs																		
None Detected	- -	- -	- - [- -]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Detected Organochlorine Pesticides																		
4,4'-DDD	0.3	<0.10	<0.10 [<0.10]	<0.16	<0.16 [<0.16]	NA	NA	<0.16	<0.16	NA	<0.17	<0.15	NA	NA	<0.16	<0.16	NA	NA
4,4'-DDE	0.2	<0.10	<0.10 [<0.10]	<0.11	<0.10 [<0.10]	NA	NA	<0.11	<0.11	NA	<0.11	<0.10	NA	NA	<0.11	<0.11	NA	NA
4,4'-DDT	0.2	0.0040 JP	<0.10 [<0.10]	<0.11	<0.10 [<0.10]	NA	NA	<0.11	<0.11	NA	<0.11	<0.10	NA	NA	<0.11	<0.11	NA	NA
Aldrin	0	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Alpha-BHC	0.01	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Alpha-Chlordane	0.05	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Beta-BHC	- -	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Delta-BHC	- -	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Dieldrin	0.004	<0.10	<0.10 [<0.10]	<0.11	<0.10 [<0.10]	NA	NA	<0.11	<0.11	NA	<0.11	<0.10	NA	NA	<0.11	<0.11	NA	NA
Endosulfan I	- -	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Endosulfan II	- -	<0.10	<0.10 [<0.10]	<0.11	<0.10 [<0.10]	NA	NA	<0.11	<0.11	NA	<0.11	<0.10	NA	NA	<0.11	<0.11	NA	NA
Endosulfan Sulfate	- -	<0.10	<0.10 [<0.10]	<0.11	<0.10 [<0.10]	NA	NA	<0.11	<0.11	NA	<0.11	<0.10	NA	NA	<0.11	<0.11	NA	NA
Endrin	0	<0.10	<0.10 [<0.10]	<0.11	<0.10 [<0.10]	NA	NA	<0.11	<0.11	NA	<0.11	<0.10	NA	NA	<0.11	<0.11	NA	NA
Gamma-BHC (Lindane)	0.05	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Gamma-Chlordane	0.05	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Heptachlor	0.04	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Heptachlor Epoxide	0.03	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Methoxychlor	35	<0.50	<0.50 [<0.50]	<0.55	<0.52 [<0.52]	NA	NA	<0.53	<0.54	NA	<0.56	<0.50	NA	NA	<0.53	<0.54	NA	NA
Detected Miscellaneous																		
BOD (5 Day)	- -	5,000	NA	<2,000	<2,000	NA	NA	<2,000	<2,000	NA	1,100 B	660 B	NA	NA	<4,000	330 B	NA	NA
CO2 by Headspace	- -	NA	NA	22,000	11,000	NA	NA	17,000	10,000	NA	44,000	38,000	NA	NA	19,000	53,000	NA	NA
Carbon monoxide	- -	NA	NA	<400	<400	NA	NA	<400	<400	NA	<400	<400	NA	NA	<400	<400	NA	NA
COD	- -	196,000	NA	715,000	902,000	NA	NA	5,860 B	7,200 B	NA	<10,000	<10,000	NA	NA	663,000	422,000	NA	NA
Chloride	250,000	13,300,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DOC	- -	NA	NA	750 B	320 B	NA	NA	680 B	600 B	NA	<1,000	480 B	NA	NA	550 B	490 B	NA	NA
Hardness, Ca/CO3	- -	822,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	- -	NA	NA	26	52,000	NA	NA	1	1,900	NA	0.66	1,600	NA	NA	29	19,000	NA	NA
Nitrate Nitrogen	10,000	470	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrite Nitrogen	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oil and Grease	- -	<1,000 N	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH, Standard Units	- -	8.07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250,000	43,800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfide	50	<1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	- -	NA	NA	750 B	440 B	NA	NA	850 B	880 B	NA	570 B	620 B	NA	NA	3,400	640 B	NA	NA
Total Dissolved Solids	1,000,000	27,500,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 9
GROUNDWATER ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, PESTICIDES, and BIOGEOCHEMICAL PARAMETERS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-16D				MW-17D					MW-18			
Date Collected:	Guidance Values	11/13/02	01/22/03	04/14/08	01/30/13	11/13/02	11/13/02	01/21/03	04/11/08	01/30/13	11/13/02	01/23/03	04/11/08	01/30/13
Detected Inorganics														
Aluminum	- -	<12,500 J	<12,500	NA	NA	3,540 JB [3,420 JB]	NA	<12,500	NA	NA	<12,500	<12,500	NA	NA
Antimony	3	<500	<500	NA	NA	<500 [<500]	NA	<500	NA	NA	<500	<500	NA	NA
Arsenic	25	<1,000	<1,000	NA	NA	<1,000 [<1,000]	NA	<1,000	NA	NA	<1,000	<1,000	NA	NA
Available Cyanide	- -	NA	<2.00	NA	NA	NA	NA	<2.00	NA	NA	NA	<2.00	NA	NA
Barium	1,000	30.8 B	29.2 B	NA	NA	83.4 B [80.7 B]	NA	35.6 B	NA	NA	28.5 B	42.5 B	NA	NA
Beryllium	- -	<125	<125	NA	NA	<125 [<125]	NA	<125	NA	NA	<125	<125	NA	NA
Cadmium	5	<250	<250	NA	NA	<250 [<250]	NA	<250	NA	NA	<250	<250	NA	NA
Calcium	- -	919,000	929,000	NA	NA	1,780,000 J [1,780,000 J]	NA	1,780,000	NA	NA	809,000	1,520,000	NA	NA
Chloride	250,000	21,000,000	22,000,000	NA	NA	63,000,000 [64,000,000]	NA	68,000,000	NA	NA	52,000,000	61,000,000	NA	NA
Chromium	50	<250	<250	NA	NA	<250 [<250]	NA	<250	NA	NA	<250	<250	NA	NA
Cobalt	- -	<250	<250	NA	NA	<250 [<250]	NA	<250	NA	NA	<250	<250	NA	NA
Copper	200	56.3 B	80.7 B	NA	NA	51.9 B [50.1 B]	NA	<250	NA	NA	46.5 B	86.5 B	NA	NA
Cyanide	200	<10.0	<10.0	NA	NA	<10.0 [<10.0]	NA	<10.0	NA	NA	<10.0	3.40 B	NA	NA
Iron	300	<5,000	<5,000	NA	NA	9,640 [9,580]	NA	4,150	NA	NA	4,120 B	6,870	NA	NA
Lead	25	<250 J	<250	NA	NA	<250 J [<250 J]	NA	<250	NA	NA	<250	91.3 B	NA	NA
Magnesium	- -	204,000	202,000	NA	NA	323,000 [322,000]	NA	302,000	NA	NA	139,000	262,000	NA	NA
Manganese	300	247 B	194 B	NA	NA	451 [455]	NA	254 B	NA	NA	178 B	355 B	NA	NA
Mercury	0.7	<0.200	<0.200	NA	NA	<0.200 [<0.200]	NA	<0.200	NA	NA	<0.200	<0.200	NA	NA
Nickel	100	<250	<250	NA	NA	<250 [<250]	NA	<250	NA	NA	<250	<250	NA	NA
Nitrate Nitrogen	10,000	<5,000	<5,000	NA	NA	<5,000 [<5,000]	NA	<5,000	NA	NA	<5,000	<5,000	NA	NA
Potassium	- -	95,100	89,100	NA	NA	282,000 [283,000]	NA	260,000	NA	NA	117,000	247,000	NA	NA
Selenium	10	<750 J	<750	NA	NA	<750 J [<750 J]	NA	<750	NA	NA	<750	<750	NA	NA
Silver	50	<150	<150	NA	NA	<150 [<150]	NA	<150	NA	NA	<150	<150	NA	NA
Sodium	- -	7,370,000	7,190,000	NA	NA	8,860,000 J [8,890,000 J]	NA	9,580,000	NA	NA	7,830,000 E	9,610,000	NA	NA
Sulfate	250,000	2,500,000	2,500,000	NA	NA	4,800,000 [4,800,000]	NA	4,800,000	NA	NA	4,300,000	4,300,000	NA	NA
Sulfide	50	<1,000	<1,000	NA	NA	<1,000 [<1,000]	NA	<1,000	NA	NA	<1,000	<1,000	NA	NA
Thallium	- -	<1,000 J	<1,000	NA	NA	<1,000 J [1,000 J]	NA	<1,000	NA	NA	<1,000	<1,000	NA	NA
Vanadium	- -	<150	<150	NA	NA	<150 [<150]	NA	<150	NA	NA	<150	<150	NA	NA
Zinc	2,000	<1,250	<1,250	NA	NA	<1,250 [<1,250]	NA	<1,250	NA	NA	<1,250	<1,250	NA	NA
Detected Inorganics-Filtered														
Iron	300	<1,000	<1,000	NA	NA	1,040 [1,300]	NA	2,310	NA	NA	4,190	3,830	NA	NA
Manganese	300	205	172	NA	NA	198 [197]	NA	197 B	NA	NA	202	248	NA	NA
Detected PCBs														
None Detected	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Detected Organochlorine Pesticides														
4,4'-DDD	0.3	<0.16	<0.16	NA	NA	<0.16 [<0.15]	NA	<0.16	NA	NA	<0.15	<0.20	NA	NA
4,4'-DDE	0.2	<0.11	<0.11	NA	NA	<0.11 [<0.10]	NA	<0.11	NA	NA	<0.10	<0.13	NA	NA
4,4'-DDT	0.2	<0.11	<0.11	NA	NA	<0.11 [<0.10]	NA	<0.11	NA	NA	<0.10	<0.13	NA	NA
Aldrin	0	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Alpha-BHC	0.01	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Alpha-Chlordane	0.05	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Beta-BHC	- -	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Delta-BHC	- -	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Dieldrin	0.004	<0.11	<0.11	NA	NA	<0.11 [<0.10]	NA	<0.11	NA	NA	<0.10	<0.13	NA	NA
Endosulfan I	- -	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Endosulfan II	- -	<0.11	<0.11	NA	NA	<0.11 [<0.10]	NA	<0.11	NA	NA	<0.10	<0.13	NA	NA
Endosulfan Sulfate	- -	<0.11	<0.11	NA	NA	<0.11 [<0.10]	NA	<0.11	NA	NA	<0.10	<0.13	NA	NA
Endrin	0	<0.11	<0.11	NA	NA	<0.11 [<0.10]	NA	<0.11	NA	NA	<0.10	<0.13	NA	NA
Gamma-BHC (Lindane)	0.05	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Gamma-Chlordane	0.05	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Heptachlor	0.04	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Heptachlor Epoxide	0.03	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Methoxychlor	35	<0.54	<0.54	NA	NA	<0.55 [<0.52]	NA	<0.53	NA	NA	<0.50	<0.67	NA	NA
Detected Miscellaneous														
BOD (5 Day)	- -	<2,000	<2,000	NA	NA	480 B [1,100 B]	NA	<2,000	NA	NA	<2,000	1,600 B	NA	NA
CO2 by Headspace	- -	28,000	21,000	NA	NA	21,000 [17,000]	NA	14,000	NA	NA	15,000	20,000	NA	NA
Carbon monoxide	- -	<400	<400	NA	NA	<40 [<40]	NA	<400	NA	NA	11,000	<400	NA	NA
COD	- -	235,000	295,000	NA	NA	497,000 [546,000]	NA	708,000	NA	NA	476,000	396,000	NA	NA
Chloride	250,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DOC	- -	660 B	590 B	NA	NA	710 B [570 B]	NA	470 B	NA	NA	800 B	520 B	NA	NA
Hardness, Ca/CO3	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	- -	24	27,000	NA	NA	60 [99]	NA	130,000	NA	NA	19	58,000	NA	NA
Nitrate Nitrogen	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrite Nitrogen	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oil and Grease	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH, Standard Units	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfide	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	- -	380 B	390 B	NA	NA	240 B [590 JB]	NA	460 B	NA	NA	180 B	400 B	NA	NA
Total Dissolved Solids	1,000,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 9

GROUNDWATER ANALYTICAL RESULTS FOR DETECTED INORGANICS, PCBs, PESTICIDES, and BIOGEOCHEMICAL PARAMETERS (ppb)

NATIONAL GRID

ERIE BOULEVARD FORMER MGP

FEASIBILITY STUDY REPORT

Notes:

1. Samples were collected by the following:
   - Engineering-Science from March 1995 to April 1995.
   - ARCADIS from August 1995 to present.
2. PCBs = Polychlorinated Biphenyls.
3. Inorganics = Resource Conservation Recovery Act (RCRA) Metals and Cyanide.
4. Samples collected between 1995 and 1999 were analyzed by Industrial and Environmental Analysts, Inc. (IEA) of Monroe, Connecticut. Samples collected between 2000 and 2008 were analyze by TestAmerica Laboratories, Inc. (TestAmerica) located in Shelton, Connecticut. Samples collected in 2013 were analyzed by Accutest Laboratories (Accutest) located in Marlborough,
   - Inorganics using USEPA SW-846 Methods 6010, 7470/7471, 9012A, and USEPA Method 335.4.
   - Available cyanide using USEPA OIA-1677.
   - PCBs using USEPA SW-846 Method 8082.
   - Pesticides using USEPA SW-846 Method 8080/8081.
   - Wet Chemistry parameters (including Hardness [CaCO3], Oil & Grease, and Total Dissolved Solids) by the following:
     - Biochemical Oxygen Demand (BOD) using USEPA Method 405.1.
     - Chloride using USEPA Method 9250.
     - Chemical Oxygen Demand (COD) using USEPA SW-846 Method 410.1.
     - Dissolved Organic Carbon (DOC) using USEPA Method 9060.
     - Nitrate/Nitrite using USEPA SW-846 Method 9200.
     - Sulfate using USEPA Method 9036.
     - Sulfide using USEPA Method 9031.
   - Dissolved Gas Analysis (CO, CO_2, and CH_4) using Method AM-15.01.
   - Natural Attenuation parameters (dissolved iron and manganese) using USEPA SW-846 Method 6010.
5. Samples collected between 1995 and 1999 were analyzed by Exygen Research (Exygen) located in State College, Pennsylvania for:
   - Available cyanide using USEPA OIA 1677.
6. Only those constituents detected in one or more samples are summarized.
7. Concentrations reported in parts per billion (ppb), which is equivalent to micrograms per liter µg/L).
8. Field duplicate sample results are presented in brackets.
9. Data qualifiers are defined as follows:
   - < - Constituent not detected at a concentration above the reported detection limit.
   - B (Inorganic) - Indicates an estimated value between the instrument detection limit and the Reporting Limit (RL).
   - D - Compound quantitated using a secondary dilution. Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis.
   - E (Inorganic) - Serial dilution exceeds the control limits.
   - H - Alternate peak selection upon analytical review.
   - J - Indicates that the associated numerical value is an estimated concentration.
   - M - Manually integrated compound.
   - * - LCS or LCSD exceeds the control limits.
10. NYSDEC groundwater standards/guidance values are from the NYSDEC Division of Water, Technical and Operational Guidance Series (TOGS) document titled "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (TOGS 1.1.1) dated June 1998, revised April 2000 and June 2004.
11. - - = No TOGS 1.1.1 Water Quality Standard/Guidance Value listed.
12. NA = Not Analyzed.
13. The samples collected July 9, 1997 from wells MW-3S and MW-7S appear to have been inadvertently switched during the preliminary site assessment. Results for wells have been switched (corrected) for this table.
14. The data has been validated in accordance with USEPA National Functional Guidelines of October 1999.

TABLE 10
SOIL ANALYTICAL RESULTS FOR VOCs, SVOCs, AND METALS IN TCLP EXTRACT, AND IGNITABILITY, CORROSIVITY, AND REACTIVITY

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Location ID:	NYSDEC Part 371 TCLP Criteria	SB-1	SB-4	SB-5	SB-7C	SB-8	SB-9	SB-10	TP-01	WB-4	MW-4	MW-7
Sample Depth(Feet):		36	28	22	28	28	38	28	8	9	14	18
Date Collected:		08/08/95	08/23/95	08/21/95	08/23/95	08/18/95	08/22/95	08/22/95	08/28/95	04/13/95	08/17/95	08/07/95
TCLP VOCs (ppm)												
1,1-Dichloroethene	0.7	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.25	<0.0050
1,2-Dichloroethane	0.5	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.25	<0.0050
2-Butanone	200	<0.010	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	0.0090 J	<0.010	<0.50	<0.010
Benzene	0.5	0.0020 J	0.16	0.019	0.093	<0.0050	<0.0050	<0.0050	0.086	<0.0050	6.5 J	0.014
Carbon Tetrachloride	0.5	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.25	<0.0050
Chlorobenzene	100	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.25	<0.0050
Chloroform	6	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.25	<0.0050
Tetrachloroethene	0.7	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.25	<0.0050
Trichloroethene	0.5	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	0.0040 J	<0.0050	<0.0050	<0.0050	<0.25	<0.0050
Vinyl Chloride	0.2	<0.010	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.50	<0.010
TCLP SVOCs (ppm)												
Pyridine	5	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NA	<0.11	<1.0	<0.020
2,4,5-Trichlorophenol	400	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	NA	<0.011	<5.0	<0.10
2,4,6-Trichlorophenol	2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NA	<0.011	<1.0	<0.020
2,4-Dinitrotoluene	0.13	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NA	<0.011	<1.0	<0.020
2-Methylphenol	200	<0.020	<0.020	<0.020	0.0070 J	<0.020	<0.020	<0.020	NA	<0.011	3.5	<0.020
1,4-Dichlorobenzene	7.5	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NA	<0.011	<1.0	<0.020
4-Methylphenol	200	<0.020	<0.020	<0.020	0.0090 J	<0.020	<0.020	<0.020	NA	<0.011	4.7	<0.020
Hexachlorobutadiene	0.5	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NA	<0.011	<1.0	<0.020
Hexachlorobenzene	0.13	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NA	<0.011	<1.0	<0.020
Hexachloroethane	3	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NA	<0.11	<1.0	<0.020
Nitrobenzene	2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NA	<0.011	<1.0	<0.020
Pentachlorophenol	100	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	NA	<0.0050	<5.0	<0.10
TCLP Metals (ppm)												
Arsenic	5	<0.0210	<0.0210	<0.0210	<0.0210	<0.0210	<0.0210	<0.0210	<0.0210	<0.118	<0.0210	<0.0210
Barium	100	0.460	0.734	0.567	0.394	0.296	0.422	1.12	0.742	0.217 B	0.227	0.556
Cadmium	1	<0.00300	<0.00300	<0.00300	0.00320 B	<0.00300	<0.00300	<0.00300	0.00590	<0.00400	<0.00300	<0.00300
Chromium	5	<0.00300	<0.00300	<0.00300	0.00310 B	<0.00300	<0.00300	0.00330 B	<0.00300	<0.00800	<0.00300	0.00350 B
Lead	5	0.0208 B	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.0487 B	<0.0200	<0.0750	0.0278 B	<0.0150
Mercury	0.2	<0.00200	<0.00200 J	<0.00200	<0.00200 J	<0.00200	<0.00200	<0.00200	<0.00200	<0.000100	<0.00200	<0.00200
Selenium	1	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	0.00650 B	<0.0330	<0.0330
Silver	5	<0.00200	<0.00200	<0.00200	<0.00200 N	<0.00200	<0.00200	<0.00200	<0.00200	<0.00800	<0.00200	<0.00200
Ignitability, Corrosivity, and Reactivity												
Reactive Cyanide (ppm)	- -	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<100	<0.500	<0.500
Reactive Sulfide (ppm)	- -	<10.0	708	<10.0	<10.0	<10.0	<10.0	<10.0	246	<100	69.2	<10.0
Corrosivity (SU)	- -	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Ignitability (SU)	- -	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Reactivity (SU)	- -	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

TABLE 10
SOIL ANALYTICAL RESULTS FOR VOCs, SVOCs, AND METALS IN TCLP EXTRACT, AND IGNITABILITY, CORROSIVITY, AND REACTIVITY

NATIONAL GRID
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FEASIBILITY STUDY REPORT

Notes:

1. Samples were collected by ARCADIS.
2. TCLP = Toxicity Characteristic Leaching Procedure.
3. VOCs = Target Compound List (TCL) Volatile Organic Compounds.
4. SVOCs = TCL Semi-Volatile Organic Compounds.
5. Inorganics = Resource Conservation Recovery Act (RCRA) Metals and Cyanide.
6. Laboratory analysis was performed by Industrial and Environmental Analysts, Inc. (IEA) of Monroe, Connecticut for:
   - Toxicity Characteristic Leaching Procedure (TCLP) Parameters (including Reactive Cyanide and Reactive Sulfide) using Method 1311 for extraction and the following methods for analysis:
     - VOCs using USEPA Method series 8000.
     - SVOCs using USEPA Method series 8000.
     - Metals and cyanide using USEPA Method series 6000 and 7000.
7. Concentrations of VOCs, SVOCs and Inorganics are reported in parts per million (ppm), which is equivalent to milligrams per liter (mg/L).
8. Concentrations of reactive cyanide and sulfide are reported in ppm, which is equivalent to milligrams per kilogram (mg/kg).
9. Corrosivity is reported in standard units (SU).
10. Data qualifiers are defined as follows:
    < - Constituent not detected at a concentration above the reported detection limit.
    B (Inorganic) - Indicates an estimated value between the instrument detection limit and the Reporting Limit (RL).
    J - Indicates that the associated numerical value is an estimated concentration.
    N - The spike recovery exceeded the upper or lower control limits.
    NC - Non-corrosive.
    NI - Non-ignitable.
    NR - Non-reactive.
11. NYSDEC Part 371 TCLP Criteria are from the NYSDEC Division of Water, Technical and Operational Guidance Series (TOGS) document titled "Identification and Listing of Hazardous Wastes", dated September 2006.
12. - - = No NYSDEC Part 371 TCLP Criteria listed.
13. The data has been validated in accordance with USEPA National Functional Guidelines of October 1999.

TABLE 11
POTENTIAL CHEMICAL, ACTION, AND LOCATION-SPECIFIC STANDARDS, CRITERIA, AND GUIDANCE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Regulation	Citation	Potential Standard (S) or Guidance (G)	Summary of Requirements	Applicability to the Remedial Design/Remedial Action
Chemical-Specific SCGs				
Federal				
Clean Water Act (CWA) - Ambient Water Quality Criteria	40 CFR Part 131; EPA 440/5-86/001 "Quality Criteria for Water - 1986", superseded by EPA-822-R-02-047 "National Recommended Water Quality Criteria: 2002"	S	Criteria for protection of aquatic life and/or human health depending on designated water use.	Not applicable. Previous site investigations support that site MGP-related constituents are not adversely affecting the Onondaga Creek surface water and sediments.
CWA Section 136	40 CFR 136	G	Identifies guidelines for test procedures for the analysis of pollutants.	
CWA Section 404	33 USC 1344	S	Regulates discharges to surface water or ocean, indirect discharges to POTWs, and discharge of dredged or fill material into waters of the U.S. (including wetlands).	
RCRA-Regulated Levels for Toxic Characteristics Leaching Procedure (TCLP) Constituents	40 CFR Part 261	S	These regulations specify the TCLP constituent levels for identification of hazardous wastes that exhibit the characteristic of toxicity.	Excavated materials may be sampled and analyzed for TCLP constituents prior to disposal to determine if the materials are hazardous based on the characteristic of toxicity.
Universal Treatment Standards/Land Disposal Restrictions (UTS/LDRs)	40 CFR Part 268	S	Identifies hazardous wastes for which land disposal is restricted and provides a set of numerical constituent concentration criteria at which hazardous waste is restricted from land disposal (without treatment).	Applicable if waste is determined to be hazardous and for remedial alternatives involving off-site land disposal.
New York State				
Environmental Remediation Programs	6 NYCRR Part 375	S	Provides an outline for the development and execution of the soil remedial programs. Includes cleanup objective tables.	Applicable for site remediation.
NYSDEC Guidance on the Management of Coal Tar Waste and Coal Tar Contaminated Soils and Sediment from Former Manufactured Gas Plants ("MGPs")	TAGM 4061(2002)	G	Outlines the criteria for conditionally excluding coal tar waste and impacted soil from former MGPs which exhibit the hazardous characteristic of toxicity for benzene (D018) from the hazardous waste requirements of 6 NYCRR Parts 370 - 374 and 376 when destined for thermal treatment.	This guidance will be used as appropriate in the management of MGP-impacted soil and coal tar waste generated during the remedial activities.
NYSDEC Ambient Water Quality Standards and Guidance Values	Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 (6/98)	S	Provides a compilation of ambient water quality standards and guidance values for toxic and non-conventional pollutants for use in the NYSDEC programs.	These standards and guidance values are to be considered in evaluating groundwater. The surface water quality standards are not applicable since previous site investigations concluded that constituents identified in surface water from Onondaga Creek are unrelated to the site or former MGP operations.
Technical Guidance for Screening Contaminated Sediments	Division of Fish, Wildlife and Marine Resources (January 1999)	G	Describes methodology for establishing sediment criteria for the purpose of identifying sediment that potentially may impact marine and aquatic ecosystems	Not applicable. Previous site investigations support that site MGP-related constituents are identified in sediment from Onondaga Creek are unrelated to the site or former MGP operations.
Identification and Listing of Hazardous Wastes	6 NYCRR Part 371	S	Outlines criteria for determining if a solid waste is a hazardous waste and is subject to regulation under 6 NYCRR Parts 371-376.	Applicable for determining if soil generated during implementation of remedial activities are hazardous wastes. These regulations do not set cleanup standards, but are considered when developing remedial alternatives.
New York State Surface Water and Groundwater Quality Standards	6 NYCRR Part 703	S	Establishes quality standards for surface water and groundwater.	Applicable for assessing groundwater quality at the site. The surface water quality standards are not applicable since previous site investigations concluded that constituents identified in surface water from Onondaga Creek are unrelated to the site or former MGP operations.
Action-Specific SCGs				
Federal				
Occupational Safety and Health Act (OSHA) - General Industry Standards	29 CFR Part 1910	S	These regulations specify the 8-hour time-weighted average concentration for worker exposure to various compounds. Training requirements for workers at hazardous waste operations are specified in 29 CFR 1910.120.	Proper respiratory equipment will be worn if it is not possible to maintain airborne concentrations of MGP-related constituents in the breathing zone below required concentrations. Appropriate training requirements will be met for remedial workers.
OSHA - Safety and Health Standards	29 CFR Part 1926	S	These regulations specify the type of safety equipment and procedures to be followed during site remediation.	Appropriate safety equipment will be utilized on-site and appropriate procedures will be followed during remedial activities.
OSHA - Record-keeping, Reporting and Related Regulations	29 CFR Part 1904	S	These regulations outline record-keeping and reporting requirements for an employer under OSHA.	These regulations apply to the company(s) contracted to install, operate, and maintain remedial actions at hazardous waste sites.

TABLE 11
POTENTIAL CHEMICAL, ACTION, AND LOCATION-SPECIFIC STANDARDS, CRITERIA, AND GUIDANCE

NATIONAL GRID
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Regulation	Citation	Potential Standard (S) or Guidance (G)	Summary of Requirements	Applicability to the Remedial Design/Remedial Action
RCRA - Preparedness and Prevention	40 CFR Part 264.30 - 264.31	S	These regulations outline requirements for safety equipment and spill control when treating, handling and/or storing hazardous wastes.	Safety and communication equipment will be utilized at the site as necessary. Local authorities will be familiarized with the site.
RCRA - Contingency Plan and Emergency Procedures	40 CFR Part 264.50 - 264.56	S	Provides requirements for outlining emergency procedures to be used following explosions, fires, etc. when storing hazardous wastes.	Emergency and contingency plans will be developed and implemented during remedial design. Copies of the plan will be kept onsite.
CWA - Discharge to Waters of the U.S., and Section 404	40 CFR Parts 403, and 230 Section 404 (b) (1); 33 USC 1344	S	Establishes site-specific pollutant limitations and performance standards which are designed to protect surface water quality. Types of discharges regulated under CWA include: indirect discharge to a POTW, and discharge of dredged or fill material into U.S. waters.	Would apply for potential discharge of water generated by excavation dewatering and treated in a temporary onsite water treatment system.
CWA Section 401	33 U.S.C. 1341	S	Requires that 401 Water Quality Certification permit be provided to federal permitting agency (USACE) for any activity including, but not limited to, the construction or operation of facilities which may result in any discharge into jurisdictional waters of the U.S. and/or state.	Would apply for potential discharge of water generated by excavation dewatering and treated in a temporary onsite water treatment system.
90 Day Accumulation Rule for Hazardous Waste	40 CFR Part 262.34	S	Allows generators of hazardous waste to store and treat hazardous waste at the generation site for up to 90 days in tanks, containers and containment buildings without having to obtain a RCRA hazardous waste permit.	Potentially applicable to remedial alternatives that involve the storing or treating of hazardous materials onsite.
Rivers and Harbors Act, Sections 9 & 10	33 USC 401 and 403; 33 CFR Parts 320-330	S	Prohibits unauthorized obstruction or alteration of navigable waters of the U.S. (dredging, fill, cofferdams, piers, etc.). Requirements for permits affecting navigable waters of the U.S.	Not applicable. No structures anticipated in navigable waterways under the remedial alternatives.
RCRA - General Standards	40 CFR Part 264.111	S	General performance standards requiring minimization of need for further maintenance and control; minimization or elimination of post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products. Also requires decontamination or disposal of contaminated equipment, structures and soils.	Decontamination actions and facilities will be constructed for remedial activities and disassembled after completion.
Standards Applicable to Transporters of Applicable Hazardous Waste - RCRA Section 3003	40 CFR Parts 170-179, 262, and 263	S	Establishes the responsibility of off-site transporters of hazardous waste in the handling, transportation and management of the waste. Requires manifesting, recordkeeping and immediate action in the event of a discharge.	These requirements will be applicable to any company(s) contracted to transport hazardous material from the site.
United States Department of Transportation (USDOT) Rules for Transportation of Hazardous Materials	49 CFR Parts 107 and 171.1 - 172.558	S	Outlines procedures for the packaging, labeling, manifesting and transporting of hazardous materials.	These requirements will be applicable to any company(s) contracted to transport hazardous material from the site.
Clean Air Act-National Ambient Air Quality Standards	40 CFR Part 50	S	Establishes ambient air quality standards for protection of public health.	Remedial operations will be performed in a manner that minimizes the production of benzene and particulate matter.
USEPA-Administered Permit Program: The Hazardous Waste Permit Program	RCRA Section 3005; 40 CFR Part 270.124	S	Covers the basic permitting, application, monitoring and reporting requirements for off-site hazardous waste management facilities.	Any offsite facility accepting hazardous waste from the site must be properly permitted. Implementation of the site remedy will include consideration of these requirements.
Land Disposal Restrictions	40 CFR Part 268	S	Restricts land disposal of hazardous wastes that exceed specific criteria. Establishes Universal Treatment Standards (UTSs) to which hazardous waste must be treated prior to land disposal.	Excavated soils that display the characteristic of hazardous waste or that are decharacterized after generation must be treated to 90% constituent concentration reduction capped at 10 times the UTS.
RCRA Subtitle C	40 U.S.C. Section 6901 et seq.; 40 CFR Part 268	S	Restricts land disposal of hazardous wastes that exceed specific criteria. Establishes UTSs to which hazardous wastes must be treated prior to land disposal.	Potentially applicable to remedial activities that include disposal of generated waste material from the site.
New York State				
Discharges to Public Waters	New York State Environmental Conservation Law, Section 71-3503	S	Provides that a person who deposits gas tar, or the refuse of a gas house or gas factory, or offal, refuse, or any other noxious, offensive, or poisonous substances into any public waters, or into any sewer or stream running or entering into such public waters, is guilty of a misdemeanor.	During the remedial activities, MGP-impacted materials will not be deposited into public waters or sewers.
NYSDEC's Monitoring Well Decommissioning Guidelines	CP-43 Groundwater Monitoring Well Decommissioning Policy dated November 3, 2009	G	This guidance presents procedure for abandonment of monitoring wells at remediation sites.	This guidance is applicable for soil or groundwater alternatives that require the decommissioning of monitoring wells onsite.
Guidelines for the Control of Toxic Ambient Air Contaminants	DAR-1 (Air Guide 1)	G	Provides guidance for the control of toxic ambient air contaminants in New York State and outlines the procedures for evaluating sources of air pollution.	This guidance may be applicable for soil or groundwater alternatives that result in certain air emissions.
Technical Guidance for Screening Contaminated Sediments	Division of Fish, Wildlife and Marine Resources (January 1999)	G	Describes methodology for establishing sediment criteria for the purpose of identifying sediment that potentially may impact marine and aquatic ecosystems.	Not applicable. Previous site investigations support that MGP-related constituents identified in sediment from Onondaga Creek are unrelated to the site or former MGP operations.
Protection of Waters Program	New York State Environmental Conservation Law, Part 608.5	S	Requires that a permit be obtained for any excavation or placement of fill within navigable waters of the state, below the mean high water level.	Not applicable. Previous site investigations support that MGP-related constituents identified in sediment from Onondaga Creek are unrelated to the site or former MGP operations.
New York Hazardous Waste Management System - General	6 NYCRR Part 370	S	Provides definitions of terms and general instructions for the Part 370 series of hazardous waste management.	Hazardous waste is to be managed according to this regulation.

TABLE 11
POTENTIAL CHEMICAL, ACTION, AND LOCATION-SPECIFIC STANDARDS, CRITERIA, AND GUIDANCE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Regulation	Citation	Potential Standard (S) or Guidance (G)	Summary of Requirements	Applicability to the Remedial Design/Remedial Action
Identification and Listing of Hazardous Wastes	6 NYCRR Part 371	S	Outlines criteria for determining if a solid waste is a hazardous waste and is subject to regulation under 6 NYCRR Parts 371-376.	Applicable for determining if solid waste generated during implementation of remedial activities are hazardous wastes. These regulations do not set cleanup standards, but are considered when developing remedial alternatives.
Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities	6 NYCRR Part 372	S	Provides guidelines relating to the use of the manifest system and its recordkeeping requirements. It applies to generators, transporters and facilities in New York State.	This regulation will be applicable to any company(s) contracted to do treatment work at the site or to transport or manage hazardous material generated at the site.
New York Regulations for Transportation of Hazardous Waste	6 NYCRR Part 372.3 a-d	S	Outlines procedures for the packaging, labeling, manifesting and transporting of hazardous waste.	These requirements will be applicable to any company(s) contracted to transport hazardous material from the site.
Waste Transporter Permits	6 NYCRR Part 364	S	Governs the collection, transport and delivery of regulated waste within New York State.	Properly permitted haulers will be used if any waste materials are transported offsite.
NYSDEC Technical and Administrative Guidance Memorandums (TAGMs), NYSDEC Commissioner Policies (CPs), and NYSDEC Division of Environmental Remediation (DER) Program Policies	NYSDEC TAGMs, CPs, and DER Program Policies	G	NYSDEC guidance and policies that are to be considered during the remedial process.	Appropriate TAGMs, CPs, and DER program policies will be considered during the remedial process.
New York Regulations for Hazardous Waste Management Facilities	6 NYCRR Part 373.1.1 - 373.1.8	S	Provides requirements and procedures for obtaining a permit to operate a hazardous waste treatment, storage and disposal facility. Also lists contents and conditions of permits.	Any off-site facility accepting waste from the site must be properly permitted.
Land Disposal of a Hazardous Waste	6 NYCRR Part 376	S	Restricts land disposal of hazardous wastes that exceed specific criteria.	New York defers to USEPA for UTS/LDR regulations.
NYSDEC Guidance on the Management of Coal Tar Waste and Coal Tar Contaminated Soils and Sediment from Former Manufactured Gas Plants	TAGM 4061(2002)	G	Outlines the criteria for conditionally excluding coal tar waste and impacted soils from former MGPs which exhibit the hazardous characteristic of toxicity for benzene (D018) from the hazardous waste requirements of 6 NYCRR Parts 370 - 374 and 376 when destined for thermal treatment.	This guidance will be used as appropriate in the management of MGP-impacted soil and coal tar waste generated during the remedial activities.
National Pollutant Discharge Elimination System (NPDES) Program Requirements, Administered Under New York State Pollution Discharge Elimination System (SPDES)	40 CFR Parts 122 Subpart B, 125, 301, 303, and 307 (Administered under 6 NYCRR 750-758)	S	Establishes permitting requirements for point source discharges; regulates discharge of water into navigable waters including the quantity and quality of discharge.	Remedial activities may involve treatment/disposal of water. If so, water generated at the site will be managed in accordance with NYSDEC SPDES permit requirements.
NYSDEC Guidance on Green Remediation	DER-31/Green Remediation	G	Identifies the approach to remediating sites in the context of the larger environment.	This guidance will be used as appropriate evaluate practices and technologies used during implementation of the remedial activities.
Location-Specific SCGs				
Federal				
National Environmental Policy Act Executive Orders 11988 and 11990	40 CFR 6.302; 40 CFR Part 6, Appendix A	S	Requires federal agencies, where possible, to avoid or minimize adverse impact of federal actions upon wetlands/floodplains and enhance natural values of such. Establishes the "no-net-loss" of waters/wetland area and/or function policy.	Not applicable. Remedial activities are not being conducted within a floodplain or wetlands.
CWA Section 404	33 USC 1344, Section 404; 33 CFR Parts 320-330; 40 CFR Part 230	S	Discharge of dredge or fill materials into waters of the U.S., including wetlands, are regulated by the USACE.	Not applicable. No dredging or filling proposed under the remedial alternatives.
Fish and Wildlife Coordination Act	16 USC 661; 40 CFR 6.302	S	Actions must be taken to protect fish or wildlife when diverting, channeling or otherwise modifying a stream or river.	Not applicable. No diversions or channeling proposed under the remedial alternatives.
Historical and Archaeological Data Preservation Act	16 USC 469a-1	S	Provides for the preservation of historical and archaeological data that might otherwise be lost as the result of alteration of the terrain.	Not applicable. The National Register of Historic Places website indicated several historical locations in the vicinity of the site, but none of the locations were within the limits of the remedial alternatives.
National Historic and Historical Preservation Act	16 USC 470; 36 CFR Part 65; 36 CFR Part 800	S	Requirements for the preservation of historic properties.	Not applicable. The National Register of Historic Places website indicated several historical locations in the vicinity of the site, but none of the locations were within the limits of the remedial alternatives.
Rivers and Harbors Act	33 USC 401/403	S	Prohibits unauthorized obstruction or alteration of navigable waters of the U.S. (dredging, fill, cofferdams, piers, etc.). Requirement for permits affecting navigable waters of the U.S.	Not applicable. No dredging or filling proposed under the remedial alternatives.
Hazardous Waste Facility Located on a Floodplain	40 CFR Part 264.18(b)	S	Requirements for a treatment, storage and disposal (TSD) facility built within a 100-year floodplain.	Hazardous waste TSD activities (if any) will be designed to comply with applicable requirements cited in this regulation.
Endangered Species Act	16 USC 1531 et seq.; 50 CFR Part 200; 50 CFR Part 402	S	Requires federal agencies to confirm that the continued existence of any endangered or threatened species and their habitat will not be jeopardized by a site action.	Not applicable as no endangered species were identified during the previous site investigations.
Floodplains Management and Wetlands Protection	40 CFR 6 Appendix A	S	Activities taking place within floodplains and/or wetlands must be conducted to avoid adverse impacts and preserve beneficial value. Procedures for floodplain management and wetlands protection provided.	Not applicable. No remedial activities would be performed in wetlands or floodplain.

TABLE 11
POTENTIAL CHEMICAL, ACTION, AND LOCATION-SPECIFIC STANDARDS, CRITERIA, AND GUIDANCE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP
FEASIBILITY STUDY REPORT

Regulation	Citation	Potential Standard (S) or Guidance (G)	Summary of Requirements	Applicability to the Remedial Design/Remedial Action
New York State				
New York State Floodplain Management Development Permits	6 NYCRR Part 500	S	Provides conditions necessitating NYSDEC permits and provides definitions and procedures for activities conducted within floodplains.	Not applicable. Previous site investigations support that site MGP-related constituents identified in sediment from Onondaga Creek are unrelated to the site of former MGP operations.
New York State Freshwater Wetlands Act	ECL Article 24 and 71; 6 NYCRR Parts 662-665	S	Activities in wetlands areas must be conducted to preserve and protect wetlands.	Not applicable. There are no wetlands identified within the site during previous investigations.
New York State Parks, Recreation, and Historic Preservation Law	New York Executive Law Article 14;	S	Requirements for the preservation of historic properties.	Not applicable. The National Register of Historic Places website indicated several historical locations in the vicinity of the site, but none of the locations were within the limits of the remedial alternatives.
Endangered & Threatened Species of Fish and Wildlife	6 NYCRR Part 182	S	Identifies endangered and threatened species of fish and wildlife in New York.	Not applicable as no endangered species were identified during the site investigations.
New York State Coastal Management Program	Significant Fish and Wildlife Habitat Policies 7 and 8	S	Requires that a Consistency Determination be obtained for activities proposed within Significant Fish and Wildlife Habitats	Not applicable as significant habitats for fish and wildlife at the site were not identified during the site investigations.
Floodplain Management Criteria for State Projects	6 NYCRR Part 502	S	Establishes floodplain management practices for projects involving state-owned and state-financed facilities.	Not applicable. Remedial activities will not be performed in a floodplain.
Local				
Local Building Permits	N/A	S	Local authorities may require a building permit for any permanent or semi-permanent structure, such as an on-site water treatment system building or a retaining wall.	Substantive provisions are potentially applicable to remedial activities that require construction of permanent or semi-permanent structures.

TABLE 12
COST ESTIMATE FOR ALTERNATIVE SM2:
INSTITUTIONAL CONTROLS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Item #	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
Capital Costs					
1	Legal/Administrative/Institutional Controls	1	LS	$50,000	$50,000
2	Site Management Plan	1	LS	$25,000	$25,000
				Subtotal Capital Cost:	$75,000
				Administration & Engineering (10%):	$7,500
				Contingency (20%):	$15,000
				Total Capital Cost:	$97,500
Annual Operation and Maintenance (O&M) Costs for 30 Years					
3	Annual Inspection and Maintenance of Existing Fencing and Cover Materials	1	LS	$10,000	$10,000
4	Annual Inspection Report	1	LS	$3,000	$3,000
5	Verification of Institutional Controls and Notifications to NYSDEC	1	LS	$5,000	$5,000
				Subtotal O&M Cost:	$18,000
				Contingency (20%):	$3,600
				Total O&M Cost:	$21,600
				Total Present Worth Cost of O&M (30-Years @ 2%):	$484,000
				Total Estimated Cost:	**$581,500**
				Rounded To:	**$582,000**

General Notes:

1. Cost estimate is based on ARCADIS of New York's (ARCADIS) past experience and vendor estimates using 2014 dollars.
2. This estimate has been prepared for the purposes of comparing potential remedial alternatives. The information in this cost estimate is based on the available information regarding the site investigation and the anticipated scope of the remedial alternative. Changes in cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. This cost estimate is expected to be within -30% to +50% of the actual projected cost. Utilization of this cost estimate information beyond the stated purpose is not recommended. ARCADIS is not licensed to provide financial or legal consulting services; as such; this cost estimate information is not intended to be utilized for complying with financial reporting requirements associated with liability services.
3. A 2% interest rate has been assumed for the present worth analysis of all post-closure costs. Per the Office of Management and Budget website (http://www.whitehouse.gov/omb/circulars_a094/a94_appx-c/), the real discount rate as of December 2013 is 1.9% (i.e., conservatively 2%).

Assumptions:

1. Legal/administrative/institutional controls cost estimate includes all labor and materials necessary to institute deed restrictions to: (1) restrict future use of the site to commercial activities; (2) notify future property owners of the presence of MGP-related constituents in soil at the site; and (3) notify future property owners of the applicability of the site management plan.
2. Site management plan cost estimate includes all labor and materials necessary to prepare a site management plan for the site that will: (1) identify known locations of MGP-impacted soil at the site; (2) address possible future intrusive subsurface activities and identify appropriate controls and measures; and (3) set forth the inspection and maintenance activities for the fencing and cover materials (asphalt pavement, landscaping).
3. Annual inspection and maintenance of fencing and cover materials cost estimate include costs for visually inspecting the perimeter fence and ground cover materials annually and performing minor repairs that may be needed. The parking lot/driveways are anticipated to remain for the foreseeable future and retaining wall is and will continue to be required for structural support, therefore this cost estimate does not include replacement of these items as they would be performed by the building/land owner.
4. Annual inspection report includes costs to prepare a letter report summarizing the results of the annual inspections and maintenance activities performed.
5. Annual costs associated with institutional controls include verifying the status of institutional controls and preparing/submitting notification to the NYSDEC to demonstrate that the institutional controls are being maintained and remain effective.

TABLE 13
COST ESTIMATE FOR ALTERNATIVE SM3:
FOCUSED SOIL CONTAINMENT AND INSTITUTIONAL CONTROLS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Item #	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
Capital Costs					
Permitting/Surveying/Utility Clearance/Engineering Design					
1	Legal/Administrative/Institutional Controls	1	LS	$50,000	$50,000
2	Site Management Plan	1	LS	$25,000	$25,000
3	Construction Permits/Erosion and Sedimentation Plans	1	LS	$20,000	$20,000
4	Health and Safety Program	1	LS	$5,000	$5,000
5	Utility Locating and Markout	1	LS	$3,000	$3,000
6	Surveying	1	LS	$5,000	$5,000
7	Full-Scale Design	1	LS	$50,000	$50,000
8	Pre-Design Investigation/Test Boring Program	1	LS	$100,000	$100,000
Site Preparation/Construction					
9	Mobilization/Demobilization	1	LS	$41,200	$41,200
10	Parking Relocation - Facility Personnel	79	each	$255	$20,145
11	Utility Relocation	1	LS	$165,000	$165,000
12	Construction and Maintenance of Decontamination Pad	1	LS	$15,000	$15,000
13	Erosion and Sedimentation Controls	1	LS	$5,000	$5,000
14	Silt Fence	550	LF	$5	$2,750
15	Install Temporary Fencing	550	LF	$40	$22,000
16	Asphalt/Concrete Removal	9,540	SF	$1	$9,540
17	Steel Sheetpiling	921,690	lbs	$1	$921,690
18	Install and Seal Watertight Sheetpiling	38,500	SF	$50	$1,925,000
19	Concrete Pile Cap	550	LF	$115	$63,250
20	Engineered Surface Cover	9,540	SF	$10	$95,400
21	Vibration Monitoring	4	week	$1,000	$4,000
22	Dust/Vapor/Odor Monitoring and Control	4	week	$3,000	$12,000
23	Demarcation Layer	1,060	SY	$3	$3,180
24	Miscellaneous Waste Disposal	1	LS	$10,000	$10,000
Site Restoration					
25	Surface Restoration - Installation of 4" Bituminous Asphalt Base Course	353	ton	$50	$17,667
26	Surface Restoration - Installation of 2" Bituminous Asphalt Top Course	177	ton	$50	$8,833
				Subtotal Capital Cost:	$3,599,655
				Administration & Engineering (10%):	$359,966
				Project Management (10%):	$359,966
				Construction Management (10%):	$359,966
				Contingency (20%):	$719,931
				Total Capital Cost:	$5,400,000
Annual Operation and Maintenance (O&M) Costs for 30 Years					
27	Annual Inspection and Maintenance of Fencing and Cover Materials	1	LS	$10,000	$10,000
28	Annual Inspection Report	1	LS	$3,000	$3,000
29	Verification of Institutional Controls and Notifications to NYSDEC	1	LS	$5,000	$5,000
				Subtotal O&M Cost:	$18,000
				Contingency (20%):	$3,600
				Total O&M Cost:	$21,600
				Total Present Worth Cost of O&M (30-Years @ 2%):	$484,000
				Total Estimated Cost:	**$5,884,000**
				Rounded To:	**$5,890,000**

TABLE 13
COST ESTIMATE FOR ALTERNATIVE SM3:
FOCUSED SOIL CONTAINMENT AND INSTITUTIONAL CONTROLS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

General Assumptions:

1. Cost estimate is based on ARCADIS of New York's (ARCADIS) past experience and vendor estimates using 2014 dollars.
2. This estimate has been prepared for the purposes of comparing potential remedial alternatives. The information in this cost estimate is based on the available information regarding the site investigation and the anticipated scope of the remedial alternative. Changes in cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. This cost estimate is expected to be within -30% to +50% of the actual projected cost. Utilization of this cost estimate information beyond the stated purpose is not recommended. ARCADIS is not licensed to provide financial or legal consulting services; as such; this cost estimate information is not intended to be utilized for complying with financial reporting requirements associated with liability services.
3. A 2% interest rate has been assumed for the present worth analysis of all post-closure costs. Per the Office of Management and Budget website (http://www.whitehouse.gov/omb/circulars_a094/a94_appx-c/), the real discount rate as of December 2013 is 1.9% (i.e., conservatively 2%).

Assumptions:

1. Legal/administrative/institutional controls cost estimate includes all labor and materials necessary to institute deed restrictions to: (1) restrict future use of the site to commercial activities; (2) notify future property owners of the presence of MGP-related constituents in soil at the site; and (3) notify future property owners of the applicability of the site management plan.
2. Site management plan cost estimate includes all labor and materials necessary to prepare a site management plan for the site that will: (1) identify known locations of MGP-impacted soil at the site; (2) address possible future intrusive subsurface activities and identify appropriate controls and measures; and (3) set forth the inspection and maintenance activities for the fencing and cover materials (asphalt pavement, landscaping).
3. Construction permits/erosion and sedimentation plans cost estimate includes costs to obtain appropriate permits necessary for the soil mixing construction activities.
4. Health and safety program cost estimate includes labor for the development of a site-specific health and safety plan.
5. Utility location and markout cost estimate includes labor, equipment, and materials necessary to locate, identify, and markout underground utilities at the site. Cost assumes that utility location and markout would be conducted by a private utility locating company over a period of 3 days at a daily rate of $1,000 per day.
6. Surveying cost estimate includes establishing control points, base mapping, as-builts, etc.
7. Full-scale design cost estimate includes final remedial action work plan and engineering design for the full-scale soil mixing.
8. Pre-design investigation/test boring estimate includes all labor, equipment, and materials necessary to collect additional information to facilitate completion of the remedial design for this alternative, including a test boring/geotechnical program.
9. Mobilization/demobilization cost estimates includes mobilization and demobilization of labor, equipment, and material necessary to install sheetpiling and low permeability cap.
10. Parking relocation for facility personnel includes costs to relocate parking for 79 parking spaces for 3 months at a rate of $85 per month at the Washington Street Garage.
11. Utility relocation cost estimate includes the disconnection and removal of existing utilities and installation of utilities outside the containment footprint. The cost estimate includes only the known existing utilities identified on figures provided by National Grid. The utility relocation cost estimate includes mobilization/demobilization of labor, equipment and materials necessary to disconnect, remove, and install utilities. The cost estimate includes disconnection and removal of 8-inch and 12-inch diameter water/storm sewer piping (150 feet), 18-inch and 20-inch diameter gas piping (40 feet), and 8-inch diameter electric piping (340 feet). Pipe bedding (30 CY) and backfill spreading and compaction (360 CY) to grade were also included in the cost estimate. The cost estimate includes soil excavation for utilities at their relocated destination for piping less than or equal to 12-inches in diameter (300 CY) and piping greater than 12-inches (90 CY). The excavated soil was assumed to be impacted and would be disposed of at an appropriate offsite facility. The cost estimate also includes furnishing and installing 8-inch and 12-inch diameter water/storm sewer piping (195 feet), 18-inch and 20-inch diameter gas piping (40 feet), and 8-inch diameter electric piping (340 feet).
12. Construction and maintenance of decontamination pad cost estimate includes labor, equipment, and materials necessary to construct and remove a 60-foot by 30-foot decontamination pad and appurtenances. The decontamination pad would consist of 40-mil high-density polyethylene (HDPE) with a 6-inch gravel drainage layer placed over the HDPE liner, surrounded by a one-foot high berm and sloped to a collection sump for the collection of decontamination water.
13. Erosion and sedimentation controls cost estimate includes miscellaneous costs (strawbales, filter bags, etc.)
14. Silt fence cost estimate includes installation of silt fence for erosion control along the perimeter of the containment area.
15. Install temporary fencing cost estimate includes labor, equipment, and materials necessary to install and remove temporary fencing around the working area.
16. Asphalt/concrete removal cost estimate includes labor, equipment, and materials necessary to sawcut and remove the existing asphalt pavement (assumed to be 6 inches thick) overlying the area within the limits of containment.
17. Steel sheetpiling cost estimate includes the materials necessary to provide steel sheetpiling for the containment structure.
18. Install and seal watertight sheetpiling cost estimate includes labor and equipment necessary to install and seal the watertight sheetpiling. Cost estimate assumes cantilever sheetpile driving (with an embedment depth of approximately 70 feet bgs) would be utilized.

TABLE 13
COST ESTIMATE FOR ALTERNATIVE SM3:
FOCUSED SOIL CONTAINMENT AND INSTITUTIONAL CONTROLS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
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19. Concrete pile cap cost estimate includes the labor, equipment, and materials necessary to install a reinforced concrete cap along the perimeter of the sheetpile barrier wall.
20. Engineered surface cover cost estimate includes the labor, equipment, and materials necessary to install an HDPE cap over the area contained by the steel sheetpiling. The HDPE cap would include an HDPE channel to drain water that may collect on the engineered surface cover.
21. Vibration monitoring cost estimate includes equipment, labor and materials necessary to monitor vibrations resulting from excavation bracing, excavation, and ISS activities.
22. Dust/vapor/odor monitoring and control cost estimate includes equipment, labor, and materials necessary to monitor dust/vapor/odor emission during intrusive site activities. Cost estimate includes application of vapor/odor suppressing foam to excavated materials staged onsite.
23. Demarcation layer cost estimate includes labor, equipment, and materials necessary to place a woven, light-weight, non-biodegradable, high-visibility demarcation layer within the containment area (above the engineered cap).
24. Miscellaneous waste disposal cost estimate includes disposal of personal protective equipment (PPE), staging area and decontamination pad materials, and disposable equipment and materials at a facility permitted to accept the waste.
25. Surface restoration - installation of 4" bituminous asphalt base course cost estimate includes labor, equipment, and materials necessary to install a 4-inch layer (approximately 6 inches prior to compaction) of bituminous asphalt base course over 9,540 sf. The weight of the material was calculated assuming 2.0 tons per cubic yard.
26. Surface restoration - installation of 2" bituminous asphalt top course cost estimate includes labor, equipment, and materials necessary to install a 2-inch layer (approximately 3 inches prior to compaction) of bituminous asphalt top course over 9,540 sf. The weight of the material was calculated assuming 2.0 tons per cubic yard.
27. Annual inspection and maintenance of fencing and cover materials cost estimate include costs for visually inspecting the perimeter fence and ground cover materials annually and performing minor repairs that may be needed. The parking lot/driveways are anticipated to remain for the foreseeable future and retaining wall will be required for structural support, therefore this cost estimate does not include replacement of these items as they would be performed by the building/land owner.
28. Annual inspection report includes costs to prepare a letter report summarizing the results of the annual inspections and maintenance activities performed.
29. Verification of institutional controls and notifications to NYSDEC cost estimate includes verifying the status of institutional controls and preparing/submitting notification to the NYSDEC to demonstrate that the institutional controls are being maintained and remain effective.

TABLE 14
COST ESTIMATE FOR ALTERNATIVE SM4:
FOCUSED IN-SITU SOIL STABILIZATION AND INSTITUTIONAL CONTROLS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Item #	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
Capital Costs					
Permitting/Surveying/Utility Clearance/Engineering Design					
1	Legal/Administrative/Institutional Controls	1	LS	$50,000	$50,000
2	Site Management Plan	1	LS	$25,000	$25,000
3	Construction Permits/Erosion and Sedimentation Plans	1	LS	$20,000	$20,000
4	Health and Safety Program	1	LS	$5,000	$5,000
5	Utility Locating and Markout	1	LS	$3,000	$3,000
6	Surveying	1	LS	$5,000	$5,000
7	Full-Scale Design	1	LS	$75,000	$75,000
8	Pre-Design Investigation/Test Boring Program	1	LS	$120,000	$120,000
Site Preparation/Construction					
9	Treatability Testing	1	LS	$20,000	$20,000
10	Parking Relocation - Facility Personnel	79	each	$255	$20,145
11	Mobilization/Demobilization - Pre-ISS Excavation	1	LS	$20,000	$20,000
12	Mobilization/Demobilization - In-Situ Soil Mixing	1	LS	$65,000	$65,000
13	Utility Relocation	1	LS	$165,000	$165,000
14	Construction and Maintenance of Decontamination Pad	1	LS	$15,000	$15,000
15	Erosion and Sedimentation Controls	1	LS	$5,000	$5,000
16	Silt Fence	550	LF	$5	$2,750
17	Install Temporary Fencing	550	LF	$40	$22,000
18	Asphalt/Concrete Removal	9,540	SF	$1	$9,540
19	Install and Remove Temporary Excavation Bracing (Soldier Pile/Lagging Wall)	1	LS	$733,000	$733,000
20	Soil Excavation, Handling, and Screening of Excavated Materials	5,300	CY	$30	$159,000
21	Sloped Entrance to Excavation Depth for ISS Equipment	1	LS	$10,000	$10,000
22	Vibration Monitoring	9	week	$1,000	$9,000
23	Dust/Vapor/Odor Monitoring and Control	9	week	$3,000	$27,000
24	In-Situ Auger Mixing	12,400	CY	$75	$930,000
25	Mixing Water	333,700	gal.	$0.002	$667
26	Quality Control Testing	1	LS	$20,000	$20,000
27	Demarcation Layer	1,060	SY	$3	$3,180
Spoils Handling and Disposal					
28	Construction and Maintenance of Soil Staging Areas	1	LS	$20,000	$20,000
29	Solid Waste Transportation and Disposal	7,950	ton	$85	$675,750
30	Miscellaneous Waste Disposal	1	LS	$10,000	$10,000
Site Restoration					
31	Fill Importation, Placement, Compaction, and Grading	2,827	CY	$35	$98,933
32	Surface Restoration - Installation of 4" Bituminous Asphalt Base Course	353	ton	$50	$17,667
33	Surface Restoration - Installation of 2" Bituminous Asphalt Top Course	177	ton	$50	$8,833
				Subtotal Capital Cost:	$3,370,466
				Administration & Engineering (10%):	$337,047
				Project Management (10%):	$337,047
				Construction Management (10%):	$337,047
				Contingency (20%):	$674,093
				Total Capital Cost:	$5,056,000
Annual Operation and Maintenance (O&M) Costs for 30 Years					
34	Annual Inspection and Maintenance of Fencing and Cover Materials	1	LS	$10,000	$10,000
35	Annual Inspection Report	1	LS	$3,000	$3,000
36	Verification of Institutional Controls and Notifications to NYSDEC	1	LS	$5,000	$5,000
				Subtotal O&M Cost:	$18,000
				Contingency (20%):	$3,600
				Total O&M Cost:	$21,600
				Total Present Worth Cost of O&M (30-Years @ 2%):	$484,000
				Total Estimated Cost:	**$5,540,000**
				Rounded To:	**$5,540,000**

TABLE 14
COST ESTIMATE FOR ALTERNATIVE SM4:
FOCUSED IN-SITU SOIL STABILIZATION AND INSTITUTIONAL CONTROLS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

General Assumptions:

1. Cost estimate is based on ARCADIS of New York's (ARCADIS) past experience and vendor estimates using 2014 dollars.
2. This estimate has been prepared for the purposes of comparing potential remedial alternatives. The information in this cost estimate is based on the available information regarding the site investigation and the anticipated scope of the remedial alternative. Changes in cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. This cost estimate is expected to be within -30% to +50% of the actual projected cost. Utilization of this cost estimate information beyond the stated purpose is not recommended. ARCADIS is not licensed to provide financial or legal consulting services; as such; this cost estimate information is not intended to be utilized for complying with financial reporting requirements associated with liability services.
3. A 2% interest rate has been assumed for the present worth analysis of all post-closure costs. Per the Office of Management and Budget website (http://www.whitehouse.gov/omb/circulars_a094/a94_appx-c/), the real discount rate as of December 2013 is 1.9% (i.e., conservatively 2%).

Assumptions:

1. Legal/administrative/institutional controls cost estimate includes all labor and materials necessary to institute deed restrictions to: (1) restrict future use of the site to commercial activities; (2) notify future property owners of the presence of MGP-related constituents in soil at the site; and (3) notify future property owners of the applicability of the site management plan.
2. Site management plan cost estimate includes all labor and materials necessary to prepare a site management plan for the site that will: (1) identify known locations of MGP-impacted soil at the site; (2) address possible future intrusive subsurface activities and identify appropriate controls and measures; and (3) set forth the inspection and maintenance activities for the fencing and cover materials (asphalt pavement, landscaping).
3. Construction permits/erosion and sedimentation plans cost estimate includes costs to obtain appropriate permits necessary for the soil mixing construction activities.
4. Health and safety program cost estimate includes labor for the development of a site-specific health and safety plan.
5. Utility location and markout cost estimate includes labor, equipment, and materials necessary to locate, identify, and markout underground utilities at the site. Cost assumes that utility location and markout would be conducted by a private utility locating company over a period of 3 days at a daily rate of $1,000 per day.
6. Surveying cost estimate includes establishing control points, base mapping, as-builts, etc.
7. Full-scale design cost estimate includes final remedial action work plan and engineering design for the full-scale soil mixing.
8. Pre-design investigation and post excavation verification sampling cost estimate includes all labor, equipment, and materials necessary to collect additional information to facilitate completion of the remedial design for this alternative, including a test boring/geotechnical program. Cost estimate also includes collection of pre-excavation, in-situ waste characterization soil samples to evaluate handling and disposal requirements for soil following excavation. It is assumed that the potential disposal facilities would require the collection and analysis of composite waste characterization samples at a frequency of 1 sample for the first 750 tons and 1 sample per 750 tons thereafter. Analysis is assumed to be for Toxicity Characteristic Leaching Procedure (TCLP) volatile organic compounds (VOCs), TCLP semi-volatile organic compounds (SVOCs), TCLP metals, ignitability, corrosivity, reactivity, total petroleum hydrocarbons (TPH), British Thermal Units (BTU), total cyanide, total sulfur, and polychlorinated biphenyls (PCBs).
9. Treatability testing cost estimate includes treatability testing to determine the proper reagent addition to produce a homogeneous mix and workable grout mix ratio (water to solids ratio) that would satisfy the project requirements.
10. Parking relocation for facility personnel includes costs to relocate parking for 79 parking spaces for 3 months at a rate of $85 per month at the Washington Street Garage.
11. Mobilization/demobilization - pre-ISS excavation cost estimate includes mobilization and demobilization of labor, equipment, and material necessary to perform excavation of soils to 15 feet below ground surface to remove subsurface foundations and debris and to allow for bulking during ISS activities.
12. Mobilization/demobilization - in-situ soil mixing cost estimates includes mobilization and demobilization of labor, equipment, and material necessary to perform in situ soil mixing.
13. Utility relocation cost estimate includes the disconnection and removal of existing utilities and installation of utilities outside the excavation/ISS treatment footprint. The cost estimate includes only the known existing utilities identified on figures provided by National Grid. The utility relocation cost estimate includes mobilization/demobilization of labor, equipment and materials necessary to disconnect, remove, and install utilities. The cost estimate includes disconnection and removal of 8-inch and 12-inch diameter water/storm sewer piping (295 feet), 18-inch and 20-inch diameter gas piping (75 feet), and 8-inch diameter electric piping (235 feet). Pipe bedding (50 CY) and backfill spreading and compaction (570 CY) to grade were also included in the cost estimate. The cost estimate includes soil excavation for utilities at their relocated destination for piping less than or equal to 12-inches in diameter (330 CY) and piping greater than 12-inches (170 CY). The excavated soil was assumed to be impacted and would be disposed of at an appropriate offsite facility. The cost estimate also includes furnishing and installing 8-inch and 12-inch diameter water/storm sewer piping (410 feet), 18-inch and 20-inch diameter gas piping (95 feet), and 8-inch diameter electric piping (255 feet).
14. Construction and maintenance of decontamination pad cost estimate includes labor, equipment, and materials necessary to construct and remove a 60-foot by 30-foot decontamination pad and appurtenances. The decontamination pad would consist of 40-mil high-density polyethylene (HDPE) with a 6-inch gravel drainage layer placed over the HDPE liner, surrounded by a one-foot high berm and sloped to a collection sump for the collection of decontamination water.
15. Erosion and sedimentation controls cost estimate includes miscellaneous costs (strawbales, filter bags, etc.)
16. Silt fence cost estimate includes installation of silt fence for erosion control along the perimeter of the soil excavation/mixing area.

TABLE 14
COST ESTIMATE FOR ALTERNATIVE SM4:
FOCUSED IN-SITU SOIL STABILIZATION AND INSTITUTIONAL CONTROLS

NATIONAL GRID
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17. Install temporary fencing cost estimate includes labor, equipment, and materials necessary to install and remove temporary fencing around the working area.
18. Asphalt/concrete removal cost estimate includes labor, equipment, and materials necessary to sawcut and remove the existing asphalt pavement (assumed to be 6 inches thick) overlying the area within the limits of excavation/stabilization.
19. Install and remove temporary excavation bracing cost estimate includes labor, equipment, and materials necessary to install and remove temporary excavation bracing. Cost estimate assumes cantilever soldier piles spaced 6 feet apart (with an embedment depth of approximately 3.0 times the excavation depth in close proximity to Building D and the existing sheetpile/containment wall, and approximately 2.0 times the excavation depth in the remaining area) would be utilized and reinforced with lagging and tiebacks, and installation and monitoring or inclinometers.
20. Soil excavation, handling, and screening of excavated materials cost estimate includes labor, equipment, and materials necessary to excavate the top 15 feet of soil from the proposed 9,540 sf treatment area and transfer the excavated material: (1) directly into waste transport containers/vehicles for offsite transportation and disposal; and/or (2) directly into the material staging area for temporary staging prior to offsite transportation and disposal. Cost estimate is based on in-place soil volumes. It is assumed that an average of 300 CY of material will be excavated per day.
21. Sloped entrance to excavation depth for ISS equipment cost estimate includes labor, equipment, and materials necessary to excavate an entrance to the limits of the treatment area and the depth of excavation (15 feet bgs). The entrance will have a minimum slope of 4 horizontal feet to 1 foot vertical, resulting in a 60 foot long by 60 foot wide entrance to allow access for ISS equipment. It is assumed that the sloped entrance will be lined with a geotextile fabric and overlain by crusher run stone. It is also assumed that excavated material will be used to backfill the sloped excavation.
22. Vibration monitoring cost estimate includes equipment, labor and materials necessary to monitor vibrations resulting from excavation bracing, excavation, and ISS activities.
23. Dust/vapor/odor monitoring and control cost estimate includes equipment, labor, and materials necessary to monitor dust/vapor/odor emission during intrusive site activities. Cost estimate includes application of vapor/odor suppressing foam to excavated materials staged onsite.
24. In-situ auger mixing cost estimate includes labor, equipment, and materials necessary to stabilize/immobilize MGP-impacted soils using ISS technology from 15 feet below ground surface (bgs) to an average depth of 50 feet (bgs) over the proposed 9,540 sf treatment area.
25. Mixing water cost estimate includes costs to provide water to produce the slurried reagent. Costs assume that water would be obtained from onsite municipal water supply. The mixing water/additives volume is based on a 15% slurried reagent with a 1 to 1 ratio of cement to water.
26. Quality control testing cost estimate includes labor, equipment, and materials necessary to perform quality control testing of the stabilized soil to verify the achievement of the performance criteria relative to unconfined compressive strength (UCS), permeability, and synthetic precipitate leaching procedure (SPLP) polycyclic aromatic hydrocarbons (PAHs). Cost assumes that approximately 48 cores (1 core every 5 vertical mixing shafts) would be analyzed for UCS ($60 per core) and 10% of the cores (5) would be analyzed for permeability ($200 per core) and SPLP PAHs ($250 per core). Cost assumes 8 cores can be collected per day, drill/core rig and crew onsite at a rate of $1,600 per day, and an onsite observer onsite at a rate of $800 per day. Cost assumes a total of 238 mixing shafts and a 20% overlap of mixing shafts with an 8 foot auger.
27. Demarcation layer cost estimate includes labor, equipment, and materials necessary to place a woven, light-weight, non-biodegradable, high-visibility demarcation layer within the focused soil excavation/ISS area (above the solidified material and below the clean fill).
28. Construction and maintenance of soil staging areas cost estimate includes labor, equipment, and materials to construct an approximate 75-foot by 75-foot material staging area consisting of a 40-mil HDPE liner below a 12-inch sacrificial gravel fill layer with bermed sidewalls and sloped to a lined collection sump. Maintenance costs include inspecting and repairing staging area as necessary and covering staged soil with polyethylene sheeting or odor suppressing foam, as necessary.
29. Solid waste transportation and disposal cost estimate includes labor, equipment, and materials necessary to transport and dispose of excavated soils as non-hazardous waste at a permitted disposal facility. Assumes a unit weight of 1.5 tons per cubic yard.
30. Miscellaneous waste disposal cost estimate includes disposal of personal protective equipment (PPE), staging area and decontamination pad materials, and disposable equipment and materials at a facility permitted to accept the waste.
31. Fill importation, placement, compaction, and grading cost estimate includes labor, equipment, and materials necessary to import, place, compact, and grade general fill to replace excavated material. The volume of fill needed is assumed to be 8 feet over the entire stabilization area, and is calculated as 50 feet (the average depth to the bottom of the stabilized soil mass) minus the height of the stabilized soil column, including a 20% bulking factor (i.e., 35 feet x 1.2 bulking factor). Cost estimate is based on in-place soil volume.
32. Surface restoration - installation of 4" bituminous asphalt base course cost estimate includes labor, equipment, and materials necessary to install a 4-inch layer (approximately 6 inches prior to compaction) of bituminous asphalt base course over 9,540 sf. The weight of the material was calculated assuming 2.0 tons per cubic yard.
33. Surface restoration - installation of 2" bituminous asphalt top course cost estimate includes labor, equipment, and materials necessary to install a 2-inch layer (approximately 3 inches prior to compaction) of bituminous asphalt top course over 9,540 sf. The weight of the material was calculated assuming 2.0 tons per cubic yard.
34. Annual inspection and maintenance of fencing and cover materials cost estimate include costs for visually inspecting the perimeter fence and ground cover materials annually and performing minor repairs that may be needed. The parking lot/driveways are anticipated to remain for the foreseeable future and retaining wall will be required for structural support, therefore this cost estimate does not include replacement of these items as they would be performed by the building/land owner.

35. Annual inspection report includes costs to prepare a letter report summarizing the results of the annual inspections and maintenance activities performed.
36. Verification of institutional controls and notifications to NYSDEC cost estimate includes verifying the status of institutional controls and preparing/submitting notification to the NYSDEC to demonstrate that the institutional controls are being maintained and remain effective.

TABLE 15
COST ESTIMATE FOR ALTERNATIVE SM5:
LARGE SCALE STABILIZATION FOR SOIL EXCEEDING COMMERCIAL USE SOIL CLEANUP OBJECTIVES AND/OR EXHIBITING NAPL, AND INSTITUTIONAL CONTROLS

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Item #	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
Capital Costs					
Permitting/Surveying/Utility Clearance/Engineering Design					
1	Legal/Administrative/Institutional Controls	1	LS	$50,000	$50,000
2	Site Management Plan	1	LS	$25,000	$25,000
3	Construction Permits/Erosion and Sedimentation Plans	1	LS	$20,000	$20,000
4	Health and Safety Program	1	LS	$5,000	$5,000
5	Utility Locating and Markout	1	LS	$5,000	$5,000
6	Surveying	1	LS	$5,000	$5,000
7	Full-Scale Design	1	LS	$85,000	$85,000
8	Pre-Design Investigation/Test Boring Program	1	LS	$240,000	$240,000
Site Preparation/Construction					
9	Treatability Testing	1	LS	$20,000	$20,000
10	Parking Relocation for Facility Personnel	133	each	$425	$56,525
11	Loading Dock Relocation	43	week	$2,000	$86,000
12	Mobilization/Demobilization - Pre-ISS Excavation	1	LS	$55,000	$55,000
13	Mobilization/Demobilization - In-Situ Soil Mixing	1	LS	$65,000	$65,000
14	Utility Relocation	1	LS	$960,000	$960,000
15	Construction and Maintenance of Decontamination Pad	1	LS	$15,000	$15,000
16	Erosion and Sedimentation Controls	1	LS	$5,000	$5,000
17	Silt Fence	1,080	LF	$5	$5,400
18	Install Temporary Fencing	1,080	LF	$40	$43,200
19	Asphalt/Concrete Removal	46,890	SF	$1	$46,890
20	Install and Remove Temporary Excavation Bracing (Soldier Pile/Lagging Wall)	1	LS	$1,456,000	$1,456,000
21	Soil Excavation, Handling, and Screening of Excavated Materials	26,050	CY	$30	$781,500
22	Sloped Entrance to Excavation Depth for ISS Equipment	1	LS	$10,000	$10,000
23	Vibration Monitoring	43	week	$1,000	$43,000
24	Dust/Vapor/Odor Monitoring and Control	43	week	$3,000	$129,000
25	In-Situ Auger Mixing	60,800	CY	$75	$4,560,000
26	Mixing Water	1,639,900	gal.	$0.002	$3,280
27	Quality Control Testing	1	LS	$97,000	$97,000
28	Demarcation Layer	5,210	SY	$3	$15,630
Spoils Handling and Disposal					
29	Construction and Maintenance of Soil Staging Areas	1	LS	$20,000	$20,000
30	Solid Waste Transportation and Disposal	39,075	ton	$85	$3,321,375
31	Miscellaneous Waste Disposal	1	LS	$35,000	$35,000
Site Restoration					
32	Fill Importation, Placement, Compaction, and Grading	13,893	CY	$35	$486,267
33	Surface Restoration - Installation of 4" Bituminous Asphalt Base Course	1,737	ton	$50	$86,833
34	Surface Restoration - Installation of 2" Bituminous Asphalt Top Course	868	ton	$50	$43,417
				Subtotal Capital Cost:	$12,881,316
				Administration & Engineering (10%):	$1,288,132
				Project Management (10%):	$1,288,132
				Construction Management (10%):	$1,288,132
				Contingency (20%):	$2,576,263
				Total Capital Cost:	$19,322,000
Annual Operation and Maintenance (O&M) Costs for 30 Years					
35	Annual Inspection and Maintenance of Fencing and Cover Materials	1	LS	$10,000	$10,000
36	Annual Inspection Report	1	LS	$3,000	$3,000
37	Verification of Institutional Controls and Notifications to NYSDEC	1	LS	$5,000	$5,000
				Subtotal O&M Cost:	$18,000
				Contingency (20%):	$3,600
				Total O&M Cost:	$21,600
				Total Present Worth Cost of O&M (30-Years @ 2%):	$484,000
				Total Estimated Cost:	**$19,806,000**
				Rounded To:	**$19,800,000**

TABLE 15
COST ESTIMATE FOR ALTERNATIVE SM5:
LARGE SCALE STABILIZATION FOR SOIL EXCEEDING COMMERCIAL USE SOIL CLEANUP OBJECTIVES AND/OR EXHIBITING NAPL, AND INSTITUTIONAL CONTROLS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

General Notes:

1. Cost estimate is based on ARCADIS of New York's (ARCADIS) past experience and vendor estimates using 2014 dollars.
2. This estimate has been prepared for the purposes of comparing potential remedial alternatives. The information in this cost estimate is based on the available information regarding the site investigation and the anticipated scope of the remedial alternative. Changes in cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. This cost estimate is expected to be within -30% to +50% of the actual projected cost. Utilization of this cost estimate information beyond the stated purpose is not recommended. ARCADIS is not licensed to provide financial or legal consulting services; as such; this cost estimate information is not intended to be utilized for complying with financial reporting requirements associated with liability services.
3. A 2% interest rate has been assumed for the present worth analysis of all post-closure costs. Per the Office of Management and Budget website (http://www.whitehouse.gov/omb/circulars_a094/a94_appx-c/), the real discount rate as of December 2013 is 1.9% (i.e., conservatively 2%).

Assumptions:

1. Legal/administrative/institutional controls cost estimate includes all labor and materials necessary to institute deed restrictions to: (1) restrict future use of the site to commercial activities; (2) notify future property owners of the presence of MGP-related constituents in soil at the site; and (3) notify future property owners of the applicability of the site management plan.
2. Site management plan cost estimate includes all labor and materials necessary to prepare a site management plan for the site that will: (1) identify known locations of MGP-impacted soil at the site; (2) address possible future intrusive subsurface activities and identify appropriate controls and measures; and (3) set forth the inspection and maintenance activities for the fencing and cover materials (asphalt pavement, landscaping).
3. Construction permits/erosion and sedimentation plans cost estimate includes costs to obtain appropriate permits necessary for the soil mixing construction activities.
4. Health and safety program cost estimate includes labor for the development of a site-specific health and safety plan.
5. Utility location and markout cost estimate includes labor, equipment, and materials necessary to locate, identify, and markout underground utilities at the site. Cost assumes that utility location and markout would be conducted by a private utility locating company over a period of 5 days at a daily rate of $1,000 per day.
6. Surveying cost estimate includes establishing control points, base mapping, as-builts, etc.
7. Full-scale design cost estimate includes final remedial action work plan and engineering design for the full-scale soil mixing.
8. Pre-design investigation and post excavation verification sampling cost estimate includes all labor, equipment, and materials necessary to collect additional information to facilitate completion of the remedial design for this alternative, including a test boring/geotechnical program. Cost estimate also includes collection of pre-excavation, in-situ waste characterization soil samples to evaluate handling and disposal requirements for soil following excavation. It is assumed that the potential disposal facilities would require the collection and analysis of composite waste characterization samples at a frequency of 1 sample for the first 750 tons and 1 sample per 750 tons thereafter. Analysis is assumed to be for Toxicity Characteristic Leaching Procedure (TCLP) volatile organic compounds (VOCs), TCLP semi-volatile organic compounds (SVOCs), TCLP metals, ignitability, corrosivity, reactivity, total petroleum hydrocarbons (TPH), British Thermal Units (BTU), total cyanide, total sulfur, and polychlorinated biphenyls (PCBs).
9. Treatability testing cost estimate includes treatability testing to determine the proper reagent addition to produce a homogeneous mix and workable grout mix ratio (water to solids ratio) that would satisfy the project requirements.
10. Parking relocation for facility personnel includes costs to relocate parking for 133 parking spaces for 5 months at a rate of $85 per month at the Washington Street Garage.
11. Loading dock relocation cost estimate includes costs to hire two additional employees working 50 hours per week to transfer cargo from vehicles displaced by the closing of loading docks.
12. Mobilization/demobilization - pre-ISS excavation cost estimate includes mobilization and demobilization of labor, equipment, and material necessary to perform excavation of soils to 15 feet below ground surface to remove subsurface foundations and debris and to allow for bulking during ISS activities.
13. Mobilization/demobilization - in-situ soil mixing cost estimates includes mobilization and demobilization of labor, equipment, and material necessary to perform in situ soil mixing.
14. Utility relocation cost estimate includes the disconnection and removal of existing utilities and installation of utilities outside the excavation/ISS treatment footprint. The cost estimate includes only the known existing utilities identified on figures provided by National Grid. The utility relocation cost estimate includes mobilization/demobilization of labor, equipment and materials necessary to disconnect, remove, and install utilities. The cost estimate includes disconnection and removal of 8-inch and 12-inch diameter water/storm sewer piping (1,450 feet), 18-inch and 20-inch diameter gas piping (290 feet), and 8-inch diameter electric piping (1,400 feet). Pipe bedding (190 CY) and backfill spreading and compaction (2,310 CY) to grade were also included in the cost estimate. The cost estimate includes soil excavation for utilities at their relocated destination for piping less than or equal to 12-inches in diameter (1,900 CY) and piping greater than 12-inches (600 CY). The excavated soil was assumed to be impacted and would be disposed of at an appropriate offsite facility. The cost estimate also includes furnishing and installing 8-inch and 12-inch diameter water/storm sewer piping (1,635 feet), 18-inch and 20-inch diameter gas piping (260 feet), 8-inch diameter electric piping (1,365 feet), and two manholes.
15. Construction and maintenance of decontamination pad cost estimate includes labor, equipment, and materials necessary to construct and remove a 60-foot by 30-foot decontamination pad and appurtenances. The decontamination pad would consist of 40-mil high-density polyethylene (HDPE) with a 6-inch gravel drainage layer placed over the HDPE liner, surrounded by a one-foot high berm and sloped to a collection sump for the collection of decontamination water.
16. Erosion and sedimentation controls cost estimate includes miscellaneous costs (strawbales, filter bags, etc.)
17. Silt fence cost estimate includes installation of silt fence for erosion control along the perimeter of the soil excavation/mixing area.

TABLE 15
COST ESTIMATE FOR ALTERNATIVE SM5:
LARGE SCALE STABILIZATION FOR SOIL EXCEEDING COMMERCIAL USE SOIL CLEANUP OBJECTIVES AND/OR EXHIBITING NAPL, AND INSTITUTIONAL CONTROLS

NATIONAL GRID
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18. Install temporary fencing cost estimate includes labor, equipment, and materials necessary to install and remove temporary fencing around the working area.
19. Asphalt/concrete removal cost estimate includes labor, equipment, and materials necessary to sawcut and remove the existing asphalt pavement (assumed to be 6 inches thick) overlying the area within the limits of excavation/stabilization.
20. Install and remove temporary excavation bracing cost estimate includes labor, equipment, and materials necessary to install and remove temporary excavation bracing. Cost estimate assumes cantilever soldier piles spaced 6 feet apart (with an embedment depth of approximately 3.0 times the excavation depth in close proximity to the buildings and the existing sheetpile/containment wall, and approximately 2.0 times the excavation depth in the remaining area) would be utilized and reinforced with lagging and tiebacks, and installation and monitoring or inclinometers.
21. Soil excavation, handling, and screening of excavated materials cost estimate includes labor, equipment, and materials necessary to excavate the top 15 feet of soil from the proposed 46,890 sf treatment area and transfer the excavated material: (1) directly into waste transport containers/vehicles for offsite transportation and disposal; and/or (2) directly into the material staging area for temporary staging prior to offsite transportation and disposal. Cost estimate is based on in-place soil volumes. It is assumed that an average of 300 CY of material will be excavated per day.
22. Sloped entrance to excavation depth for ISS equipment cost estimate includes labor, equipment, and materials necessary to excavate an entrance to the limits of the treatment area and the depth of excavation (15 feet bgs). The entrance will have a minimum slope of 4 horizontal feet to 1 foot vertical, resulting in a 60 foot long by 60 foot wide entrance to allow access for ISS equipment. It is assumed that the sloped entrance will be lined with a geotextile fabric and overlain by crusher run stone. It is also assumed that excavated material will be used to backfill the sloped excavation.
23. Vibration monitoring cost estimate includes equipment, labor and materials necessary to monitor vibrations resulting from excavation bracing, excavation, and ISS activities.
24. Dust/vapor/odor monitoring and control cost estimate includes equipment, labor, and materials necessary to monitor dust/vapor/odor emission during intrusive site activities. Cost estimate includes application of vapor/odor suppressing foam to excavated materials staged on-site.
25. In-situ auger mixing cost estimate includes labor, equipment, and materials necessary to stabilize/immobilize MGP-impacted soils using ISS technology from 15 feet below ground surface (bgs) to an average depth of 50 feet (bgs) over the proposed 46,890 sf treatment area.
26. Mixing water cost estimate includes costs to provide water to produce the slurried reagent. Costs assume that water would be obtained from onsite municipal water supply. The mixing water/additives volume is based on a 15% slurried reagent with a 1 to 1 ratio of cement to water.
27. Quality control testing cost estimate includes labor, equipment, and materials necessary to perform quality control testing of the stabilized soil to verify the achievement of the performance criteria relative to unconfined compressive strength (UCS), permeability, and synthetic precipitate leaching procedure (SPLP) polycyclic aromatic hydrocarbons (PAHs). Cost assumes that approximately 234 cores (1 core every 5 vertical mixing shafts) would be analyzed for UCS ($60 per core) and 10% of the cores (24) would be analyzed for permeability ($200 per core) and SPLP PAHs ($250 per core). Cost assumes 8 cores can be collected per day, drill/core rig and crew onsite at a rate of $1,600 per day, and an onsite observer onsite at a rate of $800 per day. Cost assumes a total of 1,167 mixing shafts and a 20% overlap of mixing shafts with an 8 foot auger.
28. Demarcation layer cost estimate includes labor, equipment, and materials necessary to place a woven, light-weight, non-biodegradable, high-visibility demarcation layer within the soil excavation/ISS (above the solidified material and below the clean fill).
29. Construction and maintenance of soil staging areas cost estimate includes labor, equipment, and materials to construct an approximate 75-foot by 75-foot material staging area consisting of a 40-mil HDPE liner below a 12-inch sacrificial gravel fill layer with bermed sidewalls and sloped to a lined collection sump. Maintenance costs include inspecting and repairing staging area as necessary and covering staged soil with polyethylene sheeting or odor suppressing foam, as necessary.
30. Solid waste transportation and disposal cost estimate includes labor, equipment, and materials necessary to transport and dispose of excavated soils as non-hazardous waste at a permitted disposal facility.
31. Miscellaneous waste disposal cost estimate includes disposal of personal protective equipment (PPE), staging area and decontamination pad materials, and disposable equipment and materials at a facility permitted to accept the waste.
32. Fill importation, placement, compaction, and grading cost estimate includes labor, equipment, and materials necessary to import, place, compact, and grade general fill to replace excavated material. The volume of fill needed is assumed to be 8 feet over the entire stabilization area, and is calculated as 50 feet (the average depth to the bottom of the stabilized soil mass) minus the height of the stabilized soil column, including a 20% bulking factor (i.e., 35 feet x 1.2 bulking factor). Cost estimate is based on in-place soil volume.
33. Surface restoration - installation of 4" bituminous asphalt base course cost estimate includes labor, equipment, and materials necessary to install a 4-inch layer (approximately 6 inches prior to compaction) of bituminous asphalt base course over 46,890 sf. The weight of the material was calculated assuming 2.0 tons per cubic yard.
34. Surface restoration - installation of 2" bituminous asphalt top course cost estimate includes labor, equipment, and materials necessary to install a 2-inch layer (approximately 3 inches prior to compaction) of bituminous asphalt top course over 46,890 sf. The weight of the material was calculated assuming 2.0 tons per cubic yard.
35. Annual inspection and maintenance of fencing and cover materials cost estimate include costs for visually inspecting the perimeter fence and ground cover materials annually and performing minor repairs that may be needed. The parking lot/driveways are anticipated to remain for the foreseeable future and retaining wall will be required for structural support, therefore this cost estimate does not include replacement of these items as they would be performed by the building/land owner.
36. Annual inspection report includes costs to prepare a letter report summarizing the results of the annual inspections and maintenance activities performed.

37. Verification of institutional controls and notifications to NYSDEC cost estimate includes verifying the status of institutional controls and preparing/submitting notification to the NYSDEC to demonstrate that the institutional controls are being maintained and remain effective.

TABLE 16
COST ESTIMATE FOR ALTERNATIVE SM6:
EXCAVATION OF SOIL EXCEEDING UNRESTRICTED USE SOIL CLEANUP OBJECTIVES AND/OR EXHIBITING NAPL, AND INSTITUTIONAL CONTROLS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Item #	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
Capital Costs					
Permitting/Surveying/Utility Clearance/Engineering Design					
1	Legal/Administrative/Institutional Controls	1	LS	$50,000	$50,000
2	Site Management Plan	1	LS	$25,000	$25,000
3	Construction Permits/Erosion and Sedimentation Plans	1	LS	$40,000	$40,000
4	State Pollution Discharge Elimination System Permit Application & Fees	1	LS	$12,000	$12,000
5	Health and Safety Program	1	LS	$15,000	$15,000
6	Utility Locating and Markout	1	LS	$10,000	$10,000
7	Surveying	1	LS	$10,000	$10,000
8	Full-Scale Design	1	LS	$250,000	$250,000
9	Pre-Design Investigation/Test Boring Program	1	LS	$800,000	$800,000
Site Preparation/Construction					
10	Parking Relocation for Facility Personnel	186	each	$8,537	$1,587,843
11	Loading Dock Relocation	402	week	$2,000	$803,463
12	Mobilization/Demobilization	1	LS	$500,000	$500,000
13	Utility Relocation	1	LS	$1,430,000	$1,430,000
14	Construction and Maintenance of Decontamination Pad	1	LS	$71,000	$71,000
15	Open Span Structure and Air Treatment	1	LS	$3,230,000	$3,230,000
16	Erosion and Sedimentation Controls	1	LS	$10,000	$10,000
17	Silt Fence	6,810	LF	$5	$34,050
18	Install Temporary Fencing	4,540	LF	$40	$181,600
19	Asphalt/Concrete Removal	92,700	SF	$1	$92,700
20	Install Secant Retaining Wall	54,211	CY	$400	$21,684,444
21	Install Steel Reinforcements in Secant Retaining Wall	97,580	LF	$193	$18,784,150
22	Install Internal Bracing	7,319	ton	$1,000	$7,318,500
23	Construct Temporary Water Treatment System	1	LS	$2,870,000	$2,870,000
24	Temporary Water Treatment System Operation and Maintenance	93	month	$80,000	$7,440,000
25	Soil Excavation, Handling, and Screening of Excavated Materials (< 40 feet bgs)	142,519	CY	$50	$7,125,926
26	Soil Excavation, Handling, and Screening of Excavated Materials (> 40 feet bgs)	106,889	CY	$150	$16,033,333
27	Vibration Monitoring	395	week	$1,000	$395,000
28	Dust/Vapor/Odor Monitoring and Control	395	week	$3,000	$1,185,000
29	Demarcation Layer	1	LS	$30,000	$30,000
Material Handling and Disposal					
30	Soil Dewatering and Stabilization	178,148	CY	$20	$3,562,963
31	Stabilization Admixture	26,722	ton	$115	$3,073,056
32	Construction and Maintenance of Soil Staging Areas	1	LS	$81,000	$81,000
33	Solid Waste Transportation and Disposal	477,926	ton	$85	$40,623,735
34	Miscellaneous Waste Disposal	1	LS	$100,000	$100,000
Site Restoration					
35	Fill Importation, Placement, Compaction, and Grading (< 40 feet bgs)	142,519	CY	$35	$4,988,148
36	Fill Importation, Placement, Compaction, and Grading (≥ 40 feet bgs)	106,889	CY	$100	$10,688,889
37	Surface Restoration - Installation of 4" Bituminous Asphalt Base Course	3,433	ton	$50	$171,667
38	Surface Restoration - Installation of 2" Bituminous Asphalt Top Course	1,717	ton	$50	$85,833
39	Surface Restoration - Grassed Areas	4,500	SF	$1	$4,500
				Subtotal Capital Cost:	$155,398,800
				Administration & Engineering (10%):	$15,539,880
				Project Management (10%):	$15,539,880
				Construction Management (10%):	$15,539,880
				Contingency (20%):	$31,079,760
				Total Capital Cost:	$233,099,000
Annual Operation and Maintenance (O&M) Costs for 30 Years					
40	Annual Inspection and Maintenance of Fencing, and Cover Materials	1	LS	$10,000	$10,000
41	Annual Inspection Report	1	LS	$3,000	$3,000
42	Verification of Institutional Controls and Notifications to NYSDEC	1	LS	$5,000	$5,000
				Subtotal O&M Cost:	$18,000
				Contingency (20%):	$3,600
				Total O&M Cost:	$21,600
				Total Present Worth Cost of O&M (30-Years @ 2%):	$484,000
				Total Estimated Cost:	**$233,583,000**
				Rounded To:	**$234,000,000**

TABLE 16
COST ESTIMATE FOR ALTERNATIVE SM6:
EXCAVATION OF SOIL EXCEEDING UNRESTRICTED USE SOIL CLEANUP OBJECTIVES AND/OR EXHIBITING NAPL, AND INSTITUTIONAL CONTROLS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

General Notes:

1. Cost estimate is based on ARCADIS of New York's (ARCADIS) past experience and vendor estimates using 2014 dollars.
2. This estimate has been prepared for the purposes of comparing potential remedial alternatives. The information in this cost estimate is based on the available information regarding the site investigation and the anticipated scope of the remedial alternative. Changes in cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. This cost estimate is expected to be within -30% to +50% of the actual projected cost. Utilization of this cost estimate information beyond the stated purpose is not recommended. ARCADIS is not licensed to provide financial or legal consulting services; as such; this cost estimate information is not intended to be utilized for complying with financial reporting requirements associated with liability services.
3. A 2% interest rate has been assumed for the present worth analysis of all post-closure costs. Per the Office of Management and Budget website (http://www.whitehouse.gov/omb/circulars_a094/a94_appx-c/), the real discount rate as of December 2013 is 1.9% (i.e., conservatively 2%).

Assumptions:

1. Legal/administrative/institutional controls cost estimate includes all labor and materials necessary to institute deed restrictions to: (1) restrict future use of the site to commercial activities; (2) notify future property owners of the presence of MGP-related constituents in soil at the site; and (3) notify future property owners of the applicability of the site management plan.
2. Site management plan cost estimate includes all labor and materials necessary to prepare a site management plan for the site that will: (1) identify known locations of MGP-impacted soil at the site; (2) address possible future intrusive subsurface activities and identify appropriate controls and measures; and (3) set forth the inspection and maintenance activities for the fencing and cover materials (asphalt pavement, landscaping).
3. Construction permits/erosion and sedimentation plans cost estimate includes costs to obtain appropriate permits necessary for the soil excavation construction activities.
4. State pollutant discharge elimination system permit application & fees costs includes all labor and materials necessary to acquire and pay for a State Pollution Discharge Elimination System (SPDES) permit for discharge into the Onondaga Creek.
5. Health and safety program cost estimate includes labor for the development of a site-specific health and safety plan.
6. Utility location and markout cost estimate includes labor, equipment, and materials necessary to locate, identify, and markout underground utilities at the site. Cost assumes that utility location and markout would be conducted by a private utility locating company over a period of 10 days at a daily rate of $1,000 per day.
7. Surveying cost estimate includes establishing control points, base mapping, as-builts, etc.
8. Full-scale design cost estimate includes final remedial action work plan and engineering design for the full-scale soil excavation.
9. Pre-design investigation/test boring program cost estimate includes labor, equipment, and materials necessary to collect additional information to facilitate completion of the remedial design for this alternative, including a test boring/geotechnical program. Cost estimate also includes collection of pre-excavation and in-situ waste characterization soil samples to evaluate handling and disposal requirements for soil following excavation. It is assumed that the potential disposal facilities would require the collection and analysis of composite waste characterization samples at a frequency of 1 sample per 750 tons. Analysis is assumed to be for Toxicity Characteristic Leaching Procedure (TCLP) volatile organic compounds (VOCs), TCLP semi-volatile organic compounds (SVOCs), TCLP metals, ignitability, corrosivity, reactivity, total petroleum hydrocarbons (TPH), British Thermal Units (BTU), total cyanide, total sulfur, and polychlorinated biphenyls (PCBs).
10. Parking relocation for facility personnel includes costs to relocate parking for 186 parking spaces for 118 months at a rate of $85 per month at the Washington Street Garage.
11. Loading dock relocation cost estimate includes costs to hire two additional employees working 50 hours per week to transfer cargo from vehicles displaced by the closing of loading docks.
12. Mobilization/demobilization cost estimate includes mobilization and demobilization of labor, equipment, and material necessary to install and demolish a temporary reinforced slurry wall and perform excavation of soils to 70 feet below ground surface.
13. Utility relocation cost estimate includes the disconnection and removal of existing utilities and installation of utilities outside the excavation footprint. The cost estimate includes only the known existing utilities identified on figures provided by National Grid. The utility relocation cost estimate includes mobilization/demobilization of labor, equipment and materials necessary to disconnect, remove, and install utilities. The cost estimate includes disconnection and removal of 8-inch and 12-inch diameter water/storm sewer/sanitary sewer piping (1,610 feet), 18-inch and 20-inch diameter gas piping (485 feet), 8-inch diameter electric piping (1,400 feet), and 6-inch diameter telecommunications piping (180 feet). Pipe bedding (310 CY) and backfill spreading and compaction (3,930 CY) to grade were also included in the cost estimate. The cost estimate includes soil excavation for utilities at their relocated destination for piping less than or equal to 12-inches in diameter (2,500 CY) and piping greater than 12-inches (1,740 CY). The excavated soil was assumed to be impacted and would be disposed of at an appropriate offsite facility. The cost estimate also includes furnishing and installing 8-inch and 12-inch diameter water/storm sewer piping (1,985 feet), 18-inch and 20-inch diameter gas piping (800 feet), 8-inch diameter electric piping (1,365 feet), 6-inch diameter telecommunications piping (250 feet), and two manholes.
14. Construction and maintenance of decontamination pad cost estimate includes labor, equipment, and materials necessary to construct and remove a 60-foot by 30-foot decontamination pad and appurtenances. The decontamination pad would consist of 40-mil high-density polyethylene (HDPE) with a 6-inch gravel drainage layer placed over the HDPE liner, surrounded by a one-foot high berm and sloped to a collection sump for the collection of decontamination water.
15. Open span structure and air treatment cost estimate includes rental of an approximately 100-foot by 100-foot Sprung-type structure to enclose the excavation area on the former MGP. Cost estimate assumes structure is equipped with overhead doors for truck and excavator access. Final structure construction details to be determined as part of the remedial design.
16. Erosion and sedimentation controls cost estimate includes miscellaneous costs (strawbales, filter bags, etc.)
17. Silt fence cost estimate includes installation of silt fence for erosion control along the perimeter of the soil excavation area.
18. Install temporary fencing cost estimate includes labor, equipment, and materials necessary to install and remove temporary fencing around the working area.
19. Asphalt/concrete removal cost estimate includes labor, equipment, and materials necessary to sawcut and remove the existing asphalt pavement (assumed to be 6 inches thick) overlying the area within the limits of excavation.

20. Install secant retaining wall cost estimate includes labor, equipment, and materials necessary to serve as excavation support for deep excavations. Estimate assumes that secant wall with be installed by jet grouting 2.5-feet diameter columns to lithology with a low hydraulic conductivity (170 feet below ground surface). Cost estimate also assumes the grout columns overlap by 20%. Final excavation support system to be determined as part of the remedial design.
21. Install steel reinforcements in secant retaining wall cost estimate includes labor, equipment, and materials necessary to serve as excavation support reinforcement for deep excavations. Estimate includes cost for steel H-piles with a weight of 150 pounds per foot to be installed to 170 feet bgs within wet slurry to serve as additional excavation support. Cost estimate assumes that H-piles will be installed in half of the columns (e.g., every second column). Final excavation support system to be determined as part of the remedial design.
22. Install internal bracing cost estimate includes labor, equipment, and materials necessary to serve as internal excavation support reinforcement for deep excavations.
23. Construct temporary water treatment system cost estimate includes labor, equipment, and materials required to install sumps within excavation areas and purchase and install a temporary water treatment system capable of operating at 1,000 gallons-per-minute to dewater excavation areas (to the extent practicable). Some excavation activities may be performed "in the wet". Cost estimate assumes water treatment system includes a pre-engineered fabricated building, lights, heaters, ventilation, pumps, influent piping and hoses, sand filtration system, frac tank, carbon filters, discharge piping and hoses, and instrumentation and controls. Cost assumes water will be treated and discharged to nearby Onondaga Creek under a SPDES permit. Cost also assumes no water treatment for chloride.
24. Temporary water treatment system operation and maintenance cost estimate includes labor and materials required to operate and maintain the water treatment system. Final structure construction details to be determined as part of the remedial design.
25. Soil excavation, handling, and screening of excavated materials (< 40 feet bgs) cost estimate includes labor, equipment, and materials necessary to excavate soil to 40 feet bgs from the proposed 96,200 sf area and transfer the excavated material: (1) directly into waste transport containers/vehicles for offsite transportation and disposal; and/or (2) directly into the material staging area for temporary staging prior to offsite transportation and disposal. Estimate assumes that removal activities would be completed using conventional equipment to facilitate soil removal. Cost estimate is based on in-place soil volumes. It is assumed that an average of 300 CY of material will be excavated per day.Cost estimate is conservatively high to be inclusive of ancillary excavation costs (e.g., survey) and based on the likely presence of former MGP structures and other subsurface obstructions located within the excavation areas.
26. Soil excavation, handling, and screening of excavated materials (> 40 feet bgs) cost estimate includes labor, equipment, and materials necessary to excavate soil from 40 to 70 feet bgs from the proposed 96,200 sf area and transfer the excavated material: (1) directly into waste transport containers/vehicles for offsite transportation and disposal; and/or (2) directly into the material staging area for temporary staging prior to offsite transportation and disposal. Estimate assumes that removal activities would be completed using cranes or other similar equipment to facilitate deep soil removal. Cost estimate is based on in-place soil volumes. It is assumed that an average of 250 CY of material will be excavated per day. Cost estimate is conservatively high to be inclusive of ancillary excavation costs (e.g., survey) and based on the likely presence of former MGP structures and other subsurface obstructions located within the excavation areas.
27. Vibration monitoring cost estimate includes equipment, labor and materials necessary to monitor vibrations resulting from excavation activities.
28. Dust/vapor/odor monitoring and control cost estimate includes equipment, labor, and materials necessary to monitor dust/vapor/odor emission during intrusive site activities. Cost estimate includes application of vapor/odor suppressing foam to excavated materials staged on-site.
29. Demarcation layer cost estimate includes labor, equipment, and materials necessary to place a woven, light-weight, non-biodegradable, high-visibility demarcation layer where the soil excavation is limited due to the presence of structures.
30. Soil dewatering and stabilization cost estimate includes the on-site handling of material excavated below the water table (20 to 70 feet bgs). Cost estimate assumes that any water generated in association with soil management will be treated by the temporary water treatment system.
31. Soil stabilization admixture cost estimate includes the the purchase and importation of stabilizing agents to amend material excavated from the below the water table. Cost estimate assumes stabilization admixture (e.g., Portland cement) will be added at ratio of 10% of the weight of material to be stabilized.
32. Construction and maintenance of soil staging areas cost estimate includes labor, equipment, and materials to construct an approximate 75-foot by 75-foot material staging area consisting of a 40-mil HDPE liner below a 12-inch sacrificial gravel fill layer with bermed sidewalls and sloped to a lined collection sump. Maintenance costs include inspecting and repairing staging area as necessary and covering staged soil with polyethylene sheeting or odor suppressing foam, as necessary.
33. Solid waste transportation and disposal cost estimate includes labor, equipment, and materials necessary to transport and dispose of excavated materials as non-hazardous waste at a permitted disposal facility.
34. Miscellaneous waste disposal cost estimate includes disposal of personal protective equipment (PPE), staging area and decontamination pad materials, and disposable equipment and materials at a facility permitted to accept the waste.
35. Fill importation, placement, compaction, and grading (< 40 feet bgs) cost estimate includes labor, equipment, and materials necessary to import, place, compact, and grade general fill to replace excavated material. Cost estimate is based on in-place soil volume. Cost estimate assumes 95% compaction based on standard proctor testing and includes survey verification and compaction testing.
36. Fill importation, placement, compaction, and grading (> 40 feet bgs) cost estimate includes labor, equipment, and materials necessary to import, place, compact, and grade general fill to replace excavated material. Cost estimate is based on in-place soil volume. Cost estimate assumes 95% compaction based on standard proctor testing and includes survey verification and compaction testing.
37. Surface restoration - installation of 4" bituminous asphalt base course cost estimate includes labor, equipment, and materials necessary to install a 4-inch layer (approximately 6 inches prior to compaction) of bituminous asphalt base course over 92,700 sf. The weight of the material was calculated assuming 2.0 tons per cubic yard.
38. Surface restoration - installation of 2" bituminous asphalt top course cost estimate includes labor, equipment, and materials necessary to install a 2-inch layer (approximately 3 inches prior to compaction) of bituminous asphalt top course over 92,700 sf. The weight of the material was calculated assuming 2.0 tons per cubic yard.
39. Surface restoration of grassed areas includes labor, equipment, and materials necessary to return surface to original condition (i.e, seed vegetated areas).

40. Annual inspection and maintenance of fencing and cover materials cost estimate include costs for visually inspecting the perimeter fence and ground cover materials annually and performing minor repairs that may be needed. The parking lot/driveways are anticipated to remain for the foreseeable future and retaining wall will be required for structural support, therefore this cost estimate does not include replacement of these items as they would be performed by the building/land owner.
41. Annual inspection report includes costs to prepare a letter report summarizing the results of the annual inspection and maintenance activities performed.
42. Verification of institutional controls and notifications to NYSDEC cost estimate includes verifying the status of institutional controls and preparing/submitting notification to the NYSDEC to demonstrate that the institutional controls are being maintained and remain effective.

TABLE 17
COST ESTIMATE FOR ALTERNATIVE GW2:
MONITORED NATURAL ATTENUATION AND INSTITUTIONAL CONTROLS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Item #	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
Capital Costs					
1	Legal/Administrative/Institutional Controls	1	LS	$50,000	$50,000
2	Site Management Plan	1	LS	$25,000	$25,000
3	Install DNAPL Recovery Wells	3	each	$8,000	$24,000
4	Quarterly DNAPL Gauging/Recovery	4	event	$2,000	$8,000
5	Reporting	1	LS	$5,000	$5,000
6	Miscellaneous Waste Disposal	1	LS	$5,000	$5,000
				Subtotal Capital Cost:	$117,000
				Administration & Engineering (10%):	$11,700
				Project Management (10%):	$11,700
				Contingency (20%):	$23,400
				Total Capital Cost:	$163,800
Annual Operation and Maintenance (O&M) Costs for Years 2 - 5					
7	Semi-Annual DNAPL Gauging/Recovery	2	event	$2,000	$4,000
8	Annual Groundwater Sampling Labor and Expenses	1	event	$20,000	$20,000
9	Lab Analytical	2	event	$5,000	$10,000
10	Reporting	1	LS	$11,000	$11,000
11	Verification of Institutional Controls and Notifications to NYSDEC	1	LS	$1,000	$1,000
				Subtotal O&M Cost for Years 2-5:	$46,000
				Contingency (20%):	$9,200
				Total O&M Cost for Years 2-5:	$55,200
				Total Present Worth Cost of O&M (Years 2-5 @ 5%):	$187,000
Annual Operation and Maintenance (O&M) Costs for Years 6 - 30					
12	DNAPL Gauging/Recovery and Groundwater Sampling Labor and Expenses (Annual)	1	event	$20,000	$20,000
13	Lab Analytical	1	event	$5,000	$5,000
14	Reporting	1	LS	$11,000	$11,000
15	Verification of Institutional Controls and Notifications to NYSDEC	1	LS	$1,000	$1,000
				Subtotal O&M Cost for Years 6-30:	$37,000
				Contingency (20%):	$7,400
				Total O&M Cost for Years 6-30:	$44,400
				Total Present Worth Cost of O&M (Years 6-30 @ 2%):	$786,000
				Total Estimated Cost:	**$1,136,800**
				Rounded To:	**$1,140,000**

General Notes:

1. Cost estimate is based on ARCADIS of New York's (ARCADIS) past experience and vendor estimates using 2014 dollars.
2. This estimate has been prepared for the purposes of comparing potential remedial alternatives. The information in this cost estimate is based on the available information regarding the site investigation and the anticipated scope of the remedial alternative. Changes in cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. This cost estimate is expected to be within -30% to +50% of the actual projected cost. Utilization of this cost estimate information beyond the stated purpose is not recommended. ARCADIS is not licensed to provide financial or legal consulting services; as such; this cost estimate information is not intended to be utilized for complying with financial reporting requirements associated with liability services.
3. A 2% interest rate has been assumed for the present worth analysis of all post-closure costs. Per the Office of Management and Budget website (http://www.whitehouse.gov/omb/circulars_a094/a94_appx-c/), the real discount rate as of December 2013 is 1.9% (i.e., conservatively 2%).

Assumptions:

1. Legal/administrative/institutional controls cost estimate includes labor and materials necessary to institute deed restrictions to: (1) restrict future use of site groundwater beneath the site; (2) notify future property owners of the presence of MGP-related constituents in groundwater at the site; and (3) notify future property owners of the applicability of the site management plan.

2. Site management plan cost estimate includes all labor and materials necessary to prepare a site management plan for the site that will: (1) identify known locations of MGP-impacted soil at the site; (2) address possible future intrusive subsurface activities and identify appropriate controls and measures; and (3) set forth the inspection and maintenance activities for the fencing and cover materials (asphalt pavement, landscaping).
3. Install DNAPL recovery wells cost estimate includes labor, materials, and equipment necessary to install dense non-aqueous phase liquid (DNAPL) recovery wells. Cost estimate assumes the 4-inch diameter DNAPL recovery wells with polyvinyl chloride (PVC) casing will be installed up to 60 feet below ground surface with 2 foot sump.
4. Quarterly DNAPL gauging/recovery cost estimate includes labor, equipment, and materials necessary to conduct quarterly DNAPL gauging/recovery. This cost estimate also includes containerizing groundwater and NAPL (if present) waste materials generated during the gauging/recovery activities. This cost estimate also includes transportation of the containerized liquid waste for disposal as a non-hazardous waste at an appropriate treatment/disposal facility.
5. Reporting cost estimate includes labor required to prepare a report summarizing the results of the gauging/recovery activities.
6. Miscellaneous waste disposal cost estimate includes disposal of soil cuttings, personal protective equipment (PPE), staging area and decontamination pad materials, and disposable equipment and materials at a facility permitted to accept the waste.
7. Semi-annual DNAPL gauging/recovery cost estimate includes labor, equipment, and materials necessary to conduct semi-annual DNAPL gauging/recovery. This cost estimate also includes containerizing groundwater and NAPL (if present) waste materials generated during the gauging/recovery activities. This cost estimate also includes transportation of the containerized liquid waste for disposal as a non-hazardous waste at an appropriate treatment/disposal facility.

8-9. Annual groundwater sampling labor and expenses (semi-annual) cost estimate includes labor, equipment, and materials necessary to conduct an annual sampling event and analyze groundwater samples. This cost estimate also includes containerizing groundwater and NAPL (if present) waste materials generated during the sampling activities. This cost estimate also includes transportation of the containerized liquid waste for disposal as a non-hazardous waste at an appropriate treatment/disposal facility.

10. Reporting cost estimate includes labor required to prepare a report summarizing the results of the gauging/recovery and groundwater sampling activities.
11. Verification of institutional controls and notifications to NYSDEC cost estimate includes verifying the status of institutional controls and preparing/submitting notification to the NYSDEC to demonstrate that the institutional controls are being maintained and remain effective.

12-14. DNAPL gauging/recovery and groundwater sampling labor and expenses (annual) cost estimate includes labor, equipment, and materials necessary to conduct annual sampling events, analyze groundwater samples, and prepare an annual groundwater monitoring report to summarize the results of the groundwater monitoring activities. This cost estimate also includes containerizing groundwater and NAPL (if present) waste materials generated during the sampling activities. This cost estimate also includes transportation of the containerized liquid waste for disposal as a non-hazardous waste at an appropriate treatment/disposal facility.

15. Verification of institutional controls and notifications to NYSDEC cost estimate includes verifying the status of institutional controls and preparing/submitting notification to the NYSDEC to demonstrate that the institutional controls are being maintained and remain effective.

TABLE 18
COST ESTIMATE FOR ALTERNATIVE GW3:
ENHANCED BIOREMEDIATION AND INSTITUTIONAL CONTROLS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Item #	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
Permitting / Surveying / Utility Clearance / Engineering Design					
1	Legal/Administrative/Institutional Controls	1	LS	$50,000	$50,000
2	Site Management Plan	1	LS	$25,000	$25,000
3	Health and Safety Program	1	LS	$5,000	$5,000
4	Utility Locating and Markout	1	LS	$3,000	$3,000
5	Surveying	1	LS	$5,000	$5,000
6	Bench-Scale Testing - Biotrap Field Sampling	1	LS	$30,000	$30,000
7	Tracer Testing	1	LS	$35,000	$35,000
8	Pilot Testing	1	LS	$80,000	$80,000
9	Full-Scale Design	1	LS	$60,000	$60,000
10	Construction Permits/Erosion and Sedimentation Plans	1	LS	$10,000	$10,000
11	Injection Permit	1	LS	$15,000	$15,000
Sulfate Injection Treatment System					
12	Monitoring Well Installation	2	each	$2,000	$4,000
13	Application Well Installation	17	each	$5,000	$85,000
14	Monitoring and Application Well Installation Oversight	10	days	$1,000	$10,000
15	Well Vault	17	each	$550	$9,350
16	Soil Cutting Disposal	29	drum	$400	$11,600
17	Waste Characterization	1	each	$600	$600
18	Injection Manifold	1	LS	$15,000	$15,000
19	Remediation System Construction	5	days	$2,000	$10,000
20	Oversight of Injection System Startup	10	days	$2,000	$20,000
21	Subcontractor Support of Injection System Startup	10	days	$1,500	$15,000
				Subtotal Capital Cost:	$498,550
				Administration and Engineering (10%):	$49,855
				Construction Management (10%):	$49,855
				Project Management (10%):	$49,855
				Contingency (20%):	$99,710
				Total Capital Cost:	$748,000
Annual Operation and Maintenance (O&M) Costs for Years 1-5					
22	Groundwater Sampling Labor and Expenses (Quarterly)	4	event	$20,000	$80,000
23	Lab Analytical	4	event	$5,000	$20,000
24	Reporting	1	LS	$11,000	$11,000
25	Verification of Institutional Controls and Notifications to NYSDEC	1	LS	$1,000	$1,000
26	Magnesium Sulfate	104,000	pound	$0.17	$17,784
27	Municipal Water Supply	748,000	gallons	$0.002	$1,496
28	Miscellaneous Field Expenses	1	LS	$4,000	$4,000
29	Injection Labor and Oversight	60	days	$1,600	$96,000
30	System Repair and Well Redevelopment	1	LS	$5,000	$5,000
31	Remedial System Data Evaluation and Reporting	1	LS	$12,000	$12,000
				Subtotal O&M Cost for Years 1-5:	$248,280
				Project Management (10%):	$24,828
				Contingency (20%):	$49,656
				Total O&M Cost for Years 1-5:	$322,764
				Total Present Worth Cost of O&M (Years 1-5 @ 5%):	$1,398,000
Annual Operation and Maintenance (O&M) Costs for Years 6-30					
32	Groundwater Sampling Labor and Expenses (Annual)	1	event	$20,000	$20,000
33	Lab Analytical	1	event	$5,000	$5,000
34	Reporting	1	LS	$11,000	$11,000
35	Verification of Institutional Controls and Notifications to NYSDEC	1	LS	$1,000	$1,000
36	Magnesium Sulfate	104,000	pound	$0.17	$17,784
37	Municipal Water Supply	748,000	gallons	$0.002	$1,496
38	Miscellaneous Field Expenses	1	LS	$4,000	$4,000
39	Injection Labor and Oversight	60	days	$1,600	$96,000

TABLE 18
COST ESTIMATE FOR ALTERNATIVE GW3:
ENHANCED BIOREMEDIATION AND INSTITUTIONAL CONTROLS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Item #	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
40	System Repair and Well Redevelopment	1	LS	$5,000	$5,000
41	Remedial System Data Evaluation and Reporting	1	LS	$12,000	$12,000
				Subtotal O&M Cost for Years 6-30:	$173,280
				Project Management (10%):	$17,328
				Contingency (20%):	$34,656
				Total O&M Cost for Years 6-30:	$225,264
				Total Present Worth Cost of O&M (Years 6-30 @ 5%):	$3,984,000
				Total Estimated Cost:	**$6,130,000**
				Rounded To:	**$6,130,000**

General Notes:
1. Cost estimate is based on ARCADIS of New York's (ARCADIS) past experience and vendor estimates using 2014 dollars.
2. This estimate has been prepared for the purposes of comparing potential remedial alternatives. The information in this cost estimate is based on the available information regarding the site investigation and the anticipated scope of the remedial alternative. Changes in cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. This cost estimate is expected to be within -30% to +50% of the actual projected cost. Utilization of this cost estimate information beyond the stated purpose is not recommended. ARCADIS is not licensed to provide financial or legal consulting services; as such; this cost estimate information is not intended to be utilized for complying with financial reporting requirements associated with liability services.
3. A 2% interest rate has been assumed for the present worth analysis of all post-closure costs. Per the Office of Management and Budget website (http://www.whitehouse.gov/omb/circulars_a094/a94_appx-c/), the real discount rate as of December 2013 is 1.9% (i.e., conservatively 2%).

Assumptions:
1. Legal/administrative/institutional controls cost estimate includes all labor and materials necessary to institute deed restrictions to: (1) restrict future use of site groundwater beneath the site; (2) notify future property owners of the presence of MGP-related constituents in groundwater at the site; and (3) notify future property owners of the applicability of the site management plan.
2. Site management plan cost estimate includes all labor and materials necessary to prepare a site management plan for the site that will: (1) identify known locations of MGP-impacted soil at the site; (2) address possible future intrusive subsurface activities and identify appropriate controls and measures; and (3) set forth the inspection and maintenance activities for the fencing and cover materials (asphalt pavement, landscaping).
3. Health and safety program cost estimate includes labor for the development of a site-specific health and safety plan.
4. Utility location and markout cost estimate includes labor, equipment, and materials necessary to locate, identify, and markout underground utilities at the site. Cost assumes that utility location and markout would be conducted by a private utility locating company over a period of 3 days at a daily rate of $1,000 per day.
5. Surveying cost estimate includes establishing control points, base mapping, as-builts, etc.
6. Bench-scale testing - biotrap field sampling cost estimate includes labor, equipment, and materials necessary to complete bench-scale studies using biotraps to evaluate the potential comparative effectiveness of aerobic and anaerobic treatment and the implications of total dissolved solids and salinity on treatment. Includes preparing a letter report summarizing the results of the bench-scale studies and providing recommendations for the pilot study.
7. Tracer testing cost estimate includes labor, equipment, and materials necessary to complete tracer testing to further assess site hydrogeology and aquifer hydraulics in the vicinity of proposed treatment area. Includes well drilling, test implementation, equipment rental, laboratory analytical, data analysis and evaluation, and preparing a letter report summarizing the results of the tracer testing and providing further data for design of the pilot system.
8. Pilot testing cost estimate includes labor, equipment, and materials necessary to evaluate the treatments identified in the bench-scale testing that have the potential to be most effective. The pilot study would evaluate the potential for implementing the treatments full-scale at the site. Includes well drilling, equipment rental, laboratory analytical, data analysis and evaluation, and preparing a letter report summarizing the results of the pilot study and providing recommendations for the full scale treatment.
9. Full-scale design cost estimate includes labor for final remedial action work plan and engineering design to be conducted following the completion of the treatability and bench-scale testing.
10. Construction permits/erosion and sedimentation plans cost estimate includes costs to obtain appropriate permits necessary for the enhanced bioremediation system construction activities.
11. Injection permit cost estimate includes costs to obtain appropriate permits necessary for the injection of a sulfate compound into the aquifer.
12. Monitoring well installation includes labor, equipment, and materials necessary to install monitoring wells. The monitoring wells will be completed with a 2-inch diameter 20-foot polyvinyl chloride (PVC) screen. Assumes the monitoring wells will be installed in pairs and will include a shallow and deep well.

TABLE 18
COST ESTIMATE FOR ALTERNATIVE GW3:
ENHANCED BIOREMEDIATION AND INSTITUTIONAL CONTROLS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

13. Application well installation includes labor, equipment, and materials necessary to install application wells. The application wells will be completed to a depth of approximately 90 feet with a 2-inch diameter 20-foot stainless steel screen. Assumes the application well spacing is approximately 30 feet and two wells have been installed for the bench-scale testing, tracer testing, and pilot testing.
14. Monitoring and application well installation oversight cost estimate includes labor necessary for well drilling oversight activities. Assumes 2 to 3 wells can be completed per day.
15. Well vault cost estimate includes labor, equipment, and materials necessary to install well vault and instrumentation for application wells.
16. Soil cutting disposal cost estimate includes labor, equipment, and materials to transport and dispose of soil cuttings as a non-hazardous waste at a permitted disposal facility. Assumes soil cuttings from each well requires 1.5 55-gallon drums.
17. Waste characterization cost estimate includes laboratory analysis of a composite sample collected from soil cuttings from monitoring and application well construction activities for disposal purposes.
18. Injection manifold cost estimate includes the cost to furnish in-line mixing, hosing, fittings, and appurtenant equipment required for application of sulfate.
19. Remediation system construction cost estimate includes labor and equipment necessary to install the components of the sulfate injection systems, which includes, but is not limited to, installation of the injection manifold components.
20. Oversight of injection system startup cost estimate includes labor for engineering oversight during injection system startup.
21. Subcontractor support of injection system startup cost estimate includes labor for subcontractor support during injection system startup.

22-24. Groundwater sampling labor and expenses (quarterly) cost estimate includes labor, equipment, and materials necessary to conduct quarterly sampling events, analyze groundwater samples, and prepare an annual groundwater monitoring report to summarize the results of the groundwater monitoring activities. This cost estimate also includes containerizing groundwater and NAPL (if present) waste materials generated during the sampling activities. This cost estimate also includes transportation of the containerized liquid waste for disposal as a non-hazardous waste at an appropriate treatment/disposal facility. The sampling frequency for years 1-5 is assumed to be quarterly, and is subject to change based on the Remedial Design.

25. Verification of institutional controls and notifications to NYSDEC cost estimate includes verifying the status of institutional controls and preparing/submitting notification to the NYSDEC to demonstrate that the institutional controls are being maintained and remain effective.
26. Magnesium sulfate cost estimate includes cost to furnish magnesium sulfate for 4 quarterly injection events.
27. Municipal water supply cost estimate includes costs to provide water to produce a diluted sulfate mixture for 4 quarterly injection events. Costs assume that water would be obtained from onsite municipal water supply. The mixture volume is based on a 1.5% sulfate concentration by volume, or 5 grams of sulfate per liter of water.
28. Miscellaneous field expenses cost estimate includes furnishing personal protective equipment (PPE), equipment, and materials required for 4 quarterly injection events.
29. Injection labor and oversight includes labor associated with injection of sulfate for 4 quarterly injection events. Assumes each injection event requires 15 days. The injection duration is based on a 1.5 gallon per minute injection rate. The actual injection rate may vary.
30. System repair and well redevelopment cost estimate includes labor and materials for injection system repair and monitoring and application well redevelopment.
31. Remedial system data evaluation and reporting cost estimate includes labor for data reduction, preparing a report summarizing the remedial system data, and communicating with regulatory agencies.

32-34. Groundwater sampling labor and expenses (annual) cost estimate includes labor, equipment, and materials necessary to conduct annual sampling events, analyze groundwater samples, and prepare an annual groundwater monitoring report to summarize the results of the groundwater monitoring activities. This cost estimate also includes containerizing groundwater and NAPL (if present) waste materials generated during the sampling activities. This cost estimate also includes transportation of the containerized liquid waste for disposal as a non-hazardous waste at an appropriate treatment/disposal facility. The sampling frequency for years 6-30 is assumed to be annual, and is subject to change based on the Remedial Design.

35. Verification of institutional controls and notifications to NYSDEC cost estimate includes verifying the status of institutional controls and preparing/submitting notification to the NYSDEC to demonstrate that the institutional controls are being maintained and remain effective.
36. Magnesium sulfate cost estimate includes cost to furnish magnesium sulfate for 4 quarterly injection events.
37. Municipal water supply cost estimate includes costs to provide water to produce a diluted sulfate mixture for 4 quarterly injection events. Costs assume that water would be obtained from onsite municipal water supply. The mixture volume is based on a 1.5% sulfate concentration by volume, or 5 grams of sulfate per liter of water.
38. Miscellaneous field expenses cost estimate includes furnishing PPE, equipment, and materials required for 4 quarterly injection events.
39. Injection labor and oversight includes labor associated with injection of sulfate for 4 quarterly injection events. Assumes each injection event requires 15 days. The injection duration is based on a 1.5 gallon per minute injection rate. The actual injection rate may vary.
40. System repair and well redevelopment cost estimate includes labor and materials for injection system repair and monitoring and application well redevelopment.

41. Remedial system data evaluation and reporting cost estimate includes labor for data reduction, preparing a report summarizing the remedial system data, and communicating with regulatory agencies.

TABLE 19
RESULTS OF REMEDIAL ALTERNATIVES EVALUATION

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
FEASIBILITY STUDY REPORT

Evaluation Criteria	Soil Alternatives						Groundwater Alternatives		
	SM1	SM2	SM3	SM4	SM5	SM6	GW1	GW2	GW3
Compliance With SCGs	○	◒	◒	◒	●	●	◒	◒	◒
Overall Protection of Human Health and the Environment	◒	●	●	●	●	●	◒	◒	◒
Short-Term Effectiveness	●	●	◒	◒	◒	○	●	●	◒
Long-Term Effectiveness	○	◒	◒	◒	◒	◒	○	◒	◒
Reduction of Toxicity, Mobility, and Volume	◒	◒	◒	●	●	●	◒	◒	●
Implementability	●	●	◒	◒	◒	○	●	●	●
Cost	$0.0 M	$0.582 M	$5.89 M	$5.54 M	$19.8 M	$234 M	$0.0 M	$1.14 M	$6.13 M

RECOMMENDED (SM2)

RECOMMENDED (GW2)

Notes:
1. ● = favorable
2. ◒ = moderate
3. ○ = not favorable
4. SM1 = No Further Action
5. SM2 = Institutional Controls
6. SM3 = Focused Soil Containment and Institutional Controls
7. SM4 = Focused In-Situ Soil Stabilization and Institutional Controls
8. SM5 = Large Scale Stabilization for Soil Exceeding Commercial-Use SCOs and/or Exhibiting NAPL, and Institutional Controls
9. SM6 = Excavation for Soil Exceeding Unrestricted Use SCOs and/or Exhibiting NAPL, and Institutional Controls
10. GW1 = No Further Action
11. GW2 = Monitored Natural Attenuation and Institutional Controls
12. GW3 = Enhanced Bioremediation and Institutional Controls

Figures

REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., SYRACUSE WEST, NEW YORK, 1973, PHOTOREVISED 1978.

2000' 0 2000'

Approximate Scale: 1" = 2000'

Area Location

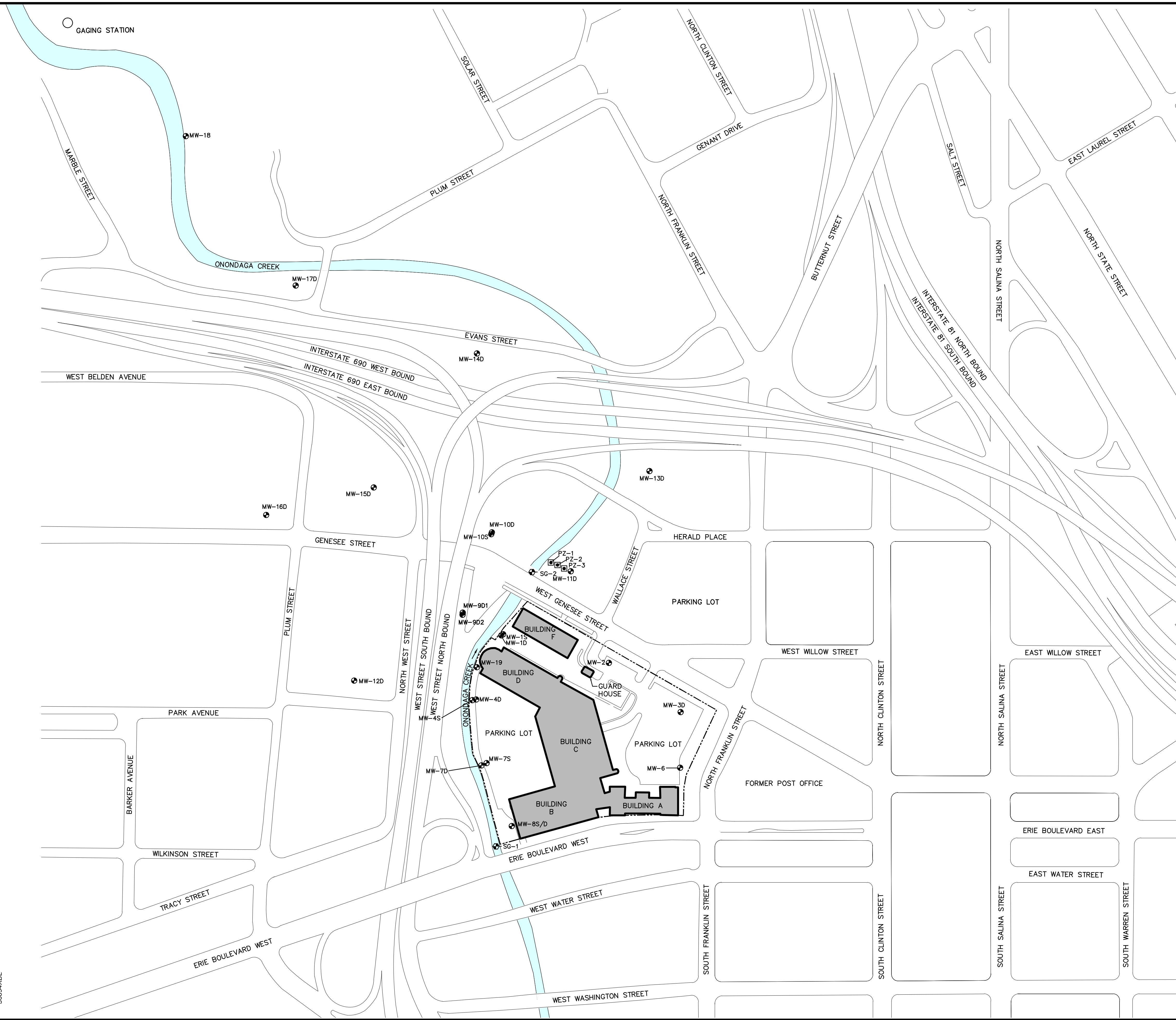
NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

SITE LOCATION MAP

ARCADIS

FIGURE
1

03/10/09 SYRACUSE-141ENV-DJH
B0036694/0000/00001/CDR/36694N01.CDR



LEGEND:

- MW-1S/1D — EXISTING MONITORING WELL LOCATION
- PZ-2 — EXISTING PIEZOMETER LOCATION
- SG-2 — EXISTING STAFF GAUGE LOCATION
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- EXISTING ONSITE BUILDING

NOTES:

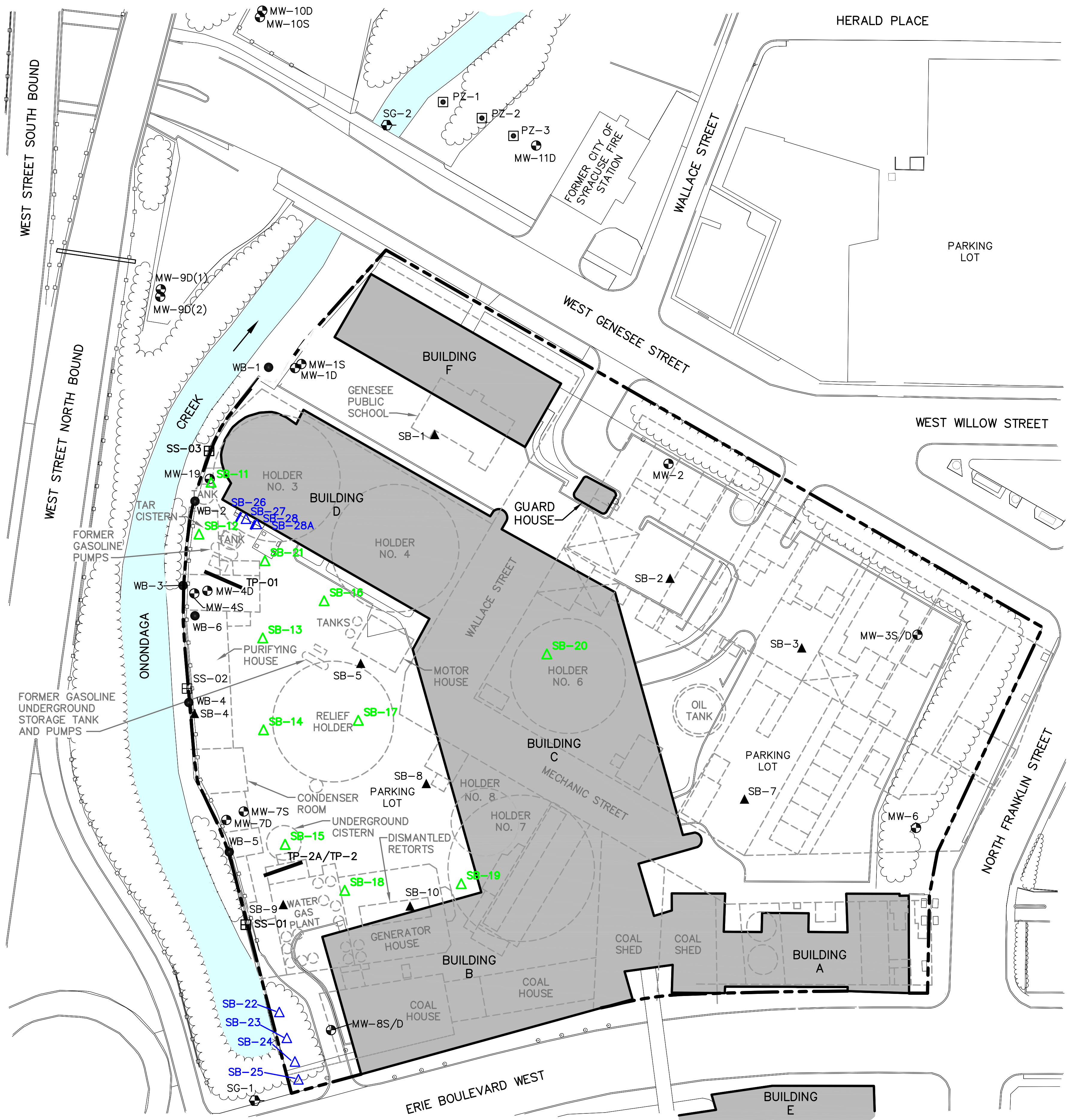
1. BASE MAP DEVELOPED FROM NEW YORK STATE GEOGRAPHIC INFORMATION SYSTEMS, OFFICE OF CYBER SECURITY & CRITICAL INFRASTRUCTURE, LAST UPDATED 4/25/2007.
2. SITE LAYOUT IS FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
3. MONITORING WELL, PIEZOMETER, AND STAFF GAUGE LOCATIONS ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

SITE LAYOUT AND MONITORING WELL LOCATIONS

ARCADIS

FIGURE
2



LEGEND:

SB-27 △	CONSTRUCTION PROJECT INVESTIGATION SOIL BORING (2012)
SB-26 ⊢—⊣	CONSTRUCTION PROJECT SOIL BORING UTILITY CLEARANCE TRENCH (2012)
SB-11 △	FINAL RI SOIL BORINGS (2008)
SB-5 ▲	PSA SOIL BORINGS (1995)
MW-1S/D	EXISTING MONITORING WELL LOCATION
PZ-2	EXISTING PIEZOMETER LOCATION
SG-2	EXISTING STAFF GAUGE LOCATION
SS-02	SURFACE SOIL SAMPLING LOCATION
WB-1 ●	FORMER WALL BORING LOCATION
TP-01	TEST PIT LOCATION
	FORMER MGP SITE BOUNDARY (APPROXIMATE)
	TREES/VEGETATION
	GUARD RAIL

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. FORMER MANUFACTURED GAS PLANT (MGP) STRUCTURES, WITH THE EXCEPTION OF HOLDERS NO. 7 AND NO. 8, ARE FROM THE FORMER SYRACUSE LIGHTING COMPANY GAS PLANT, AS SHOWN ON SANBORN MAPPING DATED 1911. HOLDER NO. 7 IS FROM PLOT PLAN PREPARED BY MELVIN L. KING ARCHITECT, DATED SEPTEMBER 2, 1931. HOLDER NO. 8 IS FROM SANBORN MAPPING DATED 1892.
3. LOCATIONS OF CONSTRUCTION PROJECT INVESTIGATION SOIL BORINGS/UTILITY CLEARANCE TRENCHES, FINAL RI SOIL BORINGS, RETAINING WALL, MONITORING WELLS, PIEZOMETERS, AND STAFF GAUGES ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
4. PRELIMINARY SITE ASSESSMENT (PSA) SOIL BORING, TEST PIT, AND SURFACE SOIL SAMPLING LOCATIONS ARE APPROXIMATE.
5. LOCATIONS OF FORMER GASOLINE UNDERGROUND STORAGE TANKS AND FORMER GASOLINE PUMPS ARE APPROXIMATED FROM SITE PLAN PREPARED BY KING AND KING ARCHITECTS, DATED MARCH 31, 1972.

0 100' 200'

GRAPHIC SCALE

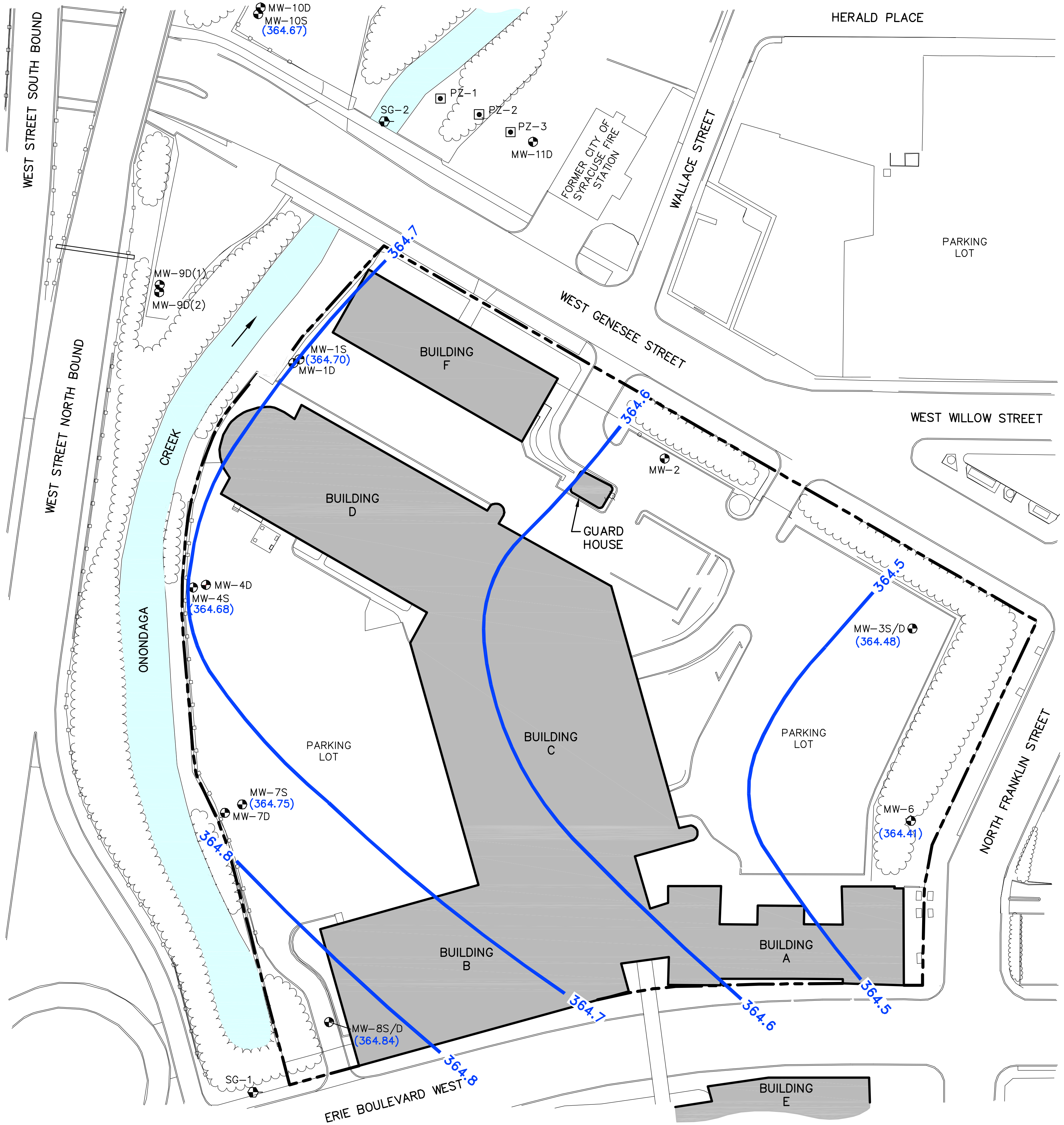
NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

HISTORICAL MGP STRUCTURES AND SAMPLING LOCATIONS

ARCADIS

FIGURE
3

CITY: SYRACUSE, NY GROUP: ENV/IEST/IM-DV DB: R. ALLEN A. SCHILLING, P. LISTER PM: J. BRUSSEL TM: M. HYSELL LYR: ON=*;OFF=REF (FRZ)
G:\ENVCAD\SYRACUSE\ACT\B0036694\0000\00003\DWG\FS\36694B23.DWG LAYOUT: 3 SAVED: 2/19/2014 3:59 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/19/2014 3:59 PM BY: LISTER, PAUL
XREFS: 36694X01 36694XBL IMAGES: PROJECTNAME: ----



LEGEND:

- MW-1S/D — EXISTING MONITORING WELL LOCATION
- PZ-2 — EXISTING PIEZOMETER LOCATION
- SG-2 — EXISTING STAFF GAUGE LOCATION
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- TREES/VEGETATION
- GUARD RAIL
- 364.5 — GROUNDWATER CONTOUR
- (364.48) — GROUNDWATER ELEVATION

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. MONITORING WELL, PIEZOMETER, AND STAFF GAUGE LOCATIONS ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
3. ELEVATIONS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.

0 100' 200'

GRAPHIC SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

WATER TABLE MAP FOR SHALLOW GROUNDWATER - APRIL 7 & 8, 2008

ARCADIS

FIGURE
4

SB-12

Depth(Feet)	(12 – 14)	(22 – 24)
Date	5/28/2008	5/28/2008
Benzene	0.035	430
Ethylbenzene	0.066	870
Toluene	0.25	870
Xylenes (total)	0.40	1,500
Total BTEX	0.75	3,700
Acenaphthene	11 D	190
Acenaphthylene	20 D	190
Anthracene	17 D	180
Benzo(a)anthracene	36 D	99
Benzo(a)pyrene	40 D	74
Benzo(b)fluoranthene	42 D	70
Benzo(k)fluoranthene	16 D	29
Chrysene	34 D	93
Dibenzo(a,h)anthracene	5.5	8.9 J
Fluoranthene	56 D	230
Fluorene	11	200
Naphthalene	15 D	2,100 D
Indeno(1,2,3–cd)pyrene	31 D	44
Phenanthrene	41	610 D
Pyrene	49 D	250
Total PAHs	460	5,300 J
Cyanide	7.3	33.6

TP-01

Depth(Feet)	(5)	(8)
Date	8/28/1995	8/28/1995
Benzene	0.092 J	5.5
Ethylbenzene	2.7	66
Toluene	<1.4	18
Xylenes (total)	5.7	140
Total BTEX	8.5 J	230
Acenaphthene	2.4 J	110
Benzo(a)anthracene	9.7	26 J
Benzo(a)pyrene	12	26 J
Benzo(b)fluoranthene	10	11 J
Benzo(k)fluoranthene	13	14 J
Chrysene	11	29 J
Dibenzo(a,h)anthracene	0.50 J	3.3 J
Fluorene	2.3 J	62 J
Naphthalene	16	400
Indeno(1,2,3–cd)pyrene	1.9 J	10 J
Phenanthrene	12	160
Total PAHs	140 J	1,300 J

WB-2

Date	3/29/1995
BTEX/VOCs	No Exceedances to GW Depth

SB-27

Depth(Feet)	(0 – 20')	(3 – 4')	(20 – 21.2')
Date	8/13/2012	8/13/2012	8/10/2012
Benzene	NA	<0.0053	1.9
Ethylbenzene	NA	<0.0053	24
Xylenes (total)	NA	<0.011	5.6
Total BTEX	NA	<0.011	32 J
Benzo(a)anthracene	2.4	NA	NA
Benzo(a)pyrene	2.6	NA	NA
Benzo(b)fluoranthene	3.4	NA	NA
Benzo(k)fluoranthene	1.7 J	NA	NA
Chrysene	2.4	NA	NA
Indeno(1,2,3–cd)pyrene	1.4 J	NA	NA
Total PAHs	31 J	NA	NA
Cyanide	27.4 J	NA	NA

SB-13

Depth(Feet)	(8 – 10)	(20 – 22)
Date	5/29/2008	5/29/2008
Benzene	0.97 J	9.4
Ethylbenzene	61 J	63
Toluene	17	20
Xylenes (total)	310 J	110
Total BTEX	390 J	200
Acenaphthene	30	0.64
Acenaphthylene	110	2.2
Anthracene	110 D	1
Benzo(a)anthracene	110	0.8
Benzo(a)pyrene	82	0.61
Benzo(b)fluoranthene	86	0.6
Benzo(k)fluoranthene	35	0.24 J
Chrysene	89	0.74
Dibenzo(a,h)anthracene	15	0.11 J
Fluoranthene	210 D	1.6
Fluorene	120	1.3
Naphthalene	700 D	55 D
Indeno(1,2,3–cd)pyrene	76	0.49
Phenanthrene	370 D	3.6
Pyrene	180 D	1.6
Total PAHs	2,600	96 J

SB-16

Depth(Feet)	(12 – 14)	(18 – 20)
Date	6/5/2008	6/5/2008
Benzene	4.4 J [2.6]	0.26
Ethylbenzene	36 [5.3 J]	0.98
Toluene	1.4 J [1.4]	0.04
Xylenes (total)	67 [10]	1.7
Total BTEX	110 J [19 J]	3
Benzo(a)anthracene	2.9 [2.5]	2.1
Benzo(a)pyrene	3.0 [2.3]	2.0
Benzo(b)fluoranthene	3.5 [2.5]	2.0
Benzo(k)fluoranthene	1.4 J [0.94]	0.85
Chrysene	2.9 [2.2]	2.0
Dibenzo(a,h)anthracene	0.62 J [0.57 J]	0.48
Naphthalene	170 D [94 D]	26 D
Indeno(1,2,3–cd)pyrene	2.2 [1.9]	2.2
Total PAHs	240 J [150 J]	68

MW-4S

Depth(Feet)	(12)	(14)
Date	8/17/1995	8/17/1995
Benzene	99	35
Ethylbenzene	30	34
Toluene	120	80
Xylenes (total)	220	180
Total BTEX	470	330
Acenaphthene	440 J	110 J
Acenaphthylene	2,000	480 J
Anthracene	2,400	480 J
Benzo(a)anthracene	1,600	340 J
Benzo(a)pyrene	1,900	270 J
Benzo(b)fluoranthene	1,400 J	180 J
Benzo(g,h,i)perylene	600 J	<740
Benzo(k)fluoranthene	1,400 J	240 J
Chrysene	1,400 J	300 J
Fluoranthene	4,400	920
Fluorene	2,100	490 J
Naphthalene	12,000	4,200
Indeno(1,2,3–cd)pyrene	1,000 J	150 J
Phenanthrene	6,700	1,700
Pyrene	3,000	760
Total PAHs	47,000 J	12,000 J

WB-3

Date	4/4/1995
BTEX/VOCs	No Exceedances to GW Depth

WB-6

Depth(Feet)	(6)	(16)
Date	4/20/1995	4/20/1995
Benzene	0.0020 J	0.88 D
Ethylbenzene	<0.0060	24
Toluene	<0.0060	2.1
Xylenes (total)	<0.0060	40
Total BTEX	0.0020 J	67
Total PAHs	NA	NA

SS-02

Depth(Feet)	(No Depth)
Date	6/27/2002
Total BTEX	0.0016 J
Benzo(a)anthracene	15
Benzo(a)pyrene	18
Benzo(b)fluoranthene	14
Benzo(k)fluoranthene	15
Chrysene	15
Dibenzo(a,h)anthracene	1.6 J
Indeno(1,2,3–cd)pyrene	21
Total PAHs	210 J

SB-21

Depth(Feet)	(14 – 16)	(20 – 22)
Date	6/9/2008	6/9/2008
Benzene	0.059 J	0.23 J
Ethylbenzene	0.71	5.6
Xylenes (total)	0.54 J	7.5
Total BTEX	1.3 J	13 J
Benzo(a)anthracene	1.4	1.7
Benzo(a)pyrene	0.98	1.1
Chrysene	1.3	1.6
Naphthalene	18 D	20 D
Indeno(1,2,3–cd)pyrene	0.70	<0.39
Total PAHs	57 J	64 J

WB-4

Depth(Feet)	(6)	(8)	(9)	(22)
Date	4/12/1995	4/12/1995	4/13/1995	4/12/1995
Ethylbenzene	<0.0060	0.38 D	NA	16
Xylenes (total)	<0.0060	0.36 D	NA	16
Total BTEX	<0.0060	0.76 J	NA	32 J
Total PAHs	NA	NA	NA	NA

SB-5

Depth(Feet)	(8)	(22)
Date	8/21/1995	8/21/1995
Benzene	<0.011	2.1 J [1.1 J]
Ethylbenzene	0.0070 J	28 [19]
Toluene	<0.011	2.3 J [1.2 J]
Xylenes (total)	0.014	43 [29]
Total BTEX	0.021 J	75 J [50 J]
Acenaphthene	0.22 J	75 [52]
Benzo(a)anthracene	4.0	13 J [9.1 J]
Benzo(a)pyrene	7.6	9.8 J [5.0 J]
Benzo(b)fluoranthene	6.5	3.9 J [2.0 J]
Benzo(k)fluoranthene	7.2	6.5 J [3.2 J]
Chrysene	4.4	13 J [9.5 J]
Dibenzo(a,h)anthracene	0.50 J	<36 [<37]
Fluorene	0.22 J	42 [29 J]
Naphthalene	1.8	270 [180]
Indeno(1,2,3–cd)pyrene	1.9	2.8 J [<37]
Total PAHs	52 J	840 J [580 J]

SB-14

Depth(Feet)	(8 – 10)	(18 – 20)
Date	5/30/2008	5/30/2008
Benzene	2.5 J	14
Ethylbenzene	130	50
Toluene	5.5 J	2.2
Xylenes (total)	220	61
Total BTEX	360 J	130
Acenaphthene	39 DJ	7.5 D
Benzo(a)anthracene	24 DJ	2.3
Benzo(a)pyrene	14 DJ	1.5
Benzo(b)fluoranthene	15 DJ	1.3
Benzo(k)fluoranthene	4.3 J	0.45
Chrysene	24 DJ	2.1
Dibenzo(a,h)anthracene	1.3 J	0.25 J
Naphthalene	450 D	37 D
Indeno(1,2,3–cd)pyrene	4.3 J	1.1
Total PAHs	950 J	110 J

SB-4

Depth(Feet)	(10)	(20)
Date	8/23/1995	8/23/1995
Benzene	2.8	8.7
Ethylbenzene	20	10
Toluene	0.94 J	11
Xylenes (total)	21	28
Total BTEX	45 J	58
Benzo(a)anthracene	8.7	14 J
Benzo(a)pyrene	7.6 J	12 J
Benzo(b)fluoranthene	4.7 J	8.6 J
Benzo(k)fluoranthene	7.4 J	10 J
Chrysene	9.3	14 J
Naphthalene	39	240
Indeno(1,2,3–cd)pyrene	<8.4	5.0 J
Total PAHs	180 J	570 J

MW-7S

Depth(Feet)	(16)	(18)
Date	8/7/1995	8/7/1995
Benzene	3.1 [2.4]	0.27 J
Ethylbenzene	19 [10]	0.70 J
Toluene	11 [6.0]	0.42 J
Xylenes (total)	28 [14]	1.1 J
Total BTEX	61 [32]	2.5 J
Acenaphthene	14 J [23 J]	3.6 J
Benzo(a)anthracene	12 J [18 J]	3.2 J
Benzo(a)pyrene	9.9 J [17 J]	3.1 J
Benzo(b)fluoranthene	6.7 J [10 J]	2.3 J
Benzo(k)fluoranthene	8.0 J [14 J]	2.1 J
Chrysene	10 J [17 J]	2.8 J
Naphthalene	210 [350]	44
Indeno(1,2,3–cd)pyrene	5.9 J [10 J]	1.8 J
Total PAHs	510 J [840 J]	130 J

SB-8

Depth(Feet)	(16)	(26)	(28)
Date	8/18/1995	8/18/1995	8/18/1995
Xylenes (total)	0.29	0.040	0.0070 J
Total BTEX	0.59	0.088 J	0.015 J
Benzo(a)anthracene	<2.1	1.4	1.8
Benzo(a)pyrene	<2.1	0.94	0.92 J
Chrysene	<2.1	1.4	1.8
Total PAHs	14	21 J	20 J

SB-9

Depth(Feet)	(16)	(20)
Date	8/22/1995	8/22/1995
Xylenes (total)	0.42 D	0.0040 J
Total BTEX	0.73	0.0054 J
Benzo(a)anthracene	26	0.40
Benzo(a)pyrene	20 J	0.39
Benzo(b)fluoranthene	12 J	0.25 J
Benzo(k)fluoranthene	20 J	0.30 J
Chrysene	22	0.37
Fluorene	32	0.52
Naphthalene	95	0.73
Indeno(1,2,3–cd)pyrene	7.4 J	0.14 J
Total PAHs	490 J	7.0 J

WB-5

Date	4/10/1995
BTEX/VOCs	No Exceedances to GW Depth

SB-15

Depth(Feet)	(14 – 16)	(22 – 24)
Date	6/2/2008	6/2/2008
Total BTEX	<0.0073 J	0.065 J
Benzo(a)anthracene	5.0	2.2
Benzo(a)pyrene	8.5 D	1.3
Benzo(b)fluoranthene	7.5 J	1.2
Benzo(k)fluoranthene	2.2 J	0.46
Chrysene	4.9	2.2
Dibenzo(a,h)anthracene	1.4 J	0.23 J
Indeno(1,2,3–cd)pyrene	5.3 J	0.91
Total PAHs	93 J	38 J

TP-2A

Depth(Feet)	(6)	(10)
Date	9/19/1995	9/19/1995
Total BTEX	<0.012	0.0010 J [0.0020 J]
Benzo(a)anthracene	32	32 [22]
Benzo(a)pyrene	34	38 [28]
Benzo(b)fluoranthene	67	45 [31]
Benzo(k)fluoranthene	23	30 [19]
Chrysene	29	32 [23]
Dibenzo(a,h)anthracene	4.4 J	2.7 J [2.1 J]
Indeno(1,2,3–cd)pyrene	18	10 [8.6]
Total PAHs	280 J	270 J [190 J]

SS-01

Depth(Feet)	(No Depth)
Date	6/27/2002
Total BTEX	0.0060 J
Benzo(a)anthracene	24
Benzo(a)pyrene	27
Benzo(b)fluoranthene	19
Benzo(k)fluoranthene	20
Chrysene	25
Dibenzo(a,h)anthracene	7.6
Indeno(1,2,3–cd)pyrene	24
Total PAHs	290 J

TP-02

Depth(Feet)	(5)	(11)
Date	8/28/1995	8/28/1995
Total BTEX	0.0030 J	<0.013 [<0.011]
Benzo(a)anthracene	14	3.0 [5.8]
Benzo(a)pyrene	26	6.5 [12]
Benzo(b)fluoranthene	24	5.6 [9.2]
Benzo(k)fluoranthene	25	6.5 [9.9]
Chrysene	14	3.3 [6.5]
Dibenzo(a,h)anthracene	1.3 J	0.19 J [0.34 J]
Indeno(1,2,3–cd)pyrene	4.6 J	1.1 J [1.8 J]
Total PAHs	170 J	37 J [68 J]

SB-18

Depth(Feet)	(4 – 6)	(24 – 26)
Date	6/3/2008	6/3/2008
Ethylbenzene	<0.0059	5.5 [0.15]
Xylenes (total)	<0.0059	5.2 [0.16]
Total BTEX	<0.0059	11 [0.31 J]
Acenaphthene	<0.39	15 D [25 D]
Benzo(a)anthracene	0.49	8.3 D [8.5 D]
Benzo(a)pyrene	0.51	6.1 D [5.5 J]
Benzo(b)fluoranthene	0.59	6.6 DJ [5.3 J]
Benzo(k)fluoranthene	0.27 J	2.2 J [1.9 J]
Chrysene	0.49	7.9 D [8.0 D]
Dibenzo(a,h)anthracene	0.11 J	0.65 J [0.57 J]
Naphthalene	1.4	15 D [27 D]
Indeno(1,2,3–cd)pyrene	0.41	2.2 J [1.8 J]
Total PAHs	6.4 J	150 J [190 J]

SB-22

Depth(Feet)	(0 – 16')	(13 – 15')
Date	8/10/2012	8/10/2012
Total BTEX	NA	<0.011
Benzo(a)anthracene	7.2	NA
Benzo(a)pyrene	6.9	NA
Benzo(b)fluoranthene	9.4	NA
Benzo(k)fluoranthene	3.7	NA
Chrysene	7.8	NA
Dibenzo(a,h)anthracene	0.98 J	NA
Indeno(1,2,3–cd)pyrene	2.3 J	NA
Total PAHs	82 J	NA

SB-10

Depth(Feet)	(22)	(28)
Date	8/22/1995	8/22/1995
Benzene	<0.010	0.37 J
Ethylbenzene	<0.010	5.4
Toluene	<0.010	0.81 J
Xylenes (total)	<0.010	5.2
Total BTEX	<0.010	12 J
Benzo(a)anthracene	1.8	1.9
Benzo(a)pyrene	2.7	1.3 J
Benzo(b)fluoranthene	2.1	0.60 J
Benzo(k)fluoranthene	1.8	1.1 J
Chrysene	1.8	1.8
Total PAHs	22 J	40 J

SB-23

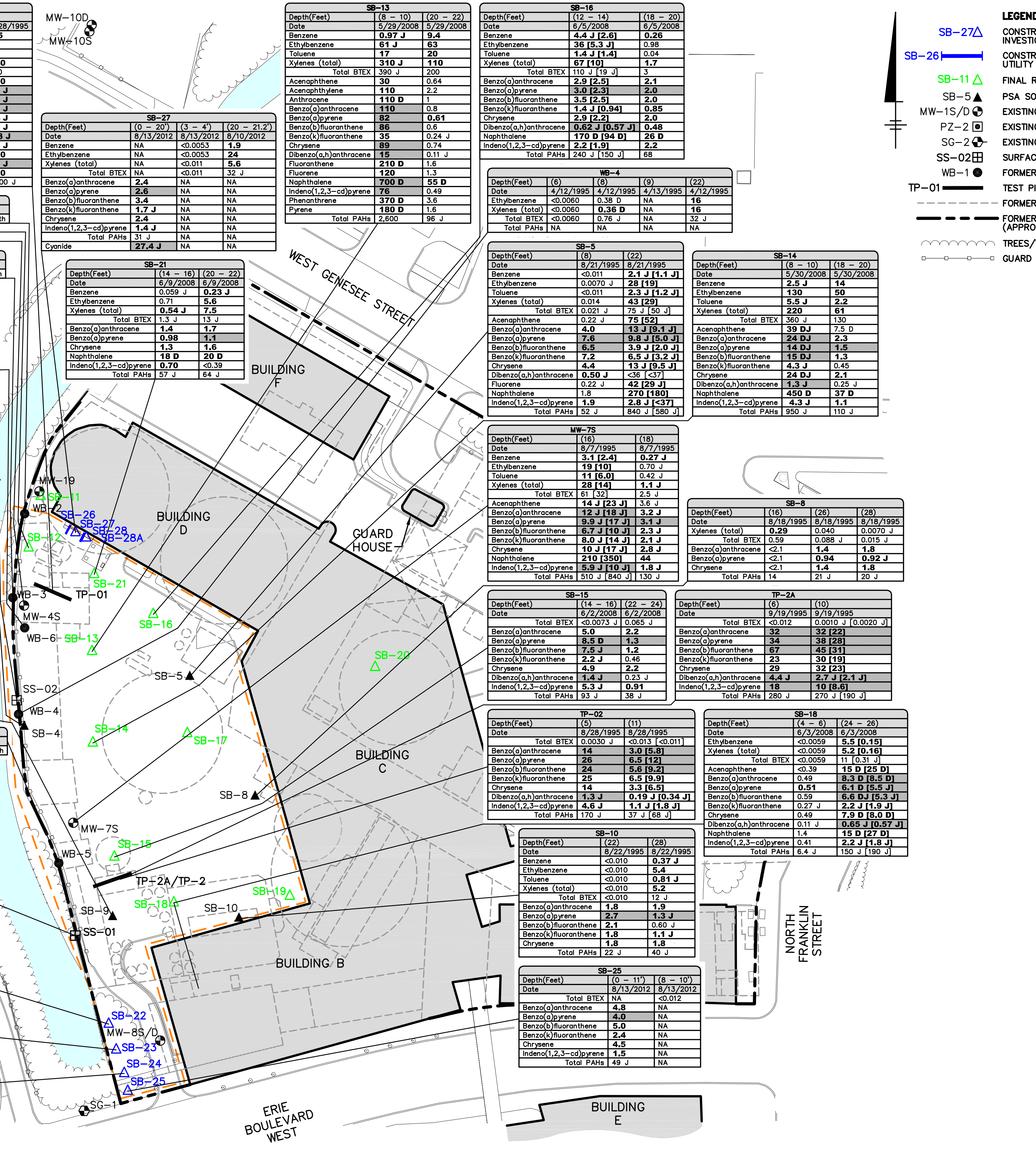
Date	8/10/2012
All Analytes	No Exceedances to GW Depth

SB-25

Depth(Feet)	(0 – 11')	(8 – 10')
Date	8/13/2012	8/13/2012
Total BTEX	NA	<0.012
Benzo(a)anthracene	4.8	NA
Benzo(a)pyrene	4.0	NA
Benzo(b)fluoranthene	5.0	NA
Benzo(k)fluoranthene	2.4	NA
Chrysene	4.5	NA
Indeno(1,2,3–cd)pyrene	1.5	NA
Total PAHs	49 J	NA

SB-24

Depth(Feet)	(0 – 15.5')	(12 – 14')
Date	8/13/2012	8/13/2012
Total BTEX	NA	<0.011 [<0.011]
Benzo(a)anthracene	6.5 [7.8]	NA
Benzo(a)pyrene	7.0 [7.5]	NA
Benzo(b)fluoranthene	7.9 [9.7]	NA
Benzo(k)fluoranthene	4.5 [4.0]	NA
Chrysene	6.4 [6.9]	NA
Indeno(1,2,3–cd)pyrene	2.6 [2.8]	NA
Total PAHs	61 J [76 J]	NA



LEGEND:

- SB-27 △ CONSTRUCTION PROJECT INVESTIGATION SOIL BORING (2012)
- SB-26 CONSTRUCTION PROJECT SOIL BORING UTILITY CLEARANCE TRENCH (2012)
- SB-11 △ FINAL RI SOIL BORING (2008)
- SB-5 ▲ PSA SOIL BORING (1995)
- MW-1S/D EXISTING MONITORING WELL LOCATION
- PZ-2 EXISTING PIEZOMETER LOCATION
- SG-2 EXISTING STAFF GAUGE LOCATION
- SS-02 SURFACE SOIL SAMPLING LOCATION
- WB-1 ● FORMER WALL BORING LOCATION
- TP-01 TEST PIT LOCATION
- FORMER MGP STRUCTURES
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- TREES/VEGETATION
- GUARD RAIL

6 NYCRR Part 375-6.8 SCOs

Constituent	Unrestricted	Commercial
Benzene	0.06	44
Ethyl Benzene	1	390
Toluenes	0.7	500
Xylenes	0.26	500
Total BTEX	– –	– –
Acenaphthene	20	500
Acenaphthylene	100	500
Anthracene	100	500
Benzo(a)anthracene	1	5.6
Benzo(a)pyrene	1	1
Benzo(b)fluoranthene	1	5.6
Benzo(g,h,i)perylene	100	500
Benzo(k)fluoranthene	0.8	56
Chrysene	1	56
Dibenzo(a,h)anthracene	0.33	0.56
Fluoranthene	100	500
Fluorene	30	500
Indeno(1,2,3–cd)pyrene	0.5	5.6
Naphthalene	12	500
Phenanthrene	100	500
Pyrene	100	500
Total PAHs	– –	– –
Cyanide	27	27

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. FORMER MANUFACTURED GAS PLANT (MGP) STRUCTURES, WITH THE EXCEPTION OF HOLDERS NO. 7 AND NO. 8, ARE FROM THE FORMER SYRACUSE LIGHTING COMPANY GAS PLANT, AS SHOWN ON SANBORN MAPPING DATED 1911. HOLDER NO. 7 IS FROM PLOT PLAN PREPARED BY MELVIN L. KING ARCHITECT, DATED SEPTEMBER 2, 1931. HOLDER NO. 8 IS FROM SANBORN MAPPING DATED 1892.
3. LOCATIONS OF CONSTRUCTION PROJECT INVESTIGATION SOIL BORINGS/UTILITY CLEARANCE TRENCHES, FINAL RI SOIL BORINGS, RETAINING WALL, MONITORING WELLS, PIEZOMETERS, AND STAFF GAUGES ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
4. PRELIMINARY SITE ASSESSMENT (PSA) SOIL BORING, TEST PIT, AND SURFACE SOIL SAMPLING LOCATIONS ARE APPROXIMATE.
5. LOCATIONS OF FORMER GASOLINE UNDERGROUND STORAGE TANKS AND FORMER GASOLINE PUMPS ARE APPROXIMATED FROM SITE PLAN PREPARED BY KING AND KING ARCHITECTS, DATED MARCH 31, 1972.
6. FIGURE SHOWS SOIL ANALYTICAL RESULTS ONLY FOR SAMPLING LOCATIONS WHERE ONE OR MORE CONSTITUENTS WERE IDENTIFIED IN UNSATURATED SOIL AT CONCENTRATIONS EXCEEDING THE SCOs. NOTE THAT CYANIDE WAS ONLY IDENTIFIED IN SB-12 AT CONCENTRATIONS EXCEEDING THE SCOs.
7. SCOs = SOIL CLEANUP OBJECTIVES FOR UNRESTRICTED AND COMMERCIAL LAND USE AS PRESENTED 6 NYCRR PART 375-6.8(a) and (b).
8. THE DEPTH TO GROUNDWATER IS CONSIDERED TO BE 28 FEET BELOW GROUND SURFACE (BGS) ONSITE AND 30 FEET BGS OFFSITE. DEPTH TO GROUNDWATER IS BASED ON MEASUREMENTS PERFORMED IN APRIL 2008. THE UNSATURATED ZONE OF SOIL IS CONSIDERED TO BE ANY SOIL SAMPLES COLLECTED AT A DEPTH LESS THAN OR EQUAL TO THE CORRESPONDING DEPTH TO GROUNDWATER.
9. BOLDED VALUE INDICATES THAT THE DETECTED CONCENTRATION EXCEEDS THE UNRESTRICTED LAND USE SCO.
10. SHADED VALUE INDICATES THAT THE DETECTED CONCENTRATION EXCEEDS THE COMMERCIAL LAND USE SCO.
11. ALL CONCENTRATIONS ARE PRESENTED IN PARTS PER MILLION (ppm), WHICH IS EQUIVALENT TO MILLIGRAMS PER KILOGRAM (mg/kg).
12. FIELD DUPLICATE SAMPLE RESULTS ARE PRESENTED IN BRACKETS [].
13. J = INDICATES THAT THE ASSOCIATED NUMERICAL VALUE IS AN ESTIMATED CONCENTRATION.
14. D = COMPOUND QUANTITATED USING A SECONDARY DILUTION.
15. NA = NOT ANALYZED
16. < = CONSTITUENT NOT DETECTED AT A CONCENTRATION ABOVE THE REPORTED DETECTION LIMIT.
17. BTEX = BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES.
18. PAHs = POLYCYCLIC AROMATIC HYDROCARBONS.
19. – – INDICATES THAT THERE IS NO SOIL CLEANUP OBJECTIVE FOR THE SPECIFIC PARAMETER.
20. NO SOIL SAMPLES FROM LOCATIONS SB-11, SB-17, SB-19, AND SB-20 WERE ANALYZED.

0 100' 200'
GRAPHIC SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

SOIL ANALYTICAL RESULTS FOR BTEX, PAHs, AND CYANIDE EXCEEDING SCOs (ppm) - WESTERN PARKING LOT

ARCADIS

FIGURE
5

CITY: SYRACUSE, NY GROUP: ENV/IEST/IM-DV DB: R. ALLEN, A. SCHILLING, P. LISTER PM: J. BRUSSEL TM: M. HYSELL LYR: ON=*;OFF=REF, (FRZ) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/26/2014 11:46 AM BY: LISTER, PAUL
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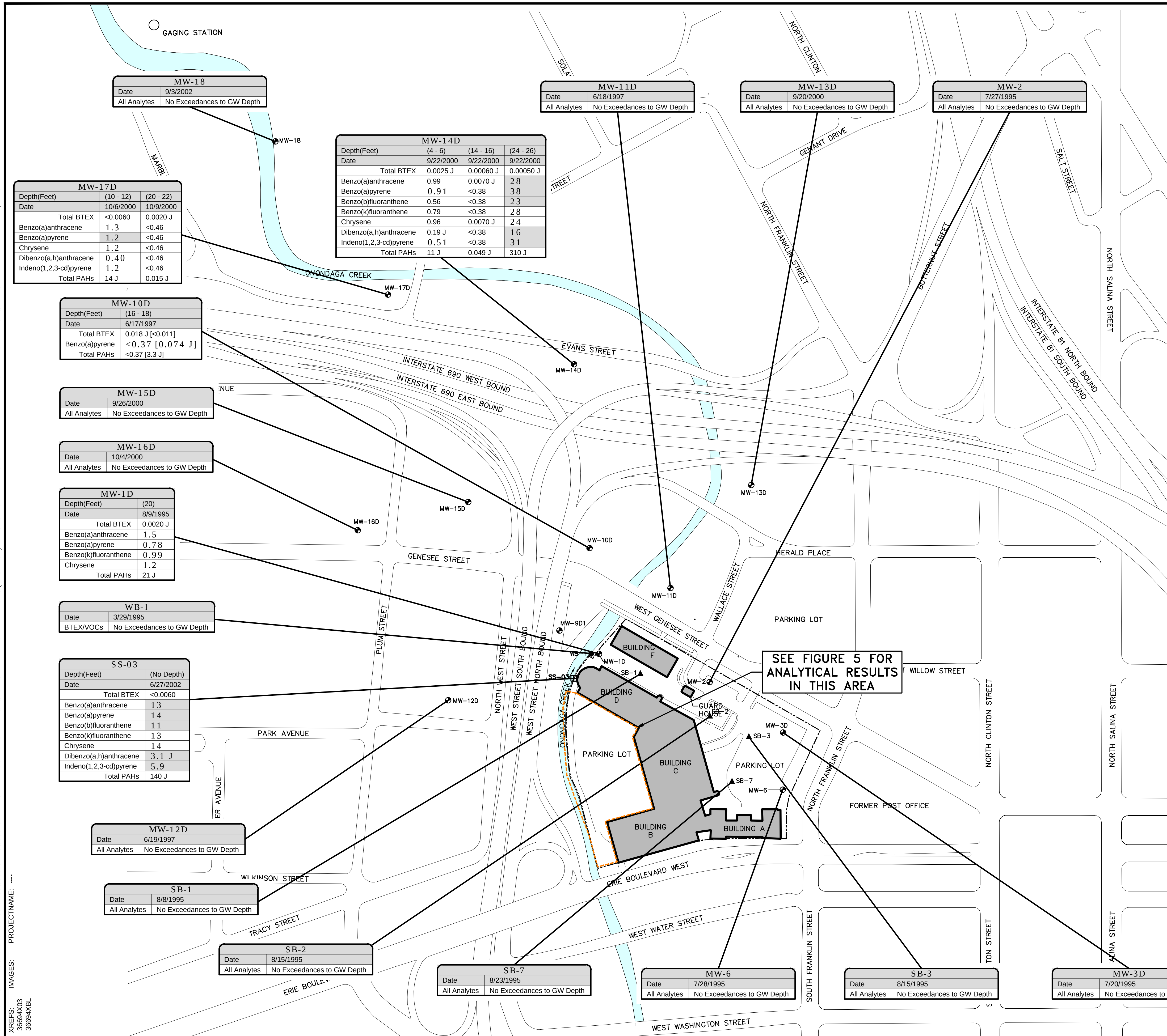

MW-18

Date	9/3/2002
All Analytes	No Exceedances to GW Depth

MW-11D

Date	6/18/1997
All Analytes	No Exceedances to GW Depth

MW-13D

Date	9/20/2000
All Analytes	No Exceedances to GW Depth

MW-2

Date	7/27/1995
All Analytes	No Exceedances to GW Depth

MW-14D

Depth(Feet)	(4 - 6)	(14 - 16)	(24 - 26)
Date	9/22/2000	9/22/2000	9/22/2000
Total BTEX	0.0025 J	0.00060 J	0.00050 J
Benzo(a)anthracene	0.99	0.0070 J	**28**
Benzo(a)pyrene	**0.91**	<0.38	**38**
Benzo(b)fluoranthene	0.56	<0.38	**23**
Benzo(k)fluoranthene	0.79	<0.38	**28**
Chrysene	0.96	0.0070 J	**24**
Dibenzo(a,h)anthracene	0.19 J	<0.38	**16**
Indeno(1,2,3-cd)pyrene	**0.51**	<0.38	**31**
Total PAHs	11 J	0.049 J	310 J

MW-17D

Depth(Feet)	(10 - 12)	(20 - 22)
Date	10/6/2000	10/9/2000
Total BTEX	<0.0060	0.0020 J
Benzo(a)anthracene	**1.3**	<0.46
Benzo(a)pyrene	**1.2**	<0.46
Chrysene	**1.2**	<0.46
Dibenzo(a,h)anthracene	**0.40**	<0.46
Indeno(1,2,3-cd)pyrene	**1.2**	<0.46
Total PAHs	14 J	0.015 J

MW-10D

Depth(Feet)	(16 - 18)
Date	6/17/1997
Total BTEX	0.018 J [<0.011]
Benzo(a)pyrene	**<0.37 [0.074 J]**
Total PAHs	<0.37 [3.3 J]

MW-15D

Date	9/26/2000
All Analytes	No Exceedances to GW Depth

MW-16D

Date	10/4/2000
All Analytes	No Exceedances to GW Depth

MW-1D

Depth(Feet)	(20)
Date	8/9/1995
Total BTEX	0.0020 J
Benzo(a)anthracene	**1.5**
Benzo(a)pyrene	**0.78**
Benzo(k)fluoranthene	**0.99**
Chrysene	**1.2**
Total PAHs	21 J

WB-1

Date	3/29/1995
BTEX/VOCs	No Exceedances to GW Depth

SS-03

Depth(Feet)	(No Depth)
Date	6/27/2002
Total BTEX	<0.0060
Benzo(a)anthracene	**13**
Benzo(a)pyrene	**14**
Benzo(b)fluoranthene	**11**
Benzo(k)fluoranthene	**13**
Chrysene	**14**
Dibenzo(a,h)anthracene	**3.1 J**
Indeno(1,2,3-cd)pyrene	**5.9**
Total PAHs	140 J

MW-12D

Date	6/19/1997
All Analytes	No Exceedances to GW Depth

SB-1

Date	8/8/1995
All Analytes	No Exceedances to GW Depth

SB-2

Date	8/15/1995
All Analytes	No Exceedances to GW Depth

SB-7

Date	8/23/1995
All Analytes	No Exceedances to GW Depth

MW-6

Date	7/28/1995
All Analytes	No Exceedances to GW Depth

SB-3

Date	8/15/1995
All Analytes	No Exceedances to GW Depth

MW-3D

Date	7/20/1995
All Analytes	No Exceedances to GW Depth

LEGEND:

- SB-2 ▲ PSA SOIL BORING (1995)
- MW-1S/D EXISTING MONITORING WELL LOCATION
- SS-03 SURFACE SOIL SAMPLING LOCATION
- WB-1 ● FORMER WALL BORING LOCATION
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- EXISTING ONSITE BUILDING

6 NYCRR Part 375-6.8 SCOs

Constituent	Unrestricted	Commercial
Benzene	0.06	44
Ethyl Benzene	1	390
Toluenes	0.7	500
Xylenes	0.26	500
Total BTEX	- -	- -
Acenaphthene	20	500
Acenaphthylene	100	500
Anthracene	100	500
Benzo(a)anthracene	1	5.6
Benzo(a)pyrene	1	1
Benzo(b)fluoranthene	1	5.6
Benzo(g,h,i)perylene	100	500
Benzo(k)fluoranthene	0.8	56
Chrysene	1	56
Dibenzo(a,h)anthracene	0.33	0.56
Fluoranthene	100	500
Fluorene	30	500
Indeno(1,2,3-cd)pyrene	0.5	5.6
Naphthalene	12	500
Phenanthrene	100	500
Pyrene	100	500
Total PAHs	- -	- -
Cyanide	27	27

NOTES:

1. BASE MAP DEVELOPED FROM NEW YORK STATE GEOGRAPHIC INFORMATION SYSTEMS, OFFICE OF CYBER SECURITY & CRITICAL INFRASTRUCTURE, LAST UPDATED 4/25/2007.
2. MONITORING WELL LOCATIONS ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
3. PRELIMINARY SITE ASSESSMENT (PSA) SOIL BORING AND SURFACE SOIL SAMPLING LOCATIONS ARE APPROXIMATE.
4. FIGURE SHOWS SOIL ANALYTICAL RESULTS ONLY FOR SAMPLING LOCATIONS WHERE ONE OR MORE CONSTITUENTS WERE IDENTIFIED IN UNSATURATED SOIL AT CONCENTRATIONS EXCEEDING THE SCOs. NOTE THAT CYANIDE WAS NOT IDENTIFIED IN ANY OF THESE SAMPLES AT CONCENTRATIONS EXCEEDING THE SCOs.
5. SCOs = SOIL CLEANUP OBJECTIVES FOR UNRESTRICTED AND COMMERCIAL LAND USE AS PRESENTED 6 NYCRR PART 375-6.8(a) and (b).
6. THE DEPTH TO GROUNDWATER IS CONSIDERED TO BE 28 FEET BELOW GROUND SURFACE (BGS) ONSITE AND 30 FEET BGS OFFSITE. DEPTH TO GROUNDWATER IS BASED ON MEASUREMENTS PERFORMED IN APRIL 2008. THE UNSATURATED ZONE OF SOIL IS CONSIDERED TO BE ANY SOIL SAMPLES COLLECTED AT A DEPTH LESS THAN OR EQUAL TO THE CORRESPONDING DEPTH TO GROUNDWATER.
7. BOLDED VALUE INDICATES THAT THE DETECTED CONCENTRATION EXCEEDS THE UNRESTRICTED LAND USE SCO.
8. SHADED VALUE INDICATES THAT THE DETECTED CONCENTRATION EXCEEDS THE COMMERCIAL LAND USE SCO.
9. ALL CONCENTRATIONS ARE PRESENTED IN PARTS PER MILLION (ppm), WHICH IS EQUIVALENT TO MILLIGRAMS PER KILOGRAM (mg/kg).
10. FIELD DUPLICATE SAMPLES ARE PRESENTED IN BRACKETS [ ].
11. J = INDICATES THAT THE ASSOCIATED NUMERICAL VALUE IS AN ESTIMATED CONCENTRATION.
12. < = CONSITITUENT NOT DETECTED AT A CONCENTRATION ABOVE THE REPORTED DETECTION LIMIT.
13. NA = NOT ANALYZED.
14. BTEX = BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES.
15. PAHs = POLYCYCLIC AROMATIC HYDROCARBONS.
16. – – INDICATES THAT THERE IS NO SOIL CLEANUP OBJECTIVE FOR THE SPECIFIC PARAMETER.

0 300' 600'

GRAPHIC SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

SOIL ANALYTICAL RESULTS FOR BTEX, PAHs, AND CYANIDE EXCEEDING SCOs (ppm) - REMAINING INVESTIGATION AREA

ARCADIS

FIGURE 6

CITY: SYRACUSE NY GROUP: ENVCAD DB: R. ALLEN A. SCHILLING E. KRAHMER PM: J. BRUSSEL TM: M. HYSELL LYR: ON=*;OFF=REF (FR2) PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 5/19/2014 9:22 AM BY: KRAHMER, ERIC
G:\ENVCAD\SYRACUSE\ACT\B0036694\0000\00003\DWG\36694C01.DWG LAYOUT: 6 SAVED: 5/19/2014 9:22 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ----
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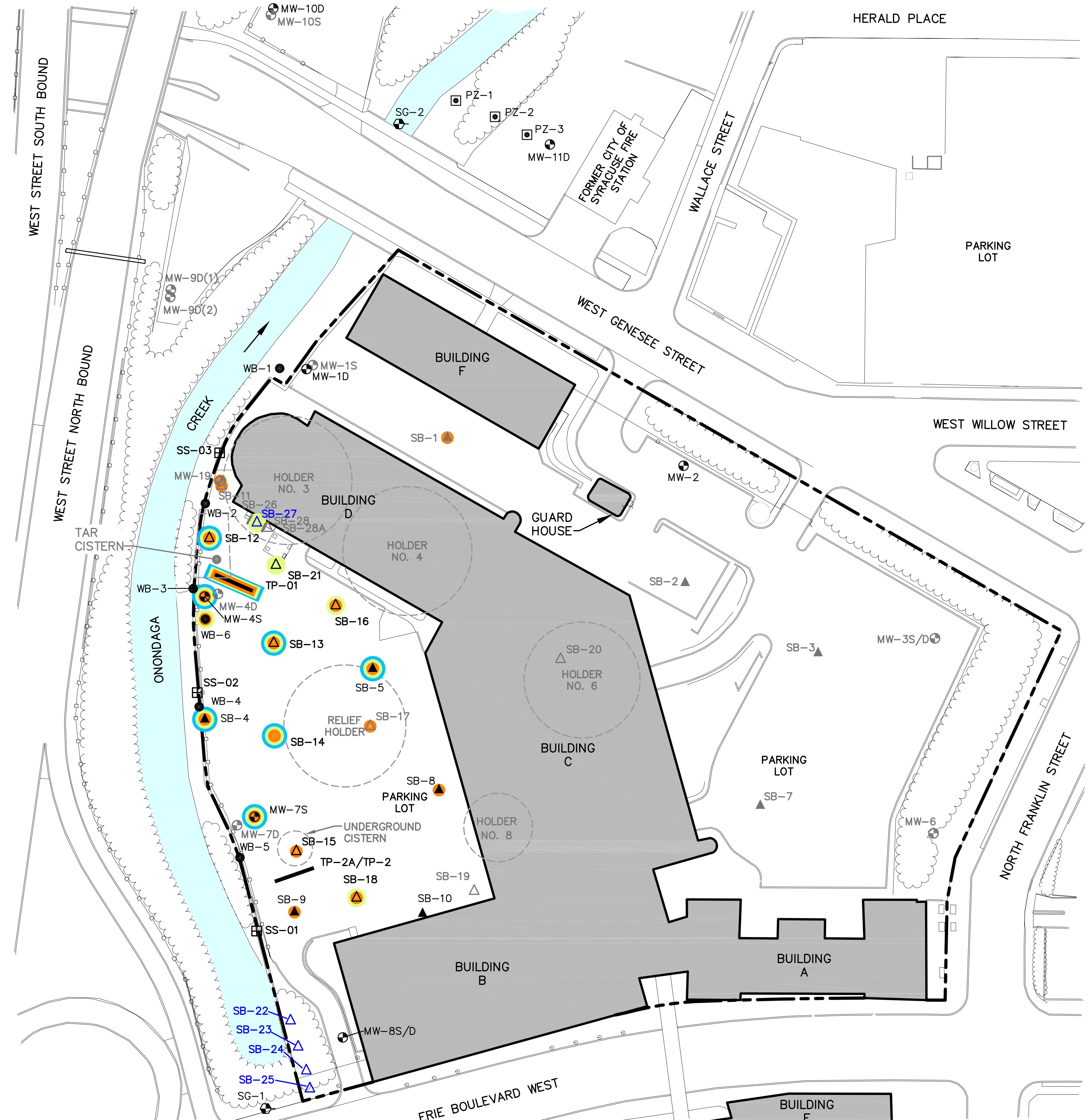


LEGEND:

- SB-27△ CONSTRUCTION PROJECT INVESTIGATION SOIL BORING (2012)
- SB-26 CONSTRUCTION PROJECT SOIL BORING UTILITY CLEARANCE TRENCH (2012)
- SB-11△ FINAL RI SOIL BORINGS (2008)
- SB-5▲ PSA SOIL BORINGS (1995)
- MW-1S/D EXISTING MONITORING WELL LOCATION
- PZ-2 EXISTING PIEZOMETER LOCATION
- SG-2 EXISTING STAFF GAUGE LOCATION
- SS-02 SURFACE SOIL SAMPLING LOCATION
- WB-1● FORMER WALL BORING LOCATION
- SB-3▲ SB-20△ SB-26 UNSATURATED SOIL SAMPLES FROM BORING WERE NOT ANALYZED
- TP-01 TEST PIT LOCATION
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- TREES/VEGETATION
- GUARD RAIL
- PAH SOIL ANALYTICAL RESULT > 500 ppm
- BTEX SOIL ANALYTICAL RESULT > 10 ppm
- NAPL OBSERVED IN SOIL

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. FORMER MANUFACTURED GAS PLANT (MGP) STRUCTURES, WITH THE EXCEPTION OF HOLDER NO. 8, ARE FROM THE FORMER SYRACUSE LIGHTING COMPANY GAS PLANT, AS SHOWN ON SANBORN MAPPING DATED 1911. HOLDER NO. 8 IS FROM SANBORN MAPPING DATED 1892.
3. LOCATIONS OF CONSTRUCTION PROJECT INVESTIGATION SOIL BORINGS/UTILITY CLEARANCE TRENCHES, FINAL RI SOIL BORINGS, RETAINING WALL, MONITORING WELLS, PIEZOMETERS, AND STAFF GAUGES ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
4. PRELIMINARY SITE ASSESSMENT (PSA) SOIL BORING, TEST PIT, AND SURFACE SOIL SAMPLING LOCATIONS ARE APPROXIMATE.
5. THE WATER TABLE IS APPROXIMATELY 28 FEET BELOW GROUND SURFACE (bgs) ONSITE AND 30 FEET bgs OFFSITE.
6. ppm = PARTS PER MILLION
7. BTEX = BENZENE, TOULENE, ETHYLBENZENE, AND XYLENES
8. PAH = POLYCYCLIC AROMATIC HYDROCARBONS
9. NAPL = NON-AQUEOUS PHASE LIQUID

0 100' 200'

GRAPHIC SCALE

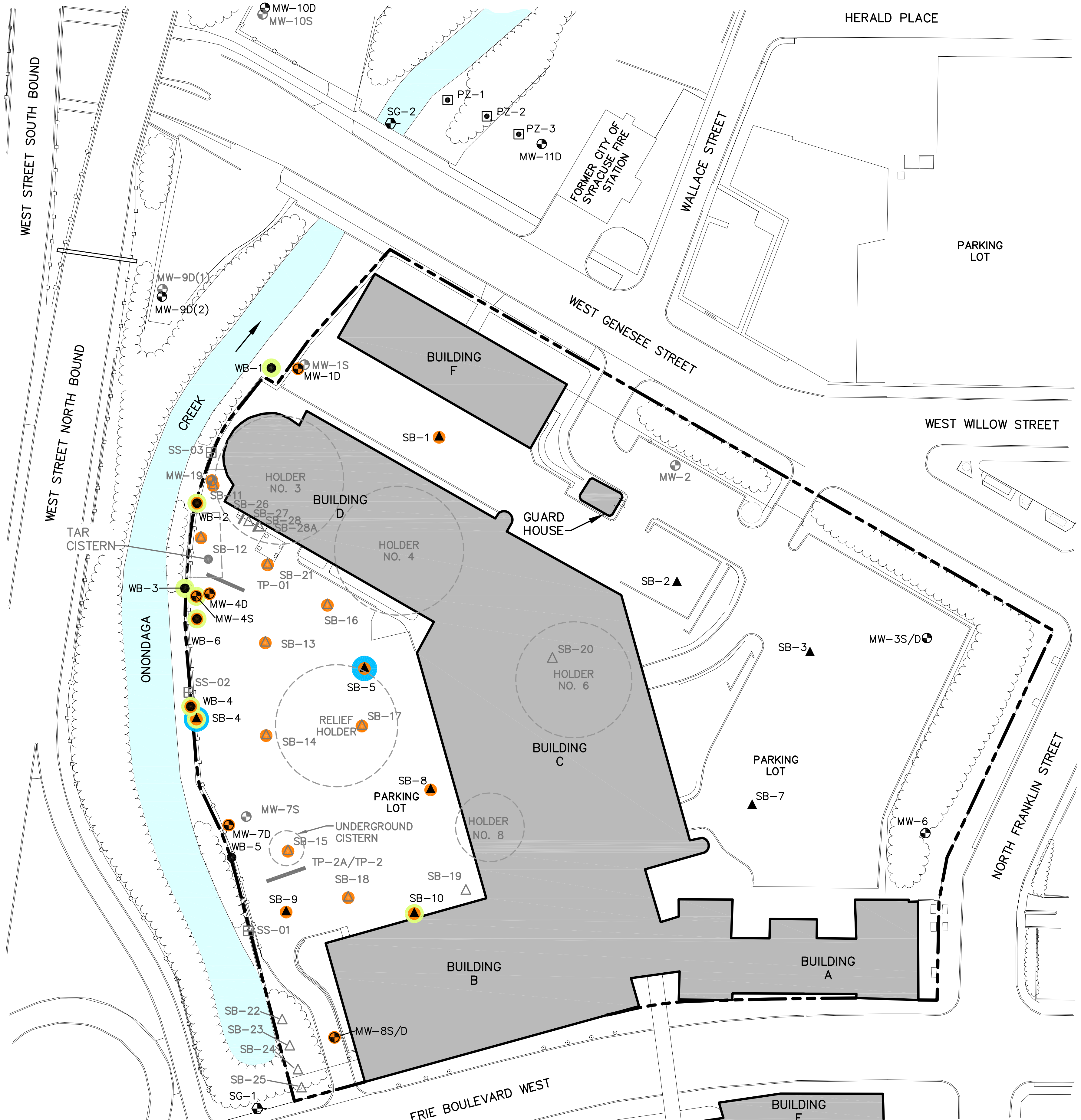
NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

DISTRIBUTION OF BTEX, PAHs, AND NAPL IN UNSATURATED SOIL

ARCADIS

FIGURE 7

CITY: SYRACUSE, NY GROUP: ENVCAD DB: R. ALLEN A. SCHILLING P. LISTER PM: J. BRUSSEL TM: L.HEALY LYR: ON=*;OFF=REF, (FRZ) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/24/2014 9:30 AM BY: LISTER, PAUL
G:\ENVCAD\SYRACUSE\ACT\B0036694\0000\00003\DWG\FS\36694B24.DWG LAYOUT: 7 SAVED: 2/24/2014 9:29 AM ACADVER: 18.1S (LMS TECH)
XREFS: 36694X01 36694XBL IMAGES: PROJECTNAME: ---



LEGEND:

- SB-27△ CONSTRUCTION PROJECT INVESTIGATION SOIL BORING (2012)
- SB-26 CONSTRUCTION PROJECT SOIL BORING UTILITY CLEARANCE TRENCH (2012)
- SB-11△ FINAL RI SOIL BORINGS (2008)
- SB-5▲ PSA SOIL BORINGS (1995)
- MW-1S/D EXISTING MONITORING WELL LOCATION
- PZ-2 EXISTING PIEZOMETER LOCATION
- SG-2 EXISTING STAFF GAUGE LOCATION
- SS-02 SURFACE SOIL SAMPLING LOCATION
- WB-1● FORMER WALL BORING LOCATION
- TP-01 TEST PIT LOCATION
- SB-20△ SB-26 SATURATED SOIL SAMPLES FROM BORING WERE NOT ANALYZED
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- TREES/VEGETATION
- GUARD RAIL
- PAH SOIL ANALYTICAL RESULT > 500 ppm
- BTEX SOIL ANALYTICAL RESULT > 10 ppm
- NAPL OBSERVED IN SOIL

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. FORMER MANUFACTURED GAS PLANT (MGP) STRUCTURES, WITH THE EXCEPTION OF HOLDER NO. 8, ARE FROM THE FORMER SYRACUSE LIGHTING COMPANY GAS PLANT, AS SHOWN ON SANBORN MAPPING DATED 1911. HOLDER NO. 8 IS FROM SANBORN MAPPING DATED 1892.
3. LOCATIONS OF CONSTRUCTION PROJECT INVESTIGATION SOIL BORINGS/UTILITY CLEARANCE TRENCHES, FINAL RI SOIL BORINGS, RETAINING WALL, MONITORING WELLS, PIEZOMETERS, AND STAFF GAUGES ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
4. PRELIMINARY SITE ASSESSMENT (PSA) SOIL BORING, TEST PIT, AND SURFACE SOIL SAMPLING LOCATIONS ARE APPROXIMATE.
5. THE WATER TABLE IS APPROXIMATELY 28 FEET BELOW GROUND SURFACE (bgs) ONSITE AND 30 FEET bgs OFFSITE.
6. ppm = PARTS PER MILLION
7. BTEX = BENZENE, TOULENE, ETHYLBENZENE, AND XYLENES
8. PAH = POLYCYCLIC AROMATIC HYDROCARBONS
9. NAPL = NON-AQUEOUS PHASE LIQUID

0 100' 200'

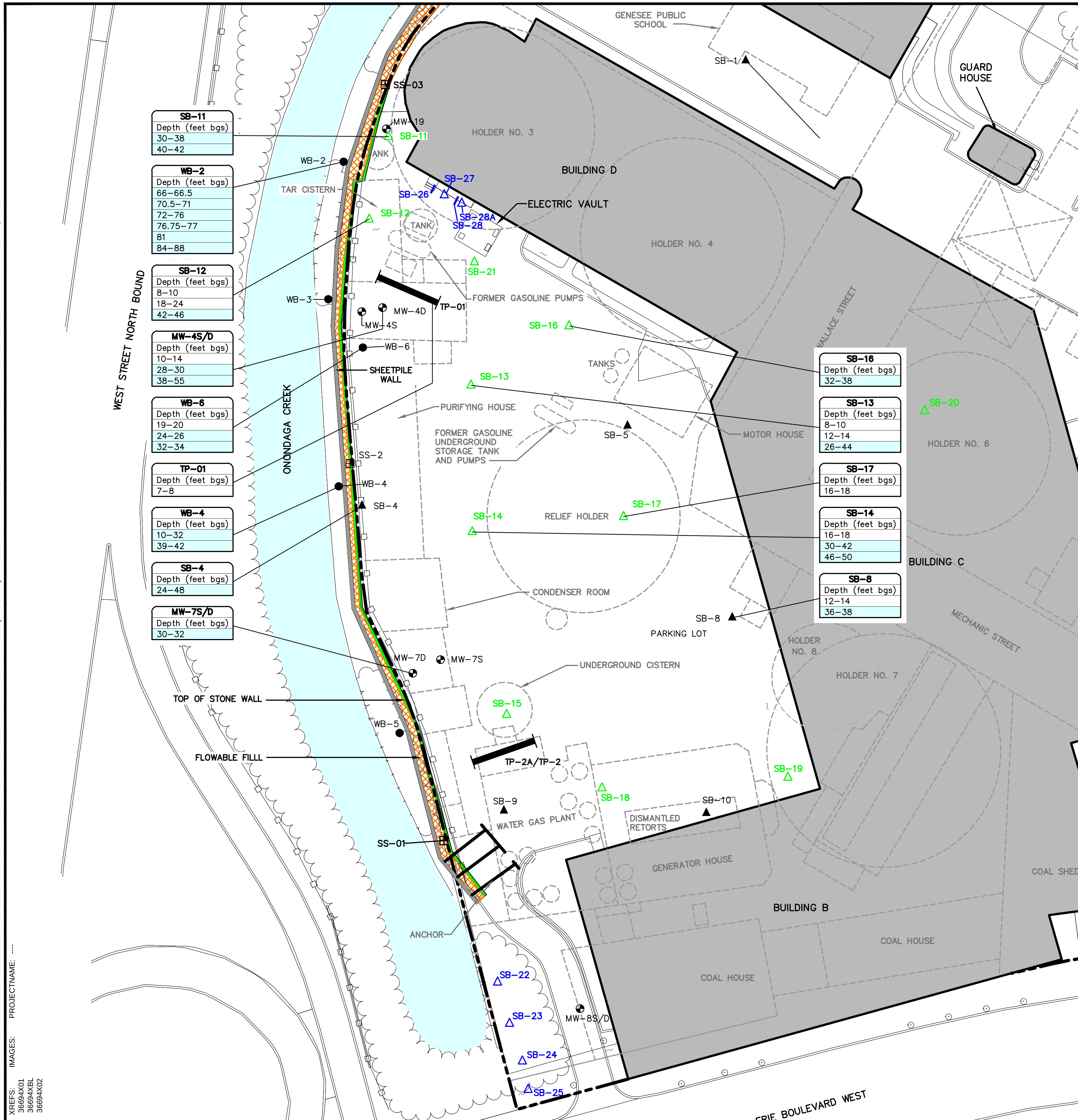
GRAPHIC SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

DISTRIBUTION OF BTEX, PAHs, AND NAPL IN SATURATED SOIL

ARCADIS

FIGURE **8**



LEGEND:

- SB-27 △ CONSTRUCTION PROJECT INVESTIGATION SOIL BORINGS (2012)
- SB-26 CONSTRUCTION PROJECT SOIL BORING UTILITY CLEARANCE TRENCH (2012)
- SB-11 △ FINAL RI SOIL BORINGS (2008)
- SB-5 ▲ PSA SOIL BORINGS (1995)
- MW-1S/D EXISTING MONITORING WELL LOCATION
- SS-02 SURFACE SOIL SAMPLING LOCATION (2002)
- WB-1 ● FORMER WALL BORING LOCATION (1995)
- TP-01 TEST PIT LOCATION
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- TREES/VEGETATION
- GUARD RAIL
- STONE WALL
- SHEETPILE WALL
- BULKHEAD TIE BACK STRUCTURE FOR SHEETPILE WALL
- FLOWABLE FILL
- SB-8 Depth (feet bgs) 12-14 36-38 — SOIL BORING AND CORRESPONDING DEPTHS OF POTENTIAL NAPL SATURATED SOIL – BLUE HIGHLIGHTING INDICATES INTERVAL IS BELOW THE WATER TABLE

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. FORMER MANUFACTURED GAS PLANT (MGP) STRUCTURES, WITH THE EXCEPTION OF HOLDERS NO. 7 AND NO. 8, ARE FROM THE FORMER SYRACUSE LIGHTING COMPANY GAS PLANT, AS SHOWN ON SANBORN MAPPING DATED 1911. HOLDER NO. 7 IS FROM PLOT PLAN PREPARED BY MELVIN L. KING ARCHITECT, DATED SEPTEMBER 2, 1931. HOLDER NO. 8 IS FROM SANBORN MAPPING DATED 1892.
3. LOCATIONS OF CONSTRUCTION PROJECT INVESTIGATION SOIL BORINGS/UTILITY CLEARANCE TRENCHES, FINAL RI SOIL BORINGS, RETAINING WALL, MONITORING WELLS, PIEZOMETERS, AND STAFF GAUGES ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
4. PRELIMINARY SITE ASSESSMENT (PSA) SOIL BORING, TEST PIT, AND SURFACE SOIL SAMPLING LOCATIONS ARE APPROXIMATE.
5. LOCATIONS OF FORMER GASOLINE UNDERGROUND STORAGE TANKS AND FORMER GASOLINE PUMPS ARE APPROXIMATED FROM SITE PLAN PREPARED BY KING AND KING ARCHITECTS, DATED MARCH 31, 1972.
6. LOCATION AND DETAILS OF SHEETPILE WALL ARE FROM ONONDAGA CREEKWALL SHEETPILING PROJECT BY McMAHON & MANN CONSULTING ENGINEERS, DATED SEPTEMBER 1996.
7. BGS = BELOW GROUND SURFACE.
8. REFER TO LETTER DATED FEBRUARY 8, 2013 FOR A DESCRIPTION OF THE PROCESS USED TO DETERMINE THE POTENTIAL PRESENCE OF NAPL SATURATED SOILS DEPICTED ON THIS FIGURE.
9. WALL BORINGS WB-2, WB-3, WB-4, AND WB-5 WERE COMPLETED WEST OF THE EXISTING SHEETPILE WALL. THE GROUND SURFACE AT THESE LOCATIONS IS APPROXIMATELY 15 FEET BELOW THE GROUND SURFACE OF THE WESTERN ONSITE PARKING LOT.
10. FIGURE WAS ORIGINALLY PRESENTED TO NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION IN A FEBRUARY 8, 2013 LETTER FROM NATIONAL GRID.

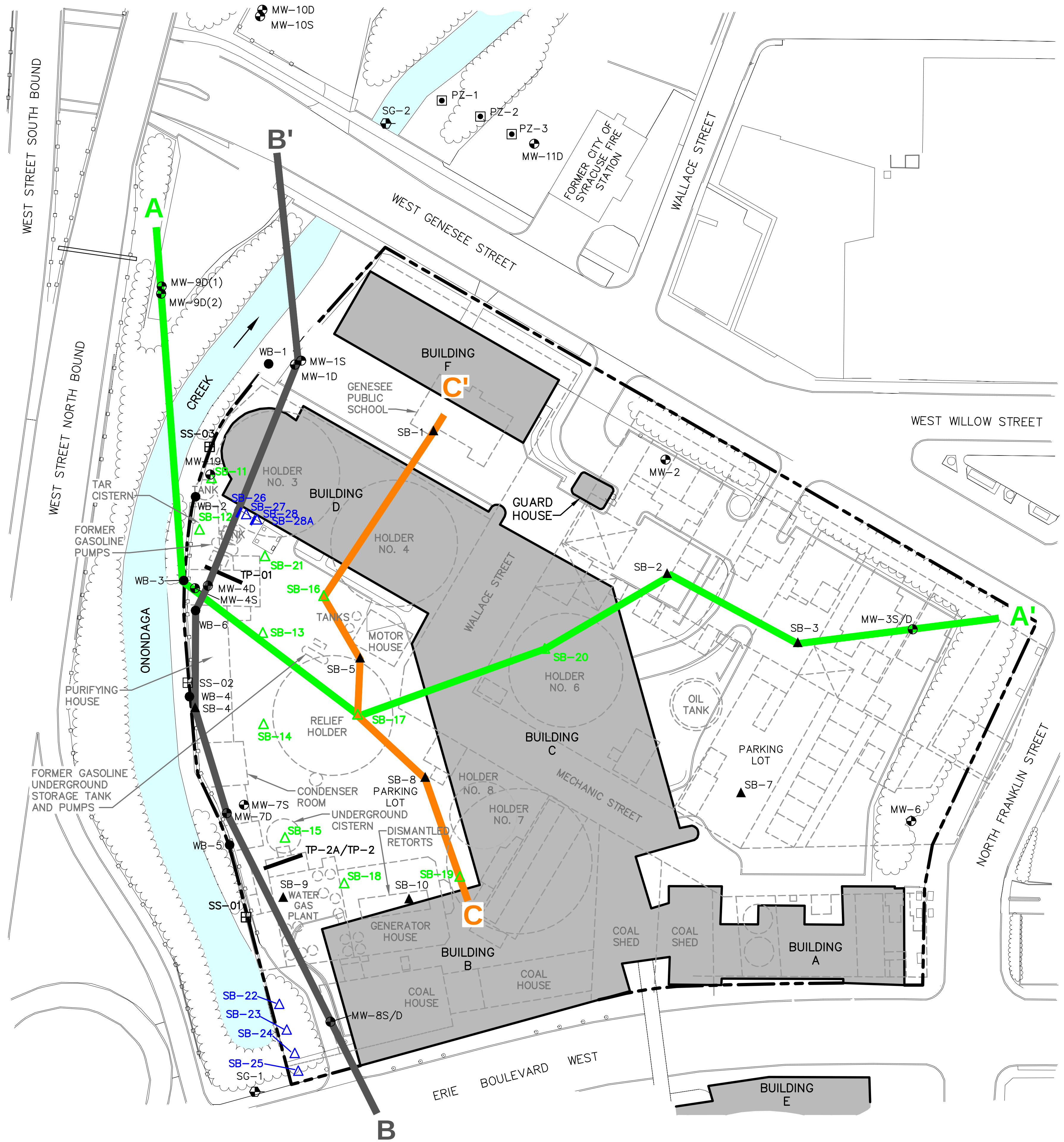
0 60' 120'
GRAPHIC SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

DISTRIBUTION OF POTENTIAL NAPL SATURATED SOIL

ARCADIS

FIGURE
9



LEGEND:

- SB-27 △ CONSTRUCTION PROJECT INVESTIGATION SOIL BORING (2012)
- SB-26 CONSTRUCTION PROJECT SOIL BORING UTILITY CLEARANCE TRENCH (2012)
- SB-11 △ FINAL RI SOIL BORINGS (2008)
- SB-5 ▲ PSA SOIL BORINGS (1995)
- MW-1S/D EXISTING MONITORING WELL LOCATION
- PZ-2 EXISTING PIEZOMETER LOCATION
- SG-2 EXISTING STAFF GAUGE LOCATION
- SS-02 SURFACE SOIL SAMPLING LOCATION
- WB-1 ● FORMER WALL BORING LOCATION
- TP-01 TEST PIT LOCATION
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- TREES/VEGETATION
- GUARD RAIL
- A — A' LINE OF CROSS SECTION

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. FORMER MANUFACTURED GAS PLANT (MGP) STRUCTURES, WITH THE EXCEPTION OF HOLDERS NO. 7 AND NO. 8, ARE FROM THE FORMER SYRACUSE LIGHTING COMPANY GAS PLANT, AS SHOWN ON SANBORN MAPPING DATED 1911. HOLDER NO. 7 IS FROM PLOT PLAN PREPARED BY MELVIN L. KING ARCHITECT, DATED SEPTEMBER 2, 1931. HOLDER NO. 8 IS FROM SANBORN MAPPING DATED 1892.
3. LOCATIONS OF CONSTRUCTION PROJECT INVESTIGATION SOIL BORINGS/UTILITY CLEARANCE TRENCHES, FINAL RI SOIL BORINGS, RETAINING WALL, MONITORING WELL, PIEZOMETER, AND STAFF GAUGE ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
4. PRELIMINARY SITE ASSESSMENT (PSA) SOIL BORING, TEST PIT, AND SURFACE SOIL SAMPLING LOCATIONS ARE APPROXIMATE.
5. LOCATIONS OF FORMER GASOLINE UNDERGROUND STORAGE TANKS AND FORMER GASOLINE PUMPS ARE APPROXIMATED FROM SITE PLAN PREPARED BY KING AND KING ARCHITECTS, DATED MARCH 31, 1972.
6. FIGURE WAS ORIGINALLY PRESENTED TO NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION IN A FEBRUARY 8, 2013 LETTER FROM NATIONAL GRID.

0 100' 200'

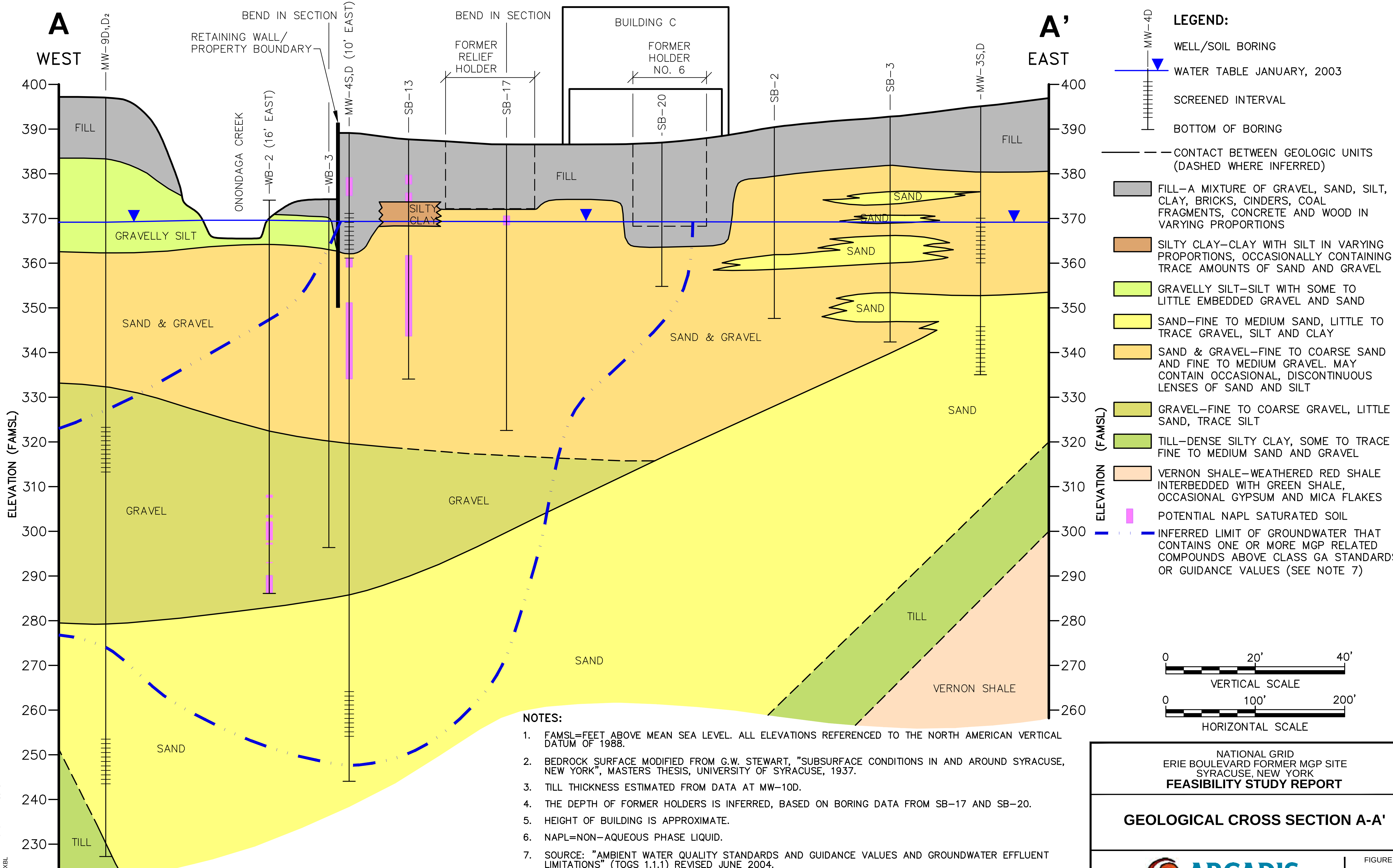
GRAPHIC SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

CROSS SECTIONS LOCATION MAP

ARCADIS

FIGURE
10



NOTES:

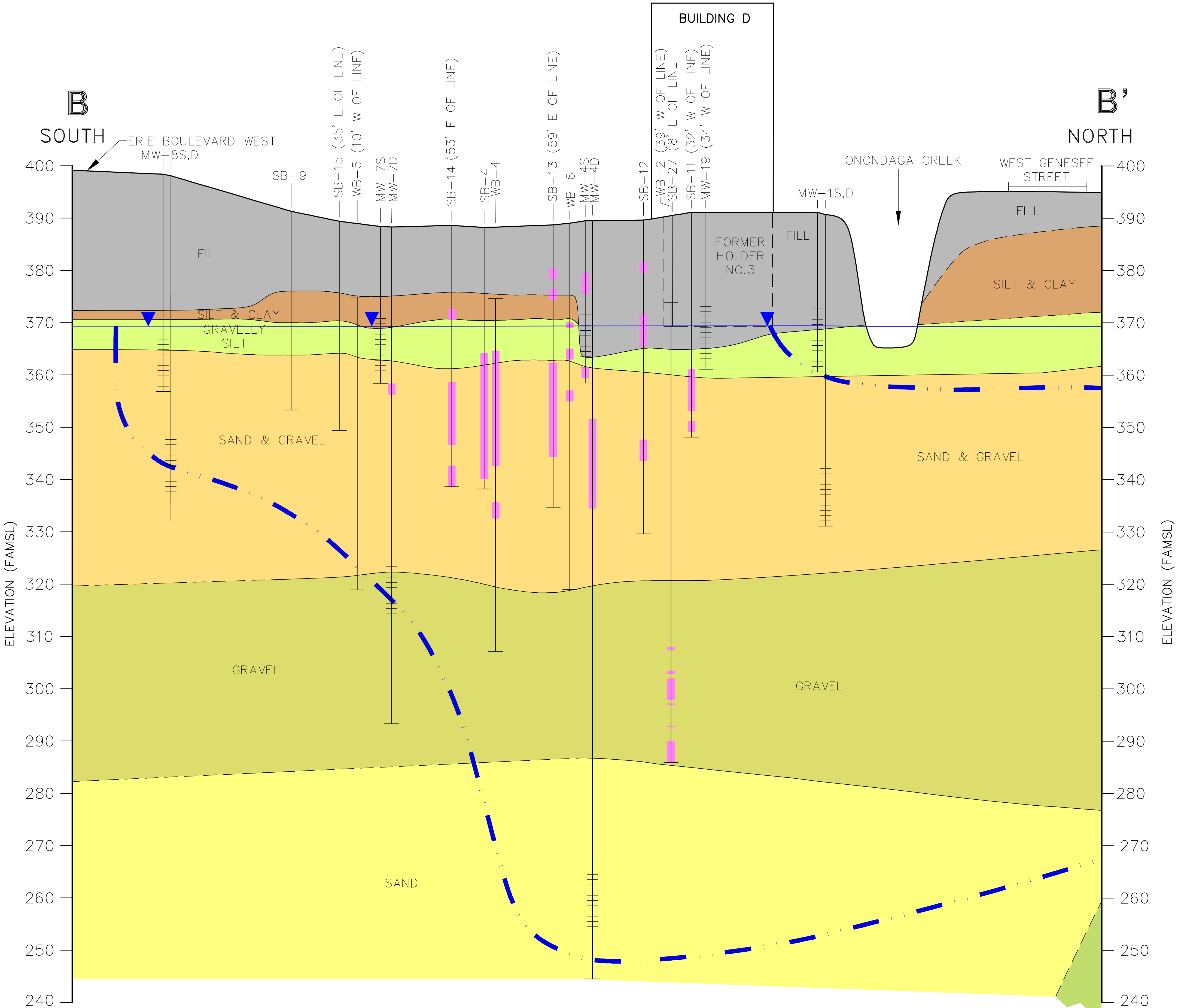
1. FAMSL=FEET ABOVE MEAN SEA LEVEL. ALL ELEVATIONS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988.
2. BEDROCK SURFACE MODIFIED FROM G.W. STEWART, "SUBSURFACE CONDITIONS IN AND AROUND SYRACUSE, NEW YORK", MASTERS THESIS, UNIVERSITY OF SYRACUSE, 1937.
3. TILL THICKNESS ESTIMATED FROM DATA AT MW-10D.
4. THE DEPTH OF FORMER HOLDERS IS INFERRED, BASED ON BORING DATA FROM SB-17 AND SB-20.
5. HEIGHT OF BUILDING IS APPROXIMATE.
6. NAPL=NON-AQUEOUS PHASE LIQUID.
7. SOURCE: "AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES AND GROUNDWATER EFFLUENT LIMITATIONS" (TOGS 1.1.1) REVISED JUNE 2004.
8. FIGURE WAS ORIGINALLY PRESENTED TO NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION IN A FEBRUARY 8, 2013 LETTER FROM NATIONAL GRID.

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

GEOLOGICAL CROSS SECTION A-A'

ARCADIS

FIGURE
11



LEGEND:

MW-7D WELL/SOIL BORING

WATER TABLE JANUARY, 2003

SCREENED INTERVAL

BOTTOM OF BORING

CONTACT BETWEEN GEOLOGIC UNITS (DASHED WHERE INFERRED)

FILL–A MIXTURE OF GRAVEL, SAND, SILT, CLAY, BRICKS, CINDERS, COAL FRAGMENTS, CONCRETE AND WOOD IN VARYING PROPORTIONS

SILTY CLAY–CLAY WITH SILT IN VARYING PROPORTIONS, OCCASIONALLY CONTAINING TRACE AMOUNTS OF SAND AND GRAVEL

GRAVELLY SILT–SILT WITH SOME TO LITTLE EMBEDDED GRAVEL AND SAND

SAND–FINE TO MEDIUM SAND, LITTLE TO TRACE GRAVEL, SILT AND CLAY

SAND & GRAVEL–FINE TO COARSE SAND AND FINE TO MEDIUM GRAVEL. MAY CONTAIN OCCASIONAL, DISCONTINUOUS LENSES OF SAND AND SILT

GRAVEL–FINE TO COARSE GRAVEL, LITTLE SAND, TRACE SILT

POTENTIAL NAPL SATURATED SOIL

INFERRED LIMIT OF GROUNDWATER THAT CONTAINS ONE OR MORE MGP RELATED COMPOUNDS ABOVE CLASS GA STANDARDS OR GUIDANCE VALUES (SEE NOTE 5)

NOTES:

1. FAMSL=FEET ABOVE MEAN SEA LEVEL. ALL ELEVATIONS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988.
2. THE DEPTH OF FORMER HOLDERS IS INFERRED, BASED ON BORING DATA FROM SB-11, SB-27, AND MW-19.
3. HEIGHT OF BUILDING IS APPROXIMATE.
4. NAPL=NON-AQUEOUS PHASE LIQUID.
5. SOURCE: "AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES AND GROUNDWATER EFFLUENT LIMITATIONS (TOGS 1.1.1) REVISED JUNE 2004.
6. FIGURE WAS ORIGINALLY PRESENTED TO NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION IN A FEBRUARY 8, 2013 LETTER FROM NATIONAL GRID.

0 20' 40'
VERTICAL SCALE:

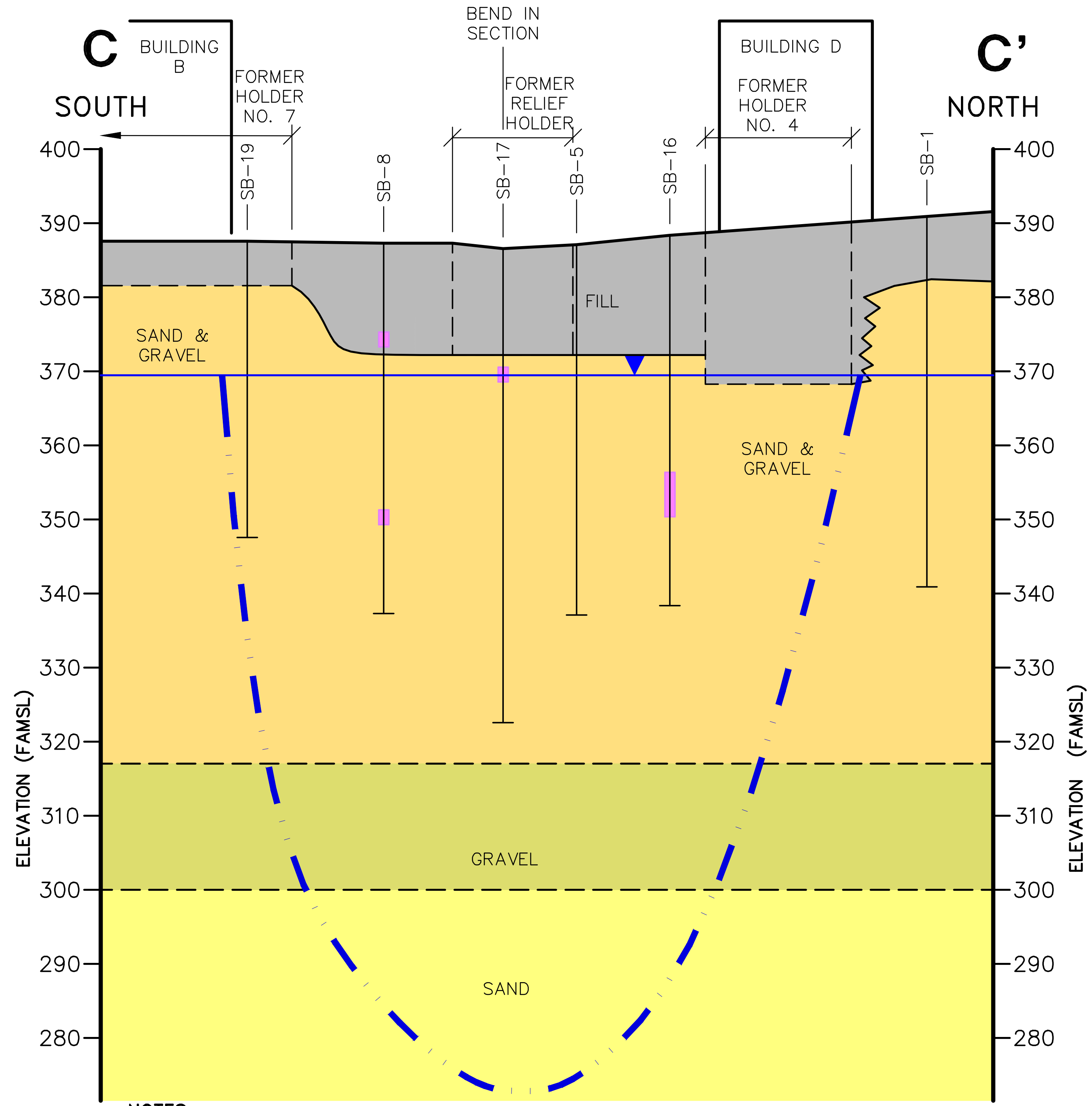
0 100' 200'
HORIZONTAL SCALE:

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

GEOLOGICAL CROSS SECTION B-B'

ARCADIS

FIGURE
12



LEGEND:

SB-1 SOIL BORING

WATER TABLE JANUARY, 2003

BOTTOM OF BORING

CONTACT BETWEEN GEOLOGIC UNITS (DASHED WHERE INFERRED)

FILL–A MIXTURE OF GRAVEL, SAND, SILT, CLAY, BRICKS, CINDERS, COAL FRAGMENTS, CONCRETE AND WOOD IN VARYING PROPORTIONS

SAND–FINE TO MEDIUM SAND, LITTLE TO TRACE GRAVEL, SILT AND CLAY

SAND & GRAVEL–FINE TO COARSE SAND AND FINE TO MEDIUM GRAVEL. MAY CONTAIN OCCASIONAL, DISCONTINUOUS LENSES OF SAND AND SILT

GRAVEL–FINE TO COARSE GRAVEL, LITTLE SAND, TRACE SILT

POTENTIAL NAPL SATURATED SOIL

INFERRED LIMIT OF GROUNDWATER THAT CONTAINS ONE OR MORE MGP RELATED COMPOUNDS ABOVE CLASS GA STANDARDS OR GUIDANCE VALUES (SEE NOTE 7)

0 20' 40'
VERTICAL SCALE

0 100' 200'
HORIZONTAL SCALE

NOTES:

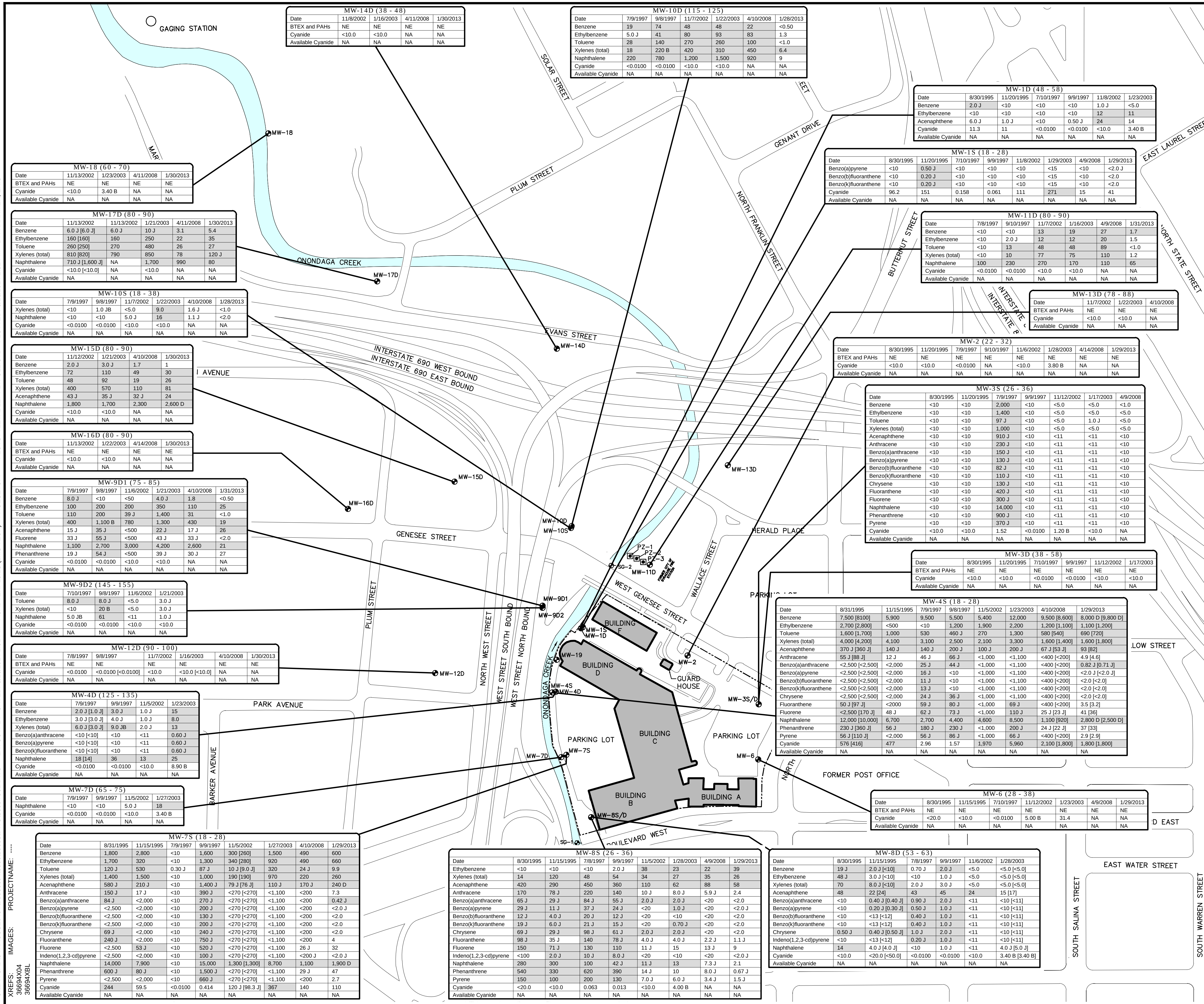
1. FAMSL=FEET ABOVE MEAN SEA LEVEL. ALL ELEVATIONS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988.
2. THE DEPTH OF THE FORMER RELIEF HOLDER IS INFERRED, BASED ON BORING DATA FROM SB–17.
3. THE DEPTH OF FORMER HOLDER NO. 4 IS APPROXIMATE, NO BORINGS HAVE BEEN ADVANCED IN THIS HOLDER TO CONFIRM THE DEPTH OF THE HOLDER FLOOR.
4. THE DEPTH OF FORMER HOLDER NO. 7 IS INFERRED, BASED ON BORING DATA FROM SB–19.
5. HEIGHT OF BUILDING IS APPROXIMATE.
6. NAPL=NON–AQUEOUS PHASE LIQUID.
7. SOURCE: "AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES AND GROUNDWATER EFFLUENT LIMITATIONS (TOGS 1.1.1) REVISED JUNE 2004.
8. FIGURE WAS ORIGINALLY PRESENTED TO NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION IN A FEBRUARY 8, 2013 LETTER FROM NATIONAL GRID.

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

GEOLOGICAL CROSS SECTION C-C'

ARCADIS

FIGURE
13



MW-14D (38 - 48)

Date	11/8/2002	1/16/2003	4/11/2008	1/30/2013
BTEX and PAHs	NE	NE	NE	NE
Cyanide	<10.0	<10.0	NA	NA
Available Cyanide	NA	NA	NA	NA

MW-10D (115 - 125)

Date	7/9/1997	9/8/1997	11/7/2002	1/22/2003	4/10/2008	1/28/2013
Benzene	19	74	48	48	22	<0.50
Ethylbenzene	5.0 J	41	80	93	83	1.3
Toluene	28	140	270	260	100	<1.0
Xylenes (total)	18	220 B	420	310	450	6.4
Naphthalene	220	780	1,200	1,500	920	9
Cyanide	<0.0100	<0.0100	<10.0	<10.0	NA	NA
Available Cyanide	NA	NA	NA	NA	NA	NA

MW-18 (60 - 70)

Date	11/13/2002	1/23/2003	4/11/2008	1/30/2013
BTEX and PAHs	NE	NE	NE	NE
Cyanide	<10.0	3.40 B	NA	NA
Available Cyanide	NA	NA	NA	NA

MW-17D (80 - 90)

Date	11/13/2002	11/13/2002	1/21/2003	4/11/2008	1/30/2013
Benzene	6.0 J [6.0 J]	6.0 J	10 J	3.1	5.4
Ethylbenzene	160 [160]	160	250	22	35
Toluene	260 [250]	270	480	26	27
Xylenes (total)	810 [820]	790	850	78	120 J
Naphthalene	710 J [1,600 J]	NA	1,700	990	80
Cyanide	<10.0 [<10.0]	NA	<10.0	NA	NA
Available Cyanide	NA	NA	NA	NA	NA

MW-10S (18 - 38)

Date	7/9/1997	9/8/1997	11/7/2002	1/22/2003	4/10/2008	1/28/2013
Xylenes (total)	<10	1.0 JB	<5.0	9.0	1.6 J	<1.0
Naphthalene	<10	<10	5.0 J	16	1.1 J	<2.0
Cyanide	<0.0100	<0.0100	<10.0	<10.0	NA	NA
Available Cyanide	NA	NA	NA	NA	NA	NA

MW-15D (80 - 90)

Date	11/12/2002	1/21/2003	4/10/2008	1/30/2013
Benzene	2.0 J	3.0 J	1.7	1
Ethylbenzene	72	110	49	30
Toluene	48	92	19	26
Xylenes (total)	400	570	110	81
Acenaphthene	43 J	35 J	32 J	24
Naphthalene	1,800	1,700	2,300	2,600 D
Cyanide	<10.0	<10.0	NA	NA
Available Cyanide	NA	NA	NA	NA

MW-16D (80 - 90)

Date	11/13/2002	1/22/2003	4/14/2008	1/30/2013
BTEX and PAHs	NE	NE	NE	NE
Cyanide	<10.0	<10.0	NA	NA
Available Cyanide	NA	NA	NA	NA

MW-9D1 (75 - 85)

Date	7/9/1997	9/8/1997	11/6/2002	1/21/2003	4/10/2008	1/31/2013
Benzene	8.0 J	<10	<50	4.0 J	1.8	<0.50
Ethylbenzene	100	200	200	350	110	25
Toluene	110	200	39 J	1,400	31	<1.0
Xylenes (total)	400	1,100 B	780	1,300	430	19
Acenaphthene	15 J	35 J	<500	22 J	17 J	26
Fluorene	33 J	55 J	<500	43 J	33 J	<2.0
Naphthalene	1,100	2,700	3,000	4,200	2,600	21
Phenanthrene	19 J	54 J	<500	39 J	30 J	27
Cyanide	<0.0100	<0.0100	<10.0	<10.0	NA	NA
Available Cyanide	NA	NA	NA	NA	NA	NA

MW-9D2 (145 - 155)

Date	7/10/1997	9/8/1997	11/6/2002	1/21/2003
Toluene	8.0 J	8.0 J	<5.0	3.0 J
Xylenes (total)	<10	20 B	<5.0	3.0 J
Naphthalene	5.0 JB	61	<11	1.0 J
Cyanide	<0.0100	<0.0100	<10.0	<10.0
Available Cyanide	NA	NA	NA	NA

MW-12D (90 - 100)

Date	7/8/1997	9/8/1997	11/7/2002	1/16/2003	4/10/2008	1/30/2013
BTEX and PAHs	NE	NE	NE	NE	NE	NE
Cyanide	<0.0100	<0.0100 [<0.0100]	<10.0	<10.0 [<10.0]	NA	NA
Available Cyanide	NA	NA	NA	NA	NA	NA

MW-4D (125 - 135)

Date	7/9/1997	9/9/1997	11/5/2002	1/23/2003
Benzene	2.0 J [1.0 J]	3.0 J	1.0 J	15
Ethylbenzene	3.0 J [3.0 J]	4.0 J	1.0 J	8.0
Xylenes (total)	6.0 J [3.0 J]	9.0 JB	2.0 J	13
Benzo(a)anthracene	<10 [<10]	<10	<11	0.60 J
Benzo(a)pyrene	<10 [<10]	<10	<11	0.60 J
Benzo(k)fluoranthene	<10 [<10]	<10	<11	0.60 J
Naphthalene	18 [14]	36	13	25
Cyanide	<0.0100	<0.0100	<10.0	8.90 B
Available Cyanide	NA	NA	NA	NA

MW-7D (65 - 75)

Date	7/9/1997	9/9/1997	11/5/2002	1/27/2003
Naphthalene	<10	<10	5.0 J	18
Cyanide	<0.0100	<0.0100	<10.0	3.40 B
Available Cyanide	NA	NA	NA	NA

MW-7S (18 - 28)

Date	8/31/1995	11/15/1995	7/9/1997	9/9/1997	11/5/2002	1/27/2003	4/10/2008	1/29/2013
Benzene	1,800	2,800	<10	1,600	300 [260]	1,500	490	600
Ethylbenzene	1,700	320	<10	1,300	340 [280]	920	490	660
Toluene	120 J	530	0.30 J	87 J	10 J [9.0 J]	320	24 J	9.9
Xylenes (total)	1,400	1,500	<10	1,000	190 [190]	970	220	260
Acenaphthene	580 J	210 J	<10	1,400 J	79 J [76 J]	110 J	170 J	240 D
Anthracene	150 J	17 J	<10	390 J	<270 [<270]	<1,100	<200	7.3
Benzo(a)anthracene	84 J	<2,000	<10	270 J	<270 [<270]	<1,100	<200	0.42 J
Benzo(a)pyrene	<2,500	<2,000	<10	200 J	<270 [<270]	<1,100	<200	<2.0 J
Benzo(b)fluoranthene	<2,500	<2,000	<10	130 J	<270 [<270]	<1,100	<200	<2.0
Benzo(k)fluoranthene	<2,500	<2,000	<10	200 J	<270 [<270]	<1,100	<200	<2.0
Chrysene	69 J	<2,000	<10	240 J	<270 [<270]	<1,100	<200	<2.0
Fluoranthene	240 J	<2,000	<10	750 J	<270 [<270]	<1,100	<200	4
Fluorene	<2,500	53 J	<10	520 J	<270 [<270]	<1,100	26 J	32
Indeno(1,2,3-cd)pyrene	<2,500	<2,000	<10	100 J	<270 [<270]	<1,100	<200 J	<2.0 J
Naphthalene	14,000	7,900	<10	15,000	1,300 [1,300]	8,700	1,100	1,900 D
Phenanthrene	600 J	80 J	<10	1,500 J	<270 [<270]	<1,100	29 J	47
Pyrene	<2,500	<2,000	<10	660 J	<270 [<270]	<1,100	<200	2.7
Cyanide	244	59.5	<0.0100	0.414	120 J [98.3 J]	367	140	110
Available Cyanide	NA	NA	NA	NA	NA	NA	NA	NA

MW-1D (48 - 58)

Date	8/30/1995	11/20/1995	7/10/1997	9/9/1997	11/8/2002	1/23/2003
Benzene	2.0 J	<10	<10	<10	1.0 J	<5.0
Ethylbenzene	<10	<10	<10	<10	12	11
Acenaphthene	6.0 J	1.0 J	<10	0.50 J	24	14
Cyanide	11.3	11	<0.0100	<0.0100	<10.0	3.40 B
Available Cyanide	NA	NA	NA	NA	NA	NA

MW-1S (18 - 28)

Date	8/30/1995	11/20/1995	7/10/1997	9/9/1997	11/8/2002	1/29/2003	4/9/2008	1/29/2013
Benzo(a)pyrene	<10	0.50 J	<10	<10	<10	<15	<10	<2.0 J
Benzo(b)fluoranthene	<10	0.20 J	<10	<10	<10	<15	<10	<2.0
Benzo(k)fluoranthene	<10	0.20 J	<10	<10	<10	<15	<10	<2.0
Cyanide	96.2	151	0.158	0.061	111	271	15	41
Available Cyanide	NA	NA	NA	NA	NA	NA	NA	NA

MW-11D (80 - 90)

Date	7/8/1997	9/10/1997	11/7/2002	1/16/2003	4/9/2008	1/31/2013
Benzene	<10	<10	13	19	27	1.7
Ethylbenzene	<10	2.0 J	12	12	20	1.5
Toluene	<10	13	48	48	89	<1.0
Xylenes (total)	<10	10	77	75	110	1.2
Naphthalene	100	230	270	170	110	65
Cyanide	<0.0100	<0.0100	<10.0	<10.0	NA	NA
Available Cyanide	NA	NA	NA	NA	NA	NA

MW-13D (78 - 88)

Date	11/7/2002	1/22/2003	4/10/2008
BTEX and PAHs	NE	NE	NE
Cyanide	<10.0	<10.0	NA
Available Cyanide	NA	NA	NA

MW-2 (22 - 32)

Date	8/30/1995	11/20/1995	7/9/1997	9/10/1997	11/6/2002	1/28/2003	4/14/2008	1/29/2013
BTEX and PAHs	NE	NE	NE	NE	NE	NE	NE	NE
Cyanide	<10.0	<10.0	<0.0100	NA	<10.0	3.80 B	NA	NA
Available Cyanide	NA	NA	NA	NA	NA	NA	NA	NA

MW-3S (26 - 36)

Date	8/30/1995	11/20/1995	7/9/1997	9/9/1997	11/12/2002	1/17/2003	4/9/2008
Benzene	<10	<10	2,000	<10	<5.0	<5.0	<1.0
Ethylbenzene	<10	<10	1,400	<10	<5.0	<5.0	<5.0
Toluene	<10	<10	97 J	<10	<5.0	1.0 J	<5.0
Xylenes (total)	<10	<10	1,000	<10	<5.0	<5.0	<5.0
Acenaphthene	<10	<10	910 J	<10	<11	<11	<10
Anthracene	<10	<10	230 J	<10	<11	<11	<10
Benzo(a)anthracene	<10	<10	150 J	<10	<11	<11	<10
Benzo(a)pyrene	<10	<10	130 J	<10	<11	<11	<10
Benzo(b)fluoranthene	<10	<10	82 J	<10	<11	<11	<10
Benzo(k)fluoranthene	<10	<10	110 J	<10	<11	<11	<10
Chrysene	<10	<10	130 J	<10	<11	<11	<10
Fluoranthene	<10	<10	420 J	<10	<11	<11	<10
Fluorene	<10	<10	300 J	<10	<11	<11	<10
Naphthalene	<10	<10	14,000	<10	<11	<11	<10
Phenanthrene	<10	<10	900 J	<10	<11	<11	<10
Pyrene	<10	<10	370 J	<10	<11	<11	<10
Cyanide	<10.0	<10.0	1.52	<0.0100	1.20 B	<10.0	NA
Available Cyanide	NA	NA	NA	NA	NA	NA	NA

MW-3D (38 - 58)

Date	8/30/1995	11/20/1995	7/10/1997	9/9/1997	11/12/2002	1/17/2003
BTEX and PAHs	NE	NE	NE	NE	NE	NE
Cyanide	<10.0	<10.0	<0.0100	<0.0100	<10.0	<10.0
Available Cyanide	NA	NA	NA	NA	NA	NA

MW-4S (18 - 28)

Date	8/31/1995	11/15/1995	7/9/1997	9/8/1997	11/5/2002	1/23/2003	4/10/2008	1/29/2013
Benzene	7,500 [8100]	5,900	9,500	5,500	5,400	12,000	9,500 [8,600]	8,000 D [9,800 D]
Ethylbenzene	2,700 [2,800]	<500	<10	1,200	1,900	2,200	1,200 [1,100]	1,100 [1,200]
Toluene	1,600 [1,700]	1,000	530	460 J	270	1,300	580 [540]	690 [720]
Xylenes (total)	4,000 [4,200]	4,100	3,100	2,500	2,100	3,300	1,600 [1,400]	1,600 [1,800]
Acenaphthene	370 J [360 J]	140 J	140 J	200 J	100 J	200 J	67 J [53 J]	93 [82]
Anthracene	55 J [88 J]	12 J	46 J	66 J	<1,000	<1,100	<400 [<200]	4.9 [4.6]
Benzo(a)anthracene	<2,500 [<2,500]	<2,000	25 J	44 J	<1,000	<1,100	<400 [<200]	0.82 J [0.71 J]
Benzo(a)pyrene	<2,500 [<2,500]	<2,000	16 J	<10	<1,000	<1,100	<400 [<200]	<2.0 J [<2.0 J]
Benzo(b)fluoranthene	<2,500 [<2,500]	<2,000	11 J	<10	<1,000	<1,100	<400 [<200]	<2.0 [<2.0]
Benzo(k)fluoranthene	<2,500 [<2,500]	<2,000	13 J	<10	<1,000	<1,100	<400 [<200]	<2.0 [<2.0]
Chrysene	<2,500 [<2,500]	<2,000	24 J	36 J	<1,000	<1,100	<400 [<200]	<2.0 [<2.0]
Fluoranthene	50 J [97 J]	<2000	59 J	80 J	<1,000	69 J	<400 [<200]	3.5 [3.2]
Fluorene	<2,500 [170 J]	48 J	62 J	73 J	<1,000	110 J	25 J [23 J]	41 [36]
Naphthalene	12,000 [10,000]	6,700	2,700	4,400	4,600	8,500	1,100 [920]	2,800 D [2,500 D]
Phenanthrene	230 J [360 J]	56 J	180 J	230 J	<1,000	200 J	24 J [22 J]	37 [33]
Pyrene	56 J [110 J]	<2,000	56 J	86 J	<1,000	66 J	<400 [<200]	2.9 [2.9]
Cyanide	576 [416]	477	2.96	1.57	1,970	5,960	2,100 [1,800]	1,800 [1,800]
Available Cyanide	NA	NA	NA	NA	NA	NA	NA	NA

MW-6 (28 - 38)

Date	8/30/1995	11/15/1995	7/10/1997	11/12/2002	1/23/2003	4/9/2008	1/29/2013
BTEX and PAHs	NE	NE	NE	NE	NE	NE	NE
Cyanide	<20.0	<10.0	<0.0100	5.00 B	31.4	NA	NA
Available Cyanide	NA	NA	NA	NA	NA	NA	NA

MW-8S (26 - 36)

Date	8/30/1995	11/15/1995	7/8/1997	9/9/1997	11/5/2002	1/28/2003	4/9/2008	1/29/2013
Ethylbenzene	<10	<10	<10	2.0 J	38	23	22	39
Xylenes (total)	14	120	48	54	34	27	35	26
Acenaphthene	420	290	450	360	110	62	88	58
Anthracene	170	78 J	220	140	10 J	8.0 J	5.9 J	2.4
Benzo(a)anthracene	65 J	29 J	84 J	55 J	2.0 J	2.0 J	<20	<2.0
Benzo(a)pyrene	29 J	11 J	37 J	24 J	<20	1.0 J	<20	<2.0 J
Benzo(b)fluoranthene	12 J	4.0 J	20 J	12 J	<20	<10	<20	<2.0
Benzo(k)fluoranthene	19 J	6.0 J	21 J	15 J	<20	0.70 J	<20	<2.0
Chrysene	69 J	29 J	98 J	61 J	2.0 J	2.0 J	<20	<2.0
Fluoranthene	98 J	35 J	140	78 J	4.0 J	4.0 J	2.2 J	1.1 J
Fluorene	150	71 J	130	110	11 J	15	13 J	9
Indeno(1,2,3-cd)pyrene	<100	2.0 J	10 J	8.0 J	<20	<10	<20	<2.0 J
Naphthalene	280	300	100	42 J	11 J	13	7.3 J	2.1
Phenanthrene	540	330	620	390	14 J	10	8.0 J	0.67 J
Pyrene	150	100	200	130	7.0 J	6.0 J	3.4 J	1.5 J
Cyanide	<20.0	<10.0	0.063	0.013	<10.0	4.00 B	NA	NA
Available Cyanide	NA	NA	NA	NA	NA	NA	NA	NA

MW-8D (53 - 63)

Date	8/30/1995	11/15/1995	7/8/1997	9/9/1997	11/6/2002	1/28/2003
Benzene	19 J	2.0 J [<10]	0.70 J	2.0 J	<5.0	<5.0 [<5.0]
Ethylbenzene	48 J	3.0 J [<10]	<10	1.0 J	<5.0	<5.0 [<5.0]
Xylenes (total)	70	8.0 J [<10]	2.0 J	3.0 J	<5.0	<5.0 [<5.0]
Acenaphthene	48	22 [24]	43	45	24	15 [17]
Benzo(a)anthracene	<10	0.40 J [0.40 J]	0.90 J	2.0 J	<11	<10 [<11]
Benzo(a)pyrene	<10	0.20 J [0.30 J]	0.50 J	1.0 J	<11	<10 [<11]
Benzo(b)fluoranthene	<10	<13 [<12]	0.40 J	1.0 J	<11	<10 [<11]
Benzo(k)fluoranthene	<10	<13 [<12]	0.40 J	1.0 J	<11	<10 [<11]
Chrysene	0.50 J	0.40 J [0.50 J]	1.0 J	2.0 J	<11	<10 [<11]
Indeno(1,2,3-cd)pyrene	<10	<13 [<12]	0.20 J	1.0 J	<11	<10 [<11]
Naphthalene	14	4.0 J [4.0 J]	<10	1.0 J	<11	4.0 J [5.0 J]
Cyanide	<10.0	<20.0 [<50.0]	<0.0100	<0.0100	<10.0	3.40 B [3.40 B]
Available Cyanide	NA	NA	NA	NA	NA	NA

LEGEND:

MW-1S/D — EXISTING MONITORING WELL LOCATION

PZ-2 — EXISTING PIEZOMETER LOCATION

SG-2 — EXISTING STAFF GAUGE LOCATION

FORMER MGP SITE BOUNDARY (APPROXIMATE)

EXISTING ONSITE BUILDING

NYSDEC TOGS 1.1.1

Constituent	Standard/Guidance Value (ppb)
Benzene	1 (Standard)
Ethylbenzene	5 (Standard)
Toluene	5 (Standard)
Xylenes (total)	5 (Standard)
Acenaphthene	20 (Guidance Value)
Anthracene	50 (Guidance Value)
Benzo(a)anthracene	0.002 (Guidance Value)
Benzo(a)pyrene	0 (Standard)
Benzo(b)fluoranthene	0.002 (Guidance Value)
Benzo(k)fluoranthene	0.002 (Guidance Value)
Chrysene	0.002 (Guidance Value)
Fluoranthene	50 (Guidance Value)
Fluorene	50 (Guidance Value)
Indeno(1,2,3-cd)pyrene	0.002 (Guidance Value)
Naphthalene	10 (Guidance Value)
Phenanthrene	50 (Guidance Value)
Pyrene	50 (Guidance Value)
Cyanide	200 (Standard)
Cyanide, Available	- -

NOTES:

1. BASE MAP DEVELOPED FROM NEW YORK STATE GEOGRAPHIC INFORMATION SYSTEMS, OFFICE OF CYBER SECURITY & CRITICAL INFRASTRUCTURE, LAST UPDATED 4/25/2007.
2. MONITORING WELL, PIEZOMETER, AND STAFF GAUGE LOCATIONS ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
3. FIGURE SHOWS GROUNDWATER ANALYTICAL RESULTS FOR SAMPLING LOCATIONS WHERE ONE OR MORE BTEX CONSTITUENTS OR PAHs WERE IDENTIFIED AT CONCENTRATION EXCEEDING THE STANDARDS/GUIDANCE VALUES. FIGURE ALSO SHOWS RESULTS FOR TOTAL AND AVAILABLE CYANIDE.
4. STANDARDS/GUIDANCE VALUES = GROUNDWATER STANDARDS/GUIDANCE VALUES FOR CLASS GA WATER AS PRESENTED IN THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TECHNICAL AND OPERATIONAL GUIDANCE SERIES DOCUMENT TITLED, "AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES AND GROUNDWATER EFFLUENT LIMITATIONS" (TOGS 1.1.1), DATED JUNE 1998, LAST REVISED JUNE 2004.
5. ND = NON-DETECTABLE CONCENTRATION BY THE APPROVED ANALYTICAL METHODS REFERENCED IN TITLE 6 OF THE OFFICIAL COMPILATION OF CODES, RULES, AND REGULATIONS OF THE STATE OF NEW YORK (6 NYCRR) PART 700.3.
6. SHADING INDICATES THE VALUE EXCEEDS THE NYSDEC TOGS 1.1.1 STANDARD/GUIDANCE VALUE.
7. ALL CONCENTRATIONS ARE PRESENTED IN PARTS PER BILLION (ppb). WHICH IS EQUIVALENT TO MICROGRAMS PER LITER (ug/L).
8. FIELD DUPLICATE SAMPLE RESULTS ARE PRESENTED IN BRACKETS [].
9. J = INDICATES THAT THE ASSOCIATED NUMERICAL VALUE IS AN ESTIMATED CONCENTRATION.
10. < = CONSITITUENT NOT DETECTED AT A CONCENTRATION ABOVE THE REPORTED DETECTION LIMIT.
11. NA = NOT ANALYZED
12. NE = NO EXCEEDANCES
13. B = INDICATES AN ESTIMATED VALUE BETWEEN THE INSTRUMENT DETECTION LIMIT AND THE REPORTING LIMIT.
14. * = A SECOND SAMPLE WAS TAKEN AT MW-17D ON THE SAME DAY.
15. __ = NYSDEC TOGS 1.1.1 STANDARD/GUIDANCE VALUE NOT AVAILABLE.
16. BTEX = BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES.
17. PAHs = POLYCYCLIC AROMATIC HYDROCARBONS.
18. THE REMEDIAL INVESTIGATION GROUNDWATER ANALYTICAL DATA AND SUBSEQUENT DATA HAS BEEN VALIDATED.
19. THE SAMPLES COLLECTED JULY 9, 1997 FROM WELLS MW-3S AND MW-7S APPEAR TO HAVE BEEN INADVERTENTLY SWITCHED DURING THE PRELIMINARY SITE ASSESSMENT. RESULTS FOR THESE WELLS HAVE BEEN SWITCHED (CORRECTED) FOR THIS FIGURE.
20. DATA IN PARENTHESIS AFTER WELL ID INDICATES SCREEN INTERVAL IN FEET BELOW GROUND SURFACE.

0 300' 600'

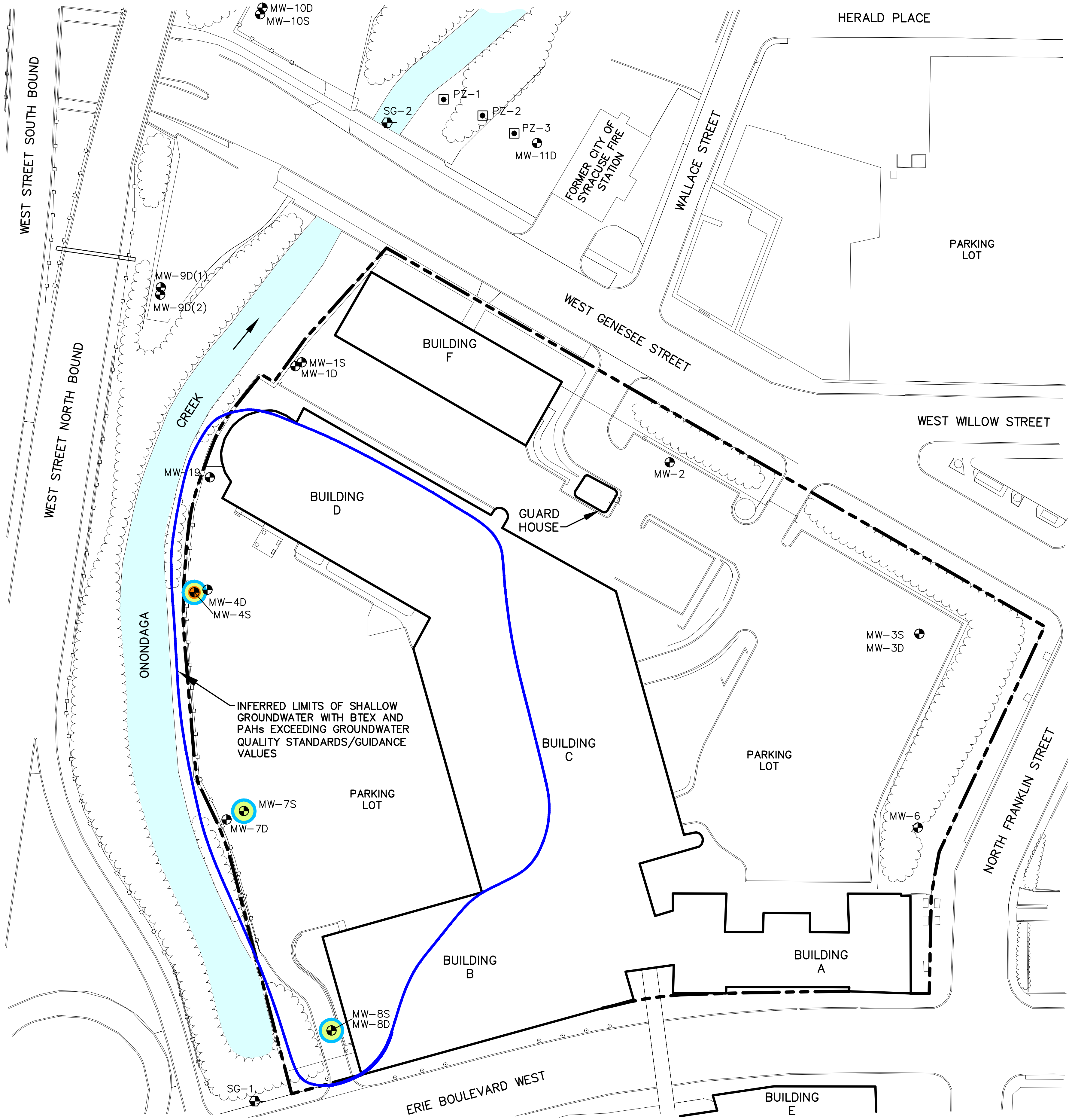
GRAPHIC SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

GROUNDWATER ANALYTICAL RESULTS FOR BTEX, PAHs, AND CYANIDE EXCEEDING STANDARDS/GUIDANCE VALUES (ppb)

ARCADIS

FIGURE
14



LEGEND:

- MW-1S/D — EXISTING MONITORING WELL LOCATION
- PZ-2 — EXISTING PIEZOMETER LOCATION
- SG-2 — EXISTING STAFF GAUGE LOCATION
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- TREES/VEGETATION
- GUARD RAIL

COLOR CODING DESIGNATES WELL WHERE ONE OR MORE OF THE FOLLOWING CONSTITUENTS WERE IDENTIFIED IN GROUNDWATER AT CONCENTRATIONS EXCEEDING TOGS 1.1.1 STANDARDS/GUIDANCE VALUES DURING THE MOST RECENT SAMPLING EVENT FOR:

- PAH
- BTEX
- CYANIDE

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. LOCATIONS OF FINAL RI SOIL BORINGS, RETAINING WALL, MONITORING WELLS, PIEZOMETERS, AND STAFF GAUGES ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
3. BTEX = BENZENE, TOULENE, ETHYLBENZENE, AND XYLENES
4. PAH = POLYCYCLIC AROMATIC HYDROCARBONS
5. NAPL = NON-AQUEOUS PHASE LIQUID
6. TOGS 1.1.1 STANDARDS/GUIDANCE VALUES ARE FROM THE NYSDEC DIVISION OF WATER, TECHNICAL AND OPERATIONAL GUIDANCE SERIES DOCUMENT TITLED "AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES AND GROUNDWATER EFFLUENT LIMITATIONS", (TOGS 1.1.1) DATED JUNE 1998, LAST REVISED JUNE 2004.
7. NO MEASURABLE NAPL IDENTIFIED IN SHALLOW GROUNDWATER.

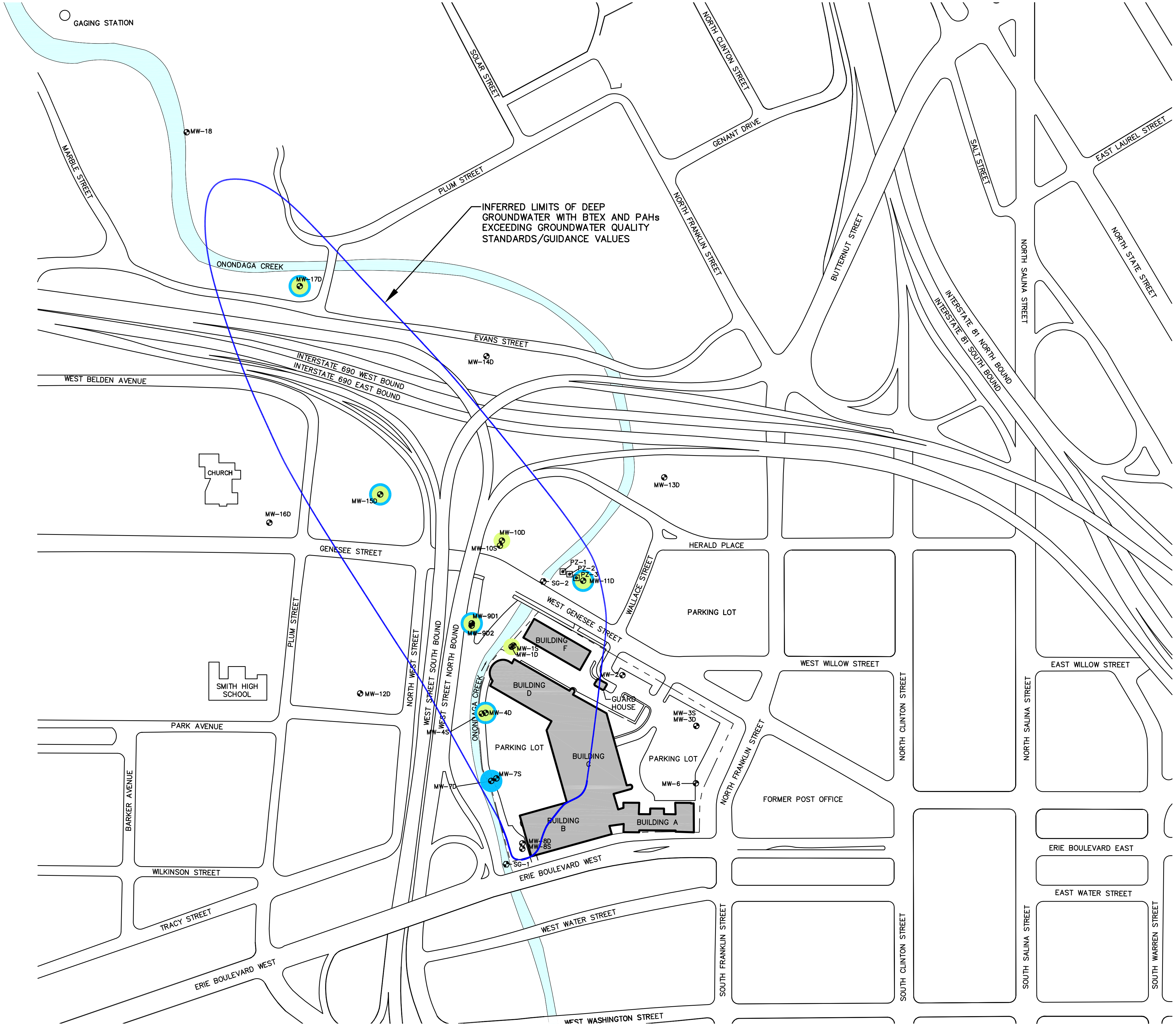
0 100' 200'
GRAPHIC SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

DISTRIBUTION OF BTEX, PAHs, AND CYANIDE IN ONSITE AND OFFSITE SHALLOW GROUNDWATER

ARCADIS

FIGURE
15



LEGEND:

- MW-1S/D — EXISTING MONITORING WELL LOCATION
- PZ-2 — EXISTING PIEZOMETER LOCATION
- SG-2 — EXISTING STAFF GAUGE LOCATION
- — — — FORMER MGP SITE BOUNDARY (APPROXIMATE)

COLOR CODING DESIGNATES WELL WHERE ONE OR MORE OF THE FOLLOWING CONSTITUENTS WAS IDENTIFIED IN GROUNDWATER AT CONCENTRATIONS EXCEEDING TOGS 1.1.1 STANDARDS/GUIDANCE VALUES DURING THE MOST RECENT SAMPLING EVENT FOR:

- PAH
- BTEX

NOTES:

1. BASE MAP DEVELOPED FROM NEW YORK STATE GEOGRAPHIC INFORMATION SYSTEMS, OFFICE OF CYBER SECURITY & CRITICAL INFRASTRUCTURE, LAST UPDATED 4/25/2007.
2. MONITORING WELL, PIEZOMETER, AND STAFF GAUGE LOCATIONS ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
3. BTEX = BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES.
4. PAH = POLYCYCLIC AROMATIC HYDROCARBONS.
5. NAPL = NON-AQUEOUS PHASE LIQUID.
6. NO NAPL OBSERVED IN DEEP GROUNDWATER.
7. TOGS 1.1.1 STANDARDS/GUIDANCE VALUES ARE FROM THE NYSDEC DIVISION OF WATER, TECHNICAL AND OPERATIONAL GUIDANCE SERIES DOCUMENT TITLED "AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES AND GROUNDWATER EFFLUENT LIMITATIONS", (TOGS 1.1.1) DATED JUNE 1998, LAST REVISED JUNE 2004.

0 300' 600'

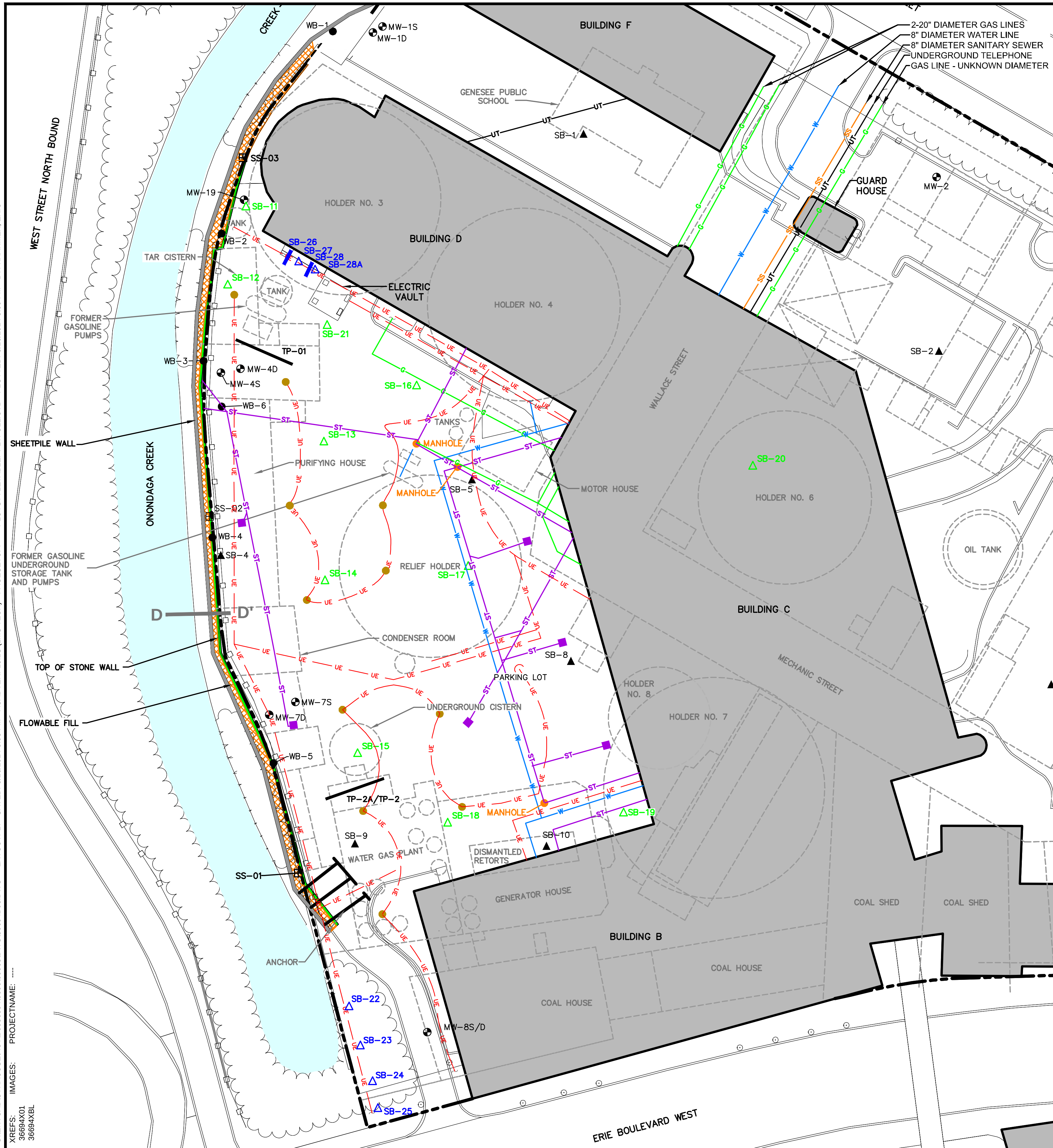
GRAPHIC SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

DISTRIBUTION OF BTEX AND PAHs IN ONSITE AND OFFSITE DEEP GROUNDWATER

ARCADIS

FIGURE
16



LEGEND:

- SB-27 △ CONSTRUCTION PROJECT INVESTIGATION SOIL BORING (2012)
- SB-26 CONSTRUCTION PROJECT SOIL BORING UTILITY CLEARANCE TRENCH (2012)
- SB-11 △ FINAL RI SOIL BORINGS (2008)
- SB-5 ▲ PSA SOIL BORINGS (1995)
- MW-1S/D EXISTING MONITORING WELL LOCATION
- SS-02 ⊞ SURFACE SOIL SAMPLING LOCATION
- WB-1 ● FORMER WALL BORING LOCATION
- TP-01 TEST PIT LOCATION
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- TREES/VEGETATION
- GUARD RAIL
- STONE WALL
- SHEETPILE WALL
- BULKHEAD TIE BACK STRUCTURE FOR SHEETPILE WALL
- FLOWABLE FILL
- UE ELECTRIC LINE
- G GAS LINE
- W WATER LINE
- ST STORM SEWER
- SS SANITARY SEWER
- UT UNDERGROUND TELEPHONE
- MANHOLE
- LIGHT POLE
- CATCH BASIN
- D — D' CROSS SECTION LOCATION

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. FORMER MANUFACTURED GAS PLANT (MGP) STRUCTURES, WITH THE EXCEPTION OF HOLDERS NO. 7 AND NO. 8, ARE FROM THE FORMER SYRACUSE LIGHTING COMPANY GAS PLANT, AS SHOWN ON SANBORN MAPPING DATED 1911. HOLDER NO. 7 IS FROM PLOT PLAN PREPARED BY MELVIN L. KING ARCHITECT, DATED SEPTEMBER 2, 1931. HOLDER NO. 8 IS FROM SANBORN MAPPING DATED 1892.
3. LOCATIONS OF CONSTRUCTION PROJECT INVESTIGATION SOIL BORINGS/UTILITY CLEARANCE TRENCHES, FINAL RI SOIL BORINGS, RETAINING WALL, MONITORING WELLS, PIEZOMETERS, AND STAFF GAUGES ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
4. PRELIMINARY SITE ASSESSMENT (PSA) SOIL BORING, TEST PIT, AND SURFACE SOIL SAMPLING LOCATIONS ARE APPROXIMATE.
5. LOCATIONS OF FORMER GASOLINE UNDERGROUND STORAGE TANKS AND FORMER GASOLINE PUMPS ARE APPROXIMATED FROM SITE PLAN PREPARED BY KING AND KING ARCHITECTS, DATED MARCH 31, 1972.
6. LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATED FROM SITE PLANS U1, 1, 3, 301, AND 402 BY KING AND KING ARCHITECTS, DATED MARCH 31, 1972. ADDITIONAL UNDERGROUND UTILITIES ARE APPROXIMATED FROM THE BUILDING DRAINAGE SURVEY REPORT BY STEARNS AND WHEELER DATED FEBRUARY 1992 AND UPDATED IN APRIL 1992.
7. LOCATION AND DETAILS OF SHEETPILE WALL ARE FROM ONONDAGA CREEKWALL SHEETPILING PROJECT BY McMAHON & MANN CONSULTING ENGINEERS, DATED SEPTEMBER 1996.

0 65' 130'
GRAPHIC SCALE

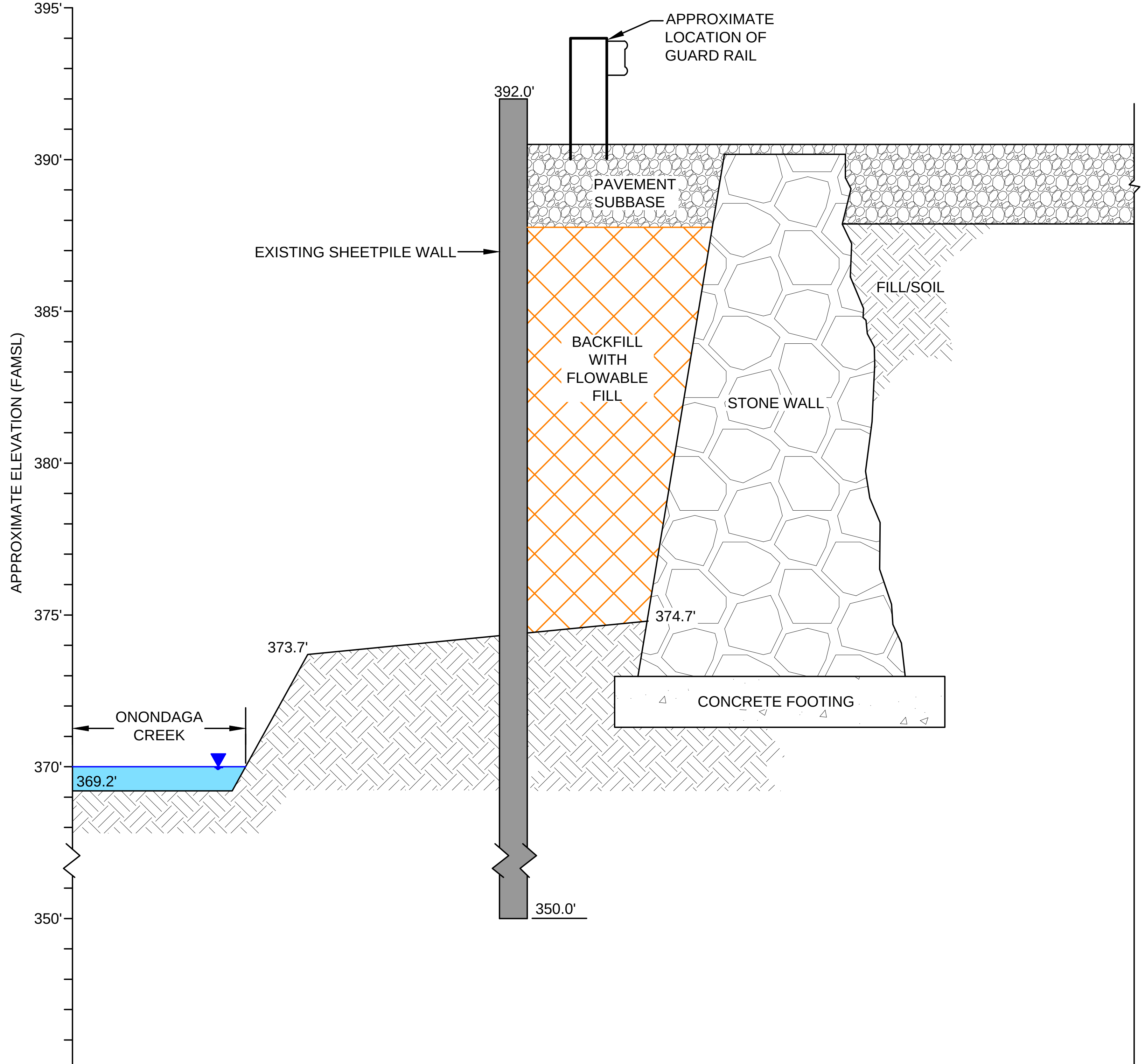
NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

SUBSURFACE UTILITY LOCATIONS

ARCADIS

FIGURE
17

CITY: SYRACUSE, NY GROUP: ENV/IEST/IM-DV DB: R. ALLEN R. BASSETT P. LISTER PM: J. BRUSSEL TM: M. HYSELL LYR: ON=*;OFF=REF (FR2)
G:\ENVCAD\SYRACUSE\ACT\B0036694\0000\00003\DWG\36694B03.DWG LAYOUT: 17 SAVED: 5/16/2014 3:08 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 5/16/2014 3:09 PM BY: KRAHMER, ERIC
XREFS: 36694X01 36694XBL IMAGES: PROJECTNAME: ----



NOTES:

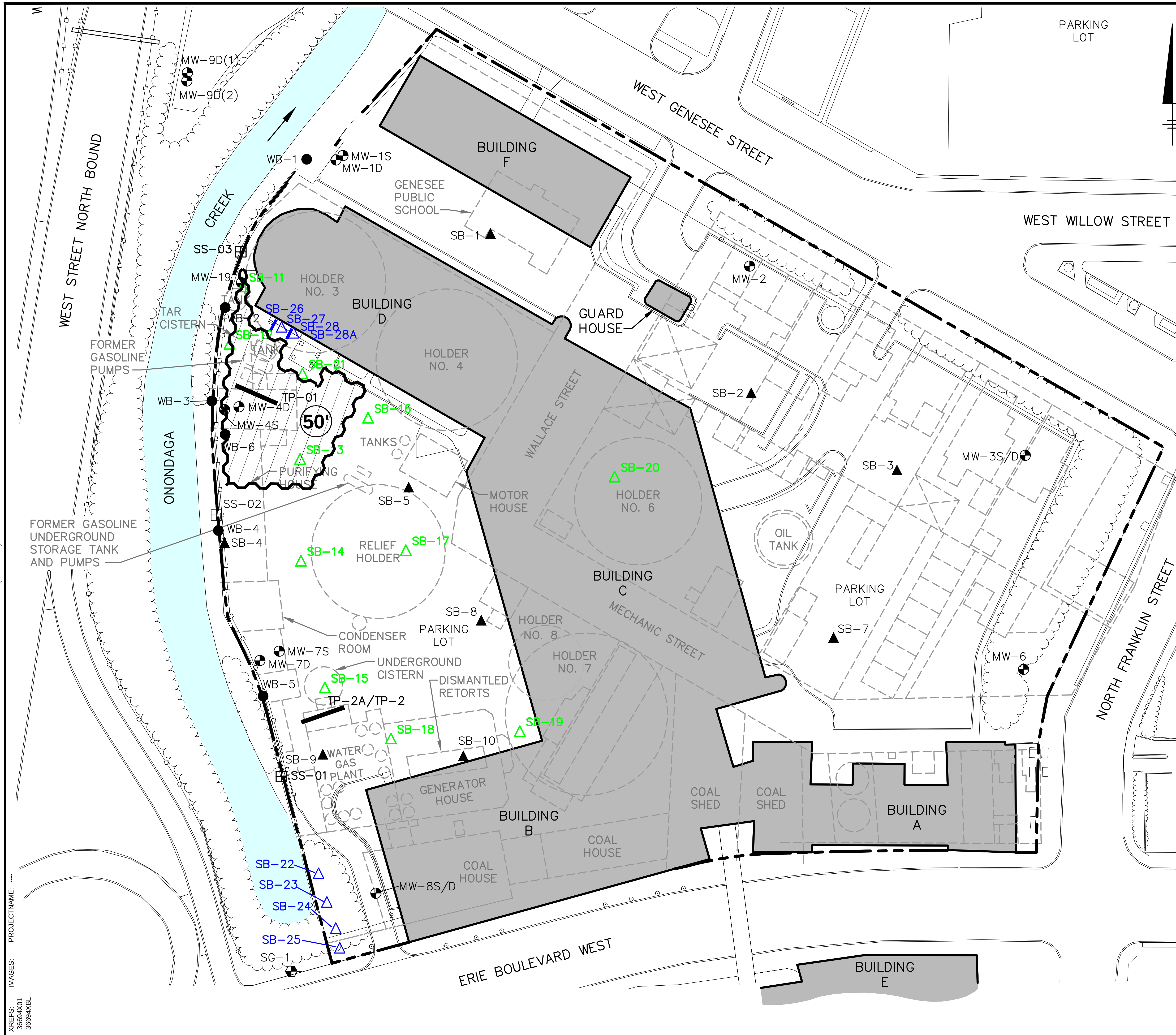
1. FAMSL = FEET ABOVE MEAN SEA LEVEL. ALL ELEVATIONS REFERENCED TO NORTH AMERICAN VERTICAL DATUM OF 1988.
2. RETAINING WALL DETAILS AND STRUCTURES FROM ONONDAGA CREEK WALL SHEET-PILING PROJECT BY McMAHON & MANN CONSULTING ENGINEERS, DATED SEPTEMBER 1996.
3. LOCATION AND THICKNESS OF STONE WALL BOTTOM AND CONCRETE FOOTING ARE APPROXIMATE.
4. LOCATION OF GUARD RAIL AND PAVEMENT/SUBBASE THICKNESS ARE APPROXIMATE.
5. DRAWING IS NOT TO SCALE HORIZONTALLY.
6. THE SURFACE WATER ELEVATION IS ASSUMED TO BE APPROXIMATELY 370 FAMSL, WHICH IS INTERPOLATED FROM MEASUREMENTS OBTAINED ON JUNE 22, 2002 FROM STREAM GAUGES SG-1 (ERIE BOULEVARD BRIDGE) AND SG-2 (WEST GENESEE STREET BRIDGE).

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

RETAINING WALL
CROSS SECTION D-D'

ARCADIS

FIGURE
18



LEGEND:

- SB-27 △ CONSTRUCTION PROJECT INVESTIGATION SOIL BORING (2012)
- SB-26 ▬ CONSTRUCTION PROJECT SOIL BORING UTILITY CLEARANCE TRENCH (2012)
- SB-11 △ FINAL RI SOIL BORINGS (2008)
- SB-5 ▲ PSA SOIL BORINGS (1995)
- MW-1S/D EXISTING MONITORING WELL LOCATION
- PZ-2 EXISTING PIEZOMETER LOCATION
- SG-2 EXISTING STAFF GAUGE LOCATION
- SS-02 SURFACE SOIL SAMPLING LOCATION
- WB-1 ● FORMER WALL BORING LOCATION
- TP-01 TEST PIT LOCATION
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- TREES/VEGETATION
- GUARD RAIL
- APPROXIMATE LIMITS OF CAPPING AND CONTAINMENT (ALTERNATIVE SM3) OR EXCAVATION AND STABILIZATION (ALTERNATIVE SM4)
- APPROXIMATE LOCATION OF CONTAINMENT WALL (FOR ALTERNATIVE SM3) OR EXCAVATION BRACING (FOR ALTERNATIVE SM4)
- 50' APPROXIMATE DEPTH OF STABILIZATION (FEET BGS) FOR ALTERNATIVE SM4

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. FORMER MANUFACTURED GAS PLANT (MGP) STRUCTURES, WITH THE EXCEPTION OF HOLDERS NO. 7 AND NO. 8, ARE FROM THE FORMER SYRACUSE LIGHTING COMPANY GAS PLANT, AS SHOWN ON SANBORN MAPPING DATED 1911. HOLDER NO. 7 IS FROM PLOT PLAN PREPARED BY MELVIN L. KING ARCHITECT, DATED SEPTEMBER 2, 1931. HOLDER NO. 8 IS FROM SANBORN MAPPING DATED 1892.
3. LOCATIONS OF CONSTRUCTION PROJECT INVESTIGATION SOIL BORINGS/UTILITY CLEARANCE TRENCHES, FINAL RI SOIL BORINGS, RETAINING WALL, MONITORING WELLS, PIEZOMETERS, AND STAFF GAUGES ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
4. PRELIMINARY SITE ASSESSMENT (PSA) SOIL BORING, TEST PIT, AND SURFACE SOIL SAMPLING LOCATIONS ARE APPROXIMATE.
5. LOCATIONS OF FORMER GASOLINE UNDERGROUND STORAGE TANKS AND FORMER GASOLINE PUMPS ARE APPROXIMATED FROM SITE PLAN PREPARED BY KING AND KING ARCHITECTS, DATED MARCH 31, 1972.
6. BGS = BELOW GROUND SURFACE.
7. THE ACTUAL LIMITS AND DEPTH OF THE SOIL EXCAVATION, AS WELL AS THE ASSOCIATED LIMITS FOR THE EXCAVATION BRACING, WOULD BE DETERMINED DURING THE REMEDIAL DESIGN BASED ON THE RESULTS OF THE PRE-DESIGN INVESTIGATION.

0 80' 160'

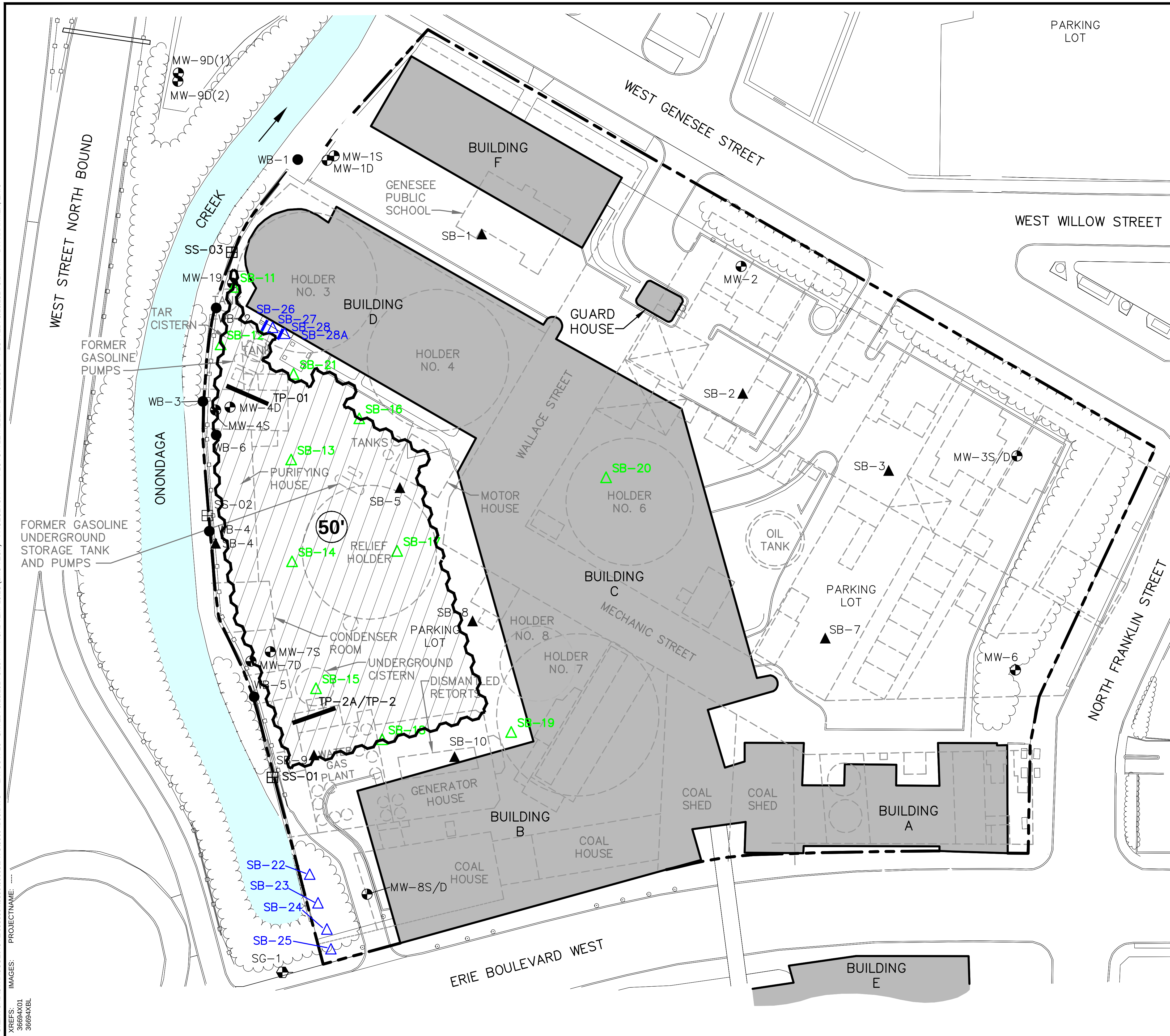
GRAPHIC SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

APPROXIMATE LIMITS OF SOIL REMEDIAL ALTERNATIVES SM3 AND SM4

ARCADIS

FIGURE
19



LEGEND:

SB-27 △	CONSTRUCTION PROJECT INVESTIGATION SOIL BORING (2012)
SB-26	CONSTRUCTION PROJECT SOIL BORING UTILITY CLEARANCE TRENCH (2012)
SB-11 △	FINAL RI SOIL BORINGS (2008)
SB-5 ▲	PSA SOIL BORINGS (1995)
MW-1S/D	EXISTING MONITORING WELL LOCATION
PZ-2	EXISTING PIEZOMETER LOCATION
SG-2	EXISTING STAFF GAUGE LOCATION
SS-02	SURFACE SOIL SAMPLING LOCATION
WB-1 ●	FORMER WALL BORING LOCATION
TP-01	TEST PIT LOCATION
	FORMER MGP SITE BOUNDARY (APPROXIMATE)
	TREES/VEGETATION
	GUARD RAIL
	APPROXIMATE EXCAVATION AND STABILIZATION LIMITS
	APPROXIMATE LOCATION OF EXCAVATION BRACING
50'	APPROXIMATE DEPTH OF STABILIZATION (FEET BGS)

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. FORMER MANUFACTURED GAS PLANT (MGP) STRUCTURES, WITH THE EXCEPTION OF HOLDERS NO. 7 AND NO. 8, ARE FROM THE FORMER SYRACUSE LIGHTING COMPANY GAS PLANT, AS SHOWN ON SANBORN MAPPING DATED 1911. HOLDER NO. 7 IS FROM PLOT PLAN PREPARED BY MELVIN L. KING ARCHITECT, DATED SEPTEMBER 2, 1931. HOLDER NO. 8 IS FROM SANBORN MAPPING DATED 1892.
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4. PRELIMINARY SITE ASSESSMENT (PSA) SOIL BORING, TEST PIT, AND SURFACE SOIL SAMPLING LOCATIONS ARE APPROXIMATE.
5. LOCATIONS OF FORMER GASOLINE UNDERGROUND STORAGE TANKS AND FORMER GASOLINE PUMPS ARE APPROXIMATE FROM SITE PLAN PREPARED BY KING AND KING ARCHITECTS, DATED MARCH 31, 1972.
6. BGS = BELOW GROUND SURFACE.
7. THE ACTUAL LIMITS AND DEPTH OF THE SOIL EXCAVATION, AS WELL AS THE ASSOCIATED LIMITS FOR THE EXCAVATION BRACING, WOULD BE DETERMINED DURING THE REMEDIAL DESIGN BASED ON THE RESULTS OF THE PRE-DESIGN INVESTIGATION.

0 80' 160'

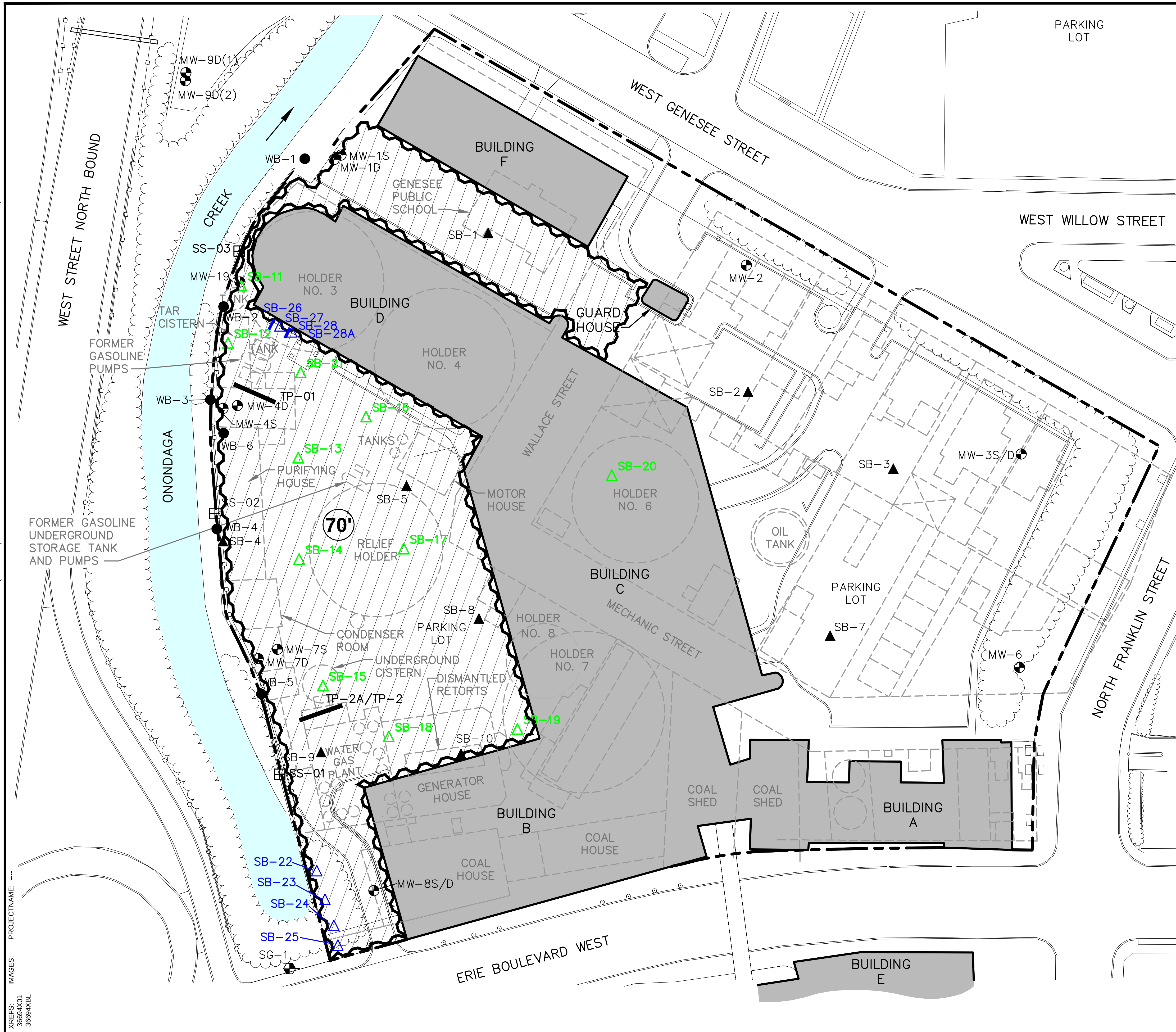
GRAPHIC SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

APPROXIMATE LIMITS OF SOIL REMEDIAL ALTERNATIVE SM5

ARCADIS

FIGURE
20



LEGEND:

SB-27 △	CONSTRUCTION PROJECT INVESTIGATION SOIL BORING (2012)
SB-26 ▬	CONSTRUCTION PROJECT SOIL BORING UTILITY CLEARANCE TRENCH (2012)
SB-11 △	FINAL RI SOIL BORINGS (2008)
SB-5 ▲	PSA SOIL BORINGS (1995)
MW-1S/D	EXISTING MONITORING WELL LOCATION
PZ-2	EXISTING PIEZOMETER LOCATION
SG-2	EXISTING STAFF GAUGE LOCATION
SS-02	SURFACE SOIL SAMPLING LOCATION
WB-1 ●	FORMER WALL BORING LOCATION
TP-01	TEST PIT LOCATION
	FORMER MGP SITE BOUNDARY (APPROXIMATE)
	TREES/VEGETATION
	GUARD RAIL
	APPROXIMATE EXCAVATION LIMITS
	APPROXIMATE LOCATION OF EXCAVATION BRACING
70'	APPROXIMATE DEPTH OF EXCAVATION (FEET BGS)

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. FORMER MANUFACTURED GAS PLANT (MGP) STRUCTURES, WITH THE EXCEPTION OF HOLDERS NO. 7 AND NO. 8, ARE FROM THE FORMER SYRACUSE LIGHTING COMPANY GAS PLANT, AS SHOWN ON SANBORN MAPPING DATED 1911. HOLDER NO. 7 IS FROM PLOT PLAN PREPARED BY MELVIN L. KING ARCHITECT, DATED SEPTEMBER 2, 1931. HOLDER NO. 8 IS FROM SANBORN MAPPING DATED 1892.
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6. BGS = BELOW GROUND SURFACE.
7. THE ACTUAL LIMITS AND DEPTH OF THE SOIL EXCAVATION, AS WELL AS THE ASSOCIATED LIMITS FOR THE EXCAVATION BRACING, WOULD BE DETERMINED DURING THE REMEDIAL DESIGN BASED ON THE RESULTS OF THE PRE-DESIGN INVESTIGATION.

0 80' 160'

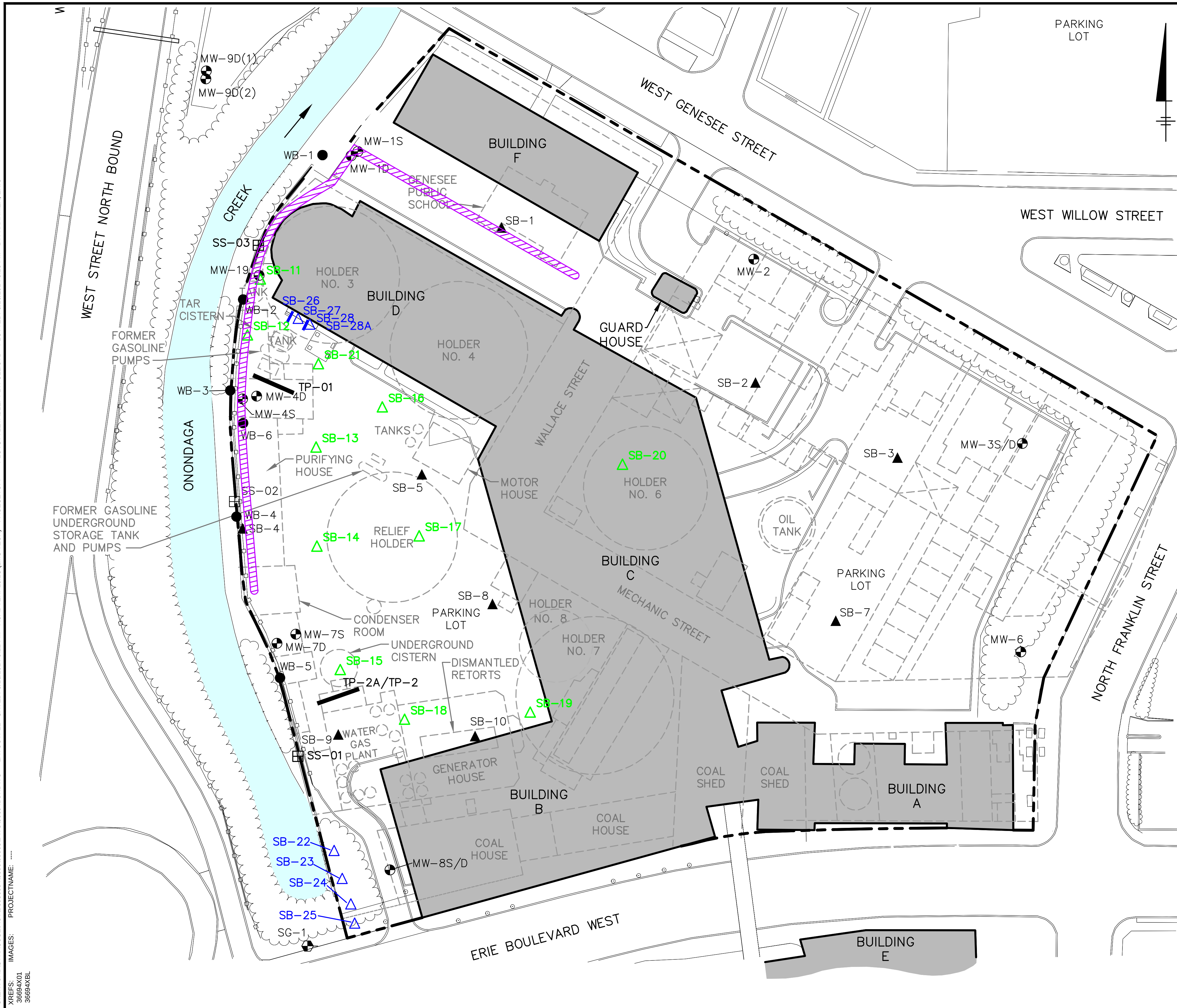
GRAPHIC SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

APPROXIMATE LIMITS OF SOIL REMEDIAL ALTERNATIVE SM6

ARCADIS

FIGURE
21



LEGEND:

- SB-27 △ CONSTRUCTION PROJECT INVESTIGATION SOIL BORING (2012)
- SB-26 CONSTRUCTION PROJECT SOIL BORING UTILITY CLEARANCE TRENCH (2012)
- SB-11 △ FINAL RI SOIL BORINGS (2008)
- SB-5 ▲ PSA SOIL BORINGS (1995)
- MW-1S/D EXISTING MONITORING WELL LOCATION
- PZ-2 EXISTING PIEZOMETER LOCATION
- SG-2 EXISTING STAFF GAUGE LOCATION
- SS-02 SURFACE SOIL SAMPLING LOCATION
- WB-1 ● FORMER WALL BORING LOCATION
- TP-01 TEST PIT LOCATION
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- TREES/VEGETATION
- GUARD RAIL
- APPROXIMATE EXTENT OF ENHANCED BIOREMEDIATION TREATMENT

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. FORMER MANUFACTURED GAS PLANT (MGP) STRUCTURES, WITH THE EXCEPTION OF HOLDERS NO. 7 AND NO. 8, ARE FROM THE FORMER SYRACUSE LIGHTING COMPANY GAS PLANT, AS SHOWN ON SANBORN MAPPING DATED 1911. HOLDER NO. 7 IS FROM PLOT PLAN PREPARED BY MELVIN L. KING ARCHITECT, DATED SEPTEMBER 2, 1931. HOLDER NO. 8 IS FROM SANBORN MAPPING DATED 1892.
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4. PRELIMINARY SITE ASSESSMENT (PSA) SOIL BORING, TEST PIT, AND SURFACE SOIL SAMPLING LOCATIONS ARE APPROXIMATE.
5. LOCATIONS OF FORMER GASOLINE UNDERGROUND STORAGE TANKS AND FORMER GASOLINE PUMPS ARE APPROXIMATED FROM SITE PLAN PREPARED BY KING AND KING ARCHITECTS, DATED MARCH 31, 1972.
6. LOCATION OF TREATMENT MAY BE MODIFIED BASED ON THE RESULTS OF BENCH-SCALE, TRACER AND PILOT TESTING.

0 80' 160'

GRAPHIC SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
FEASIBILITY STUDY REPORT

APPROXIMATE LIMITS OF GROUNDWATER REMEDIAL ALTERNATIVE GW3

ARCADIS

FIGURE 22

Appendix A

Project Correspondence

April 28, 2005 Letter from USEPA to NYSDEC – Re: Niagara Mohawk – Erie Boulevard Former MGP Site

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

RECEIVED
MAY
REMEDIAL BUREAU B

APR 28 2005

Susan Benjamin
New York State Department of
Environmental Conservation
Bureau of Central Remedial Action
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY 12233

Re: Niagara Mohawk - Erie Boulevard Former MGP Site

Dear Ms. Benjamin:

The U.S. Environmental Protection Agency (EPA) has reviewed the New York State Department of Environmental Conservation's (NYSDEC's) draft "Onondaga Lake NPL Subsite Evaluation" form for the Niagara Mohawk - Erie Boulevard Former MGP site submitted in April 2005.

EPA concurs with NYSDEC's recommendation that the Niagara Mohawk - Erie Boulevard Former MGP site not be designated a sub-site of the Onondaga Lake Superfund Site on EPA's National Priorities List.

If you have any questions, please contact me at (212) 637-4254.

Sincerely yours,

Robert Nunes
Remedial Project Manager
Central New York Remediaton Section

cc: D. Hesler, NYSDEC
G. Shanahan, ORC

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION

1.P.2.i
Approved 4/28/05

ONONDAGA LAKE NPL SUBSITE EVALUATION

1. SITE NAME

Niagara Mohawk- Erie Boulevard Former MGP Site

2. RECOMMENDATION — **DATE**

Subsite______ Not Subsite___X___ Potential Subsite______ — April 2005 (revised)

3. LOCATION OF SITE (Site location map attached)

Erie Boulevard, Syracuse, New York

4. BRIEFLY DESCRIBE THE SITE (Site Summary Report attached)

The site is located in the City of Syracuse and is approximately 10 acres in size. Of these 10 acres approximately 7 acres were occupied by the former Manufactured Gas Plant (MGP), which operated a coal gas plant from 1849 to 1916 and a water gas plant from 1896 to 1933. The area of the former MGP is now covered by paved parking lots and roads, with the remainder of the site occupied by five office buildings and surrounded by a chain link fence with restricted access points. The site is adjacent to Onondaga Creek, approximately 9000 feet upstream from Onondaga Lake.

Soils and shallow groundwater on-site are contaminated with various contaminants including polycyclic aromatic hydrocarbons (PAHs) and volatile compounds (benzene, toluene, ethylbenzene, and xylene (BTEX)), the likely sources of which were a tar well, cistern and gas holders, which no longer exist.

A Dense Non-aqueous Phase Liquid (DNAPL) plume of PAHs, exists in the deep groundwater approximately 65 feet below the ground surface. The plume appears to start about 200 feet south of West Genesee Street and extends north toward Onondaga Lake. Although contamination exists in the shallow groundwater proximate to Onondaga Creek, the contamination is not discharging to the stream. A barrier/reinforcement wall was installed adjacent to the creek to stabilize the bank, which also serves to dissuade groundwater flow toward the creek. Furthermore, the shallow groundwater gradient is relatively flat in the area of the site and Onondaga Creek is a losing stream, at least seasonally. Groundwater discharge to the stream in the reach adjacent to the site is not significant. Based on upstream and downstream surface water and sediment samples, the contaminated groundwater is not impacting Onondaga Creek. The deep groundwater plume of DNAPL is 8000 feet from Onondaga Lake, therefore, the lake is not impacted by this plume.

Site Work Completed to Date: ( )Phase I ( )Phase II (X) PSA (X)RI ( )PA/SI ( )Other:

5. IS THERE A KNOWN RELEASE OF HAZARDOUS SUBSTANCES TO THE ENVIRONMENT? Yes_X___ No____ Potential___

Is the release historic or ongoing? Historic

6. IS THE RELEASE INTO THE LAKE OR A TRIBUTARY? Yes____ No_X___ Potential _

What is the location and nature of the release? Onondaga Creek is adjacent to the site, but no ongoing impacts or releases have been found.

7. IS THERE A THREAT OF RELEASE INTO THE LAKE OR A TRIBUTARY? Yes___ No_X__ Potential ____

What is the location and nature of the threat? Surface water and sediment data indicate that contaminated groundwater is not reaching Onondaga Creek.

8. HAZARDOUS SUBSTANCES/WASTES ASSOCIATED WITH THE SITE

Coal Tar, (PAHs), BTEX

9. ANALYTICAL DATA AVAILABLE

( )Air (X)Groundwater (X)Surface Water (X)Sediment (X)Soil ( )Waste ( )Leachate

Highest levels of COCs to date

Shallow Groundwater: (On-site)	BTEX:	9.7 ppm (MW-4S)	Deep Groundwater: (On-site)	BTEX:	0.018 ppm (MW-1D)
	Napthalene:	4.6 ppm (MW-4S)		Napthalene:	0.0013 ppm (MW-4D)
		1.3 ppm (MW-7S)		Cyanide:	0.0089 ppm (MW-4D)
	Cyanide:	5.9 ppm (MW-4S)	(Off-site)	BTEX:	1.2 ppm (MW-17D)
(Off-site)	Napthalene:	16 ppb (MW-10S)		Napthalene:	1.8 ppm (MW-15D)
				Cyanide	< 0.01 ppm (all wells)

Soil: Total PAHs : 48,340 ppm (10-12 ft bgs)

Dibenzofurans: 1,600 ppm (10-12 ft bgs)

BTEX: 2,577 ppm (32-34 ft bgs)

Sediment: Total PAHs: 651 ppm

Copper: 438 ppm

Soil: Creek Bank:

Benzene: 2 ppb

Toluene: 2 ppb

Xylene: 2 ppb

Total PAHs: 290 ppm

(All of above creek bank soil concentrations are below recommended soil cleanup)

10. EXPLANATION OF RECOMMENDATION

Although there is DNAPL and contaminated groundwater associated with this site, the cumulative PSA and RI data indicate that there are no ongoing releases or impacts to Onondaga Creek nor to Onondaga Lake..

11. RECOMMENDATIONS FOR FURTHER ACTION

No further action under the Onondaga Lake NPL Site program. Proceed with completion of the Remedial Investigation/feasibility Study via the existing NYS consent order and the NYS Inactive Hazardous Waste/Substances Program.

12. SITE OWNER'S NAME	13. ADDRESS	14. TELEPHONE NUMBER
Niagara Mohawk Power Corporation	300 Erie Boulevard West Syracuse, NY 13202	(315))428-5690

ARCADIS

February 8, 2013 Letter from National Grid to NYSDEC – Summary of Nature and Extent of NAPL

nationalgrid

James F. Morgan
Lead Senior Environmental Engineer
Environmental Department

February 8, 2013

Mr. Anthony Karwiel
Remedial Bureau C, 11th Floor
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7014

Re: National Grid
Erie Boulevard Former MGP Site
Syracuse, New York
NYSDEC Site No. 734060
Summary of Nature and Extent of NAPL

Dear Mr. Karwiel:

This letter provides additional information regarding the extent of non-aqueous phase liquid (NAPL) saturated soil and NAPL recovery efforts conducted to-date at the Erie Boulevard former manufactured gas plant (MGP) site (the site). The additional information is being provided as requested by the New York State Department of Environmental Conservation (NYSDEC) during a January 16, 2013 meeting with National Grid and ARCADIS. The NYSDEC requested the information provided herein to support further evaluation of selecting a limited action remedy at this site (one that relies on engineering controls that are currently in place, supplemented with institutional controls).

As discussed during the meeting, this letter:

- Approximates the extent of NAPL-saturated soil
- Summarizes NAPL recovery observations and efforts
- Provides an update regarding additional groundwater monitoring efforts

Details of these efforts are presented below, followed by an action item status update and conclusions supported by the findings summarized herein.

I. NAPL-Saturated Soil Approximation

As requested during the meeting, ARCADIS evaluated site data to approximate areas (locations and depth intervals) where “NAPL-saturated soil” is present based on NYSDEC’s document titled “Field Descriptions of Samples for Former Manufactured Gas Plant (MGP) Sites”. As part of this effort, it was recognized that the soil borings at the site were drilled over a period of 18 years by multiple firms and geologists. Due to differing judgments (by the various geologists) and the fact that guidance for describing and logging NAPL-containing soil has evolved over this time period, descriptions of NAPL-containing soils are inconsistent. Therefore, the data were evaluated in a stepwise fashion using multiple lines of evidence and professional judgment to identify locations and depth intervals that contain NAPL-saturated soil. These steps are as follows:

- **Step 1:** Review boring logs and screen out all borings that do not appear to have penetrated NAPL-saturated soil based on the visual descriptions documented. As discussed during the meeting, intervals described as containing NAPL stringers, blebs, staining, etc., were not considered “NAPL-saturated”. It should also be noted that the terms "NAPL saturation" and "NAPL saturated" as used in this evaluation are defined as intervals of soil that appear to contain NAPL at a level above *residual saturation*. That is, soils where the degree of NAPL saturation is believed to be high enough such that NAPL would drain from the soil into a well screened across the NAPL-containing interval.

- **Step 2:** Review well construction logs and NAPL recovery efforts for wells screened across depth intervals of potentially NAPL-saturated soil that are located at or near the soil borings being reviewed. The purpose of this effort was to screen out or confirm the presence of NAPL-saturated soil for intervals in question. The absence of NAPL in a properly-designed well screened across a potential NAPL-saturated interval was considered evidence that the questionable interval did not meet the definition of "NAPL-saturated".

- **Step 3:** Review laboratory analytical data, where available, for remaining depth intervals where it was unclear if the soil within those intervals (based on information reported on the boring logs alone) met the definition of "NAPL-saturated". If total polycyclic aromatic hydrocarbon (PAH) concentrations in the questionable interval were less than half the 500 part per million (ppm) subsurface soil cleanup level presented in the NYSDEC policy document titled "CP-51/Soil Cleanup Guidance" dated October 21, 2010, then the soil within that interval was not considered "NAPL-saturated".

The results of the data evaluation are summarized on the attached figures. For convenience, Figure 1 shows the locations and depth intervals where potential NAPL-saturated soil was observed and identifies those intervals that are below the water table using blue-colored shading.

Based on the above data evaluation, NAPL-saturated soil at the site appears to occur in limited depth intervals, typically below the water table (depths greater than 20 feet below the surface of the paved parking lot in the western portion of the site). In addition, the largest occurrence (volume) of NAPL-saturated soil was observed below the northwestern portion of the parking lot. As described in the next section, it should be noted that a monitoring well (MW-19) was installed in this portion of the site in an attempt to recover NAPL. However, over the course of five years, this well has never produced any recoverable NAPL.

II. NAPL Recovery Observations and Efforts

Based on discussions during the meeting, ARCADIS reviewed soil boring and construction logs for monitoring wells plus historical recovery data to: (1) identify where NAPL recovery has occurred; and (2) confirm that the wells were constructed in a manner that will allow NAPL collection. The focus of this assessment is the onsite wells. No residual NAPL or NAPL-saturated soil was encountered in any of the borings for the offsite wells, except for a few isolated brown stringers approximately 113 to 115 feet below ground surface (bgs) in deep well MW-9D2, located immediately downgradient from the site.

Monitoring Well Construction Evaluation

A total of 13 shallow and deep monitoring wells were installed at the site, including 9 wells that were screened across soil containing sheens, residual NAPL, or NAPL-saturated soil. Historical monitoring well construction logs were reviewed for each location to evaluate the potential for NAPL to enter the screen and collect in the well. Based on this review, the wells are constructed as follows:

- MW-19 has a 4-foot long sump and 4-inch diameter polyvinyl chloride (PVC) riser pipe and screen section. The 10-foot long factory-slotted screen (0.02-inch slot size) in this well was installed in an area thought to contain NAPL-saturated soil. Appropriately-sized sand was installed in the annular space around the screen.

- All other onsite wells have 2-foot long sumps and 2-inch diameter PVC riser pipes and screen sections. The factory-slotted screens in these other wells are also 10 feet long (except in MW-10S where the screen length is 20 feet long), but have 0.01-inch slot size. Appropriately-sized sand was installed in the annular space around each well screen.

The ability of NAPL to enter a monitoring well screen depends on several factors, most of which are unrelated to the well materials/construction, and primarily include: (1) pressure exerted by the height of the NAPL column; (2) horizontal and vertical hydraulic gradients; and (3) percentage of effective porosity saturated with NAPL. Viscosity, which is commonly associated with NAPL mobility, only influences the velocity at which NAPL travels, not the ability to enter the well screen. With this in mind, we have concluded that the wells at the site are adequately constructed to allow NAPL to enter them based on the following:

- All of the wells are constructed with sumps.

- Wells are screened over depth intervals where potential NAPL-saturated material was suspected to be present based on field observations.

- Groundwater with visible impacts has historically been observed to enter wells with either the smaller diameter pipe and slot size (MW-8S) or the larger pipe size and slot size (MW-19), indicating that both construction types are appropriate for collection purposes.

The results of a review of the NAPL gauging and recovery efforts at the site are summarized below.

NAPL Gauging and Recovery

Over 18 years of investigation and associated monitoring, a measureable amount of NAPL has never been identified in any site well. Based on this assessment, none of the intervals screened by site wells contain NAPL-saturated soil. As noted above, the wells are adequately constructed to allow NAPL collection. The absence of NAPL entering the wells indicates that the NAPL in the subsurface soil does not appear to be mobile or recoverable.

III. Action Item Status Update

The groundwater monitoring activities described in the January 17, 2013 ARCADIS e-mail correspondence were completed on January 31, 2013. No NAPL was encountered in any of the wells, other than trace NAPL droplets observed on the interface probe after gauging monitoring well MW-4S (consistent with previous observations at this well). Preliminary groundwater analytical results are anticipated to be available during the week of February 18, 2013. The findings of the groundwater monitoring, including validated laboratory analytical results, will be presented in a summary letter to the NYSDEC during the week of March 4, 2013.

IV. Summary & Conclusions

ARCADIS reviewed site data to approximate the extent of NAPL-saturated soil at the site. ARCADIS also reviewed monitoring well construction logs and NAPL recovery data to evaluate if existing site wells are adequate for NAPL recovery. ARCADIS and National Grid have found that: (1) the area of NAPL-saturated soil at the site is much smaller than the area shown in the *Feasibility Study Report* (ARCADIS, June 2009) as containing NAPL (i.e., without distinction between residual NAPL and NAPL-saturated soil); and (2) NAPL at the site does not appear to be recoverable.

Based on the evaluations described above and the evaluations completed in the Feasibility Study Report, the recommendation for a limited action remedy at this site (one that relies on the engineering controls that are currently in place, supplemented with institutional controls in the form of an Environmental Easement and Site Management Plan) is appropriate because:

- Existing conditions are currently protective of human health and the environment.

- The property where the former MGP site was located is owned by National Grid and will continue to be owned by National Grid for the foreseeable future. In addition, site access is restricted to the general public by perimeter fencing, locking gates, and onsite security service.

- No complete exposure pathways currently exist. The potential for direct contact exposure is somewhat limited because most of the former MGP site impacts start at a depth of approximately 8 to 10 feet below grade. Potential exposure associated with future excavation activities (for utility maintenance or construction) could easily be controlled by a Site Management Plan.

- The dissolved phase plume is deep and groundwater is naturally very saline, which renders it unsuitable for potable purposes. The Onondaga County Department of Health has confirmed that there are no known wells in the City of Syracuse used for potable water supply. The City of Syracuse derives its potable water supply from Skaneateles Lake, and New York law prohibits the installation of private wells where public water supply is available (unless approval is expressly granted by the public water authority per 10 NYCRR 5-1.31(b)).

- A substantial retaining wall system, consisting of steel sheet piling extending to depths greater than 40 feet bgs, laid-up stone, and flowable fill between the sheet piling and stone, extends along the western property boundary adjacent to Onondaga Creek and provides a physical barrier to impacted subsurface soil. In addition, the site is almost entirely covered with buildings and asphalt pavement that limit infiltration of precipitation into subsurface soil containing NAPL.

- No site-related impacts are present in Onondaga Creek, which is a losing stream in the vicinity of the site (meaning that shallow groundwater moves away from the creek). In addition, the site is not a part of the Onondaga Lake Superfund Site as noted in an April 28, 2005 letter from the United States Environmental Protection Agency (USEPA) to the NYSDEC.

- No vapor intrusion associated with the former MGP site into on-site buildings is occurring as demonstrated by the vapor intrusion investigation.

- Monitoring wells installed at the site are constructed adequately to support NAPL recovery. However, no measurable NAPL has ever been recovered from any of the wells.

- Finally, the site investigation data indicate that the former MGP structures (to the extent that such structures still remain) do not contain pooled NAPL.

As discussed during the January 16, 2013 meeting, National Grid and ARCADIS would be happy to meet with the NYSDEC to further discuss the information presented in this letter and the remedial alternative selection for the site. Following that meeting, we will revise the Feasibility Study Report to: (1) incorporate the changes outlined in the above-referenced January 17, 2013 e-mail correspondence; and (2) reflect the outcome of the upcoming discussions with the NYSDEC.

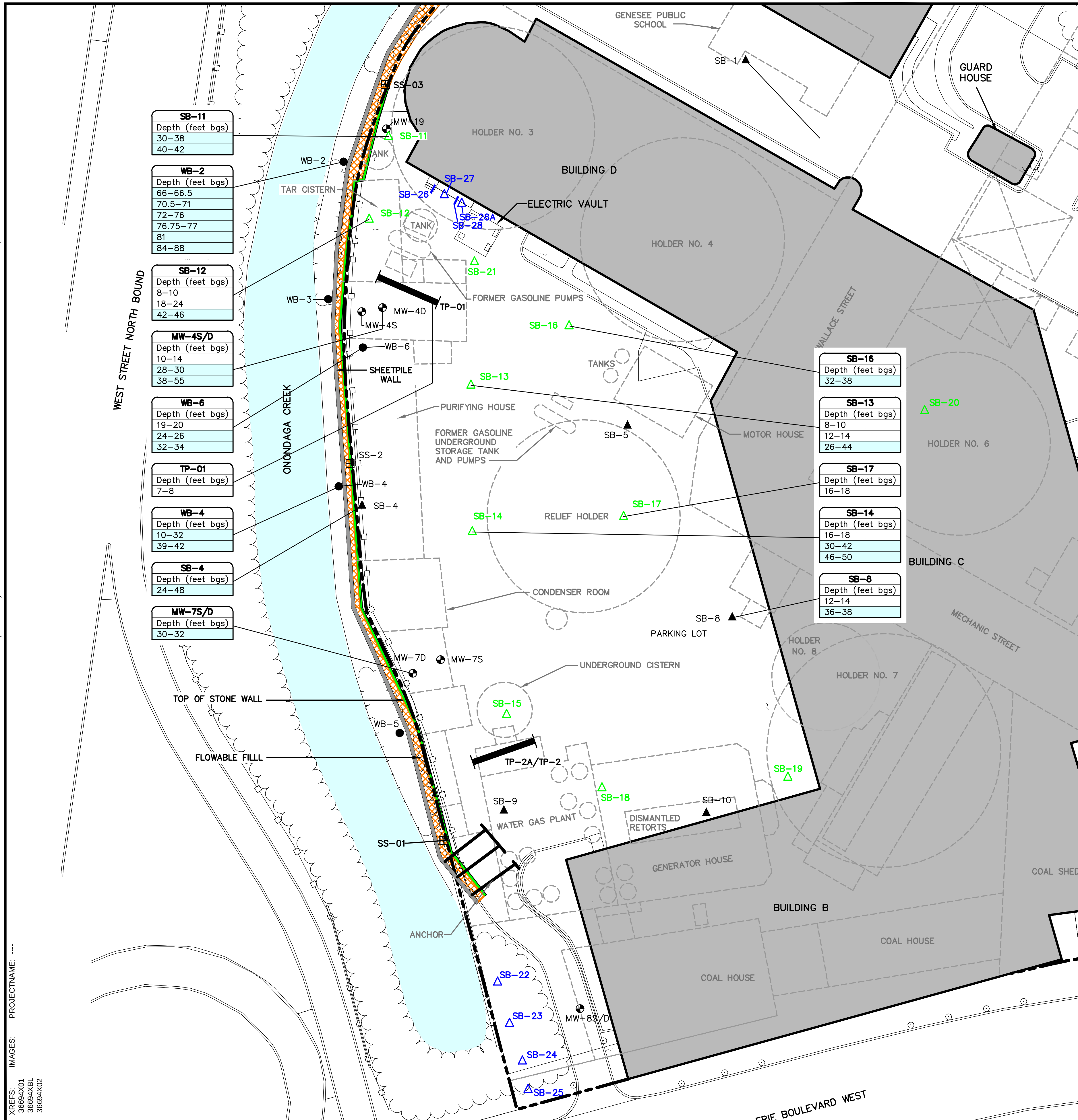
We will contact you next week to discuss potential meeting dates/times. In the interim, please do not hesitate to call me at (315) 428-3101 if you have any questions or require additional information.

Sincerely,

James F. Morgan

James F. Morgan
Lead Senior Environmental Engineer

cc: Amen Omorogbe, P.E., NYSDEC (via e-mail)
George Heitzman, P.E., NYSDEC (via e-mail)
Brian Stearns, P.E., National Grid (via e-mail)
Terry Young, P.E., ARCADIS (via e-mail)
John Brussel, P.E., ARCADIS (via e-mail)



LEGEND:

- SB-11 △ (green) FINAL RI SOIL BORINGS (2008)
- SB-5 ▲ PSA SOIL BORINGS (1995)
- SB-22 △ (blue) CONSTRUCTION PROJECT INVESTIGATION SOIL BORINGS (2012)
- MW-1S/D EXISTING MONITORING WELL LOCATION
- SS-02 SURFACE SOIL SAMPLING LOCATION (2002)
- WB-1 ● FORMER WALL BORING LOCATION (1995)
- TP-01 TEST PIT LOCATION
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- TREES/VEGETATION
- GUARD RAIL
- STONE WALL
- SHEETPILE WALL
- BULKHEAD TIE BACK STRUCTURE FOR SHEETPILE WALL
- FLOWABLE FILL
- SB-8 Depth (feet bgs) 12-14 36-38 — SOIL BORING AND CORRESPONDING DEPTHS OF NAPL SATURATED SOIL – BLUE HIGHLIGHTING INDICATES INTERVAL IS BELOW THE WATER TABLE

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. FORMER MANUFACTURED GAS PLANT (MGP) STRUCTURES, WITH THE EXCEPTION OF HOLDERS NO. 7 AND NO. 8, ARE FROM THE FORMER SYRACUSE LIGHTING COMPANY GAS PLANT, AS SHOWN ON SANBORN MAPPING DATED 1911. HOLDER NO. 7 IS FROM PLOT PLAN PREPARED BY MELVIN L. KING ARCHITECT, DATED SEPTEMBER 2, 1931. HOLDER NO. 8 IS FROM SANBORN MAPPING DATED 1892.
3. LOCATIONS OF FINAL RI SOIL BORINGS, RETAINING WALL, MONITORING WELLS, PIEZOMETERS, AND STAFF GAUGES ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
4. PRELIMINARY SITE ASSESSMENT (PSA) SOIL BORING, TEST PIT, AND SURFACE SOIL SAMPLING LOCATIONS ARE APPROXIMATE.
5. LOCATIONS OF FORMER GASOLINE UNDERGROUND STORAGE TANKS AND FORMER GASOLINE PUMPS ARE APPROXIMATED FROM SITE PLAN PREPARED BY KING AND KING ARCHITECTS, DATED MARCH 31, 1972.
6. LOCATION AND DETAILS OF SHEETPILE WALL ARE FROM ONONDAGA CREEKWALL SHEETPILING PROJECT BY McMAHON & MANN CONSULTING ENGINEERS, DATED SEPTEMBER 1996.
7. BGS = BELOW GROUND SURFACE.
8. REFER TO LETTER DATED FEBRUARY 8, 2013 FOR A DESCRIPTION OF THE PROCESS USED TO DETERMINE THE POTENTIAL PRESENCE OF NAPL SATURATED SOILS DEPICTED ON THIS FIGURE.
9. WALL BORINGS WB-2, WB-3, WB-4, AND WB-5 WERE COMPLETED WEST OF THE EXISTING SHEETPILE WALL. THE GROUND SURFACE AT THESE LOCATIONS IS APPROXIMATELY 15 FEET BELOW THE GROUND SURFACE OF THE WESTERN ONSITE PARKING LOT.

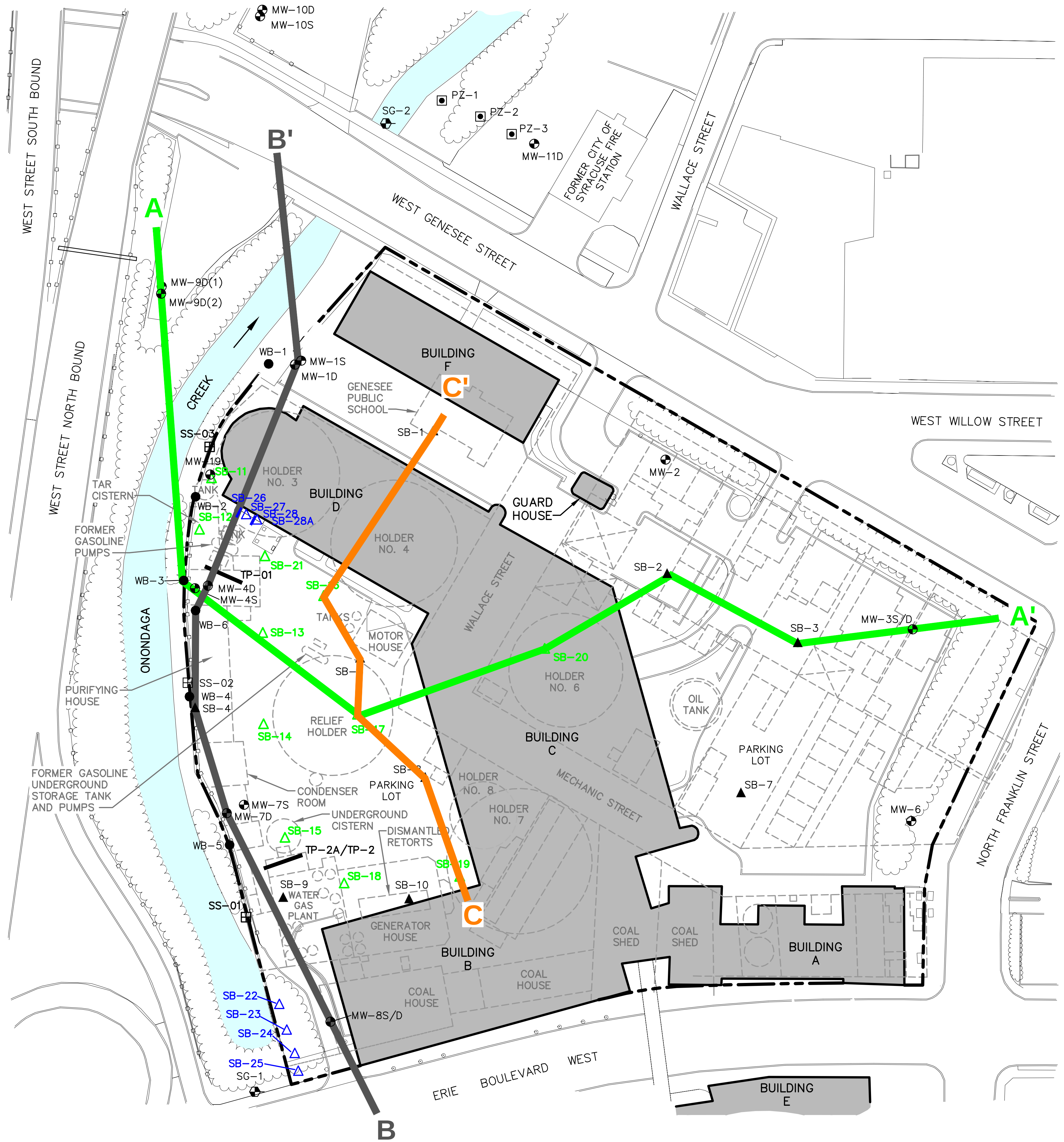
0 60' 120'
GRAPHIC SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK

DISTRIBUTION OF NAPL SATURATED SOIL

ARCADIS

FIGURE
1



LEGEND:

- SB-27△ CONSTRUCTION PROJECT INVESTIGATION SOIL BORING (2012)
- SB-26 CONSTRUCTION PROJECT SOIL BORING UTILITY CLEARANCE TRENCH (2012)
- SB-11△ FINAL RI SOIL BORINGS (2008)
- SB-5 ▲ PSA SOIL BORINGS (1995)
- MW-1S/D EXISTING MONITORING WELL LOCATION
- PZ-2 EXISTING PIEZOMETER LOCATION
- SG-2 EXISTING STAFF GAUGE LOCATION
- SS-02 SURFACE SOIL SAMPLING LOCATION
- WB-1 ● FORMER WALL BORING LOCATION
- TP-01 TEST PIT LOCATION
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- TREES/VEGETATION
- GUARD RAIL
- A — A' LINE OF CROSS SECTION

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. FORMER MANUFACTURED GAS PLANT (MGP) STRUCTURES, WITH THE EXCEPTION OF HOLDERS NO. 7 AND NO. 8, ARE FROM THE FORMER SYRACUSE LIGHTING COMPANY GAS PLANT, AS SHOWN ON SANBORN MAPPING DATED 1911. HOLDER NO. 7 IS FROM PLOT PLAN PREPARED BY MELVIN L. KING ARCHITECT, DATED SEPTEMBER 2, 1931. HOLDER NO. 8 IS FROM SANBORN MAPPING DATED 1892.
3. LOCATIONS OF CONSTRUCTION PROJECT INVESTIGATION SOIL BORINGS/UTILITY CLEARANCE TRENCHES, FINAL RI SOIL BORINGS, RETAINING WALL, MONITORING WELL, PIEZOMETER, AND STAFF GAUGE ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
4. PRELIMINARY SITE ASSESSMENT (PSA) SOIL BORING, TEST PIT, AND SURFACE SOIL SAMPLING LOCATIONS ARE APPROXIMATE.
5. LOCATIONS OF FORMER GASOLINE UNDERGROUND STORAGE TANKS AND FORMER GASOLINE PUMPS ARE APPROXIMATED FROM SITE PLAN PREPARED BY KING AND KING ARCHITECTS, DATED MARCH 31, 1972.

0 100' 200'

GRAPHIC SCALE

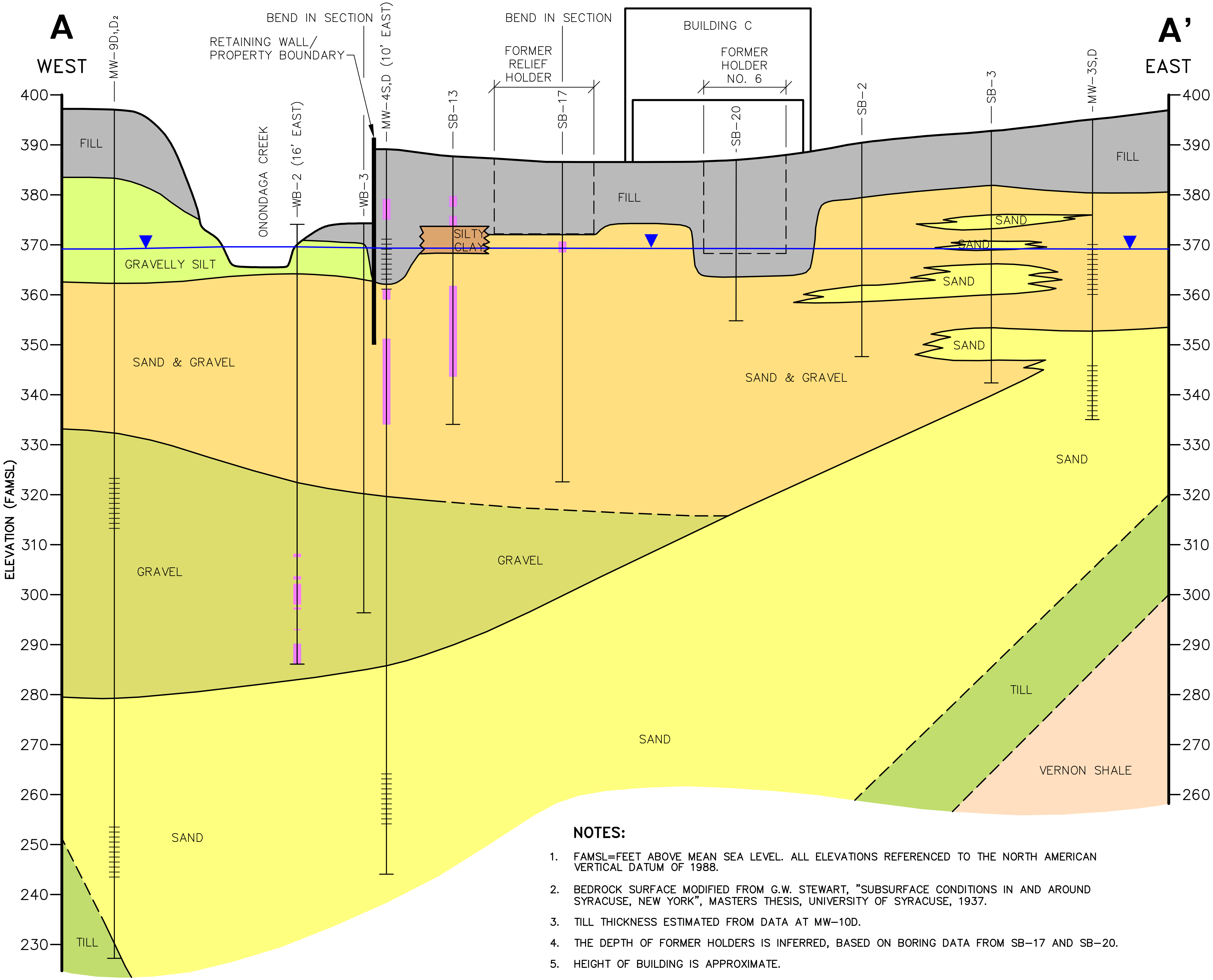
NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK

CROSS SECTIONS LOCATION MAP

ARCADIS

FIGURE
2

CITY: SYRACUSE, NY GROUP: ENVCAD DB: R. ALLEN, A. SCHILLING, P. LISTER PM: J. BRUSSEL TM: L.HEALY LYR: ON=*;OFF=REF (FRZ) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/7/2013 2:24 PM BY: LISTER, PAUL
G:\ENVCAD\SYRACUSE\ACT\B0036694\0000\00003\DWG\FS\36694V03.DWG LAYOUT: 2 SAVED: 2/7/2013 2:24 PM ACADVER: 18.1S (LMS TECH)
XREFS: 36694X01 IMAGES: PROJECTNAME: ----



LEGEND:

- MW-4D WELL/SOIL BORING
- WATER TABLE JANUARY, 2003
- SCREENED INTERVAL
- BOTTOM OF BORING
- CONTACT BETWEEN GEOLOGIC UNITS (DASHED WHERE INFERRED)
- FILL–A MIXTURE OF GRAVEL, SAND, SILT, CLAY, BRICKS, CINDERS, COAL FRAGMENTS, CONCRETE AND WOOD IN VARYING PROPORTIONS
- SILTY CLAY–CLAY WITH SILT IN VARYING PROPORTIONS, OCCASIONALLY CONTAINING TRACE AMOUNTS OF SAND AND GRAVEL
- GRAVELLY SILT–SILT WITH SOME TO LITTLE EMBEDDED GRAVEL AND SAND
- SAND–FINE TO MEDIUM SAND, LITTLE TO TRACE GRAVEL, SILT AND CLAY
- SAND & GRAVEL–FINE TO COARSE SAND AND FINE TO MEDIUM GRAVEL. MAY CONTAIN OCCASIONAL, DISCONTINUOUS LENSES OF SAND AND SILT
- GRAVEL–FINE TO COARSE GRAVEL, LITTLE SAND, TRACE SILT
- TILL–DENSE SILTY CLAY, SOME TO TRACE FINE TO MEDIUM SAND AND GRAVEL
- VERNON SHALE–WEATHERED RED SHALE INTERBEDDED WITH GREEN SHALE, OCCASIONAL GYPSUM AND MICA FLAKES
- NAPL SATURATED SOIL

0 20' 40'
VERTICAL SCALE

0 100' 200'
HORIZONTAL SCALE

NOTES:

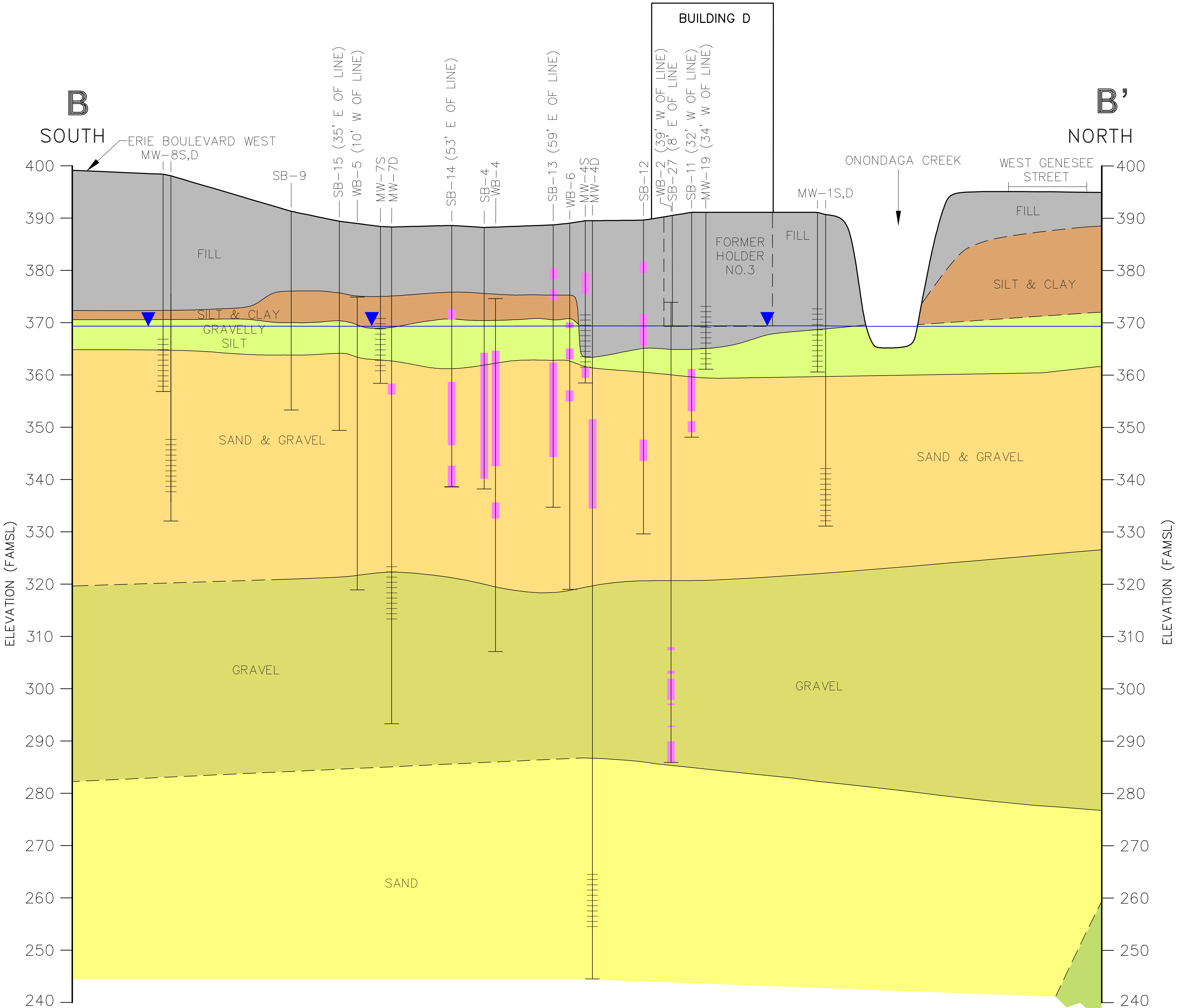
1. FAMSL=FEET ABOVE MEAN SEA LEVEL. ALL ELEVATIONS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988.
2. BEDROCK SURFACE MODIFIED FROM G.W. STEWART, "SUBSURFACE CONDITIONS IN AND AROUND SYRACUSE, NEW YORK", MASTERS THESIS, UNIVERSITY OF SYRACUSE, 1937.
3. TILL THICKNESS ESTIMATED FROM DATA AT MW-10D.
4. THE DEPTH OF FORMER HOLDERS IS INFERRED, BASED ON BORING DATA FROM SB-17 AND SB-20.
5. HEIGHT OF BUILDING IS APPROXIMATE.
6. NAPL=NON-AQUEOUS PHASE LIQUID.

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK

GEOLOGICAL CROSS SECTION A-A'

ARCADIS

FIGURE
3



LEGEND:

- MW-7D — WELL/SOIL BORING
- WATER TABLE JANUARY, 2003
- SCREENED INTERVAL
- BOTTOM OF BORING
- CONTACT BETWEEN GEOLOGIC UNITS (DASHED WHERE INFERRED)
- FILL–A MIXTURE OF GRAVEL, SAND, SILT, CLAY, BRICKS, CINDERS, COAL FRAGMENTS, CONCRETE AND WOOD IN VARYING PROPORTIONS
- SILTY CLAY–CLAY WITH SILT IN VARYING PROPORTIONS, OCCASIONALLY CONTAINING TRACE AMOUNTS OF SAND AND GRAVEL
- GRAVELLY SILT–SILT WITH SOME TO LITTLE EMBEDDED GRAVEL AND SAND
- SAND–FINE TO MEDIUM SAND, LITTLE TO TRACE GRAVEL, SILT AND CLAY
- SAND & GRAVEL–FINE TO COARSE SAND AND FINE TO MEDIUM GRAVEL. MAY CONTAIN OCCASIONAL, DISCONTINUOUS LENSES OF SAND AND SILT
- GRAVEL–FINE TO COARSE GRAVEL, LITTLE SAND, TRACE SILT
- NAPL SATURATED SOIL

NOTES:

1. FAMSL=FEET ABOVE MEAN SEA LEVEL. ALL ELEVATIONS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988.
2. THE DEPTH OF FORMER HOLDERS IS INFERRED, BASED ON BORING DATA FROM SB-11, SB-27, AND MW-19.
3. HEIGHT OF BUILDING IS APPROXIMATE.
4. NAPL=NON-AQUEOUS PHASE LIQUID.

VERTICAL SCALE: 0 20' 40'

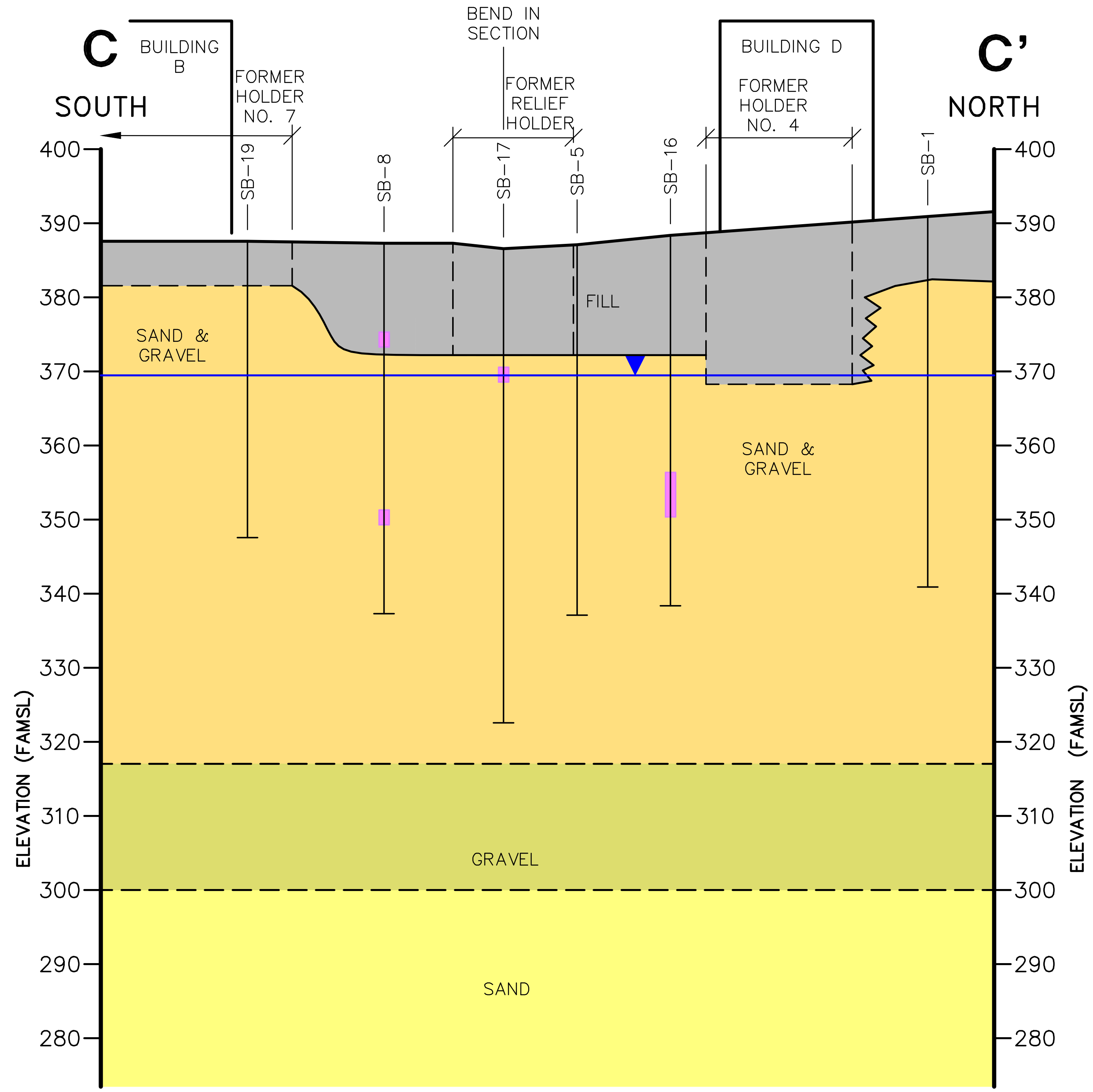
HORIZONTAL SCALE: 0 100' 200'

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK

GEOLOGICAL CROSS SECTION B-B'

ARCADIS

FIGURE 4



LEGEND:

- SB-1 SOIL BORING
- WATER TABLE JANUARY, 2003
- BOTTOM OF BORING
- CONTACT BETWEEN GEOLOGIC UNITS (DASHED WHERE INFERRED)
- FILL–A MIXTURE OF GRAVEL, SAND, SILT, CLAY, BRICKS, CINDERS, COAL FRAGMENTS, CONCRETE AND WOOD IN VARYING PROPORTIONS
- SAND–FINE TO MEDIUM SAND, LITTLE TO TRACE GRAVEL, SILT AND CLAY
- SAND & GRAVEL–FINE TO COARSE SAND AND FINE TO MEDIUM GRAVEL. MAY CONTAIN OCCASIONAL, DISCONTINUOUS LENSES OF SAND AND SILT
- GRAVEL–FINE TO COARSE GRAVEL, LITTLE SAND, TRACE SILT
- NAPL SATURATED SOIL

NOTES:

1. FAMSL=FEET ABOVE MEAN SEA LEVEL. ALL ELEVATIONS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988.
2. THE DEPTH OF THE FORMER RELIEF HOLDER IS INFERRED, BASED ON BORING DATA FROM SB–17.
3. THE DEPTH OF FORMER HOLDER NO. 4 IS APPROXIMATE, NO BORINGS HAVE BEEN ADVANCED IN THIS HOLDER TO CONFIRM THE DEPTH OF THE HOLDER FLOOR.
4. THE DEPTH OF FORMER HOLDER NO. 7 IS INFERRED, BASED ON BORING DATA FROM SB–19.
5. HEIGHT OF BUILDING IS APPROXIMATE.
6. NAPL=NON–AQUEOUS PHASE LIQUID.

0 20' 40'
VERTICAL SCALE

0 100' 200'
HORIZONTAL SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK

GEOLOGICAL CROSS SECTION C-C'

ARCADIS

FIGURE 5

March 8, 2013 Letter from
National Grid to NYSDEC –
Groundwater Monitoring Report -
January 2013 Monitoring Event

James F. Morgan
Lead Senior Environmental Engineer
Environmental Department

March 8, 2013

Mr. Anthony Karwiel
Remedial Bureau C, 11th Floor
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7014

Re: National Grid
Erie Boulevard Former MGP Site
Syracuse, New York
NYSDEC Site No. 734060
Groundwater Monitoring Report – January 2013 Monitoring Event

Dear Mr. Karwiel:

This letter summarizes the findings of the January 2013 groundwater monitoring performed at the Erie Boulevard former manufactured gas plant (MGP) site (the site). Fieldwork was implemented by ARCADIS during the week of January 28, 2013 as a follow-up to discussions during a January 16, 2013 meeting attended by the New York State Department of Environmental Conservation (NYSDEC), National Grid, and ARCADIS concerning remedy evaluation for the site. The monitoring was performed to assess current groundwater conditions at and hydraulically downgradient from the site. The previous groundwater monitoring event was conducted approximately five years ago (in April 2008).

As summarized herein, concentrations of constituents of interest in the monitoring wells at and downgradient from the site are generally less than or consistent with the levels identified in the previous monitoring events. These new data support the limited action remedy proposed in the Feasibility Study Report and discussed with the NYSDEC during the January 16th meeting.

Work performed as part of the monitoring event is described below, followed by a summary of the findings and conclusions/recommendations.

I. GROUNDWATER MONITORING ACTIVITIES

ARCADIS purged and sampled groundwater from 16 monitoring wells as part of the January 2013 groundwater monitoring event. This included six onsite wells and 10 offsite wells, as listed below and shown on Figure 1:

- Onsite wells: MW-1S, MW-2, MW-4S, MW-6, MW-7S, and MW-8S.
- Offsite wells: MW-9D1, MW-10S, MW-10D, MW-11D, MW-12D, MW-14D through MW-17D, and MW-18.

ARCADIS had also planned to sample MW-3S and MW-13D, but these two wells were inaccessible. Monitoring well MW-3S, which is located in the paved parking area at the northeastern corner of the site, was buried under a snow bank. The protective stickup casing at monitoring well MW-13D, which is an offsite well near the West Street off-ramp to Interstate I-690 East, had been removed unbeknownst to National Grid and ARCADIS, and the ground surface in the area of the well was covered with several inches of crushed stone. National Grid surveyed and field-staked the as-built location of MW-13D.

Following the survey, ARCADIS hand-shoveled stone from the area, but was unable to locate the well (potentially in part due to the frozen ground). Monitoring wells MW-3S and MW-13D were not critical wells for the groundwater monitoring event. This is because no constituents of interest were identified at concentrations exceeding groundwater quality standards/guidance values in either of these wells during the previous monitoring events (seven events at MW-3 between August 1995 and April 2008, and three events at MW-13D between November 2002 and April 2008).

Prior to sampling, ARCADIS used an oil/water interface probe to gauge the above-identified 16 wells (plus monitoring well MW-19, located off the southwest corner of Building D) for the presence of light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL). No NAPL was identified in any of these wells.

ARCADIS used low-flow techniques (a Monsoon pump with dedicated disposable tubing) to purge the monitoring wells prior to sampling. Field parameters consisting of pH, conductivity, dissolved oxygen, oxidation-reduction potential (ORP), temperature, and turbidity were measured approximately every 5 minutes during purging. Purging continued until the field parameters stabilized, with three (?) consecutive readings within the following ranges:

- Conductivity and temperature readings within 3%.
- pH readings within 0.1 standard units.
- Dissolved oxygen readings within 10% or 0.1 milligrams per liter.
- ORP readings within 10 millivolts.

Field parameter measurements are presented on the groundwater sampling logs included as Attachment A.

After well purging, ARCADIS collected groundwater samples from each well for laboratory analysis for benzene, toluene, ethylbenzene, and xylenes (BTEX) and polycyclic aromatic hydrocarbons (PAHs). Samples from three onsite monitoring wells (MW-1S, MW-4S, and MW-7S) were also submitted for analysis of total and available cyanide. The samples for BTEX were collected using dedicated polyethylene bailers, and the samples for PAHs and cyanide were collected using low-flow techniques. Laboratory analysis of the samples was performed by Accutest Laboratories of Marlborough, Massachusetts.

ARCADIS waited until two days after groundwater samples were collected from the onsite wells (until January 31, 2013) to obtain a synoptic round of water-level measurements from each accessible onsite shallow monitoring well. The slight postponement of the synoptic water-level measurements was in anticipation that warm temperatures during the workweek might melt enough snow to make MW-3S accessible for water level measurement. This did not happen, but the absence of water level data from MW-3S did not affect ARCADIS' ability to examine the shallow groundwater gradients and estimated flow directions at the site. The water-level data collected during the January 2013 monitoring event, consistent with past data, show that Onondaga Creek is a losing stream (i.e., a component of flow in the creek discharges to the groundwater system). The water level data also show that there is a slight horizontal gradient to the east, away from Onondaga Creek.

II. FINDINGS

An analytical sample summary, which identifies the sample dates and the analyses performed on each groundwater sample collected as part of the January 2013 and previous monitoring events, is included as Table 1. A monitoring well construction summary is included as Table 2. Water-level measurements for the January 2013 and previous monitoring events are presented in Table 3. Field parameter measurements recorded immediately prior to sampling during the January 2013 and previous monitoring events are presented in Table 4.

The laboratory analytical results for the January 2013 groundwater monitoring event were validated by ARCADIS and found to be of good quality and useable, as intended. The validated groundwater analytical results for the January 2013 and previous monitoring events are presented in Table 5. This table also compares the data to the groundwater quality standards and guidance values presented in NYSDEC Division of Water, Technical and Operational Guidance Series document titled "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (TOGS 1.1.1) dated June 1998, last revised October 2004. Figure 1 summarizes all groundwater analytical results for BTEX, PAHs, and cyanide that exceed the groundwater quality standards or guidance values. The full laboratory analytical data report (NYSDEC Analytical Services Protocol Category B data deliverables package), electronic data deliverables (EDDs), and the data validation report for the January 2013 monitoring event are provided on the attached CD. The EDDs will be separately e-mailed to the NYSDEC for upload to the NYSDEC's EQuIS database.

The analytical results for the January 2013 groundwater sampling event compared to the historical groundwater quality data are summarized below.

- For the shallow monitoring wells in the northern and eastern portion of the site (wells MW-1S, MW-2, and MW-6), no BTEX, PAHs, or cyanide were identified at concentrations exceeding the groundwater quality standards or guidance values in any of the January 2013 samples. These results are consistent with the historical data.

- For the shallow monitoring wells in the western portion of the site and offsite, one or more BTEX compounds or PAHs were identified at concentrations exceeding the groundwater quality standards or guidance values. The following bullets compare the January 2013 results to the previous data.

  - BTEX and PAH concentrations in shallow groundwater southwest of Building D (at well MW-4S) are generally the same as those from previous sampling events, with one exception: the naphthalene concentrations in well MW-4S have fluctuated somewhat, but have generally decreased over time (from a maximum of 12,000 parts per billion [ppb] in the initial sampling event in August 1995 to 2,800 ppb in the most recent sampling event in January 2013).

  - BTEX and PAH concentrations in shallow groundwater in the western/southwestern portion of the site (at wells MW-7S and MW-8S) and northwest of the site (at well MW-10S) are generally the same as those from the previous sampling events or may be decreasing. No BTEX or PAHs were identified in the two most-recent sets of samples collected from MW-10S at concentrations exceeding groundwater quality standards or guidance values.

- For the deep monitoring wells located hydraulically downgradient from the site, the following is apparent from review of the January 2013 and historical groundwater data:

- No BTEX or PAHs have been identified at concentrations exceeding groundwater quality standards or guidance values in any of the samples collected from the sentinel monitoring wells. This includes MW-12D (the first well west of the site), MW-14D (just north of the Interstate I-690 and West Street interchanges), MW-16D (on the church property just northwest of the intersection of Genesee Street and Plum Street), and MW-18 (the most downgradient well).

- BTEX concentrations in groundwater at several deep monitoring wells located along the offsite groundwater plume have generally decreased by one or two orders of magnitude since the previous monitoring events. BTEX concentrations have decreased by an order of magnitude at monitoring wells MW-9D1 and MW-11D (the first two downgradient wells from the site) and by two orders of magnitude at monitoring well MW-10D (the third downgradient well from the site). BTEX concentrations in the January 2013 groundwater samples collected from the next two wells further downgradient along the plume axis (wells MW-15D and MW-17) appear to be slightly less than or generally consistent with concentrations from 2008, respectively, and less than earlier concentrations (from 2002 and 2003).

- Naphthalene concentrations in two of the first three deep offsite monitoring wells within the groundwater plume (MW-9D1 and MW-10D) and in the most downgradient well along the plume (MW-17D) are one-to-two orders of magnitude less than the concentrations identified in these wells during each of the previous monitoring events. For the remaining PAHs in groundwater at these three wells, the concentrations in the 2013 samples are generally consistent with concentrations identified in the previous samples. At the other locations along the plume, the PAH concentrations appear to have slightly decreased (MW-11D) or remained generally the same (MW-15D). The quantity of data does not support identification of statistically significant trends.

• Total cyanide was previously identified at concentrations exceeding the 200 ppb groundwater quality standard in only three wells (wells MW-1S, MW-4S, and MW-7S). Total cyanide concentrations in the January 2013 samples collected from these wells were less than the 200 ppb standard, except for the 1,800 ppb concentration at MW-4S (which was less than the results for the three previous sampling events).

III. SUMMARY & CONCLUSIONS

Overall, the groundwater analytical data generated by the January 2013 and previous sampling events suggest that the region of groundwater that exceeds groundwater quality standards and guidance values at and downgradient from the site is stable and may be decreasing. These new data also support selection of the limited action remedy proposed in the Feasibility Study Report and discussed with the NYSDEC during the January 16, 2013 meeting.

No further groundwater sampling is proposed at this time. Following an end to freezing conditions, additional efforts will be made to uncover monitoring well MW-13D (additional hand-shoveling or scraping of surface stone/soil using a mini-excavator). National Grid proposes to properly decommission the well if it can be found.

We look forward to meeting again with the NYSDEC to discuss the remedial alternative selection for the site, including the information presented in this letter and our February 8, 2013 letter. In the meantime, please do not hesitate to call me at (315) 428-3101 if you have any questions or require additional information.

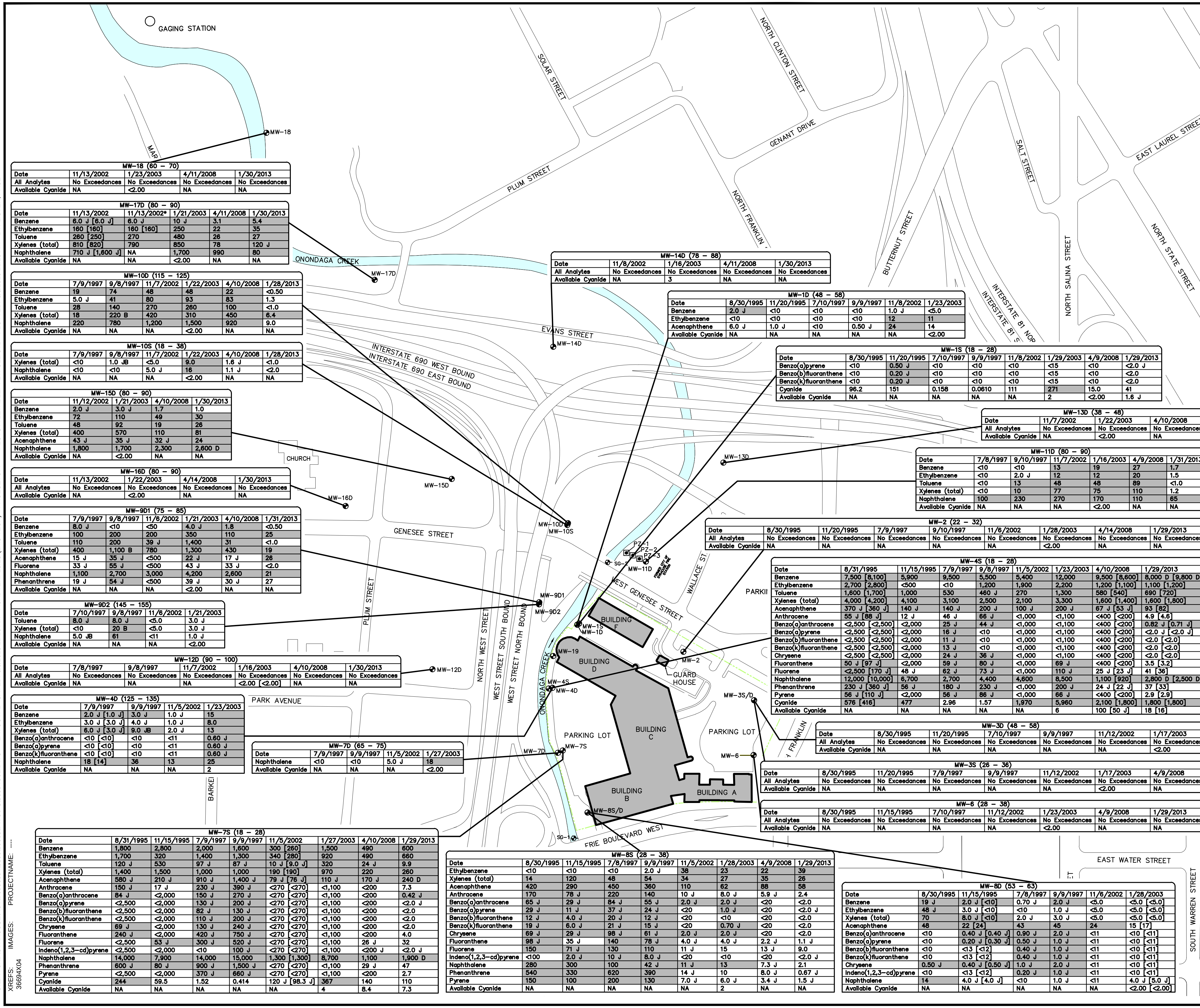
Sincerely,

James F. Morgan
Lead Senior Environmental Engineer

cc: Amen Omorogbe, P.E., NYSDEC (via e-mail)
George Heitzman, P.E., NYSDEC (via e-mail)
Brian Stearns, P.E., National Grid (via e-mail)
Terry Young, P.E., ARCADIS (via e-mail)
Keith White, C.P.G., ARCADIS (via e-mail)
John Brussel, P.E., ARCADIS (via e-mail)

Environmental Department, 300 Erie Boulevard West, Syracuse, New York 13202
T: (315) 428-3101 ■ F: (315) 460-9644 ■ James.F.Morgan@us.ngrid.com ■ www.nationalgrid.com

Figure



MW-18 (60 – 70)				
Date	11/13/2002	1/23/2003	4/11/2008	1/30/2013
All Analytes	No Exceedances	No Exceedances	No Exceedances	No Exceedances
Available Cyanide	NA	<2.00	NA	NA

MW-17D (80 – 90)					
Date	11/13/2002	11/13/2002*	1/21/2003	4/11/2008	1/30/2013
Benzene	6.0 J [6.0 J]	6.0 J	10 J	3.1	5.4
Ethylbenzene	160 [160]	160 [160]	250	22	35
Toluene	260 [250]	270	480	26	27
Xylenes (total)	810 [820]	790	850	78	120 J
Naphthalene	710 J [1,600 J]	NA	1,700	990	80
Available Cyanide	NA	NA	<2.00	NA	NA

MW-10D (115 – 125)						
Date	7/9/1997	9/8/1997	11/7/2002	1/22/2003	4/10/2008	1/28/2013
Benzene	19	74	48	48	22	<0.50
Ethylbenzene	5.0 J	41	80	93	83	1.3
Toluene	28	140	270	260	100	<1.0
Xylenes (total)	18	220 B	420	310	450	6.4
Naphthalene	220	780	1,200	1,500	920	9.0
Available Cyanide	NA	NA	NA	<2.00	NA	NA

MW-10S (18 – 38)						
Date	7/9/1997	9/8/1997	11/7/2002	1/22/2003	4/10/2008	1/28/2013
Xylenes (total)	<10	1.0 JB	<5.0	9.0	1.6 J	<1.0
Naphthalene	<10	<10	5.0 J	16	1.1 J	<2.0
Available Cyanide	NA	NA	NA	<2.00	NA	NA

MW-15D (80 – 90)				
Date	11/12/2002	1/21/2003	4/10/2008	1/30/2013
Benzene	2.0 J	3.0 J	1.7	1.0
Ethylbenzene	72	110	49	30
Toluene	48	92	19	26
Xylenes (total)	400	570	110	81
Acenaphthene	43 J	35 J	32 J	24
Naphthalene	1,800	1,700	2,300	2,600 D
Available Cyanide	NA	<2.00	NA	NA

MW-16D (80 – 90)				
Date	11/13/2002	1/22/2003	4/14/2008	1/30/2013
All Analytes	No Exceedances	No Exceedances	No Exceedances	No Exceedances
Available Cyanide	NA	<2.00	NA	NA

MW-9D1 (75 – 85)						
Date	7/9/1997	9/8/1997	11/6/2002	1/21/2003	4/10/2008	1/31/2013
Benzene	8.0 J	<10	<50	4.0 J	1.8	<0.50
Ethylbenzene	100	200	200	350	110	25
Toluene	110	200	39 J	1,400	31	<1.0
Xylenes (total)	400	1,100 B	780	1,300	430	19
Acenaphthene	15 J	35 J	<500	22 J	17 J	26
Fluorene	33 J	55 J	<500	43 J	33 J	<2.0
Naphthalene	1,100	2,700	3,000	4,200	2,600	21
Phenanthrene	19 J	54 J	<500	39 J	30 J	27
Available Cyanide	NA	NA	NA	<2.00	NA	NA

MW-9D2 (145 – 155)				
Date	7/10/1997	9/8/1997	11/6/2002	1/21/2003
Toluene	8.0 J	8.0 J	<5.0	3.0 J
Xylenes (total)	<10	20 B	<5.0	3.0 J
Naphthalene	5.0 JB	61	<11	1.0 J
Available Cyanide	NA	NA	NA	<2.00

MW-12D (90 – 100)						
Date	7/8/1997	9/8/1997	11/7/2002	1/16/2003	4/10/2008	1/30/2013
All Analytes	No Exceedances	No Exceedances	No Exceedances	No Exceedances	No Exceedances	No Exceedances
Available Cyanide	NA	NA	NA	<2.00 [<2.00]	NA	NA

MW-4D (125 – 135)				
Date	7/9/1997	9/9/1997	11/5/2002	1/23/2003
Benzene	2.0 J [1.0 J]	3.0 J	1.0 J	15
Ethylbenzene	3.0 J [3.0 J]	4.0 J	1.0 J	8.0
Xylenes (total)	6.0 J [3.0 J]	9.0 JB	2.0 J	13
Benzo(a)anthracene	<10 [<10]	<10	<11	0.60 J
Benzo(a)pyrene	<10 [<10]	<10	<11	0.60 J
Benzo(k)fluoranthene	<10 [<10]	<10	<11	0.60 J
Naphthalene	18 [14]	36	13	25
Available Cyanide	NA	NA	NA	2

MW-7D (65 – 75)				
Date	7/9/1997	9/9/1997	11/5/2002	1/27/2003
Naphthalene	<10	<10	5.0 J	18
Available Cyanide	NA	NA	NA	<2.00

MW-7S (18 – 28)								
Date	8/31/1995	11/15/1995	7/9/1997	9/9/1997	11/5/2002	1/27/2003	4/10/2008	1/29/2013
Benzene	1,800	2,800	2,000	1,600	300 [260]	1,500	490	600
Ethylbenzene	1,700	320	1,400	1,300	340 [280]	920	490	660
Toluene	120 J	530	97 J	87 J	10 J [9.0 J]	320	24 J	9.9
Xylenes (total)	1,400	1,500	1,000	1,000	190 [190]	970	220	260
Acenaphthene	580 J	210 J	910 J	1,400 J	79 J [76 J]	110 J	170 J	240 D
Anthracene	150 J	17 J	230 J	390 J	<270 [<270]	<1,100	<200	7.3
Benzo(a)anthracene	84 J	<2,000	150 J	270 J	<270 [<270]	<1,100	<200	0.42 J
Benzo(a)pyrene	<2,500	<2,000	130 J	200 J	<270 [<270]	<1,100	<200	<2.0 J
Benzo(b)fluoranthene	<2,500	<2,000	82 J	130 J	<270 [<270]	<1,100	<200	<2.0
Benzo(k)fluoranthene	<2,500	<2,000	110 J	200 J	<270 [<270]	<1,100	<200	<2.0
Chrysene	69 J	<2,000	130 J	240 J	<270 [<270]	<1,100	<200	<2.0
Fluoranthene	240 J	<2,000	420 J	750 J	<270 [<270]	<1,100	<200	4.0
Fluorene	<2,500	53 J	300 J	520 J	<270 [<270]	<1,100	26 J	32
Indeno(1,2,3-cd)pyrene	<2,500	<2,000	<10	100 J	<270 [<270]	<1,100	<200 J	<2.0 J
Naphthalene	14,000	7,900	14,000	15,000	1,300 [1,300]	8,700	1,100	1,900 D
Phenanthrene	600 J	80 J	900 J	1,500 J	<270 [<270]	<1,100	29 J	47
Pyrene	<2,500	<2,000	370 J	660 J	<270 [<270]	<1,100	<200	2.7
Cyanide	244	59.5	1.52	0.414	120 J [98.3 J]	367	140	110
Available Cyanide	NA	NA	NA	NA	NA	4	8.4	7.3

MW-8S (28 – 38)								
Date	8/30/1995	11/15/1995	7/8/1997	9/9/1997	11/5/2002	1/28/2003	4/9/2008	1/29/2013
Ethylbenzene	<10	<10	<10	2.0 J	38	23	22	39
Xylenes (total)	14	120	48	54	34	27	35	26
Acenaphthene	420	290	450	360	110	62	88	58
Anthracene	170	78 J	220	140	10 J	8.0 J	5.9 J	2.4
Benzo(a)anthracene	65 J	29 J	84 J	55 J	2.0 J	2.0 J	<20	<2.0
Benzo(a)pyrene	29 J	11 J	37 J	24 J	<20	1.0 J	<20	<2.0 J
Benzo(b)fluoranthene	12 J	4.0 J	20 J	12 J	<20	<10	<20	<2.0
Benzo(k)fluoranthene	19 J	6.0 J	21 J	15 J	<20	0.70 J	<20	<2.0
Chrysene	69 J	29 J	98 J	61 J	2.0 J	2.0 J	<20	<2.0
Fluoranthene	98 J	35 J	140	78 J	4.0 J	4.0 J	2.2 J	1.1 J
Fluorene	150	71 J	130	110	11 J	15	13 J	9.0
Indeno(1,2,3-cd)pyrene	<100	2.0 J	10 J	8.0 J	<20	<10	<20	<2.0 J
Naphthalene	280	300	100	42 J	11 J	13	7.3 J	2.1
Phenanthrene	540	330	620	390	14 J	10	8.0 J	0.67 J
Pyrene	150	100	200	130	7.0 J	6.0 J	3.4 J	1.5 J
Available Cyanide	NA	NA	NA	NA	NA	2	NA	NA

MW-8D (53 – 63)						
Date	8/30/1995	11/15/1995	7/8/1997	9/9/1997	11/6/2002	1/28/2003
Benzene	19 J	2.0 J [<10]	0.70 J	2.0 J	<5.0	<5.0 [<5.0]
Ethylbenzene	48 J	3.0 J [<10]	<10	1.0 J	<5.0	<5.0 [<5.0]
Xylenes (total)	70	8.0 J [<10]	2.0 J	3.0 J	<5.0	<5.0 [<5.0]
Acenaphthene	48	22 [24]	43	45	24	15 [17]
Benzo(a)anthracene	<10	0.40 J [0.40 J]	0.90 J	2.0 J	<11	<10 [<11]
Benzo(a)pyrene	<10	0.20 J [0.30 J]	0.50 J	1.0 J	<11	<10 [<11]
Benzo(b)fluoranthene	<10	<13 [<12]	0.40 J	1.0 J	<11	<10 [<11]
Benzo(k)fluoranthene	<10	<13 [<12]	0.40 J	1.0 J	<11	<10 [<11]
Chrysene	0.50 J	0.40 J [0.50 J]	1.0 J	2.0 J	<11	<10 [<11]
Indeno(1,2,3-cd)pyrene	<10	<13 [<12]	0.20 J	1.0 J	<11	<10 [<11]
Naphthalene	14	4.0 J [4.0 J]	<10	1.0 J	<11	4.0 J [5.0 J]
Available Cyanide	NA	NA	NA	NA	NA	<2.00 [<2.00]

MW-14D (78 – 88)				
Date	11/8/2002	1/16/2003	4/11/2008	1/30/2013
All Analytes	No Exceedances	No Exceedances	No Exceedances	No Exceedances
Available Cyanide	NA	3	NA	NA

MW-1D (48 – 58)						
Date	8/30/1995	11/20/1995	7/10/1997	9/9/1997	11/8/2002	1/23/2003
Benzene	2.0 J	<10	<10	<10	1.0 J	<5.0
Ethylbenzene	<10	<10	<10	<10	12	11
Acenaphthene	6.0 J	1.0 J	<10	0.50 J	24	14
Available Cyanide	NA	NA	NA	NA	NA	<2.00

MW-1S (18 – 28)								
Date	8/30/1995	11/20/1995	7/10/1997	9/9/1997	11/8/2002	1/29/2003	4/9/2008	1/29/2013
Benzo(a)pyrene	<10	0.50 J	<10	<10	<10	<15	<10	<2.0 J
Benzo(b)fluoranthene	<10	0.20 J	<10	<10	<10	<15	<10	<2.0
Benzo(k)fluoranthene	<10	0.20 J	<10	<10	<10	<15	<10	<2.0
Cyanide	96.2	151	0.158	0.0610	111	271	15.0	41
Available Cyanide	NA	NA	NA	NA	NA	2	<2.00	1.6 J

MW-13D (38 – 48)			
Date	11/7/2002	1/22/2003	4/10/2008
All Analytes	No Exceedances	No Exceedances	No Exceedances
Available Cyanide	NA	<2.00	NA

MW-11D (80 – 90)						
Date	7/8/1997	9/10/1997	11/7/2002	1/16/2003	4/9/2008	1/31/2013
Benzene	<10	<10	13	19	27	1.7
Ethylbenzene	<10	2.0 J	12	12	20	1.5
Toluene	<10	13	48	48	89	<1.0
Xylenes (total)	<10	10	77	75	110	1.2
Naphthalene	100	230	270	170	110	65
Available Cyanide	NA	NA	NA	<2.00	NA	NA

MW-2 (22 – 32)								
Date	8/30/1995	11/20/1995	7/9/1997	9/10/1997	11/6/2002	1/28/2003	4/14/2008	1/29/2013
All Analytes	No Exceedances	No Exceedances	No Exceedances	No Exceedances	No Exceedances	No Exceedances	No Exceedances	No Exceedances
Available Cyanide	NA	NA	NA	NA	NA	<2.00	NA	NA

MW-4S (18 – 28)								
Date	8/31/1995	11/15/1995	7/9/1997	9/8/1997	11/5/2002	1/23/2003	4/10/2008	1/29/2013
Benzene	7,500 [8,100]	5,900	9,500	5,500	5,400	12,000	9,500 [8,600]	8,000 D [9,800 D]
Ethylbenzene	2,700 [2,800]	<500	<10	1,200	1,900	2,200	1,200 [1,100]	1,100 [1,200]
Toluene	1,600 [1,700]	1,000	530	460 J	270	1,300	580 [540]	690 [720]
Xylenes (total)	4,000 [4,200]	4,100	3,100	2,500	2,100	3,300	1,600 [1,400]	1,600 [1,800]
Acenaphthene	370 J [360 J]	140 J	140 J	200 J	100 J	200 J	67 J [53 J]	93 [82]
Anthracene	55 J [88 J]	12 J	46 J	66 J	<1,000	<1,100	<400 [<200]	4.9 [4.6]
Benzo(a)anthracene	<2,500 [<2,500]	<2,000	25 J	44 J	<1,000	<1,100	<400 [<200]	0.82 J [0.71 J]
Benzo(a)pyrene	<2,500 [<2,500]	<2,000	16 J	<10	<1,000	<1,100	<400 [<200]	<2.0 J [<2.0 J]
Benzo(b)fluoranthene	<2,500 [<2,500]	<2,000	11 J	<10	<1,000	<1,100	<400 [<200]	<2.0 [<2.0]
Benzo(k)fluoranthene	<2,500 [<2,500]	<2,000	13 J	<10	<1,000	<1,100	<400 [<200]	<2.0 [<2.0]
Chrysene	<2,500 [<2,500]	<2,000	24 J	36 J	<1,000	<1,100	<400 [<200]	<2.0 [<2.0]
Fluoranthene	50 J [97 J]	<2,000	59 J	80 J	<1,000	69 J	<400 [<200]	3.5 [3.2]
Fluorene	<2,500 [170 J]	48 J	62 J	73 J	<1,000	110 J	25 J [23 J]	41 [36]
Naphthalene	12,000 [10,000]	6,700	2,700	4,400	4,600	8,500	1,100 [920]	2,800 D [2,500 D]
Phenanthrene	230 J [360 J]	56 J	180 J	230 J	<1,000	200 J	24 J [22 J]	37 [33]
Pyrene	56 J [110 J]	<2,000	56 J	86 J	<1,000	66 J	<400 [<200]	2.9 [2.9]
Cyanide	576 [416]	477	2.96	1.57	1,970	5,960	2,100 [1,800]	1,800 [1,800]
Available Cyanide	NA	NA	NA	NA	NA	6	100 [50 J]	18 [16]

MW-3D (48 – 58)						
Date	8/30/1995	11/20/1995	7/10/1997	9/9/1997	11/12/2002	1/17/2003
All Analytes	No Exceedances	No Exceedances	No Exceedances	No Exceedances	No Exceedances	No Exceedances
Available Cyanide	NA	NA	NA	NA	NA	<2.00

MW-3S (26 – 36)							
Date	8/30/1995	11/20/1995	7/9/1997	9/9/1997	11/12/2002	1/17/2003	4/9/2008
All Analytes	No Exceedances	No Exceedances	No Exceedances	No Exceedances	No Exceedances	No Exceedances	No Exceedances
Available Cyanide	NA	NA	NA	NA	NA	<2.00	NA

MW-6 (28 – 38)							
Date	8/30/1995	11/15/1995	7/10/1997	11/12/2002	1/23/2003	4/9/2008	1/29/2013
All Analytes	No Exceedances	No Exceedances	No Exceedances	No Exceedances	No Exceedances	No Exceedances	No Exceedances
Available Cyanide	NA	NA	NA	NA	<2.00	NA	NA

LEGEND:

- MW-1S/D EXISTING MONITORING WELL LOCATION
- PZ-2 EXISTING PIEZOMETER LOCATION
- SG-2 EXISTING STAFF GAUGE LOCATION
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- EXISTING ONSITE BUILDING

NYSDEC TOGS 1.1.1	
Constituent	Standard/Guidance Value (ppb)
Benzene	1 (Standard)
Ethylbenzene	5 (Standard)
Toluene	5 (Standard)
Xylenes (total)	5 (Standard)
Acenaphthene	20 (Guidance Value)
Anthracene	50 (Guidance Value)
Benzo(a)anthracene	0.002 (Guidance Value)
Benzo(a)pyrene	0 (Standard)
Benzo(b)fluoranthene	0.002 (Guidance Value)
Benzo(k)fluoranthene	0.002 (Guidance Value)
Chrysene	0.002 (Guidance Value)
Fluoranthene	50 (Guidance Value)
Fluorene	50 (Guidance Value)
Indeno(1,2,3-cd)pyrene	0.002 (Guidance Value)
Naphthalene	10 (Guidance Value)
Phenanthrene	50 (Guidance Value)
Pyrene	50 (Guidance Value)
Cyanide	200 (Standard)
Available Cyanide	– –

NOTES:

1. BASE MAP DEVELOPED FROM NEW YORK STATE GEOGRAPHIC INFORMATION SYSTEMS, OFFICE OF CYBER SECURITY & CRITICAL INFRASTRUCTURE, LAST UPDATED 4/25/2007.
2. MONITORING WELL, PIEZOMETER, AND STAFF GAUGE LOCATIONS ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
3. FIGURE SHOWS GROUNDWATER ANALYTICAL RESULTS FOR SAMPLING LOCATIONS WHERE ONE OR MORE BTEX CONSTITUENTS, PAHs, OR TOTAL CYANIDE WERE IDENTIFIED AT CONCENTRATION EXCEEDING THE STANDARDS/GUIDANCE VALUES. FIGURE ALSO SHOWS RESULTS FOR AVAILABLE CYANIDE, WHERE DETECTED.
4. STANDARDS/GUIDANCE VALUES = GROUNDWATER STANDARDS/GUIDANCE VALUES FOR CLASS GA WATER AS PRESENTED IN THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TECHNICAL AND OPERATIONAL GUIDANCE SERIES DOCUMENT TITLED, "AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES AND GROUNDWATER EFFLUENT LIMITATIONS" (TOGS 1.1.1), DATED JUNE 1998, LAST REVISED JUNE 2004.
5. SHADING INDICATES THE VALUE EXCEEDS THE NYSDEC TOGS 1.1.1 STANDARD/GUIDANCE VALUE.
6. ALL CONCENTRATIONS ARE PRESENTED IN PARTS PER BILLION (ppb). WHICH IS EQUIVALENT TO MICROGRAMS PER LITER (ug/L).
7. FIELD DUPLICATE SAMPLE RESULTS ARE PRESENTED IN BRACKETS [].
8. J = INDICATES THAT THE ASSOCIATED NUMERICAL VALUE IS AN ESTIMATED CONCENTRATION.
9. < = CONSITITUENT NOT DETECTED AT A CONCENTRATION ABOVE THE REPORTED DETECTION LIMIT.
10. NA = NOT ANALYZED.
11. B = INDICATES AN ESTIMATED VALUE BETWEEN THE INSTRUMENT DETECTION LIMIT AND THE REPORTING LIMIT.
12. D = COMPOUND QUANTITATED USING A SECONDARY DILUTION. SURROGATE OR MATRIX SPIKE FOR RECOVERIES WERE NOT OBTAINED BECAUSE THE EXTRACT WAS DILUTED FRO ANALYSIS.
13. * = A SECOND SAMPLE WAS TAKEN AT MW-17D ON THE SAME DAY.
14. __ = NYSDEC TOGS 1.1.1 STANDARD/GUIDANCE VALUE NOT AVAILABLE.
15. BTEX = BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES.
16. PAHs = POLYCYCLIC AROMATIC HYDROCARBONS.
17. THE REMEDIAL INVESTIGATION GROUNDWATER ANALYTICAL DATA AND SUBSEQUENT DATA HAS BEEN VALIDATED.
18. THE SAMPLES COLLECTED JULY 9, 1997 FROM WELLS MW-3S AND MW-7S APPEAR TO HAVE BEEN INADVERTENTLY SWITCHED DURING THE PRELIMINARY SITE ASSESSMENT. RESULTS FOR THESE WELLS HAVE BEEN SWITCHED (CORRECTED) FOR THIS FIGURE.

0 300' 600'
GRAPHIC SCALE

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK

GROUNDWATER ANALYTICAL RESULTS FOR BTEX, PAHs, AND CYANIDE EXCEEDING STANDARDS/GUIDANCE VALUES (ppb)

ARCADIS

FIGURE
1

Tables

TABLE 1
SUMMARY OF SAMPLING LOCATIONS AND LABORATORY ANALYSES

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE

Location	Sample Date	VOCs/ BTEX	SVOCs/ PAHs	Inorgancis	Cyanide	Pesticides	PCBs	Wet Chemistry	Dissolved Gas Analysis	Natural Attenuation
MW-1S	8/30/1995	X	X	X	X	X	X	X		
	11/20/1995	X	X	X	X	X	X	X		
	7/10/1997	X	X	X	X	X	X	X(N)		
	9/9/1997	X	X	X	X	X	X			
	11/8/2002	X	X	X	X	X		X(D)	X	X
	1/29/2003	X	X	X	X	X		X(D)	X	X
	4/9/2008	X	X		X					
	1/29/2013	X	X		X					
MW-1D	8/30/1995	X	X	X	X	X	X	X		
	11/20/1995	X	X	X	X	X	X	X		
	7/10/1997	X	X	X	X	X	X	X(N)		
	9/9/1997	X	X	X	X	X	X			
	11/8/2002	X	X	X	X	X		X(D)	X	X
	1/29/2003	X	X	X	X	X		X(D)	X	X
MW-2	8/30/1995	X	X	X	X	X	X	X		
	11/20/1995	X	X	X	X	X	X	X		
	7/9/1997	X	X	X	X	X	X	X(N)		
	9/10/1997	X	X	X		X	X			
	11/6/2002	X	X	X	X	X		X(D)	X	X
	1/28/2003	X	X	X	X	X		X(D)	X	X
	4/14/2008	X	X							
	1/29/2013	X	X							
MW-3S	8/30/1995	X	X	X	X	X	X	X		
	11/20/1995	X	X	X	X	X	X	X		
	7/9/1997	X	X	X	X	X	X	X(N)		
	9/9/1997	X	X	X	X	X	X			
	11/12/2002	X	X	X	X	X		X(D)	X	X
	1/17/2003	X	X	X	X	X		X(D)	X	X
	4/9/2008	X	X							
MW-3D	8/30/1995	X	X	X	X	X	X	X		
	11/20/1995	X	X	X	X	X	X	X		
	7/10/1997	X	X	X	X	X	X	X(N)		
	9/9/1997	X	X	X	X	X	X			
	11/12/2002	X	X	X	X	X		X(D)	X	X
	1/17/2003	X	X	X	X	X		X(D)	X	X
MW-4S	8/31/1995	X	X	X	X	X	X	X		
	11/15/1995	X	X	X	X	X	X	X		
	7/9/1997	X	X	X	X	X	X	X(N)		
	9/10/1997	X	X	X	X	X	X			
	11/5/2002	X	X	X	X	X		X(D)	X	X
	1/23/2003	X	X	X	X	X		X(D)	X	X
	4/10/2008	X	X		X					
	1/29/2013	X	X		X					
DUP [MW-4S]	8/31/1995	X	X	X	X	X	X	X		
DUP-4/10/08 [MW-4S]	4/10/2008	X	X		X					
DUP-1-012913 [MW-4S]	1/29/2013	X	X		X					
MW-4D	7/9/1997	X	X	X	X	X	X	X(N)		
	9/9/1997	X	X	X	X	X	X			
	11/5/2002	X	X	X	X	X		X(D)	X	X
	1/23/2003	X	X	X	X	X		X(D)	X	X
DUP-1 [MW-4D]	7/9/1997	X	X	X		X	X	X(N)		

TABLE 1
SUMMARY OF SAMPLING LOCATIONS AND LABORATORY ANALYSES

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE

Location	Sample Date	VOCs/ BTEX	SVOCs/ PAHs	Inorgancis	Cyanide	Pesticides	PCBs	Wet Chemistry	Dissolved Gas Analysis	Natural Attenuation
MW-6	8/30/1995	X	X	X	X	X	X	X		
	11/15/1995	X	X	X	X	X	X	X		
	7/10/1997	X	X	X	X	X	X	X(N)		
	9/10/1997	X	X	X		X	X			
	11/12/2002	X	X	X	X	X		X(D)	X	X
	1/23/2003	X	X	X	X	X		X(D)	X	X
	4/9/2008	X	X							
	1/29/2013	X	X							
MW-7S	8/31/1995	X	X	X	X	X	X	X		
	11/15/1995	X	X	X	X	X	X	X		
	7/9/1997	X	X	X	X	X	X	X(N)		
	9/9/1997	X	X	X	X	X	X			
	11/5/2002	X	X	X	X	X		X(D)	X	X
	1/27/2003	X	X	X	X	X		X(D)	X	X
	4/10/2008	X	X		X					
	1/29/2013	X	X		X					
MW-7S DUP [MW-7S]	11/5/2002	X	X	X	X	X		X(D)	X	
MW-7D	7/9/1997	X	X	X	X	X	X	X(N)		
	9/9/1997	X	X	X	X	X	X			
	11/5/2002	X	X	X	X	X		X(D)	X	X
	1/27/2003	X	X	X	X	X		X(D)	X	X
MW-8S	8/30/1995	X	X	X	X	X	X	X		
	11/15/1995	X	X	X	X	X	X	X		
	7/8/1997	X	X	X	X	X	X	X(N)		
	9/9/1997	X	X	X	X	X	X			
	11/5/2002	X	X	X	X	X		X(D)	X	X
	1/28/2003	X	X	X	X	X		X(D)	X	X
	4/9/2008	X	X							
	1/29/2013	X	X							
MW-8D	8/30/1995	X	X	X	X	X	X	X		
	11/15/1995	X	X	X	X	X	X	X		
	7/8/1997	X	X	X	X	X	X	X(N)		
	9/9/1997	X	X	X	X	X	X			
	11/6/2002	X	X	X	X	X		X(D)	X	X
	1/28/2003	X	X	X	X	X		X(D)	X	X
DUP [MW-8D]	11/15/1995	X	X	X	X	X	X	X		
MW-8D DUP [MW-8D]	1/28/2003	X	X	X	X	X		X(D)		
MW-9D$_1$	7/9/1997	X	X	X	X	X	X	X(N)		
	9/8/1997	X	X	X	X	X	X			
	11/6/2002	X	X	X	X	X		X(D)	X	X
	1/21/2003	X	X	X	X	X		X(D)	X	X
	4/10/2008	X	X							
	1/31/2013	X	X							
MW-9D$_2$	7/10/1997	X	X	X	X	X	X	X(N)		
	9/8/1997	X	X	X	X	X	X			
	11/6/2002	X	X	X	X	X		X(D)	X	X
	1/21/2003	X	X	X	X	X		X(D)	X	X
MW-10S	7/9/1997	X	X	X	X	X	X	X(N)		
	9/8/1997	X	X	X	X	X	X			
	11/7/2002	X	X	X	X	X		X(D)	X	X
	1/22/2003	X	X	X	X	X		X(D)	X	X
	4/10/2008	X	X							
	1/28/2013	X	X							

TABLE 1
SUMMARY OF SAMPLING LOCATIONS AND LABORATORY ANALYSES

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE

Location	Sample Date	VOCs/ BTEX	SVOCs/ PAHs	Inorgancis	Cyanide	Pesticides	PCBs	Wet Chemistry	Dissolved Gas Analysis	Natural Attenuation
MW-10D	7/9/1997	X	X	X	X	X	X	X(N)		
	9/8/1997	X	X	X	X	X	X			
	11/7/2002	X	X	X	X	X		X(D)	X	X
	1/22/2003	X	X	X	X	X		X(D)	X	X
	4/10/2008	X	X							
	1/28/2013	X	X							
MW-11D	7/8/1997	X	X	X	X	X	X	X(N)		
	9/10/1997	X	X	X	X	X	X			
	11/7/2002	X	X	X	X	X		X(D)	X	X
	1/16/2003	X	X	X	X	X		X(D)	X	X
	4/9/2008	X	X							
	1/31/2013	X	X							
MW-12D	7/8/1997	X	X	X	X	X	X	X(N)		
	9/8/1997	X	X	X	X	X	X			
	11/7/2002	X	X	X	X	X		X(D)	X	X
	1/16/2003	X	X	X	X	X		X(D)	X	X
	4/10/2008	X	X							
	1/30/2013	X	X							
DUP [MW-12D]	9/8/1997	X	X	X	X	X	X			
DUP [MW-12D]	1/16/2003	X	X	X	X	X				X
MW-13D	11/7/2002	X	X	X	X	X		X(D)	X	X
	1/22/2003	X	X	X	X	X		X(D)	X	X
	4/10/2008	X	X							
MW-14D	11/8/2002	X	X	X	X	X		X(D)	X	X
	1/16/2003	X	X	X	X	X		X(D)	X	X
	4/11/2008	X	X							
	1/30/2013	X	X							
MW-15D	11/12/2002	X	X	X	X	X		X(D)	X	X
	1/21/2003	X	X	X	X	X		X(D)	X	X
	4/10/2008	X	X							
	1/30/2013	X	X							
MW-16D	11/13/2002	X	X	X	X	X		X(D)	X	X
	1/22/2003	X	X	X	X	X		X(D)	X	X
	4/14/2008	X	X							
	1/30/2013	X	X							
MW-17D	11/13/2002	X	X	X	X	X		X(D)	X	X
	11/13/2002	X								
	1/21/2003	X	X	X	X	X		X(D)	X	X
	4/11/2008	X	X							
	1/30/2013	X	X							
DUP [MW-17D]	11/13/2002	X	X	X	X	X		X(D)	X	X
MW-18	11/13/2002	X	X	X	X	X		X(D)	X	X
	1/23/2003	X	X	X	X	X		X(D)	X	X
	4/11/2008	X	X							
	1/30/2013	X	X							

TABLE 1
SUMMARY OF SAMPLING LOCATIONS AND LABORATORY ANALYSES

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE

Notes:

1. Samples were collected by the following:
   - Engineering-Science from March 1995 to April 1995.
   - ARCADIS from August 1995 to present.
2. DUP = Blind duplicate [corresponding sampling location is identified in brackets].
3. Laboratory analysis of the samples collected in January 2013 was performed by Accutest Laboratories (Accutest) of Marlborough, Massachusetts for:
   - Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) using USEPA SW-846 Method 8260.
   - Polynuclear Aromatic Hydrocarbons (PAHs) using USEPA SW-846 Method 8270.
   - Total cyanide using USEPA SW-846 Methods 9012.
   - Available cyanide using USEPA OIA-1677.
4. Laboratory analysis of the Remedial Investigation (RI) samples (2000-2003) and Final RI samples (2008) was performed by TestAmerica Laboratories, Inc. (TestAmerica) of Shelton, Connecticut for:
   - Target Compound List (TCL) Volatile Organic Compounds (VOCs)/BTEX using USEPA SW-846 Method 8260.
   - TCL Semi Volatile Organic Compounds (SVOCs)/PAHs using USEPA SW-846 Method 8270.
   - Target Analyte List (TAL) Inorganics using USEPA SW-846 Methods 6010, 7470/7471, and 9012.
   - Pesticides using USEPA Method 8080.
   - Wet Chemistry parameters (including Oil & Grease and Total Dissolved Solids) by the following:
     - Biochemical Oxygen Demand (BOD) using USEPA Method 405.1.
     - Chloride using USEPA Method 9250.
     - Chemical Oxygen Demand (COD) using USEPA SW-846 Method 410.1.
     - Dissolved Organic Carbon (DOC) using USEPA Method 9060.
     - Nitrate/Nitrite using USEPA SW-846 Method 9200.
     - Sulfate using USEPA Method 9036.
     - Sulfide using USEPA Method 9031.
   - Dissolved Gas Analysis (CO, CO_2, and CH_4) using Method AM-15.01.
   - Natural Attenuation parameters (dissolved iron and manganese) using USEPA SW-846 Method 6010.
5. Laboratory analysis of the Preliminary Site Assessment / Interim Remedial Measure (PSA/IRM) study samples (1995-1997) was performed by Industrial and Environmental Analysts, Inc. (IEA) of Monroe, Connecticut for:
   - TCL VOCs/BTEX using USEPA SW-846 Method 8240.
   - TCL SVOCs/PAHs using USEPA SW-846 Method 8270.
   - TAL Inorganics using USEPA SW-846 Methods 6010 and 7470/7471.
   - Cyanide using USEPA Method 335.4.
   - Pesticides using USEPA Method 8080.
   - Polychlorinated Biphenyls (PCBs) using USEPA SW-846 Method 8082.
   - Wet Chemistry parameters (including Hardness [$CaCO_3$], Oil & Grease, and Total Dissolved Solids) by the following:
     - Biochemical Oxygen Demand (BOD) using USEPA Method 405.1.
     - Chloride using USEPA Method 9250.
     - Chemical Oxygen Demand (COD) using USEPA SW-846 Method 410.1.
     - Nitrite using USEPA SW-846 Method 9200.
     - Sulfate using USEPA Method 9036.
     - Sulfide using USEPA Method 9031.
6. Samples were analyzed by Exygen Research (Exygen) located in State College, Pennsylvania for
   - Cyanide (available) using USEPA OIA 1677.
7. An X indicates analysis was conducted.
8. X(D) - Wet chemistry parameters and DOC were analyzed, except hardness.
9. X(N) - Wet chemistry parameters were analyzed, except nitrate.
10. - - = A depth is not applicable for the sample.
11. Shading indicates groundwater samples collected as part of the January 2013 monitoring event.

TABLE 2
MONITORING WELL AND PIEZOMETER CONSTRUCTION DETAILS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE

Location ID	Major Material Screened/ Location	Date Completed / Date Modified	Easting Coordinate	Northing Coordinate	Measuring Point Elev.	Ground Surface Elev.	Stickup Length	Well Diam.	Casing/Screen Type	Screen Slot Size	Screen Length	Depth to Screened Interval (ft. bgs) Top	Depth to Screened Interval (ft. bgs) Bottom	Well Depth (Bottom of Sump)	Boring Depth	Type of Hyraulic Conductivity Slug Test In	Type of Hyraulic Conductivity Slug Test Out	Estimated Hydraulic Conductivity (K)	Estimated Hydraulic Conductivity (K)
			ft. NAD 83	ft. NAD 83	ft. NAVD 88	ft. NAVD 88	ft. ags	in.		in.	ft.	Top	Bottom	ft. bgs	ft. bgs	In	Out	cm/sec	ft/day
MW-1S	silt and sand	8/9/1995 4/25/2008	933981.318	1112516.959	390.82 390.76	391.23 391.35	- -	2	PVC	0.01	10	18	28	30	31	- -	- -	- -	- -
MW-1D	gravel and sand	8/9/1995	933972.92	1112514.38	390.49	391.14	- -	2	PVC	0.01	10	48	58	60	61	- -	- -	- -	- -
MW-2	sand and gravel	7/26/1995 4/25/2008	934300.4021	1112430.283	391.16 391.35	391.50 391.95	- -	2	PVC	0.01	10	22	32	34	35	- -	- -	- -	- -
MW-3S	gravel	7/21/1995	934544.5871	1112288.626	395.26	395.70	- -	2	PVC	0.01	10	26	36	38	42	- -	- -	- -	- -
MW-3D	gravel, intermittent silt and sand	7/26/1995	934541.9985	1112284.313	395.68	395.70	- -	2	PVC	0.01	10	48	58	60	61	- -	- -	- -	- -
MW-4S	gravel, brick fragments, and sand	8/17/1995	933899.634	1112319.863	388.74	389.54	- -	2	PVC	0.01	10	18	28	30	31	X	X	2.50 E-02 1.13 E-02	71 32
MW-4D	sand and trace silt	6/12/1997	933888.279	1112317.588	389.12	389.47	- -	2	PVC	0.01	10	125	135	137	145	X	X	2.12 E-02 2.41 E-02	60 68
MW-6	gravel and sand	7/28/1995	934515.4938	1112113.713	400.71	398.20	- -	2	PVC	0.01	10	28	38	40	41	- -	- -	- -	- -
MW-7S	silt, sand, and gravel	8/7/1995	933931.229	1112127.993	388.22	388.41	- -	2	PVC	0.01	10	18	28	30	30	X	X	1.44 E-03 5.28 E-03	4.1 15
MW-7D	sand and gravel	6/16/1997	933916.115	1112120.659	387.98	388.32	- -	2	PVC	0.01	10	65	75	77	95	X	X	3.17 E-01 5.33 E-01	898 1,510
MW-8S	sand and gravel	8/4/1995	934008.009	1111946.163	398.06	398.41	- -	2	PVC	0.01	10	28	38	40	40	X	X	1.24 E-02 2.35 E-03	35 6.7
MW-8D	gravel	8/2/1995	934001.241	1111945.191	398.09	398.40	- -	2	PVC	0.01	10	53	63	65	65	X	X	9.04 E-04 6.30 E-04	2.6 1.8
MW-9D$_1$	gravel	6/21/1997	933864.916	1112588.422	397.92	398.32	- -	2	PVC	0.01	10	75	85	87	87	X	X	4.87 E-01 4.13 E-01	1,380 1,170
MW-9D$_2$	sand	6/20/1997	933861.654	1112576.80	398.10	398.45	- -	2	PVC	0.01	10	145	155	157	170	- -	- -	- -	- -
MW-10S	silt, clay, sand, and gravel	10/18/1997	933972.441	1112849.10	394.37	394.77	- -	2	PVC	0.01	20	18	38	40	40	- -	- -	- -	- -
MW-10D	sand and gravel	6/17/1997	933975.533	1112859.735	394.49	394.84	- -	2	PVC	0.01	10	115	125	127	155	X	X	2.04 E-01/1.67 E-01 3.17 E-01/4.06 E-01	577/474 899/1,150
MW-11D	gravel	6/18/1997	934182.785	1112723.90	394.50	392.18	2.3	2	PVC	0.01	10	80	90	92	95	X	X	2.58 E-01/2.56 E-01 4.80 E-01/1.32	732/726 1,360/3,730
MW-12D	silt, sand, and gravel	6/19/1997	933568.39	1112372.87	399.24	399.60	- -	2	PVC	0.01	10	90	100	102	102	- -	- -	- -	- -
MW-13D	clay, silt, sand, and gravel	9/20/2000	934414.121	1113019.036	399.05	397.05	2.0	2	PVC	0.01	10	38	48	50	62	X	X	1.58 E-02 1.38 E-02	45 39
MW-14D	clay, silt, and gravel	9/25/2000	933974.166	1113332.273	398.27	396.42	1.8	2	PVC	0.01	10	78	88	90	100	X	X	1.69 E-03 1.92 E-03	4.8 5.4
MW-15D	clay, silt, sand, and gravel	9/29/2000	933665.824	1112944.434	398.82	399.37	- -	2	PVC	0.01	10	80	90	94	122	X	X	1.58 E-01 2.28 E-01	449 646
MW-16D	clay, silt, sand, and gravel	10/5/2000	933308.141	1112889.647	398.80	399.30	- -	2	PVC	0.01	10	80	90	92	120	X	X	9.14 E-02 1.80 E-01	259 510
MW-17D	sand, gravel, and silt	10/10/2000	933405.808	1113578.118	387.63	388.18	- -	2	PVC	0.01	10	80	90	92	120	X	X	1.81 E-01/1.25 E-01 1.68 E-01/1.59 E-01	514/354 477/452

TABLE 2
MONITORING WELL AND PIEZOMETER CONSTRUCTION DETAILS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE

Location ID	Major Material Screened/ Location	Date Completed / Date Modified	Easting Coordinate	Northing Coordinate	Measuring Point Elev.	Ground Surface Elev.	Stickup Length	Well Diam.	Casing/Screen Type	Screen Slot Size	Screen Length	Depth to Screened Interval (ft. bgs)		Well Depth (Bottom of Sump)	Boring Depth	Type of Hyraulic Conductivity Slug Test		Estimated Hydraulic Conductivity (K)	Estimated Hydraulic Conductivity (K)
			ft. NAD 83	ft. NAD 83	ft. NAVD 88	ft. NAVD 88	ft. ags	in.		in.	ft.	Top	Bottom	ft. bgs	ft. bgs	In	Out	cm/sec	ft/day
MW-18D	clay, silt, sand, and gravel	9/4/2002	933063.7243	1114158.684	376.31	376.66	- -	2	PVC	0.01	10	60	70	72	94	X	X	1.07 E-03 1.42 E-03	3.0 4.0
MW-19	clay, silt, sand, and gravel	6/10/2008	933901.758	1112417.16	390.73	391.12	- -	4	PVC	0.02	10	18	28	30	30	- -	- -	- -	- -
PZ-1	clay, silt, sand, and gravel	10/2/2000	934148.087	1112785.728	376.99	374.13	2.9	2	PVC	0.01	10	5	15	15	15	- -	- -	- -	- -
PZ-2	sand and gravel	10/2/2000	934150.981	1112770.941	378.70	376.01	2.7	2	PVC	0.01	10	5	15	15	18	- -	- -	- -	- -
PZ-3	sand and gravel	10/3/2000	934169.381	1112745.13	393.94	392.14	1.8	2	PVC	0.01	15	21	36	36	36	- -	- -	- -	- -

Notes:
1. NAVD 88 = North American Vertical Datum (NAVD) of 1988, based on NGS Station S-34, elevation 405.340 feet.
2. NAD 83 = North American Datum (NAD) of 1983, New York State Plane (Central-3102), in U.S. survey feet.
3. ags = above ground surface.
4. bgs = below ground surface.
5. Wells MW-1S and MW-2 were modified on April 25, 2008 so that the cover for each well is flush with new asphalt pavement installed in Fall 2007. Casings were extended and new curb boxes were installed. Wells were resurveyed on May 12, 2008.

TABLE 3
WATER LEVEL DATA

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE

Refer to Page 2 for Groundwater Elevations

Location	Reference Point Elevation	Depth to Groundwater (feet bmp)																					
		8/30/1995	11/14/1995	7/8/1997	9/8/1997	2/28/2002	3/1/2002	3/21/2002	4/16/2002	4/24/2002	5/17/2002	5/24/2002	6/14/2002	6/22/2002	7/11/2002	7/26/2002	8/1/2002	9/5/2002	11/4/2002	11/11/2002	1/17/2003	4/7/2008 4/8/2008	1/31/2013
MW-1S (thru 4/25/08)	390.82	22.91	21.93	22.12	22.58	21.61	21.66	21.78	20.77	21.32	20.55	20.99	20.61	20.95	21.81	22.08	22.09	22.32	NM	21.71	21.47	26.12	- -
MW-1S (after 4/25/08)	390.76	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	22.51
MW-1D	390.49	22.97	22.02	22.4	22.68	NM	NM	NM	NM	20.83	20.18	20.86	20.47	20.54	21.39	21.67	21.66	21.91	NM	22.13	21.06	25.65	22.12
MW-2 (thru 4/25/08)	391.16	23.13	22.16	22.68	22.94	NM	NM	NM	NM	22.03	21.29	21.68	21.99	21.65	22.54	22.79	22.78	23.04	22.89	22.84	22.19	- -	- -
MW-2 (after 4/25/08)	391.35	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	23.09
MW-3S	395.26	27.03	26.07	26.54	26.85	NM	NM	NM	NM	25.96	25.16	25.58	25.95	25.56	NM	26.66	26.68	26.89	27.19	26.73	26.10	30.78	- -
MW-3D	395.68	27.48	26.5	26.95	27.5	NM	NM	NM	NM	26.36	25.60	26.02	26.36	25.97	NM	27.09	27.10	27.37	27.89	27.18	26.52	31.18	- -
MW-4S	388.74	20.44	19.48	18.45	20.21	19.54	19.58	19.71	18.76	19.27	18.51	18.91	18.42	18.89	19.72	19.99	19.99	20.27	20.13	20.05	19.41	24.06	20.51
MW-4D	389.12	- -	- -	18.42	23.85	24.91	24.67	24.24	20.20	18.87	19.42	19.83	19.25	17.93	18.08	18.15	18.10	18.62	17.96	18.24	17.65	20.85	16.89
MW-6	400.71	32.56	31.61	31.97	32.39	NM	NM	NM	NM	24.40	30.69	31.05	30.96	31.08	31.94	32.21	32.20	32.45	32.35	32.29	31.63	36.30	32.69
MW-7S	388.22	19.94	18.98	18.13	19.71	19.05	19.16	19.20	18.24	18.73	17.98	15.75	17.35	18.39	19.26	19.34	19.52	19.78	19.68	19.57	18.90	23.47	19.87
MW-7D	387.98	- -	- -	19.25	20.09	19.37	19.38	19.50	18.49	18.99	17.98	18.36	18.41	17.97	18.80	19.08	19.06	19.31	19.20	19.22	18.56	23.33	19.65
MW-8S	398.06	29.72	28.76	28.86	29.57	28.84	28.88	28.99	28.05	28.54	27.81	28.22	28.58	28.19	29.04	29.29	29.31	29.56	29.45	29.33	28.71	33.22	29.81
MW-8D	398.09	30.13	28.79	29.12	29.66	28.86	28.92	29.02	28.08	28.59	27.80	28.20	28.57	28.19	29.09	29.30	29.31	29.56	29.45	29.37	28.80	33.41	29.95
MW-9D$_1$	397.92	- -	- -	29.95	30.21	NM	NM	NM	NM	28.53	27.77	28.25	28.50	29.24	29.80	29.22	29.25	29.49	29.61	29.61	28.75	33.50	- -
MW-9D$_2$	398.10	- -	- -	25.79	33.79	NM	NM	NM	NM	28.4	28.96	29.08	29.37	28.57	29.00	28.45	29.80	30.05	29.40	29.39	28.42	27.41	- -
MW-10S	394.37	- -	- -	25.72	25.87	25.21	25.24	25.34	21.26	21.80	24.28	24.67	24.98	24.56	22.25	25.68	25.68	25.92	25.81	25.82	25.09	29.70	- -
MW-10D	394.49	- -	- -	24.23	31	29.98	30.06	26.63	24.37	24.94	20.98	21.66	21.91	21.42	25.43	22.64	22.52	22.26	22.71	22.71	22.60	27.20	- -
MW-11D	394.50	- -	- -	25.94	27.89	27.24	27.25	27.34	26.44	26.98	26.26	26.60	26.96	26.81	27.45	27.63	27.65	27.86	27.74	NM	27.21	31.20	- -
MW-12D	399.24	- -	- -	26.7	32.05	NM	NM	NM	NM	NM	NM	NM	NM	NM	30.84	31.16	31.10	31.31	31.21	NM	30.92	34.30	- -
MW-13D	399.05	- -	- -	- -	- -	NM	NM	NM	NM	29.62	28.82	29.26	29.40	28.25	NM	30.35	30.36	30.58	30.49	NM	29.80	34.28	- -
MW-14D	398.27	- -	- -	- -	- -	NM	NM	NM	NM	24.22	23.42	23.89	24.04	NM	NM	24.97	24.81	25.32	25.58	NM	24.25	28.17	- -
MW-15D	398.82	- -	- -	- -	- -	NM	NM	NM	NM	30.55	29.81	30.20	30.52	30.19	31.02	31.28	31.38	31.61	31.41	NM	31.15	35.03	- -
MW-16D	398.80	- -	- -	- -	- -	NM	NM	NM	NM	30.51	29.78	30.24	30.50	30.15	30.99	31.21	31.45	31.62	31.48	NM	31.17	34.92	- -
MW-17D	387.63	- -	- -	- -	- -	NM	NM	NM	NM	21.30	20.59	21.00	21.15	21.02	21.77	21.98	22.04	22.26	22.14	NM	21.80	23.18	- -
MW-18	376.31	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	7.60	11.01	NM	10.47	12.35	- -
MW-19	390.73	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	21.91
PZ-1	376.99	- -	- -	- -	- -	7.73	7.74	7.83	6.55	7.44	6.54	7.07	4.77	7.09	7.96	8.21	8.22	8.48	8.34	NM	7.65	- -	- -
PZ-2	378.70	- -	- -	- -	- -	9.43	9.42	9.55	8.25	9.05	8.25	8.78	6.80	8.81	9.88	9.90	9.96	10.21	10.09	NM	9.37	- -	- -
PZ-3	393.94	- -	- -	- -	- -	24.73	24.77	24.87	23.87	24.48	23.68	24.08	24.19	24.07	24.94	25.20	25.21	25.47	25.34	NM	24.62	- -	25.55
SG-1	384.55	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
SG-2	391.26	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

TABLE 3
WATER LEVEL DATA

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE

Refer to Page 1 for Depths to Groundwater

Location	Reference Point Elevation	Water Level Elevation (feet NAVD 88)																					
		8/30/1995	11/14/1995	7/8/1997	9/8/1997	2/28/2002	3/1/2002	3/21/2002	4/16/2002	4/24/2002	5/17/2002	5/24/2002	6/14/2002	6/22/2002	7/11/2002	7/26/2002	8/1/2002	9/5/2002	11/4/2002	11/11/2002	1/17/2003	4/7/2008 4/8/2008	1/31/2013
MW-1S (thru 4/25/08)	390.82	367.91	368.89	368.70	368.24	369.21	369.16	369.04	370.05	369.50	370.27	369.83	370.21	369.87	369.01	368.74	368.73	368.50	- -	369.11	369.35	364.70	- -
MW-1S (after 4/25/08)	390.76	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	368.25
MW-1D	390.49	367.52	368.47	368.09	367.81	- -	- -	- -	- -	369.66	370.31	369.63	370.02	369.95	369.10	368.82	368.83	368.58	- -	368.36	369.43	364.84	368.37
MW-2 (thru 4/25/08)	391.16	368.03	369.00	368.48	368.22	- -	- -	- -	- -	369.13	369.87	369.48	369.17	369.51	368.62	368.37	368.38	368.12	368.27	368.32	368.97	- -	- -
MW-2 (after 4/25/08)	391.35	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	368.26
MW-3S	395.26	368.23	369.19	368.72	368.41	- -	- -	- -	- -	369.30	370.10	369.68	369.31	369.70	- -	368.60	368.58	368.37	368.07	368.53	369.16	364.48	- -
MW-3D	395.68	368.20	369.18	368.73	368.18		- -	- -	- -	369.32	370.08	369.66	369.32	369.71	- -	368.59	368.58	368.31	367.79	368.50	369.16	364.50	- -
MW-4S	388.74	368.30	369.26	370.29	368.53	369.20	369.16	369.03	369.98	369.47	370.23	369.83	370.32	369.85	369.02	368.75	368.75	368.47	368.61	368.69	369.33	364.68	368.23
MW-4D	389.12	- -	- -	370.70	365.27	364.21	364.45	364.88	368.92	370.25	369.70	369.29	369.87	371.19	371.04	370.97	371.02	370.50	371.16	370.88	371.47	368.27	372.23
MW-6	400.71	368.15	369.10	368.74	368.32	- -	- -	- -	- -	376.31	370.02	369.66	369.75	369.63	368.77	368.50	368.51	368.26	368.36	368.42	369.08	364.41	368.02
MW-7S	388.22	368.28	369.24	370.09	368.51	369.17	369.06	369.02	369.98	369.49	370.24	372.47	370.87	369.83	368.96	368.88	368.70	368.44	368.54	368.65	369.32	364.75	368.35
MW-7D	387.98	- -	- -	368.73	367.89	368.61	368.60	368.48	369.49	368.99	370.00	369.62	369.57	370.01	369.18	368.90	368.92	368.67	368.78	368.76	369.42	364.65	368.33
MW-8S	398.06	368.34	369.30	369.20	368.49	369.22	369.18	369.07	370.01	369.52	370.25	369.84	369.48	369.87	369.02	368.77	368.75	368.50	368.61	368.73	369.35	364.84	368.25
MW-8D	398.09	367.96	369.30	368.97	368.43	369.23	369.17	369.07	370.01	369.50	370.29	369.89	369.52	369.90	369.00	368.79	368.78	368.53	368.64	368.72	369.29	364.68	368.14
$MW\text{-}9D_1$	397.92	- -	- -	367.97	367.71	- -	- -	- -	- -	369.39	370.15	369.67	369.42	368.68	368.12	368.70	368.67	368.43	368.31	368.31	369.17	364.42	- -
$MW\text{-}9D_2$	398.10	- -	- -	372.31	364.31	- -	- -	- -	- -	369.70	369.14	369.02	368.73	369.53	369.10	369.65	368.30	368.05	368.70	368.71	369.68	370.69	- -
MW-10S	394.37	- -	- -	368.65	368.50	369.16	369.13	369.03	373.11	372.57	370.09	369.70	369.39	369.81	372.12	368.69	368.69	368.45	368.56	368.55	369.28	364.67	- -
MW-10D	394.49	- -	- -	370.26	363.49	364.51	364.43	367.86	370.12	369.55	373.51	372.83	372.58	373.07	369.06	371.85	371.97	372.23	371.78	371.78	371.89	367.29	- -
MW-11D	394.50	- -	- -	368.56	366.61	367.26	367.25	367.16	368.06	367.52	368.24	367.90	367.54	367.69	367.05	366.87	366.85	366.64	366.76	- -	367.29	363.30	- -
MW-12D	399.24	- -	- -	372.54	367.19	- -	- -	- -	- -	- -	- -	- -	- -	- -	368.40	368.08	368.14	367.93	368.03	- -	368.32	364.94	- -
MW-13D	399.05	- -	- -	- -	- -	- -	- -	- -	- -	369.43	370.23	369.79	369.65	370.80	- -	368.70	368.69	368.47	368.56	- -	369.25	364.77	- -
MW-14D	398.27	- -	- -	- -	- -	- -	- -	- -	- -	374.05	374.85	374.38	374.23	- -	- -	373.30	373.46	372.95	372.69	- -	374.02	370.10	- -
MW-15D	398.82	- -	- -	- -	- -	- -	- -	- -	- -	368.27	369.01	368.62	368.30	368.63	367.80	367.54	367.44	367.21	367.41	- -	367.67	363.79	- -
MW-16D	398.80	- -	- -	- -	- -	- -	- -	- -	- -	368.29	369.02	368.56	368.30	368.65	367.81	367.59	367.35	367.18	367.32	- -	367.63	363.88	- -
MW-17D	387.63	- -	- -	- -	- -	- -	- -	- -	- -	366.33	367.04	366.63	366.48	366.61	365.86	365.65	365.59	365.37	365.49	- -	365.83	364.45	- -
MW-18	376.31	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	368.71	365.3	- -	365.84	363.96	- -
MW-19	390.73	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	368.82
PZ-1	376.99	- -	- -	- -	- -	369.26	369.25	369.16	370.44	369.55	370.45	369.92	372.22	369.90	369.03	368.78	368.77	368.51	368.65	- -	369.34	- -	- -
PZ-2	378.70	- -	- -	- -	- -	369.27	369.28	369.15	370.45	369.65	370.45	369.92	371.90	369.89	368.82	368.80	368.74	368.49	368.61	- -	369.33	- -	- -
PZ-3	393.94	- -	- -	- -	- -	369.21	369.17	369.07	370.07	369.46	370.26	369.86	369.75	369.87	369.00	368.74	368.73	368.47	368.6	- -	369.32	- -	368.39
SG-1	384.55	- -	- -	- -	- -	NM	- -	370.63	- -	372.42	372.08	370.69	374.76	370.31	NM	NM	396.17	NM	- -	NM	NM	- -	- -
SG-2	391.26	- -	- -	- -	- -	NM	- -	396.85	371.71	370.08	371.13	370.05	373.79	369.52	NM	NM	368.47	NM	- -	NM	NM	- -	- -

TABLE 3
WATER LEVEL DATA

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE

Notes:
1. MW = Monitoring Well; S = Shallow Well; D = Deep Well; PZ = Piezometer.
2. All elevations are referenced to the North American Vertical Datum (NAVD) of 1988, based on United States Geologic Survey (USGS) Mon. #S-34
3. Depth to water measurements are in feet below measuring point (bmp) (top of casing).
4. NM = Not measured.
5. - - = Data is not available.
6. Wells MW-1S and MW-2 were modified on April 25, 2008 so that the cover for each well is flush with new asphalt pavement installed in Fall 2007. Casings were extended and new curb boxes were installed. Wells were re-surveyed on May 12, 2008.

TABLE 4
GROUNDWATER QUALITY PARAMETERS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE

Sampling Location	Date	Temp. (°C)	pH (S.U.)	Cond. (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	Specific Gravity
MW-1S	8/30/1995	15.5	6.7	3.00	- -	- -	- -	- -
	11/20/1995	15.2	6.8	2.75	- -	- -	- -	- -
	7/10/1997	13.6	6.6	2.60	- -	- -	- -	- -
	9/9/1997	13.1	6.6	1.60	- -	- -	- -	- -
	11/8/2002	17.7	6.9	0.82	0.90	120	-52	- -
	1/29/2003	15.0	6.9	2.87	2.56	630	65	- -
	4/9/2008	11.5	7.3	6.75	3.26	0.00	58	1.00
	1/29/2013	14.0	7.0	6.23	1.19	2.76	66	1.00
MW-1D	8/30/1995	15.9	6.8	1.50	- -	- -	- -	- -
	11/20/1995	15.6	7.1	1.75	- -	- -	- -	- -
	7/10/1997	14.0	6.8	0.25	- -	- -	- -	- -
	9/9/1997	13.9	6.8	1.00	- -	- -	- -	- -
	11/8/2002	- -	7.2	11.30	0.51	>999	-339	- -
	1/29/2003	15.1	7.1	13.30	1.97	>999	-303	- -
MW-2	8/30/1995	15.0	7.4	0.75	- -	- -	- -	- -
	11/20/1995	12.7	7.0	0.76	- -	- -	- -	- -
	7/9/1997	13.9	7.3	0.80	- -	- -	- -	- -
	9/10/1997	13.0	7.1	2.30	- -	- -	- -	- -
	11/6/2002	17.8	7.4	2.40	0.87	15.0	-71	- -
	1/28/2003	16.3	7.4	3.15	2.5	737	-36	- -
	4/14/2008	11.7	7.2	2.39	7.35	1.29	96	1.00
	1/29/2013	15.0	7.8	0.81	1.17	3.31	-15	1.00
MW-3S	8/30/1995	14.3	6.8	0.70	- -	- -	- -	- -
	11/20/1995	11.8	7.4	0.88	- -	- -	- -	- -
	7/9/1997	14.3	7.5	1.50	- -	- -	- -	- -
	9/9/1997	13.0	6.8	1.60	- -	- -	- -	- -
	11/12/2002	18.4	7.3	2.88	0.96	42.4	13	- -
	1/17/2003	15.4	7.5	3.31	2.29	860	-52	- -
	4/9/2008	14.7	7.4	2.91	0.00	3.0	164	1.00
MW-3D	8/30/1995	13.6	7.2	1.40	- -	- -	- -	- -
	11/20/1995	11.8	7.4	1.25	- -	- -	- -	- -
	7/10/1997	14.1	7.3	2.00	- -	- -	- -	- -
	9/9/1997	13.2	7.8	3.3	- -	- -	- -	- -
	11/12/2002	16.7	7.1	3.62	0.59	177	-124	- -
	1/17/2003	14.8	7.3	4.39	2.82	>999	-90	- -
MW-4S	8/31/1995	16.1	6.9	1.50	- -	- -	- -	- -
	11/15/1995	13.1	7.7	1.25	- -	- -	- -	- -
	7/9/1997	15.9	7.2	2.00	- -	- -	- -	- -
	9/10/1997	13.4	7.2	3.50	- -	- -	- -	- -
	11/5/2002	15.7	7.2	3.95	0.51	0	-369	- -
	1/23/2003	14.4	7.2	7.37	1.59	907	-338	- -
	4/10/2008	13.0	6.7	7.12	0.00	1.52	-333	1.00
	1/29/2013	14.6	7.2	7.37	0.18	4.17	-334	1.00

TABLE 4
GROUNDWATER QUALITY PARAMETERS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE

Sampling Location	Date	Temp. (°C)	pH (S.U.)	Cond. (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	Specific Gravity
MW-4D	7/9/1997	13.9	7.2	2.00	- -	- -	- -	- -
	9/9/1997	12.8	7.3	4.00	- -	- -	- -	- -
	11/5/2002	14.1	6.7	>99.99	0.72	48.6	-177	- -
	1/23/2003	- -	- -	- -	- -	- -	- -	- -
MW-6	8/30/1995	15.1	6.6	0.70	- -	- -	- -	- -
	11/15/1995	10.1	7.4	0.79	- -	- -	- -	- -
	7/10/1997	17.1	6.6	1.30	- -	- -	- -	- -
	9/10/1997	- -	- -	- -	- -	- -	- -	- -
	11/12/2002	18.4	7.4	2.48	0.85	41.1	-137	- -
	1/23/2003	15.9	7.6	3.06	2.71	659	-102	- -
	4/9/2008	15.8	7.2	2.36	0.32	0.20	156	1.00
	1/29/2013	14.8	7.9	0.91	2.07	3.34	24	1.00
MW-7S	8/31/1995	15.9	6.7	2.10	- -	- -	- -	- -
	11/15/1995	9.9	6.8	1.22	- -	- -	- -	- -
	7/9/1997	14.4	7.3	5.00	- -	- -	- -	- -
	9/9/1997	13.0	7.5	7.00	- -	- -	- -	- -
	11/5/2002	17.9	7.1	2.70	0.54	89.7	-218	- -
	1/27/2003	14.3	7.0	18.80	2.46	>999	-138	- -
	4/10/2008	14.4	6.8	4.98	0.00	0.80	-307	1.00
	1/29/2013	14.3	7.0	10.67	0.2	4.01	-171	1.00
MW-7D	7/9/1997	13.7	7.4	4.90	- -	- -	- -	- -
	9/9/1997	13.0	7.4	5.00	- -	- -	- -	- -
	11/5/2002	14.7	6.6	61.00	0.56	55.2	-107	- -
	1/27/2003	12.3	6.9	74.10	1.33	449	-37	- -
MW-8S	8/30/1995	15.7	7.7	6.00	- -	- -	- -	- -
	11/15/1995	12.1	7.6	3.60	- -	- -	- -	- -
	7/8/1997	17.2	7.4	5.00	- -	- -	- -	- -
	9/9/1997	13.1	7.5	10.00	- -	- -	- -	- -
	11/5/2002	16.2	7.8	2.94	0.50	20.2	-261	- -
	1/28/2003	12.9	7.6	3.86	2.54	742	-219	- -
	4/9/2008	13.3	7.7	3.50	0.00	1.07	-99	1.00
	1/29/2013	13.7	7.9	2.18	0.28	3.92	-115	1.00
MW-8D	8/30/1995	15.5	7.3	3.00	- -	- -	- -	- -
	11/15/1995	11.9	7.4	1.25	- -	- -	- -	- -
	7/8/1997	18.0	7.1	1.90	- -	- -	- -	- -
	9/9/1997	13.0	7.3	2.30	- -	- -	- -	- -
	11/6/2002	15.8	7.2	4.97	0.67	76.1	-157	- -
	1/28/2003	13.9	7.1	6.90	2.42	830	-88	- -
MW-9D$_1$	7/9/1997	15.2	7.9	7.00	- -	- -	- -	- -
	9/8/1997	13.0	7.7	10.00	- -	- -	- -	- -
	11/6/2002	14.9	7.0	33.20	0.6	7.4	-345	- -
	1/21/2003	12.4	7.2	64.70	1.69	830	-247	- -
	4/10/2008	12.5	6.5	41.30	0.00	5.96	-317	1.00
	1/31/2013	11.0	7.1	16	0.39	4.55	-305	1.00

TABLE 4
GROUNDWATER QUALITY PARAMETERS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE

Sampling Location	Date	Temp. (°C)	pH (S.U.)	Cond. (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	Specific Gravity
$MW-9D_2$	7/10/1997	13.7	6.2	5.00	- -	- -	- -	- -
	9/8/1997	12.9	6.9	6.00	- -	- -	- -	- -
	11/6/2002	13.7	6.8	>99.99	0.95	0.1	-96	- -
	1/21/2003	12.3	7.0	>99.99	1.06	384	-40	- -
MW-10S	7/9/1997	14.7	6.9	2.40	- -	- -	- -	- -
	9/8/1997	13.0	6.6	8.50	- -	- -	- -	- -
	11/7/2002	16.3	7.4	3.30	0.59	37.7	-143	- -
	1/22/2003	14.6	7.5	3.97	1.71	909	-83	- -
	4/10/2008	15.1	7.1	3.66	2.53	8.53	51	1.00
	1/28/2013	13.8	7.5	1.23	0.76	- -	82	1.00
MW-10D	7/9/1997	14.3	6.1	6.50	- -	- -	- -	- -
	9/8/1997	13.2	6.9	9.00	- -	- -	- -	- -
	11/7/2002	13.5	6.6	99.99	0.66	51.1	-134	- -
	1/22/2003	12.1	6.9	>99.99	0.6	>999	-60	- -
	4/10/2008	13.5	6.5	>99.99	0.00	15.4	-73	1.10
	1/28/2013	7.5	10.5	18.44	0.57	13.4	-3.4	1.00
MW-11D	7/8/1997	14.3	15.8	7.50	- -	- -	- -	- -
	9/10/1997	12.8	7.4	9.00	- -	- -	- -	- -
	11/7/2002	14.0	6.8	99.99	0.66	220	-350	- -
	1/16/2003	13.6	6.9	>99.99	0.9	290	-320	- -
	4/9/2008	13.9	6.8	99.99	0.00	11.2	-298	1.07
	1/31/2013	11.1	6.6	59.85	0.18	2.0	-214	1.03
MW-12D	7/8/1997	17.0	6.4	3.00	- -	- -	- -	- -
	9/8/1997	14.0	6.9	10.00	- -	- -	- -	- -
	11/7/2002	15.2	6.9	78.90	0.64	9.8	-125	- -
	1/16/2003	12.4	6.9	>99.99	1.18	268	-48	- -
	4/10/2008	13.0	6.2	>99.99	0.00	4.27	-72	1.07
	1/30/2013	12.6	7.0	63.82	1.47	109	13	1.03
MW-13D	11/7/2002	16.3	7.7	2.74	0.73	137	-290	- -
	1/22/2003	15.2	7.4	3.53	2.11	808	17	- -
	4/10/2008	10.0	7.6	3.37	2.78	2.32	126	0.99
MW-14D	11/8/2002	13.2	6.8	3.68	0.83	255	-124	- -
	1/16/2003	12.1	7.1	4.44	2.53	>999	-113	- -
	4/11/2008	12.0	6.3	3.89	0.00	44.1	-36	1.00
	1/30/2013	12.5	5.7	3.43	0.39	48.6	-397	1.00
MW-15D	11/12/2002	13.7	6.7	85.90	0.64	529	-156	- -
	1/21/2003	13.3	7	92.20	1.42	>999	-243	- -
	4/10/2008	13.4	7	>99.99	0.00	10.8	-304	1.05
	1/30/2013	13.4	7.3	57.91	0.2	32.2	-285	1.04
MW-16D	11/13/2002	15.9	6.8	69.10	0.64	0	-57	- -
	1/22/2003	14.6	7	56.40	1.4	649	-90	- -
	4/14/2008	13.4	6.5	>99.99	1.31	27.6	-85	1.04
	1/30/2013	14.7	7.1	33.96	0.23	49.6	-308	1.02

TABLE 4
GROUNDWATER QUALITY PARAMETERS

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE

Sampling Location	Date	Temp. (°C)	pH (S.U.)	Cond. (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	Specific Gravity
MW-17D	11/13/2002	- -	6.7	>99.99	0.68	200	-61	- -
	1/21/2003	13.3	7	>99.99	0.9	>999	-86	- -
	4/11/2008	11.8	6.9	>99.99	0.00	35.6	-47	1.08
	1/30/2013	12.3	6.3	81.54	0.31	75.9	69	1.03
MW-18D	11/13/2002	9.9	6.8	>99.99	1.14	0	-69	- -
	1/23/2002	13.8	6.9	>99.99	1.41	926	-36	- -
	4/11/2008	12	6.9	>99.99	0.00	16.1	-51	1.07
	1/30/2013	13.5	8.1	97.70	0.26	323	-58	1.03

Notes:
1. Field parameters recorded immediately before groundwater samples were collected.
2. Temperature reported in degrees Celsius (°C).
3. pH reported in Standard Units (S.U.).
4. Specific Conductivity reported in milliSiemens per centimeter (mS/cm).
5. Dissolved Oxygen (DO) reported in milligrams per liter (mg/L).
6. Turbidity reported in Nephelometric Turbidity Units (NTU).
7. Oxidation/Reduction Potential (ORP) reported in millivolts (mV).
8. Specific gravity is at groundwater temperature.

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-1S								MW-1D					
Date Collected:	Guidance Values	08/30/95	11/20/95	07/10/97	09/09/97	11/08/02	01/29/03	04/09/08	01/29/13	08/30/95	11/20/95	07/10/97	09/09/97	11/08/02	01/23/03
Detected VOCs															
1,1,1-Trichloroethane	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
1,1,2,2-Tetrachloroethane	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	0.40 J	<5.0
1,1-Dichloroethane	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
1,2-Dichloroethane	0.6	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	1.0 J	<10	<5.0	<5.0
1,2-Dichloroethene (total)	- -	<10	<10	<10	<10	NA	NA	NA	NA	<10	<10	2.0 J	<10	NA	NA
2-Butanone	- -	<10	<10	<10	<10	<10	<10	NA	NA	<10	<10	<10	<10	<10	<10
2-Hexanone	50	<10	<10	<10	<10	<10	<10	NA	NA	<10	<10	<10	<10	<10	<10
4-Methyl-2-pentanone	- -	<10	<10	<10	<10	<10	<10 J	NA	NA	<10	<10	<10	<10	<10	<10 J
Acetone	50	<10	<10	12 B	<10	<5.0 J	<10	NA	NA	140	<10	140	<10	<10 J	<10
Benzene	1	<10	<10	<10	<10	<5.0	<5.0	<1.0	<0.50	2.0 J	<10	<10	<10	1.0 J	<5.0
Bromodichloromethane	50	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
Bromoform	50	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
Carbon Disulfide	- -	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
Chloroform	7	<10	<10	2.0 J	8.0 J	<5.0	<5.0	NA	NA	<10	<10	21 B	<10	<5.0	<5.0
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	<5.0	<5.0	NA	NA	NA	NA	NA	NA	<5.0	<5.0
Dibromochloromethane	50	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
Ethylbenzene	5	<10	<10	<10	<10	<5.0	<5.0	<5.0	<1.0	<10	<10	<10	<10	12	11
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	5.0 J	<10	5.0 J	<10	<5.0	<5.0
Styrene	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
Tetrachloroethene	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
Toluene	5	<10	<10	<10	<10	<5.0	<5.0	<5.0	<1.0	<10	<10	<10	<10	0.50 J	<5.0
Trichloroethene	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0
Xylenes (total)	5	<10	<10	<10	<10	<5.0	<5.0	<5.0	<1.0	<10	<10	<10	<10	5.0 J	4.0 J
Total BTEX	- -	<10	<10	<10	<10	<5.0	<5.0	<5.0	<1.0	2.0 J	<10	<10	<10	19 J	15 J
Total VOCs	- -	<10	<10	14 J	8.0 J	<10	<10	<5.0	<1.0	150 J	<10	170 J	<10	19 J	15 J
Detected SVOCs															
2,4-Dimethylphenol	50	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
2-Methylnaphthalene	- -	<10	<10	<10	<10	<10	<15	<10	<2.0	<10	<10	<10	<10	<11	<10
2-Methylphenol	- -	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
4-Chloro-3-Methylphenol	- -	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
4-Chloroaniline	5	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
4-Methylphenol	- -	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
Acenaphthene	20	1.0 J	<10	<10	<10	<10	<15	<10	<2.0	6.0 J	1.0 J	<10	0.50 J	24	14
Acenaphthylene	- -	0.90 J	0.70 J	0.20 J	<10	<10	<15	<10	<2.0	1.0 J	<10	0.090 J	<10	66	30
Anthracene	50	<10	0.20 J	<10	<10	<10	<15	<10	<2.0	1.0 J	<10	<10	<10	1.0 J	0.80 J
Benzo(a)anthracene	0.002	<10	<10	<10	<10	<10	<15	<10	<2.0	<10	<10	<10	<10	<11	<10
Benzo(a)pyrene	0	<10	0.50 J	<10	<10	<10	<15	<10	<2.0 J	<10	<10	<10	<10	<11	<10
Benzo(b)fluoranthene	0.002	<10	0.20 J	<10	<10	<10	<15	<10	<2.0	<10	<10	<10	<10	<11	<10
Benzo(g,h,i)perylene	- -	<10	0.30 J	<10	<10	<10	<15	<10	<2.0	<10	<10	<10	<10	<11	<10
Benzo(k)fluoranthene	0.002	<10	0.20 J	<10	<10	<10	<15	<10	<2.0	<10	<10	<10	<10	<11	<10
bis(2-Ethylhexyl)phthalate	5	<10	<10	0.90 JB	0.90 JB	<10	<15	NA	NA	<10	<10	0.40 JB	2.0 JB	<11 J	<10
Butylbenzylphthalate	50	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
Carbazole	- -	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	2.0 J	1.0 J
Chrysene	0.002	<10	<10	<10	<10	<10	<15	<10	<2.0	<10	<10	<10	<10	<11	<10
Dibenzo(a,h)anthracene	- -	<10	<10	<10	<10	<10	<15	<10	<2.0 J	<10	<10	<10	<10	<11	<10
Dibenzofuran	- -	<10	<10	<10	<10	<10	<15	NA	NA	0.40 J	<10	<10	<10	3.0 J	2.0 J
Diethylphthalate	50	<10	<10	0.40 JB	0.40 JB	<10	<15	NA	NA	<10	<10	0.50 JB	0.50 JB	<11	<10
Dimethylphthalate	50	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
Di-n-Butylphthalate	50	0.70 J	<10	<10	0.20 JB	<10	<15	NA	NA	<10	<10	0.20 JB	0.30 JB	<11	<10
Di-n-Octylphthalate	50	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	0.20 J	<10	<11	<10
Fluoranthene	50	<10	<10	<10	<10	<10	<15	<10	<2.0	0.70 J	<10	<10	<10	<11	<10
Fluorene	50	<10	<10	<10	<10	<10	<15	<10	<2.0	4.0 J	<10	4.0 J	<10	<11	1.0 J
Indeno(1,2,3-cd)pyrene	0.002	<10	<10	<10	<10	<10	<15	<10	<2.0 J	<10	<10	<10	<10	<11	<10
Naphthalene	10	<10	<10	<10	<10	<10	<15	<10	<2.0	1.0 J	<10	<10	<10	2.0 J	1.0 J
N-Nitrosodiphenylamine	50	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
Phenanthrene	50	<10	<10	<10	<10	<10	<15	<10	<2.0	4.0 J	<10	<10	<10	12	7.0 J
Phenol	1	<10	<10	<10	<10	<10	<15	NA	NA	<10	<10	<10	<10	<11	<10
Pyrene	50	<10	0.20 J	<10	<10	<10	<15	<10	<2.0	1.0 J	0.30 J	0.10 J	<10	<11	<10
Total PAHs	- -	1.9 J	2.3 J	0.20 J	<10	<10	<15	<10	<2.0	19 J	1.3 J	4.2 J	0.50 J	110 J	54 J
Total SVOCs	- -	2.6 J	2.3 J	1.5 J	1.5 J	<50	<75	<10	<2.0	19 J	1.3 J	5.5 J	3.3 J	110 J	57 J

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-1S								MW-1D					
Date Collected:	Guidance Values	08/30/95	11/20/95	07/10/97	09/09/97	11/08/02	01/29/03	04/09/08	01/29/13	08/30/95	11/20/95	07/10/97	09/09/97	11/08/02	01/23/03
Detected Inorganics															
Aluminum	- -	141,000	1,590	39,500	52,200 *	<2,500 J	<2,500	NA	NA	1,260	<33.7	2,390	1,270 B*	1,810 JB	3,790 B
Antimony	3	<3.00	<27.0	<8.00	<80.0	<100	<100	NA	NA	<3.00	<27.0	<8.00	<80.0	<100	<500
Arsenic	25	88.3	<2.00	27.6	53.2 B	<200	<200	NA	NA	<3.00	<2.00	<3.00	<30.0	<200	<1,000
Available Cyanide	- -	NA	NA	NA	NA	NA	2.00	<2.00	16 J	NA	NA	NA	NA	NA	<2.00
Barium	1,000	1,160	88.4 B	235 N	411 B	78.8	70.6	NA	NA	62.1 B	54.6 B	61.2 BN	80.4 B	58.7	106 B
Beryllium	- -	7.30	1.30 B	1.20 B	<10.0	<25.0	<25.0	NA	NA	<1.00	<1.00	<1.00	<10.0	<25.0	<125
Cadmium	5	<1.00	<2.00	<1.00 N	<10.0 N	<50.0	<50.0	NA	NA	<1.00	<2.00	2.20 BN	18.1 BN	<50.0	<250
Calcium	- -	1,070,000	415,000	276,000 E	561,000 E	150,000	235,000	NA	NA	155,000	112,000	69,900 E	197,000 E	755,000	775,000
Chloride	250,000	NA	NA	NA	NA	320,000	450,000	NA	NA	NA	NA	NA	NA	4,400,000	4,300,000
Chromium	50	211	4.60 B	83.2	93.2 B	13.1 B	<50.0	NA	NA	2.80 B	<3.00	9.20 B	14.0 B	<50.0	<250
Cobalt	- -	141	7.80 B	44.3 BN	65.5 B	<50.0	<50.0	NA	NA	1.70 B	<4.00	<9.00 N	<10.0	<50.0	<250
Copper	200	1,640	183	403	904	14.6 B	29.8 B	NA	NA	13.0 B	<8.10	6.10 B	33.4 B	<50.0	94.0 B
Cyanide	200	96.2	151	0.158	0.0610	111	271	15.0	41	11.3	11.0	<0.0100	<0.0100	<10.0	3.40 B
Iron	300	228,000	2,970	72,600 NE	111,000	952 B	859 B	NA	NA	2,080	324	4,480 NE	2,680	3,390	9,560
Lead	25	306	52.3	126 N	212	<50.0 J	<50.0	NA	NA	2.10 B	<2.00	20.1 N	18.9 B	<50.0 J	<250
Magnesium	- -	518,000	136,000	106,000 E	232,000 E	32,500	58,400	NA	NA	35,000	28,100	14,900 E	41,300 BE	102,000	112,000
Manganese	300	16,700	2,280	3,670 E	6,500	48.9 B	20.6 B	NA	NA	625	786	278 NE	513	884	1,210
Mercury	0.7	1.20 B	0.290 B	0.800	0.670 N	<0.200	<0.200	NA	NA	<0.200	<0.200	<0.200	<0.200 N	<0.200	<0.200
Nickel	100	307	<11.0	89.6 N	130 B	<50.0	<50.0	NA	NA	<4.40	<11.0	6.80 BN	43.8 B	<50.0	<250
Nitrate Nitrogen	10,000	NA	NA	NA	NA	1,000	110	NA	NA	NA	NA	NA	NA	<2,500	<100
Potassium	- -	80,500	17,900	32,300	35,400 BE	15,100	24,800	NA	NA	11,700	7,240	1,710 B	8,690 BE	29,800	21,100
Selenium	10	<2.00	3.80 B	8.30	<30.0 N	<150 J	<150	NA	NA	<2.00	<2.00	<3.00	<30.0 N	<150 J	<750
Silver	50	2.00 B	<3.00	<1.00	<10.0	<30.0	<30.0	NA	NA	<1.00	<3.00	<1.00	<10.0	<30.0	<150
Sodium	- -	220,000	452,000	24,400	361,000 E	218,000	235,000	NA	NA	201,000	335,000	24,400	411,000 E	2,180,000	2,310,000
Sulfate	250,000	NA	NA	NA	NA	180,000	420,000	NA	NA	NA	NA	NA	NA	1,800,000	1,700,000
Sulfide	50	NA	NA	NA	NA	<1,000	<1,000	NA	NA	NA	NA	NA	NA	7,400	7,000
Thallium	- -	<4.00	<2.00	<3.00 N	<30.0	<200 J	<200	NA	NA	<4.00	<2.00	<3.00 N	<30.0	<200 J	<1,000
Vanadium	- -	209	<4.00	6.70 BN	88.8 B	<30.0	<30.0	NA	NA	1.10 B	<4.00	6.70 BN	<10.0	<30.0	<150
Zinc	2,000	948	90.6	148	427	<250	<250	NA	NA	<22.0	<27.6	148	75.6 B	<250	<1,250
Detected Inorganics-Filtered															
Iron	300	NA	NA	NA	NA	<200	<1,000	NA	NA	NA	NA	NA	NA	105 B	<1,000
Manganese	300	NA	NA	NA	NA	6.70 B	7.60 B	NA	NA	NA	NA	NA	NA	476	7.60 B
Detected PCBs															
None Detected	- -	- -	- -	- -	- -	NA	NA	NA	NA	- -	- -	- -	- -	NA	NA
Detected Organochlorine Pesticides															
4,4'-DDD	0.3	<0.10	<0.10	<0.10	<0.10	<0.17	<0.27	NA	NA	<0.10	<0.10	<0.10	<0.10	<0.16	<0.16
4,4'-DDE	0.2	<0.10	<0.10	<0.10	<0.10	<0.11	0.070 J	NA	NA	<0.10	<0.10	<0.10	<0.10	<0.11	<0.11
4,4'-DDT	0.2	<0.10	<0.10	<0.10	<0.10	<0.11	0.041 J	NA	NA	<0.10	<0.10	<0.10	<0.10	<0.11	<0.11
Aldrin	0	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Alpha-BHC	0.01	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Alpha-Chlordane	0.05	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Beta-BHC	- -	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Delta-BHC	- -	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	0.0084 J	0.012 J
Dieldrin	0.004	<0.10	<0.10	<0.10	<0.10	<0.11	<0.18	NA	NA	<0.10	<0.10	<0.10	<0.10	<0.11	<0.11
Endosulfan I	- -	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Endosulfan II	- -	<0.10	<0.10	<0.10	<0.10	<0.11	<0.18	NA	NA	<0.10	<0.10	<0.10	<0.10	<0.11	<0.11
Endosulfan Sulfate	- -	<0.10	<0.10	<0.10	<0.10	<0.11	<0.18	NA	NA	<0.10	<0.10	<0.10	<0.10	<0.11	<0.11
Endrin	0	<0.10	<0.10	<0.10	<0.10	<0.11	<0.18	NA	NA	<0.10	<0.10	<0.10	<0.10	<0.11	<0.11
Gamma-BHC (Lindane)	0.05	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Gamma-Chlordane	0.05	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Heptachlor	0.04	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	0.058
Heptachlor Epoxide	0.03	<0.050	<0.050	<0.050	<0.050	<0.056	<0.089	NA	NA	<0.050	<0.050	<0.050	<0.050	<0.054	<0.054
Methoxychlor	35	<0.52	<0.50	<0.50	<0.50	<0.56	<0.89	NA	NA	<0.52	<0.50	<0.50	<0.50	<0.54	<0.54
Detected Miscellaneous															
BOD (5 Day)	- -	7,000	6,810	4,000	NA	1,300 B	<2,000	NA	NA	4,000	6,810	3,000	3,000	8,600	7,700
CO2 by Headspace	- -	NA	NA	NA	NA	42,000	53,000	NA	NA	NA	NA	NA	NA	33,000	29,000
Carbon monoxide	- -	NA	NA	NA	NA	<400	<400	NA	NA	NA	NA	NA	NA	<400	<400
COD	- -	<72,900	<34,700	27,100	NA	13,400	35,700	NA	NA	<203,000	<21,300	<10,000	<10,000	69,500	53,800
Chloride	250,000	1,720,000	870,000	878,000	NA	NA	NA	NA	NA	897,000	758,000	88,200	88,200	NA	NA
DOC	- -	NA	NA	NA	NA	690 B	1,600	NA	NA	NA	NA	NA	NA	710 B	370 B
Hardness, Ca/CO3	- -	2,920,000	2,040,000	1,050,000	NA	NA	NA	NA	NA	601,000	443,000	234,000	234,000	NA	NA
Methane	- -	NA	NA	NA	NA	1	19,000	NA	NA	NA	NA	NA	NA	44	47
Nitrate Nitrogen	10,000	260	790	1,590	NA	NA	NA	NA	NA	<100	<100	540	540	NA	NA
Nitrite Nitrogen	1,000	14	48	NA	NA	NA	NA	NA	NA	<5	8	NA	NA	NA	NA
Oil and Grease	- -	<1,000	<1,000	<1,000	NA	NA	NA	NA	NA	<1,000	<1,000	<1,000	<1,000	NA	NA
pH, Standard Units	- -	6.78	6.85	7.57	NA	NA	NA	NA	NA	7.28	7.39	8.07	8.01	NA	NA
Sulfate	250,000	318,000	510,000	232,000	NA	NA	NA	NA	NA	295,000	251,000	31,300	31,300	NA	NA
Sulfide	50	<1,000	<1,000	<1,000	NA	NA	NA	NA	NA	<1,000	<1,000	<1,000	<1,000	NA	NA
Total Organic Carbon	- -	NA	NA	NA	NA	2,500	4,400	NA	NA	NA	NA	NA	NA	510 B	460 B
Total Dissolved Solids	1,000,000	3,030,000	2,470,000	2,181,000	NA	NA	NA	NA	NA	901,000	1,550,000	266,000	266,000	NA	NA

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-2								MW-3S							MW-3D					
Date Collected:		08/30/95	11/20/95	07/09/97	09/10/97	11/06/02	01/28/03	04/14/08	01/29/13	08/30/95	11/20/95	07/09/97	09/09/97	11/12/02	01/17/03	04/09/08	08/30/95	11/20/95	07/10/97	09/09/97	11/12/02	01/17/03
Detected VOCs																						
1,1,1-Trichloroethane	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0 J	<5.0	NA	<10	<10	<10	<10	<5.0 J	<5.0
1,1,2,2-Tetrachloroethane	5	<10	<10	0.80 J	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
1,1-Dichloroethane	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
1,2-Dichloroethane	0.6	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
1,2-Dichloroethene (total)	- -	<10	<10	<10	<10	NA	NA	NA	NA	<10	<10	<10	<10	NA	NA	NA	<10	<10	<10	<10	NA	NA
2-Butanone	- -	<10	<10	<10	<10	<10	<10	NA	NA	<10	<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
2-Hexanone	50	<10	<10	<10	<10	<10	<10	NA	NA	<10	<10	<10	<10	<10 J	<10	NA	<10	<10	<10	<10	<10	<10
4-Methyl-2-pentanone	- -	<10	<10	<10	<10	<10	<10	NA	NA	<10	<10	<10	<10	<10	<10	NA	<10	<10	<10	<10	<10	<10
Acetone	50	<10	<10	<10	<10	<10	<10	NA	NA	<10	<10	<10	<10	<10	<10	NA	24	<10	<10	<10	<10	<10
Benzene	1	<10	<10	<10	<10	<5.0	<5.0	<1.0	0.76	<10	<10	<10	<10	<5.0	<5.0	<1.0	<10	<10	<10	<10	<5.0	<5.0
Bromodichloromethane	50	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
Bromoform	50	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0 J	<5.0	NA	<10	<10	<10	<10	<5.0 J	<5.0
Carbon Disulfide	- -	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
Chloroform	7	<10	<10	2.0 J	8.0 J	<5.0	<5.0	NA	NA	<10	<10	<10	<10	0.50 J	0.30 J	NA	<10	<10	<10	<10	<5.0	<5.0
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	<5.0	<5.0	NA	NA	NA	NA	NA	NA	<5.0	<5.0	NA	NA	NA	NA	NA	<5.0	<5.0
Dibromochloromethane	50	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
Ethylbenzene	5	<10	<10	<10	<10	<5.0	<5.0	<5.0	1.1	<10	<10	<10	<10	<5.0	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	3.0 JB	<10	<5.0	<5.0	NA	<10	<10	<10	1.0 JB	<5.0 J	<5.0
Styrene	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
Tetrachloroethene	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
Toluene	5	<10	<10	<10	<10	<5.0	<5.0	0.19 J	<1.0	<10	<10	0.30 J	<10	<5.0	1.0 J	<5.0	<10	<10	<10	<10	<5.0	0.70 J
Trichloroethene	5	<10	<10	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	<5.0	<5.0	NA	<10	<10	<10	<10	<5.0	<5.0
Xylenes (total)	5	<10	<10	<10	<10	<5.0	<5.0	<5.0	<1.0	<10	<10	<10	<10	<5.0	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0
Total BTEX	- -	<10	<10	<10	<10	<5.0	<5.0	0.19 J	1.9	<10	<10	0.30 J	<10	<5.0	1.0 J	<5.0	<10	<10	<10	<10	<5.0	0.70 J
Total VOCs	- -	<10	<10	2.8 J	8.0 J	<10	<10	0.19 J	1.9	<10	<10	3.3 J	<10	0.50 J	1.3 J	<5.0	24	<10	<10	1.0 J	<10	0.70 J
Detected SVOCs																						
2,4-Dimethylphenol	50	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
2-Methylnaphthalene	- -	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
2-Methylphenol	- -	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	0.30 J	<10	<10	<15
4-Chloro-3-Methylphenol	- -	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
4-Chloroaniline	5	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
4-Methylphenol	- -	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
Acenaphthene	20	<10	<11	<10	NA	<11	<11	<11	0.39 J	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Acenaphthylene	- -	<10	<11	0.10 J	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Anthracene	50	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Benzo(a)anthracene	0.002	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Benzo(a)pyrene	0	<10	<11	<10	NA	<11	<11	<11	<2.2 J	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Benzo(b)fluoranthene	0.002	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Benzo(g,h,i)perylene	- -	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Benzo(k)fluoranthene	0.002	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
bis(2-Ethylhexyl)phthalate	5	<10	<11	0.80 JB	NA	<11	<11	NA	NA	<10	<10	0.50 JB	1.0 JB	<11	<11	NA	<10	<15	0.90 JB	33 B	10	<15
Butylbenzylphthalate	50	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
Carbazole	- -	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
Chrysene	0.002	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Dibenzo(a,h)anthracene	- -	<10	<11	<10	NA	<11	<11	<11	<2.2 J	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Dibenzofuran	- -	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
Diethylphthalate	50	<10	<11	0.30 JB	NA	<11	<11	NA	NA	<10	<10	0.20 JB	0.40 JB	<11	<11	NA	<10	<10	<10	0.30 JB	<10	<15
Dimethylphthalate	50	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	0.90 JB	<10	<10	<15
Di-n-Butylphthalate	50	0.60 J	<11	0.40 JB	NA	<11	<11	NA	NA	0.50 J	<10	0.20 JB	0.20 JB	<11	<11	NA	0.60 J	<10	0.90 JB	0.30 JB	<10	<15
Di-n-Octylphthalate	50	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
Fluoranthene	50	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Fluorene	50	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Indeno(1,2,3-cd)pyrene	0.002	<10	<11	<10	NA	<11	<11	<11	<2.2 J	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Naphthalene	10	<10	<11	<10	NA	<11	3.0 J	<11	2.4	<10	<10	<10	<10	<11	<11	<10	3.0 J	<10	<10	0.50 J	<10	<15
N-Nitrosodiphenylamine	50	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
Phenanthrene	50	<10	<11	<10	NA	<11	<11	<11	0.38 J	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Phenol	1	<10	<11	<10	NA	<11	<11	NA	NA	<10	<10	<10	<10	<11	<11	NA	<10	<10	<10	<10	<10	<15
Pyrene	50	<10	<11	<10	NA	<11	<11	<11	<2.2	<10	<10	<10	<10	<11	<11	<10	<10	<10	<10	<10	<10	<15
Total PAHs	- -	<10	<11	0.10 J	NA	<11	3.0 J	<11	3.2 J	<10	<10	<10	<10	<11	<11	<10	3.0 J	<10	<10	0.50 J	<10	<15
Total SVOCs	- -	0.60 J	<28	1.6 J	NA	<53	3.0 J	<11	3.2 J	0.50 J	<25	0.90 J	1.6 J	<54	<56	<10	3.6 J	<25	3.0 J	34 J	10	<74

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-2								MW-3S							MW-3D					
Date Collected:	Guidance Values	08/30/95	11/20/95	07/09/97	09/10/97	11/06/02	01/28/03	04/14/08	01/29/13	08/30/95	11/20/95	07/09/97	09/09/97	11/12/02	01/17/03	04/09/08	08/30/95	11/20/95	07/10/97	09/09/97	11/12/02	01/17/03
Detected Inorganics																						
Aluminum	- -	17,000	1,050	45,600	NA	<2,500 J	<2,500	NA	NA	4,480	4,150	67,800	53,100 *	<2,500	<2,500	NA	224	<37.4	904	5,830 *	<2,500 J	<2,500
Antimony	3	<3.00	<27.0	<8.00	NA	<100	<100	NA	NA	<3.00	<27.0	<8.00	<80.0	<100	<100	NA	<3.00	<27.0	<8.00	<80.0	<100	<100
Arsenic	25	7.90 B	<2.00	20.1	NA	<200	<200	NA	NA	<3.00	<2.00	41.0	<30.0	<200	<200	NA	<3.00	<2.00	<3.00	<30.0	<200	<200
Available Cyanide	- -	NA	NA	NA	NA	NA	<2.00	NA	NA	NA	NA	NA	NA	NA	<2.00	NA	NA	NA	NA	NA	NA	<2.00
Barium	1,000	118 B	63.3 B	255 N	NA	123	154	NA	NA	64.3 B	150 B	389 N	281 B	98.7	106	NA	58.8 B	45.0 B	56.8 BN	82.0 B	52.8	50.0
Beryllium	- -	1.50 B	<1.00	1.60 B	NA	<25.0	<25.0	NA	NA	1.00 B	<1.00	4.40 B	<10.0	<25.0	<25.0	NA	<1.00	<1.00	<1.00	<10.0	<25.0	<25.0
Cadmium	5	<1.00	<2.00	<1.00 N	NA	<50.0	<50.0	NA	NA	<1.00	<2.00	5.00 N	<10.0 N	<50.0	<50.0	NA	<1.00	<2.00	1.80 BN	11.0 BN	<50.0	<50.0
Calcium	- -	220,000	98,200	275,000 E	NA	122,000	128,000	NA	NA	111,000	517,000	937,000 E	787,000 E	138,000	151,000	NA	126,000	116,000	232,000 E	298,000 E	297,000	287,000
Chloride	250,000	NA	NA	NA	NA	660,000	650,000	NA	NA	NA	NA	NA	NA	710,000	740,000	NA	NA	NA	NA	NA	930,000	960,000
Chromium	50	33.5	11.9	84.2	NA	<50.0	18.3 B	NA	NA	11.2	15.9	173	130	<50.0	<50.0	NA	1.30 B	<3.00	<6.00	15.6 B	<50.0	<50.0
Cobalt	- -	13.6 B	<4.00	42.9 BN	NA	<50.0	<50.0	NA	NA	4.50 B	18.2 B	70.2 N	50.0 B	<50.0	<50.0	NA	<1.00	<4.00	<9.00 N	<10.0	<50.0	<50.0
Copper	200	36.1	<11.0	109	NA	<50.0	21.5 B	NA	NA	10.8 B	<42.3	222	161 B	<50.0	<50.0	NA	3.10 B	<11.5	<1.00	22.5 B	<50.0	<50.0
Cyanide	200	<10.0	<10.0	<0.0100	NA	<10.0	3.80 B	NA	NA	<10.0	<10.0	<0.0100	<0.0100	1.20 B	<10.0	NA	<10.0	<10.0	<0.0100	<0.0100	<10.0	<10.0
Iron	300	24,400	1,940	72,100 E	NA	905 B	999 B	NA	NA	7,340	10,900	119,000 NE	103,000	<1,000	<1,000	NA	400	97.4 B	1,290 NE	9,150	940 B	495 JB
Lead	25	14.6	<4.90	51.2 N	NA	<50.0 J	<50.0	NA	NA	4.80	23.5	76.9 N	55.1	<50.0	<50.0	NA	2.40 B	<11.6	4.60 N	15.6 B	<150 J	<50.0
Magnesium	- -	109,000	30,400	133,000 E	NA	33,800	36,300	NA	NA	44,300	234,000	397,000 E	392,000 E	30,400	33,000	NA	27,500	27,200	37,200 E	76,000 E	50,000	45,700
Manganese	300	955	178	2,170 E	NA	306	667	NA	NA	301	1,380	3,440 NE	2,300	171	139	NA	68.1	38.9	74.0 NE	228	71.0 B	46.4 B
Mercury	0.7	<0.200	<0.200	0.290	NA	<0.200	<0.200	NA	NA	<0.200	0.290 B	0.940	0.300 N	<0.200	<0.200	NA	<0.200	<0.200	<0.200	<0.200 N	<0.200	<0.200
Nickel	100	33.4 B	<11.0	96.5 N	NA	<50.0	10.0 B	NA	NA	12.0 B	18.2 B	155 N	122 B	<50.0	<50.0	NA	2.70 B	<11.0	3.40 BN	16.4 B	<50.0	<50.0
Nitrate Nitrogen	10,000	NA	NA	NA	NA	100	700	NA	NA	NA	NA	NA	NA	540	850	NA	NA	NA	NA	NA	<100	<100
Potassium	- -	13,100	4,710	16,800	NA	10,900	10,100	NA	NA	9,440	9,520	24,900	21,800 BE	9,920	10,800	NA	15,900	13,800	10,500	11,100 BE	11,500	11,400
Selenium	10	<2.00	<2.00	<3.00	NA	<150 J	<150	NA	NA	<2.00	<2.00	<3.00	<30.0 N	<150	<150	NA	<2.00	<2.00	<3.00	<30.0 N	<150	<150
Silver	50	<1.00	<3.00	<1.00	NA	<30.0	<30.0	NA	NA	<1.00	<3.00	<1.00	<10.0	<30.0	<30.0	NA	<1.00	<3.00	<1.00	<10.0	<30.0	<30.0
Sodium	- -	129,000	136,000	27,700	NA	340,000	351,000	NA	NA	110,000	156,000	246,000	261,000 E	377,000	389,000	NA	179,000	296,000	330,000	398,000 E	450,000	443,000
Sulfate	250,000	NA	NA	NA	NA	120,000	130,000	NA	NA	NA	NA	NA	NA	170,000	160,000	NA	NA	NA	NA	NA	530,000	470,000
Sulfide	50	NA	NA	NA	NA	<1,000	<1,000	NA	NA	NA	NA	NA	NA	<1,000	200 B	NA	NA	NA	NA	NA	<1,000	400 B
Thallium	- -	<4.00	<2.00	<3.00 N	NA	<200 J	<200	NA	NA	<4.00	<2.00	<3.00 N	<30.0	<200	<200	NA	<4.00	<2.00	<3.00 N	<30.0	<200 J	<200
Vanadium	- -	27.2 B	<4.00	72.8 N	NA	<30.0	<30.0	NA	NA	6.80 B	15.4 B	109 N	89.6 B	<30.0	<30.0	NA	<1.00	<4.00	<1.00 N	<10.0	<30.0	<30.0
Zinc	2,000	71.6	<37.5	206	NA	<250	<250	NA	NA	24.9	<57.3	354	243	<250	<250	NA	<22.5	<20.2	13.1 B	86.8	<250	<250
Detected Inorganics-Filtered																						
Iron	300	NA	NA	NA	NA	<200	<1,000	NA	NA	NA	NA	NA	NA	<1,000	<1,000	NA	NA	NA	NA	NA	<1,000	<1,000
Manganese	300	NA	NA	NA	NA	87.9	154	NA	NA	NA	NA	NA	NA	118	117	NA	NA	NA	NA	NA	38.8 B	35.1 B
Detected PCBs																						
None Detected	- -	- -	- -	- -	NA	NA	NA	NA	NA	- -	- -	- -	- -	NA	NA	NA	- -	- -	- -	- -	NA	NA
Detected Organochlorine Pesticides																						
4,4'-DDD	0.3	<0.11	<0.10	<0.10	NA	<0.15	<0.17	NA	NA	<0.11	<0.10	<0.10	<0.10	<0.16	<0.17	NA	<0.11	<0.10	<0.10	<0.10	<0.15	<0.24
4,4'-DDE	0.2	<0.11	<0.10	<0.10	NA	<0.10	<0.11	NA	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.11	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.16
4,4'-DDT	0.2	<0.11	<0.10	<0.10	NA	<0.10	<0.11	NA	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.11	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.16
Aldrin	0	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Alpha-BHC	0.01	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Alpha-Chlordane	0.05	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Beta-BHC	- -	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Delta-BHC	- -	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Dieldrin	0.004	<0.11	<0.10	<0.10	NA	<0.10	<0.11	NA	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.11	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.16
Endosulfan I	- -	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Endosulfan II	- -	<0.11	<0.10	<0.10	NA	<0.10	<0.11	NA	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.11	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.16
Endosulfan Sulfate	- -	<0.11	<0.10	<0.10	NA	<0.10	<0.11	NA	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.11	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.16
Endrin	0	<0.11	<0.10	<0.10	NA	<0.10	<0.11	NA	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.11	NA	<0.11	<0.10	<0.10	<0.10	<0.10	<0.16
Gamma-BHC (Lindane)	0.05	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Gamma-Chlordane	0.05	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Heptachlor	0.04	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Heptachlor Epoxide	0.03	<0.050	<0.050	<0.050	NA	<0.050	<0.056	NA	NA	<0.060	<0.050	<0.050	<0.050	<0.052	<0.057	NA	<0.060	<0.050	<0.050	<0.050	<0.050	<0.079
Methoxychlor	35	<0.54	<0.50	<0.50	NA	<0.50	<0.56	NA	NA	<0.56	<0.50	<0.50	<0.50	<0.52	<0.57	NA	<0.56	<0.50	<0.50	<0.50	<0.50	<0.79
Detected Miscellaneous																						
BOD (5 Day)	- -	2,000	5,310	<1,680	NA	330 B	1,500 B	NA	NA	<2,000	4,710	<1,380	NA	840 B	1,400 B	NA	3,000	5,010	1,000	NA	1,400 B	2,000
CO2 by Headspace	- -	NA	NA	NA	NA	13,000	13,000	NA	NA	NA	NA	NA	NA	10,000	12,000	NA	NA	NA	NA	NA	18,000	19,000
Carbon monoxide	- -	NA	NA	NA	NA	<400	<400	NA	NA	NA	NA	NA	NA	<400	<400	NA	NA	NA	NA	NA	<400	<400
COD	- -	<39,200	<16,800	<10,000	NA	7,490 B	8,820 B	NA	NA	<39,200	<21,300	14,000	NA	<10,000	<10,000	NA	<32,500	<23,500	19,100	NA	9,770 B	<10,000
Chloride	250,000	344,000	242,000	46,000	NA	NA	NA	NA	NA	269,000	367,000	452,000	NA	NA	NA	NA	688,000	565,000	661,000	NA	NA	NA
DOC	- -	NA	NA	NA	NA	610 B	390 B	NA	NA	NA	NA	NA	NA	340 B	620 B	NA	NA	NA	NA	NA	440 B	700 B
Hardness, Ca/CO3	- -	869,000	451,000	1,170,000	NA	NA	NA	NA	NA	501,000	2,700,000	3,360,000	NA	NA	NA	NA	490,000	458,000	684,000	NA	NA	NA
Methane	- -	NA	NA	NA	NA	1.5	2,200	NA	NA	NA	NA	NA	NA	8.5	1.1	NA	NA	NA	NA	NA	2.8	0.78
Nitrate Nitrogen	10,000	120	270	270	NA	NA	NA	NA	NA	2,900	330	970	NA	NA	NA	NA	<100	<100	<100	NA	NA	NA
Nitrite Nitrogen	1,000	<5	77	NA	NA	NA	NA	NA	NA	34	94	NA	NA	NA	NA	NA	8	9	NA	NA	NA	NA
Oil and Grease	- -	<1,000	<1,000	1,800 N	NA	NA	NA	NA	NA	<1,000	<1,000	<1,000	NA	NA	NA	NA	<1,000	<1,000	<1,000	NA	NA	NA
pH, Standard Units	- -	7.36	7.45	7.86	NA	NA	NA	NA	NA	7.26	7.38	7.71	NA	NA	NA	NA	7.49	7.61	7.46	NA	NA	NA
Sulfate	250,000	79,800	121,000	60,800	NA	NA	NA	NA	NA	84,800	151,000	109,000	NA	NA	NA	NA	298,000	333,000	419,000	NA	NA	NA
Sulfide	50	<1,000	<1,000	<2,500	NA	NA	NA	NA	NA	<1,000	<1,000	<5,000	NA	NA	NA	NA	<1,000	<1,000	<1,000	NA	NA	NA
Total Organic Carbon	- -	NA	NA	NA	NA	290 B	660 B	NA	NA	NA	NA	NA	NA	250 B	740 B	NA	NA	NA	NA	NA	200 B	230 B
Total Dissolved Solids	1,000,000	815,000	769,000	273,000	NA	NA	NA	NA	NA	1,430,000	942,000	1,210,000	NA	NA	NA	NA	1,500,000	1,450,000	1,920,000	NA	NA	NA

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-4S								MW-4D				MW-6						
Date Collected:	Guidance Values	08/31/95	11/15/95	07/09/97	09/08/97	11/05/02	01/23/03	04/10/08	01/29/13	07/09/97	09/09/97	11/05/02	01/23/03	08/30/95	11/15/95	07/10/97	11/12/02	01/23/03	04/09/08	01/29/13
Detected VOCs																				
1,1,1-Trichloroethane	5	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	<10 [<10]	<10	<5.0	<5.0	<10	<10	<10	<5.0 J	<5.0	NA	NA
1,1,2,2-Tetrachloroethane	5	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	2.0 J [<10]	2.0 J	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
1,1-Dichloroethane	5	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	<10 [<10]	<10	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
1,2-Dichloroethane	0.6	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	<10 [<10]	<10	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
1,2-Dichloroethene (total)	- -	<1,000 [<500]	<500	<10	<10	NA	NA	NA	NA	<10 [<10]	<10	NA	NA	<10	<10	<10	NA	NA	NA	NA
2-Butanone	- -	<1,000 [<500]	<500	<10	<10	<500	<1,000	NA	NA	<10 [<10]	2.0 JB	<10	<10	<10	<10	<10	<10	<10	NA	NA
2-Hexanone	50	<1,000 [<500]	<500	<10	<10	<500	<1,000	NA	NA	4.0 J [<10]	4.0 J	<10	<10	<10	<10	<10	<10 J	<10	NA	NA
4-Methyl-2-pentanone	- -	<1,000 [<500]	<500	<10	<10	<500	<1,000	NA	NA	4.0 J [<10]	4.0 J	<10	<10	<10	<10	<10	<10	<10	NA	NA
Acetone	50	<1,000 [<500]	<500	1,500 B	<10	1,400	<1,000	NA	NA	<10 [<10]	10 B	<10	<10	<10	<10	14 B	<10	<10	NA	NA
Benzene	1	7,500 [8,100]	5,900	9,500	5,500	5,400	12,000	9,500 [8,600]	8,000 D [9,800 D]	2.0 J [1.0 J]	3.0 J	1.0 J	15	<10	<10	<10	<5.0	<5.0	<1.0	<0.50
Bromodichloromethane	50	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	0.90 J [0.80 J]	0.90 J	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
Bromoform	50	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	0.90 J [<10]	0.90 J	<5.0	<5.0	<10	<10	<10	<5.0 J	<5.0	NA	NA
Carbon Disulfide	- -	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	2.0 J [1.0 J]	68	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
Chloroform	7	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	6.0 J [5.0 J]	6.0 J	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	<250	<500	NA	NA	NA	NA	<5.0	<5.0	NA	NA	NA	<5.0	<5.0	NA	NA
Dibromochloromethane	50	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	0.50 J [<10]	0.50 J	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
Ethylbenzene	5	2,700 [2,800]	<500	<10	1,200	1,900	2,200	1,200 [1,100]	1,100 [1,200]	3.0 J [3.0 J]	4.0 J	1.0 J	8.0	<10	<10	<10	<5.0	<5.0	<5.0	<1.0
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<1,000 [<500]	<500	160 JB	170 J	310 B	<500	NA	NA	2.0 JB [2.0 JB]	<10	<5.0	<5.0	<10	<10	1.0 J	<5.0	<5.0	NA	NA
Styrene	5	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	<10 [0.30 J]	2.0 J	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
Tetrachloroethene	5	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	<10 [<10]	<10	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
Toluene	5	1,600 [1,700]	1,000	530	460 J	270	1,300	580 [540]	690 [720]	5.0 J [3.0 J]	4.0 J	<5.0	3.0 J	<10	<10	<10	<5.0	<5.0	<5.0	<1.0
Trichloroethene	5	<1,000 [<500]	<500	<10	<10	<250	<500	NA	NA	0.60 J [<10]	0.60 J	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	NA	NA
Xylenes (total)	5	4,000 [4,200]	4,100	3,100	2,500	2,100	3,300	1,600 [1,400]	1,600 [1,800]	6.0 J [3.0 J]	9.0 JB	2.0 J	13	<10	<10	<10	<5.0	<5.0	<5.0	<1.0
Total BTEX	- -	16,000 [17,000]	11,000	13,000	9,700 J	9,700	19,000	13,000 [12,000]	12,000 [13,000]	16 J [10 J]	20 J	4.0 J	39 J	<10	<10	<10	<5.0	<5.0	<5.0	<1.0
Total VOCs	- -	16,000 [17,000]	11,000	15,000 J	9,800 J	11,000	19,000	13,000 [12,000]	12,000 [13,000]	39 J [19 J]	120 J	4.0 J	39 J	<10	<10	15 J	<10	<10	<5.0	<1.0
Detected SVOCs																				
2,4-Dimethylphenol	50	1,400 J [1,100 J]	370 J	820	510 J	310 J	1,700	NA	NA	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
2-Methylnaphthalene	- -	2,000 J [1,800 J]	830 J	490	720 J	61 J	110 J	<400 [<200]	31 [25]	0.70 J [0.60 J]	2.0 J	0.60 J	1.0 J	<10	<10	<10	<10	<11	<10	<2.0
2-Methylphenol	- -	<2,500 [<2,500]	<2,000	1,400	360 J	540 J	4,000	NA	NA	<10 [<10]	<10	<11	0.60 J	<10	<10	<10	<10	<11	NA	NA
4-Chloro-3-Methylphenol	- -	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
4-Chloroaniline	5	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
4-Methylphenol	- -	400 J [310 J]	<2,000	1,000	150 J	<1,000	1,600	NA	NA	<10 [0.30 J]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
Acenaphthene	20	370 J [360 J]	140 J	140 J	200 J	100 J	200 J	67 J [53 J]	93 [82]	0.60 J [0.50 J]	2.0 J	1.0 J	2.0 J	<10	<10	<10	<10	<11	<10	<2.0
Acenaphthylene	- -	<2,500 [160 J]	59 J	58 J	94 J	<1,000	120 J	20 J [18 J]	25 [21]	2.0 J [1.0 J]	3.0 J	1.0 J	2.0 J	<10	<10	<10	<10	<11	<10	<2.0
Anthracene	50	55 J [88 J]	12 J	46 J	66 J	<1,000	<1,100	<400 [<200]	4.9 [4.6]	0.060 J [0.060 J]	<10	0.70 J	1.0 J	<10	<10	<10	<10	<11	<10	<2.0
Benzo(a)anthracene	0.002	<2,500 [<2,500]	<2,000	25 J	44 J	<1,000	<1,100	<400 [<200]	0.82 J [0.71 J]	<10 [<10]	<10	<11	0.60 J	<10	<10	<10	<10	<11	<10	<2.0
Benzo(a)pyrene	0	<2,500 [<2,500]	<2,000	16 J	<10	<1,000	<1,100	<400 [<200]	<2.0 J [<2.0 J]	<10 [<10]	<10	<11	0.60 J	<10	<10	<10	<10	<11	<10	<2.0 J
Benzo(b)fluoranthene	0.002	<2,500 [<2,500]	<2,000	11 J	<10	<1,000	<1,100	<400 [<200]	<2.0 [<2.0]	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	<10	<2.0
Benzo(g,h,i)perylene	- -	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	<400 [<200]	<2.0 [<2.0]	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	<10	<2.0
Benzo(k)fluoranthene	0.002	<2,500 [<2,500]	<2,000	13 J	<10	<1,000	<1,100	<400 [<200]	<2.0 [<2.0]	<10 [<10]	<10	<11	0.60 J	<10	<10	<10	<10	<11	<10	<2.0
bis(2-Ethylhexyl)phthalate	5	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	4.0 JB [7.0 JB]	34 B	<11	<12	<10	<10	0.50 JB	<10	<11	NA	NA
Butylbenzylphthalate	50	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
Carbazole	- -	350 J [330 J]	290 J	96 J	81 J	<1,000	210 J	NA	NA	0.60 J [0.70 J]	0.40 J	<11	0.60 J	<10	<10	<10	<10	<11	NA	NA
Chrysene	0.002	<2,500 [<2,500]	<2,000	24 J	36 J	<1,000	<1,100	<400 [<200]	<2.0 [<2.0]	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	<10	<2.0
Dibenzo(a,h)anthracene	- -	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	<400 [<200]	<2.0 J [<2.0 J]	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	<10	<2.0 J
Dibenzofuran	- -	<2,500 [68 J]	<2,000	31 J	38 J	<1,000	<1,100	NA	NA	<10 [<10]	0.30 J	<11	0.60 J	<10	<10	<10	<10	<11	NA	NA
Diethylphthalate	50	<2,500 [270 J]	<2,000	<10	<10	<1,000	<1,100	NA	NA	5.0 JB [5.0 JB]	0.40 JB	<11	<12	<10	<10	0.40 JB	<10	<11	NA	NA
Dimethylphthalate	50	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	<10 [0.50 J]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
Di-n-Butylphthalate	50	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	0.80 JB [0.80 JB]	0.30 JB	<11	<12	0.50 J	<10	<10	<10	<11	NA	NA
Di-n-Octylphthalate	50	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	0.80 JB [2.0 J]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
Fluoranthene	50	50 J [97 J]	<2,000	59 J	80 J	<1,000	69 J	<400 [<200]	3.5 [3.2]	<10 [0.10 J]	<10	1.0 J	2.0 J	<10	<10	<10	<10	<11	<10	<2.0
Fluorene	50	<2,500 [170 J]	48 J	62 J	73 J	<1,000	110 J	25 J [23 J]	41 [36]	0.20 J [0.20 J]	0.70 J	<11	2.0 J	<10	<10	<10	<10	<11	<10	<2.0
Indeno(1,2,3-cd)pyrene	0.002	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	<400 [<200]	<2.0 J [<2.0 J]	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	<10	<2.0 J
Naphthalene	10	12,000 [10,000]	6,700	2,700	4,400	4,600	8,500	1,100 [920]	2,800 D [2,500 D]	18 [14]	36	13	25	<10	<10	<10	<10	1.0 J	<10	0.50 J
N-Nitrosodiphenylamine	50	<2,500 [<2,500]	<2,000	<10	<10	<1,000	<1,100	NA	NA	<10 [<10]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
Phenanthrene	50	230 J [360 J]	56 J	180 J	230 J	<1,000	200 J	24 J [22 J]	37 [33]	0.30 J [0.30 J]	0.80 J	3.0 J	5.0 J	<10	<10	<10	<10	<11	<10	<2.0
Phenol	1	240 J [<2,500]	<2,000	630	76 J	<1,000	600 J	NA	NA	<10 [5.0 J]	<10	<11	<12	<10	<10	<10	<10	<11	NA	NA
Pyrene	50	56 J [110 J]	<2,000	56 J	86 J	<1,000	66 J	<400 [<200]	2.9 [2.9]	<10 [0.10 J]	<10	2.0 J	2.0 J	<10	0.30 J	<10	<10	<11	<10	<2.0
Total PAHs	- -	15,000 J [13,000 J]	7,900 J	3,900 J	6,000 J	4,800 J	9,400 J	1,200 J [1,000 J]	3,000 J [2,700 J]	22 J [17 J]	45 J	22 J	44 J	<10	0.30 J	<10	<10	1.0 J	<10	0.50 J
Total SVOCs	- -	17,000 J [15,000 J]	8,500 J	7,900 J	7,200 J	5,600 J	18,000 J	1,200 J [1,000 J]	3,000 J [2,700 J]	33 J [38 J]	80 J	22 J	46 J	0.50 J	0.30 J	0.90 J	<50	1.0 J	<10	0.50 J

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-4S								MW-4D				MW-6						
Date Collected:	Guidance Values	08/31/95	11/15/95	07/09/97	09/08/97	11/05/02	01/23/03	04/10/08	01/29/13	07/09/97	09/09/97	11/05/02	01/23/03	08/30/95	11/15/95	07/10/97	11/12/02	01/23/03	04/09/08	01/29/13
Detected Inorganics																				
Aluminum	- -	65,400 [51,100]	944	13,200	8,570 *	<2,500 J	532 B	NA	NA	506 [553]	324 B*	<12,500 J	<12,500	105,000	1,320	111,000	<2,500 J	<2,500	NA	NA
Antimony	3	<3.00 [<3.00]	<27.0	<8.00	<80.0	<100	<100	NA	NA	<8.00 [<8.00]	<80.0	<500	<500	<3.00	32.0 B	<8.00	<100	<100	NA	NA
Arsenic	25	48.0 [45.5]	8.30 B	108	45.2	<200	<200	NA	NA	<3.00 [<3.00]	<30.0	<1,000	<1,000	58.6	<2.00	65.2	<200	<200	NA	NA
Available Cyanide	- -	NA	NA	NA	NA	NA	6.00	100 J [50.0 J]	160 [180]	NA	NA	NA	2.00	NA	NA	NA	NA	<2.00	NA	NA
Barium	1,000	452 [373]	107 B	314 N	374 B	128	142	NA	NA	83.6 BN [82.7 BN]	161 B	48.3 B	51.5 B	692	142 B	448 N	118	127	NA	NA
Beryllium	- -	3.40 B [2.60 B]	<1.00	<1.00	<10.0	<25.0	<25.0	NA	NA	<1.00 [<1.00]	<10.0	<125	<125	6.20	1.50 B	4.30 B	<25.0	<25.0	NA	NA
Cadmium	5	<1.00 [<1.00]	<2.00	19.3 N	36.2 BN	<50.0	<50.0	NA	NA	3.40 BN [4.40 BN]	<10.0 N	<250	<250	<1.00	<2.00	6.90 N	<50.0	<50.0	NA	NA
Calcium	- -	540,000 [473,000]	75,600	274,000 E	312,000 E	182,000	411,000	NA	NA	907,000 E [652,000 E]	1,040,000 E	1,930,000	1,920,000	1,210,000	473,000	1,690,000 E	124,000	131,000	NA	NA
Chloride	250,000	NA	NA	NA	NA	1,000,000	1,200,000	NA	NA	NA	NA	93,000,000	100,000,000	NA	NA	NA	640,000	750,000	NA	NA
Chromium	50	99.1 [81.7]	<3.00	20.4	12.8 B	<50.0	<50.0	NA	NA	10.7 [7.80 B]	<10.0	<250	<250	215	4.70 B	265	<50.0	10.4 B	NA	NA
Cobalt	- -	72.7 [58.7]	<4.00	16.0 BN	14.3 B	<50.0	9.10 B	NA	NA	<9.00 N [<9.00 N]	<10.0	<250	<250	106	6.40 B	99.8 N	<50.0	<50.0	NA	NA
Copper	200	231 [214]	<12.9	60.5	52.8 B	<50.0	12.4 B	NA	NA	14.0 B [18.7 B]	24.7 B	<250	64.7 B	257	<14.3	298	<50.0	11.2 B	NA	NA
Cyanide	200	576 [416]	477	2.96	1.57	1,970	5,960	2,100 [1,800]	1,800 [1,800]	<0.0100	<0.0100	<10.0	8.90 B	<20.0	<10.0	<0.0100	5.00 B	31.4	NA	NA
Iron	300	119,000 [96,400]	4,300	222,000 NE	18,800	1,240	4,170	NA	NA	962 NE [949 NE]	682 B	8,160	7,840	162,000	4,860	189,000 NE	456 B	<1,000	NA	NA
Lead	25	73.5 [61.8]	<2.00	17.4 N	24.7 B	<50.0 J	<50.0	NA	NA	<1.00 N [5.00 N]	<10.0	<250 J	<250	68.2	<2.00	83.2 N	<50.0 J	<50.0	NA	NA
Magnesium	- -	304,000 [269,000]	61,300	218,000 E	245,000 E	153,000	374,000	NA	NA	51,700 E [49,900 E]	166,000 E	296,000	297,000	851,000	204,000	689,000 E	32,300	38,800	NA	NA
Manganese	300	2,190 [1,770]	99.6	524 NE	664	171	488	NA	NA	129 NE [127 NE]	287	881	830	8,720	1,510	4,490 NE	218	200	NA	NA
Mercury	0.7	0.480 B [0.370 B]	<0.200	0.230	0.260 N	<0.200	<0.200	NA	NA	<0.200 [<0.200]	<0.200 N	<0.200	<0.200	0.530 B	<0.200	0.960	<0.200	<0.200	NA	NA
Nickel	100	149 [118]	<11.0	28.6 BN	25.2 B	<50.0	<50.0	NA	NA	4.30 BN [4.60 BN]	<10.0	<250	<250	212	<11.0	226 N	<50.0	<50.0	NA	NA
Nitrate Nitrogen	10,000	NA	NA	NA	NA	<100	<100	NA	NA	NA	NA	<5,000	<5,000	NA	NA	NA	390	1,500	NA	NA
Potassium	- -	30,000 [26,500]	7,170	25,000	45,100 BE	19,400	37,800 J	NA	NA	60,200 [60,700]	317,000 E	449,000	441,000	53,700	7,970	44,800	10,600	17,100	NA	NA
Selenium	10	2.90 B [3.20 B]	<2.00	3.40 B	<30.0 N	<150	<150	NA	NA	<3.00 [<3.00]	<30.0 N	<750 J	<750	<2.00	<2.00	<3.00	<150 J	<150	NA	NA
Silver	50	<1.00 [<1.00]	<3.00	<1.00	<10.0	<30.0 J	<30.0	NA	NA	<1.00 [<1.00]	<10.0	<150	<150	<1.00	<3.00	<1.00	<30.0	<30.0	NA	NA
Sodium	- -	188,000 [186,000]	347,000	888,000	626,000 E	408,000	494,000	NA	NA	23,000,000 [23,300,000]	588,000 E	8,470,000 E	9,570,000	132,000	170,000	300,000 B	350,000	374,000	NA	NA
Sulfate	250,000	NA	NA	NA	NA	160,000	910,000	NA	NA	NA	NA	4,400,000	5,000,000	NA	NA	NA	140,000	130,000	NA	NA
Sulfide	50	NA	NA	NA	NA	7,500	8,000	NA	NA	NA	NA	<1,000	<1,000	NA	NA	NA	<1,000	<1,000	NA	NA
Thallium	- -	<4.00 [<4.00]	<2.00	<3.00 N	<30.0	<200 J	<200	NA	NA	<3.00 N [<3.00 N]	<30.0	<1,000 J	<1,000	<4.00	<2.00	6.40 BN	<200 J	<200	NA	NA
Vanadium	- -	99.2 [79.2]	<4.00	16.3 BN	13.0 B	<30.0	<30.0	NA	NA	<1.00 N [<1.00 N]	<10.0	<150	<150	163	14.7 B	177 N	<30.0	<30.0	NA	NA
Zinc	2,000	364 [298]	<54.2	4,640	2,820	<250	390	NA	NA	42.5 [63.7]	<60.0	<1,250	<1,250	395	<22.9	479	<250	<250	NA	NA
Detected Inorganics-Filtered																				
Iron	300	NA	NA	NA	NA	802	1,840	NA	NA	NA	NA	2,900	4,350	NA	NA	NA	<1,000	<1,000	NA	NA
Manganese	300	NA	NA	NA	NA	143	346	NA	NA	NA	NA	408	634	NA	NA	NA	190	171	NA	NA
Detected PCBs																				
None Detected	- -	- - [- -]	- -	- -	- -	NA	NA	NA	NA	- - [- -]	- -	NA	NA	- -	- -	- -	NA	NA	NA	NA
Detected Organochlorine Pesticides																				
4,4'-DDD	0.3	<0.50 [<0.50]	<0.10	<0.10	<0.10	<0.30	<0.16	NA	NA	<0.10 [<0.10]	<0.10	<0.16	<0.17	<0.11	<0.10	<0.10	<0.15	<0.18	NA	NA
4,4'-DDE	0.2	<0.50 [<0.50]	<0.10	0.090 JP	<0.050	<0.20	0.17	NA	NA	<0.10 [<0.10]	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10	<0.10	<0.12	NA	NA
4,4'-DDT	0.2	<0.50 [<0.50]	<0.10	0.0060 JP	<0.10	<0.20	<0.11	NA	NA	<0.10 [<0.10]	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10	<0.10	<0.12	NA	NA
Aldrin	0	<0.25 [<0.25]	<0.050	<0.050	<0.050	<0.10	<0.055	NA	NA	<0.050 [<0.050]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Alpha-BHC	0.01	<0.25 [<0.25]	<0.050	0.045 JP	<0.050	<0.10	<0.055	NA	NA	<0.050 [0.34]	<0.050	<0.054	0.026 J	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Alpha-Chlordane	0.05	<0.25 [<0.25]	<0.050	<0.050	<0.050	<0.10	<0.055	NA	NA	<0.050 [<0.050]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Beta-BHC	- -	<0.25 [<0.25]	<0.050	<0.050	<0.050	<0.10	0.046 J	NA	NA	0.0083 JP [0.074 P]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Delta-BHC	- -	<0.25 [<0.25]	<0.050	0.030 JP	<0.050	<0.10	<0.055	NA	NA	<0.050 [0.025 JP]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Dieldrin	0.004	<0.50 [<0.50]	<0.10	<0.10	<0.10	<0.20	<0.11	NA	NA	<0.10 [<0.10]	<0.10	<0.11	<0.11	<0.11	0.0096 J	<0.10	<0.10	<0.12	NA	NA
Endosulfan I	- -	<0.25 [<0.25]	<0.050	<0.050	<0.050	0.094 J	<0.055	NA	NA	<0.050 [<0.050]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Endosulfan II	- -	<0.50 [<0.50]	<0.10	<0.10	<0.10	<0.20	<0.11	NA	NA	<0.10 [<0.10]	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10	<0.10	<0.12	NA	NA
Endosulfan Sulfate	- -	<0.50 [<0.50]	<0.10	0.20 P	0.043 JP	0.052 J	<0.11	NA	NA	<0.10 [<0.10]	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10	<0.10	<0.12	NA	NA
Endrin	0	<0.50 [<0.50]	<0.10	<0.10	<0.10	<0.20	<0.11	NA	NA	<0.10 [<0.10]	<0.10	<0.11	<0.11	<0.11	<0.10	<0.10	<0.10	<0.12	NA	NA
Gamma-BHC (Lindane)	0.05	<0.25 [<0.25]	<0.050	<0.050	<0.050	<0.10	<0.055	NA	NA	<0.050 [0.067]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Gamma-Chlordane	0.05	<0.25 [<0.25]	<0.050	0.094 JP	<0.050	<0.10	<0.055	NA	NA	<0.050 [<0.050]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Heptachlor	0.04	<0.25 [<0.25]	<0.050	<0.050	<0.050	<0.10	0.15	NA	NA	<0.050 [<0.050]	<0.050	<0.054	0.013 J	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Heptachlor Epoxide	0.03	0.040 JP [0.040 JP]	<0.050	<0.050	<0.050	0.083 J	0.17	NA	NA	0.030 JP [0.028 J]	<0.050	<0.054	<0.056	<0.060	<0.050	<0.050	<0.050	<0.059	NA	NA
Methoxychlor	35	<2.5 [<2.5]	<0.50	0.46 JP	<0.50	<1.0	<0.55	NA	NA	<0.50 [<0.50]	<0.50	<0.54	<0.56	<0.56	<0.50	<0.50	<0.50	<0.59	NA	NA
Detected Miscellaneous																				
BOD (5 Day)	- -	>87,000 [>82,000]	178,000	31,000	NA	35,000	46,000	NA	NA	100 [5,000]	NA	540 B	2,200	<2,000	19,200	3,000	9,400	1,600 B	NA	NA
CO2 by Headspace	- -	NA	NA	NA	NA	67,000	92,000	NA	NA	NA	NA	17,000	14,000	NA	NA	NA	12,000	9,000	NA	NA
Carbon monoxide	- -	NA	NA	NA	NA	<400	<400	NA	NA	NA	NA	<400	<400	NA	NA	NA	<400	<400	NA	NA
COD	- -	<133,000 [<203,000]	<136,000	184,000	NA	170,000	339,000	NA	NA	709,000 [505,000]	NA	934,000	998,000	<32,500	<10,000	35,300	4,880 B	9,470 B	NA	NA
Chloride	250,000	757,000 [692,000]	652,000	1,890,000	NA	NA	NA	NA	NA	16,900,000 [8,220,000]	NA	NA	NA	267,000	344,000	555,000	NA	NA	NA	NA
DOC	- -	NA	NA	NA	NA	40,000	85,000	NA	NA	NA	NA	650 B	450 B	NA	NA	NA	750 B	1,600	NA	NA
Hardness, Ca/CO3	- -	2,830,000 [1,970,000]	490,000	1,440,000	NA	NA	NA	NA	NA	964,000 [920,000]	NA	NA	NA	4,560,000	2,320,000	5,040,000	NA	NA	NA	NA
Methane	- -	NA	NA	NA	NA	890	970,000	NA	NA	NA	NA	50	30,000	NA	NA	NA	17	9,300	NA	NA
Nitrate Nitrogen	10,000	<100 [<100]	<100	<100	NA	NA	NA	NA	NA	190 [290]	NA	NA	NA	<100	<100	640	NA	NA	NA	NA
Nitrite Nitrogen	1,000	69 [71]	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA
Oil and Grease	- -	2,000 [4,400]	3,000	4,900 N	NA	NA	NA	NA	NA	<1,000 N [<1,000 N]	NA	NA	NA	<1,000	<1,000	2,000 N	NA	NA	NA	NA
pH, Standard Units	- -	7.33 [7.33]	7.5	7.39	NA	NA	NA	NA	NA	7.36 [10.8]	NA	NA	NA	7.55	7.29	7.62	NA	NA	NA	NA
Sulfate	250,000	12,300 [<10,000]	<10,000	229,000	NA	NA	NA	NA	NA	17,800 [52,700]	NA	NA	NA	103,000	119,000	86,000	NA	NA	NA	NA
Sulfide	50	<1,000 [<1,000]	<1,000	1,900	NA	NA	NA	NA	NA	<1,000 [<1,000]	NA	NA	NA	<1,000	<1,000	<1,000	NA	NA	NA	NA
Total Organic Carbon	- -	NA	NA	NA	NA	48,000	110,000	NA	NA	NA	NA	330 B	290 B	NA	NA	NA	480 B	3,400	NA	NA
Total Dissolved Solids	1,000,000	1,500,000 [1,550,000]	1,420,000	4,650,000	NA	NA	NA	NA	NA	68,000,000 [49,500,000]	NA	NA	NA	759,000	862,000	1,290,000	NA	NA	NA	NA

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water Guidance Values	MW-7S								MW-7D				MW-8S							
Date Collected:		08/31/95	11/15/95	07/09/97	09/09/97	11/05/02	01/27/03	04/10/08	01/29/13	07/09/97	09/09/97	11/05/02	01/27/03	08/30/95	11/15/95	07/08/97	09/09/97	11/05/02	01/28/03	04/09/08	01/29/13
Detected VOCs																					
1,1,1-Trichloroethane	5	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
1,1,2,2-Tetrachloroethane	5	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
1,1-Dichloroethane	5	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
1,2-Dichloroethane	0.6	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
1,2-Dichloroethene (total)	- -	<200	<200	<10	<10	NA	NA	NA	NA	<10	<10	NA	NA	<10	<10	<10	<10	NA	NA	NA	NA
2-Butanone	- -	<200	<200	<10	<10	<40 [<50]	<200	NA	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA	NA
2-Hexanone	50	<200	<200	<10	<10	<40 [<50]	<200	NA	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA	NA
4-Methyl-2-pentanone	- -	<200	<200	<10	<10	<40 [<50]	<200 J	NA	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA	NA
Acetone	50	<200	<200	<10	<10	<40 [<50]	<200	NA	NA	23 B	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA	NA
Benzene	1	1,800	2,800	2,000	1,600	300 [260]	1,500	490	600	<10	<10	<5.0	1.0 J	<10	<10	<10	<10	0.40 J	<5.0	0.38 J	<0.50
Bromodichloromethane	50	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	1.0 J	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Bromoform	50	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Carbon Disulfide	- -	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Chloroform	7	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	8.0 J	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	<20 [<25]	<100	NA	NA	NA	NA	<5.0	<5.0	NA	NA	NA	NA	<5.0	<5.0	NA	NA
Dibromochloromethane	50	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	0.50 J	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Ethylbenzene	5	1,700	320	1,400	1,300	340 [280]	920	490	660	<10	0.60 J	<5.0	3.0 J	<10	<10	<10	2.0 J	38	23	22	39
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<200	<200	62 JB	<10	<20 [26 B]	<100	NA	NA	2.0 JB	1.0 JB	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Styrene	5	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Tetrachloroethene	5	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	0.40 J	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Toluene	5	120 J	530	97 J	87 J	10 J [9.0 J]	320	24 J	9.9	1.0 J	<10	<5.0	<5.0	<10	<10	<10	<10	1.0 J	<5.0	1.0 J	<1.0
Trichloroethene	5	<200	<200	<10	<10	<20 [<25]	<100	NA	NA	<10	<10	<5.0	<5.0	<10	<10	<10	<10	<5.0	<5.0	NA	NA
Xylenes (total)	5	1,400	1,500	1,000	1,000	190 [190]	970	220	260	<10	2.0 JB	<5.0	3.0 J	14	120	48	54	34	27	35	26
Total BTEX	- -	5,000 J	5,200	4,500 J	4,000 J	840 J [740 J]	3,700	1,200 J	1,500	1.0 J	2.6 J	<5.0	7.0 J	14	120	48	56 J	73 J	50	58 J	66
Total VOCs	- -	5,000 J	5,200	4,600 J	4,000 J	840 J [770 J]	3,700	1,200 J	1,500	36 J	3.6 J	<10	7.0 J	14	120	48	56 J	73 J	50	58 J	66
Detected SVOCs																					
2,4-Dimethylphenol	50	170 J	<2,000	210 J	<10	<270 [<270]	250 J	NA	NA	<10	<10	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
2-Methylnaphthalene	- -	1,100 J	400 J	870 J	1,100 J	17 J [18 J]	370 J	24 J	26	<10	<10	<11	1.0 J	30 J	18 J	<10	<10	<20	<10	<20	<2.0
2-Methylphenol	- -	<2,500	<2,000	<10	<10	<270 [<270]	100 J	NA	NA	<10	<10	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
4-Chloro-3-Methylphenol	- -	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	<10	<10	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
4-Chloroaniline	5	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	<10	<10	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
4-Methylphenol	- -	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	0.30 J	<10	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
Acenaphthene	20	580 J	210 J	910 J	1,400 J	79 J [76 J]	110 J	170 J	240 D	<10	<10	0.60 J	0.50 J	420	290	450	360	110	62	88	58
Acenaphthylene	- -	<2,500	36 J	120 J	140 J	<270 [<270]	<1,100	<200	3.7	<10	<10	<11	<11	120	50 J	95 J	70 J	23	16	17 J	8.4
Anthracene	50	150 J	17 J	230 J	390 J	<270 [<270]	<1,100	<200	7.3	<10	<10	<11	<11	170	78 J	220	140	10 J	8.0 J	5.9 J	2.4
Benzo(a)anthracene	0.002	84 J	<2,000	150 J	270 J	<270 [<270]	<1,100	<200	0.42 J	<10	<10	<11	<11	65 J	29 J	84 J	55 J	2.0 J	2.0 J	<20	<2.0
Benzo(a)pyrene	0	<2,500	<2,000	130 J	200 J	<270 [<270]	<1,100	<200	<2.0 J	<10	<10	<11	<11	29 J	11 J	37 J	24 J	<20	1.0 J	<20	<2.0 J
Benzo(b)fluoranthene	0.002	<2,500	<2,000	82 J	130 J	<270 [<270]	<1,100	<200	<2.0	<10	<10	<11	<11	12 J	4.0 J	20 J	12 J	<20	<10	<20	<2.0
Benzo(g,h,i)perylene	- -	<2,500	<2,000	<10	120 J	<270 [<270]	<1,100	<200	<2.0	<10	<10	<11	<11	8.0 J	2.0 J	10 J	7.0 J	<20	<10	<20	<2.0
Benzo(k)fluoranthene	0.002	<2,500	<2,000	110 J	200 J	<270 [<270]	<1,100	<200	<2.0	<10	<10	<11	<11	19 J	6.0 J	21 J	15 J	<20	0.70 J	<20	<2.0
bis(2-Ethylhexyl)phthalate	5	<2,500	<2,000	<10	0.50 JB	<270 [<270]	<1,100	NA	NA	9.0 JB	4.0 JB	<11	<11	<100	<100	<10	18 JB	<20	<10	NA	NA
Butylbenzylphthalate	50	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	<10	<10	<11	0.60 J	<100	<100	<10	<10	<20	<10	NA	NA
Carbazole	- -	600 J	550 J	480 J	420 J	35 J [36 J]	240 J	NA	NA	0.40 J	<10	<11	0.60 J	<100	<100	<10	<10	<20	2.0 J	NA	NA
Chrysene	0.002	69 J	<2,000	130 J	240 J	<270 [<270]	<1,100	<200	<2.0	<10	<10	<11	<11	69 J	29 J	98 J	61 J	2.0 J	2.0 J	<20	<2.0
Dibenzo(a,h)anthracene	- -	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	<200 J	<2.0 J	<10	<10	<11	<11	<100	<100	5.0 J	<10	<20	<10	<20	<2.0 J
Dibenzofuran	- -	150 J	45 J	260 J	380 J	12 J [12 J]	<1,100	NA	NA	<10	<10	<11	<11	<100	14 J	<10	16 J	7.0 J	4.0 J	NA	NA
Diethylphthalate	50	54 J	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	0.90 JB	0.40 JB	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
Dimethylphthalate	50	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	0.30 J	<10	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
Di-n-Butylphthalate	50	<2,500	<2,000	0.50 J	<10	<270 [<270]	<1,100	NA	NA	0.20 JB	0.40 JB	<11	<11	<100	<100	<10	<10	<20	<10	NA	NA
Di-n-Octylphthalate	50	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	2.0 J	<10	<11	0.60 J	<100	<100	<10	<10	<20	<10	NA	NA
Fluoranthene	50	240 J	<2,000	420 J	750 J	<270 [<270]	<1,100	<200	4.0	0.20 J	<10	1.0 J	0.70 J	98 J	35 J	140	78 J	4.0 J	4.0 J	2.2 J	1.1 J
Fluorene	50	<2,500	53 J	300 J	520 J	<270 [<270]	<1,100	26 J	32	<10	<10	<11	<11	150	71 J	130	110	11 J	15	13 J	9.0
Indeno(1,2,3-cd)pyrene	0.002	<2,500	<2,000	<10	100 J	<270 [<270]	<1,100	<200 J	<2.0 J	<10	<10	<11	<11	<100	2.0 J	10 J	8.0 J	<20	<10	<20	<2.0 J
Naphthalene	10	14,000	7,900	14,000	15,000	1,300 [1,300]	8,700	1,100	1,900 D	<10	<10	5.0 J	18	280	300	100	42 J	11 J	13	7.3 J	2.1
N-Nitrosodiphenylamine	50	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	<10	<10	<11	<11	<100	9.0 J	<10	<10	<20	<10	NA	NA
Phenanthrene	50	600 J	80 J	900 J	1,500 J	<270 [<270]	<1,100	29 J	47	0.10 J	<10	1.0 J	0.60 J	540	330	620	390	14 J	10	8.0 J	0.67 J
Phenol	1	<2,500	<2,000	<10	<10	<270 [<270]	<1,100	NA	NA	<10	<10	<11	<11	24 J	<100	<10	<10	<20	<10	NA	NA
Pyrene	50	<2,500	<2,000	370 J	660 J	<270 [<270]	<1,100	<200	2.7	0.20 J	<10	1.0 J	0.70 J	150	100	200	130	7.0 J	6.0 J	3.4 J	1.5 J
Total PAHs	- -	17,000 J	8,700 J	19,000 J	23,000 J	1,400 J [1,400 J]	9,200 J	1,400 J	2,200 J	0.50 J	<10	8.6 J	22 J	2,200 J	1,400 J	2,200 J	1,500 J	190 J	140 J	150 J	83 J
Total SVOCs	- -	18,000 J	9,300 J	20,000 J	24,000 J	1,400 J [1,400 J]	9,800 J	1,400 J	2,200 J	14 J	4.8 J	8.6 J	23 J	2,200 J	1,400 J	2,200 J	1,500 J	200 J	150 J	150 J	83 J

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-7S								MW-7D				MW-8S							
Date Collected:	Guidance Values	08/31/95	11/15/95	07/09/97	09/09/97	11/05/02	01/27/03	04/10/08	01/29/13	07/09/97	09/09/97	11/05/02	01/27/03	08/30/95	11/15/95	07/08/97	09/09/97	11/05/02	01/28/03	04/09/08	01/29/13
Detected Inorganics																					
Aluminum	- -	125,000	7,250	111,000	170,000 *	394 JB [218 JB]	551 B	NA	NA	117 B	373 B*	<12,500 J	2,320 B	226,000	1,430	250,000	271,000 *	379 JB	951 JB	NA	NA
Antimony	3	<3.00	<27.0	<8.00	<80.0	<20.0 [<20.0]	<100	NA	NA	<8.00	<80.0	<500	<500	<3.00	<27.0	<8.00	<80.0	<20.0	<100	NA	NA
Arsenic	25	65.3	<2.00	97.3	141	<40.0 [<40.0]	<200	NA	NA	<3.00	<30.0	<1,000	<1,000	96.1	<2.00	97.7	103	<40.0	<200	NA	NA
Available Cyanide	- -	NA	NA	NA	NA	NA	4.00	8.40 J	7.3	NA	NA	NA	<2.00	NA	NA	NA	NA	NA	4.00	NA	NA
Barium	1,000	1,800	822	1,610 N	2,310	405 [410]	440	NA	NA	20.3 BN	41.9 B	<125	44.6 B	1,650	396	1,660 N	1,910 B	110	131	NA	NA
Beryllium	- -	6.80	<1.00	8.60	<10.0	<5.00 [<5.00]	<25.0	NA	NA	<1.00	<10.0	<125	<125	10.3	1.40 B	17.8	<10.0	<5.00	<25.0	NA	NA
Cadmium	5	<1.00	2.90 B	22.3 N	<10.0 N	<10.0 [<10.0]	<50.0	NA	NA	<1.00 N	<10.0 N	<250	<250	3.00 B	<2.00	26.8 N	<10.0 N	<10.0	<50.0	NA	NA
Calcium	- -	922,000	410,000	1,410,000	1,530,000 E	169,000 [167,000]	253,000	NA	NA	592,000 E	823,000 E	1,090,000	1,210,000	1,040,000	292,000	1,830,000 E	1,770,000 E	43,600	56,100	NA	NA
Chloride	250,000	NA	NA	NA	NA	710,000 [730,000]	4,500,000	NA	NA	NA	NA	30,000,000	33,000,000	NA	NA	NA	NA	800,000	820,000	NA	NA
Chromium	50	230	12.1	234	288	14.3 J [5.40 JB]	26.1 B	NA	NA	<6.00	<10.0	<250	45.3 B	386	3.20 B	493	493	2.90 B	9.30 B	NA	NA
Cobalt	- -	108	7.60 B	120 N	178 B	<10.0 [<10.0]	7.50 B	NA	NA	<9.00 N	<10.0	<250	<250	186	4.40 B	240 N	261 B	<10.0	<50.0	NA	NA
Copper	200	322	<19.1	355	579	5.10 JB [2.20 JB]	28.1 B	NA	NA	4.40 B	12.8 B	<250	143 B	670	<8.00	888	858	5.90 B	18.6 B	NA	NA
Cyanide	200	244	59.5	1.52	0.414	120 J [98.3 J]	367	140	110	<0.0100	<0.0100	<10.0	3.40 B	<20.0	<10.0	0.0630	0.0130	<10.0	4.00 B	NA	NA
Iron	300	216,000	16,600	194,000 NE	323,000	7,230 [6,460]	3,740	NA	NA	1,300 NE	1,320	4,050 B	14,100	330,000	6,010	365,000 NE	488,000	729	2,060	NA	NA
Lead	25	130	<9.30	126 N	199	10.7 [4.30 JB]	23.1 B	NA	NA	<1.00 N	<10.0	<250 J	91.8 B	217	<4.60	259 N	326	<10.0 J	<50.0	NA	NA
Magnesium	- -	530,000	151,000	436,000 E	713,000 E	61,600 [60,700]	116,000	NA	NA	87,800 E	184,000 E	215,000	244,000	598,000	61,900	556,000 E	812,000 E	11,500	14,100	NA	NA
Manganese	300	7,060	1,650	5,740 NE	8,260	320 [298]	321	NA	NA	112 NE	229	265 B	441	9,780	1,580	7,710 NE	10,600	62.2	112	NA	NA
Mercury	0.7	0.530 B	0.290 B	1.30	0.930 N	<0.200 [<0.200]	<0.200	NA	NA	<0.200	<0.200 N	<0.200	<0.200	0.640 B	<0.200	1.20	1.00 N	<0.200	<0.200	NA	NA
Nickel	100	258	<11.0	260 N	423	9.30 JB [3.60 JB]	13.3 B	NA	NA	<1.00 N	<10.0	<250	<250	464	15.7 B	511 N	670	3.00 B	<50.0	NA	NA
Nitrate Nitrogen	10,000	NA	NA	NA	NA	<100 [<100]	<100	NA	NA	NA	NA	<5,000	<5,000	NA	NA	NA	NA	<100	<100	NA	NA
Potassium	- -	47,700	10,200	40,600	63,600 E	18,600 [17,500]	63,400	NA	NA	22,700	76,400 E	122,000	136,000 B	88,300	7,670	59,500	70,100 E	12,300	11,400 J	NA	NA
Selenium	10	<2.00	<2.00	<3.00	<30.0 N	<30.0 J [30.0 JB]	<150	NA	NA	<3.00	<30.0 N	<750 J	<750	<2.00	<2.00	<3.00	<30.0 N	<30.0 J	<150	NA	NA
Silver	50	<1.00	<3.00	<1.00	<10.0	<6.00 [<6.00]	<30.0	NA	NA	<1.00	<10.0	<150	<150	<1.00	<3.00	<1.00	<10.0	<6.00	<30.0	NA	NA
Sodium	- -	186,000	276,000	950,000	728,000 E	195,000 [220,000 E]	1,480,000	NA	NA	9,550,000	1,410,000 E	7,830,000	8,720,000	172,000	5,460,000	1,050,000	782,000 E	310,000	529,000	NA	NA
Sulfate	250,000	NA	NA	NA	NA	15,000 [13,000]	80,000	NA	NA	NA	NA	2,700,000	3,200,000	NA	NA	NA	NA	60,000	79,000	NA	NA
Sulfide	50	NA	NA	NA	NA	<1,000 [<1,000]	600 B	NA	NA	NA	NA	<1,000	<1,000	NA	NA	NA	NA	<1,000	200 B	NA	NA
Thallium	- -	<4.00	<2.00	<3.00 N	<30.0	<40.0 J [<40.0 J]	<200	NA	NA	5.00 BN	<30.0	<1,000 J	<1,000	<4.00	<2.00	5.20 BN	<30.0	<40.0 J	<200	NA	NA
Vanadium	- -	202	20.8 B	174 N	264 B	2.00 B [2.00 B]	<30.0	NA	NA	<1.00 N	<10.0	<150	<150	322	9.10 B	344 N	403 B	<6.00	<30.0	NA	NA
Zinc	2,000	570	112	944	1,080	28.1 J [<50.0]	<250	NA	NA	<6.00	<60.0	<1,250	<1,250	1,070	<24.1	1,530	1,560	<50.0	<250	NA	NA
Detected Inorganics-Filtered																					
Iron	300	NA	NA	NA	NA	4,210 [4,880]	4,440	NA	NA	NA	NA	1,970	2,440	NA	NA	NA	NA	248	<1,000	NA	NA
Manganese	300	NA	NA	NA	NA	220 [246]	292	NA	NA	NA	NA	162	214	NA	NA	NA	NA	48.9	85.2	NA	NA
Detected PCBs																					
None Detected	- -	- -	- -	- -	- -	NA	NA	NA	NA	- -	- -	NA	NA	- -	- -	- -	- -	NA	NA	NA	NA
Detected Organochlorine Pesticides																					
4,4'-DDD	0.3	<0.50	<0.10	<0.10	0.043 JP	<0.15 [<0.15]	<0.16	NA	NA	<0.10	<0.10	<0.17	<0.16	<0.50	<0.10	<0.10	0.094 JP	<0.16	<0.15	NA	NA
4,4'-DDE	0.2	<0.50	<0.10	0.034 J	0.040 JP	<0.10 [<0.10]	0.13	NA	NA	<0.10	<0.10	<0.11	<0.11	<0.50	<0.10	0.26 J	<0.10	0.14	0.031 J	NA	NA
4,4'-DDT	0.2	<0.50	<0.10	0.034 JP	0.019 JP	<0.10 [<0.10]	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	<0.50	<0.10	0.082 JP	<0.10	<0.11	<0.10	NA	NA
Aldrin	0	<0.25	<0.050	<0.050	<0.050	<0.050 [<0.050]	<0.055	NA	NA	<0.050	<0.050	<0.056	<0.054	<0.25	<0.050	0.024 JP	<0.050	<0.054	<0.050	NA	NA
Alpha-BHC	0.01	<0.25	<0.050	0.010 JP	<0.050	<0.050 [<0.050]	<0.055	NA	NA	<0.050	<0.050	<0.056	<0.054	<0.25	<0.050	<0.050	<0.050	0.0088 J	0.072	NA	NA
Alpha-Chlordane	0.05	<0.25	<0.050	<0.050	<0.050	<0.050 [<0.050]	0.038 J	NA	NA	<0.050	<0.050	<0.056	<0.054	<0.25	<0.050	<0.050	<0.050	<0.054	<0.050	NA	NA
Beta-BHC	- -	<0.25	<0.050	<0.050	<0.050	0.014 J [0.015 J]	<0.055	NA	NA	<0.050	<0.050	<0.056	<0.054	<0.25	<0.050	0.079 JP	0.093 JP	<0.054	<0.050	NA	NA
Delta-BHC	- -	<0.25	<0.050	0.038 JP	0.028 JP	<0.050 [<0.050]	<0.055	NA	NA	<0.050	<0.050	<0.056	0.021 J	<0.25	<0.050	0.31 P	0.17	<0.054	<0.050	NA	NA
Dieldrin	0.004	<0.50	<0.10	<0.10	<0.10	<0.10 [<0.10]	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	<0.50	<0.10	<0.10	<0.10	<0.11	<0.10	NA	NA
Endosulfan I	- -	<0.25	<0.050	<0.050	<0.050	<0.050 [<0.050]	<0.055	NA	NA	<0.050	<0.050	<0.056	<0.054	<0.25	<0.050	<0.050	<0.050	0.028 J	0.045 J	NA	NA
Endosulfan II	- -	<0.50	<0.10	<0.10	<0.10	0.026 J [0.021 J]	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	<0.50	<0.10	<0.10	<0.10	<0.11	<0.10	NA	NA
Endosulfan Sulfate	- -	<0.50	<0.10	0.088 JP	<0.10	<0.10 [<0.10]	<0.11	NA	NA	<0.10	<0.10	<0.11	<2.0	<0.50	<0.10	0.21 JP	0.20 P	0.027 J	<0.10	NA	NA
Endrin	0	<0.50	<0.10	<0.10	<0.10	<0.10 [<0.10]	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	<0.50	<0.10	<0.10	<0.10	<0.11	<0.10	NA	NA
Gamma-BHC (Lindane)	0.05	<0.25	<0.050	<0.050	<0.050	<0.050 [<0.050]	<0.055	NA	NA	<0.050	<0.050	<0.056	<0.054	0.090 JP	0.072 P	<0.050	<0.050	<0.054	<0.050	NA	NA
Gamma-Chlordane	0.05	<0.25	<0.050	0.033 JP	0.035 J	<0.050 [<0.050]	0.039 J	NA	NA	<0.050	<0.050	<0.056	<0.054	<0.25	0.38 P	0.40	0.23	<0.054	<0.050	NA	NA
Heptachlor	0.04	<0.25	<0.050	<0.050	<0.050	<0.050 [<0.050]	0.25	NA	NA	<0.050	<0.050	<0.056	<0.054	<0.25	<0.050	<0.050	<0.050	0.085	0.32	NA	NA
Heptachlor Epoxide	0.03	0.060 JP	<0.050	<0.050	<0.050	<0.050 [<0.050]	0.22	NA	NA	<0.050	<0.050	<0.056	<0.054	0.16 JP	<0.050	<0.050	<0.050	<0.054	<0.050	NA	NA
Methoxychlor	35	<2.5	<0.50	1.0 P	<0.50	<0.50 [<0.50]	<0.55	NA	NA	<0.50	<0.50	<0.56	<0.54	<2.5	<0.50	<0.50	<0.50	<0.54	<0.50	NA	NA
Detected Miscellaneous																					
BOD (5 Day)	- -	>92,000	33,600	15,000	NA	10,000 [9,500]	22,000	NA	NA	4,920	NA	<2,000	570 B	58,000	337,000	80,000	NA	3,200	4,900	NA	NA
CO2 by Headspace	- -	NA	NA	NA	NA	84,000 [85,000]	120,000	NA	NA	NA	NA	36,000	34,000	NA	NA	NA	NA	13,000	12,000	NA	NA
Carbon monoxide	- -	NA	NA	NA	NA	<400 [<400]	<400	NA	NA	NA	NA	<400	<400	NA	NA	NA	NA	<400	<400	NA	NA
COD	- -	950,000	<174,000	139,000	NA	68,400 J [53,700 J]	115,000	NA	NA	116,000	NA	133,000	461,000	838,000	<172,000	71,400	NA	13,600	15,300	NA	NA
Chloride	250,000	884,000	595,000	479,000	NA	NA	NA	NA	NA	2,170,000	NA	NA	NA	4,490,000	3,530,000	1,420,000	NA	NA	NA	NA	NA
DOC	- -	NA	NA	NA	NA	7,700 [7,500]	7,700	NA	NA	NA	NA	460 B	500	NA	NA	NA	NA	510 B	1,300	NA	NA
Hardness, Ca/CO3	- -	3,900,000	1,700,000	3,670,000	NA	NA	NA	NA	NA	1,220,000	NA	NA	NA	2,180,000	1,030,000	4,440,000	NA	NA	NA	NA	NA
Methane	- -	NA	NA	NA	NA	2,600 [2,700]	3,000,000	NA	NA	NA	NA	30	35,000	NA	NA	NA	NA	310	270,000	NA	NA
Nitrate Nitrogen	10,000	<100	120	<100	NA	NA	NA	NA	NA	566	NA	NA	NA	<100	110	<100	NA	NA	NA	NA	NA
Nitrite Nitrogen	1,000	35	25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA
Oil and Grease	- -	8,600	2,700	7,800 N	NA	NA	NA	NA	NA	<1,000 N	NA	NA	NA	5,900	3,300	73,400 N	NA	NA	NA	NA	NA
pH, Standard Units	- -	6.83	7	7.04	NA	NA	NA	NA	NA	10.8	NA	NA	NA	7.5	7.82	7.79	NA	NA	NA	NA	NA
Sulfate	250,000	20,600	82,300	119,000	NA	NA	NA	NA	NA	197,000	NA	NA	NA	153,000	384,000	138,000	NA	NA	NA	NA	NA
Sulfide	50	<1,000	<1,000	<5,000	NA	NA	NA	NA	NA	<1,000	NA	NA	NA	1,000	<1,000	<5,000	NA	NA	NA	NA	NA
Total Organic Carbon	- -	NA	NA	NA	NA	12,000 [12,000]	37,000	NA	NA	NA	NA	420 B	740 B	NA	NA	NA	NA	470 B	3,400	NA	NA
Total Dissolved Solids	1,000,000	1,970,000	887,000	4,670,000	NA	NA	NA	NA	NA	4,250,000	NA	NA	NA	5,470,000	5,230,000	2,990,000	NA	NA	NA	NA	NA

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-8D						MW-9D1						MW-9D2			
Date Collected:	Guidance Values	08/30/95	11/15/95	07/08/97	09/09/97	11/06/02	01/28/03	07/09/97	09/08/97	11/06/02	01/21/03	04/10/08	01/31/13	07/10/97	09/08/97	11/06/02	01/21/03
Detected VOCs																	
1,1,1-Trichloroethane	5	<50	<10 [42]	<10	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
1,1,2,2-Tetrachloroethane	5	<50	<10 [6.0 J]	0.80 J	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
1,1-Dichloroethane	5	<50	<10 [13]	<10	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
1,2-Dichloroethane	0.6	<50	<10 [<10]	<10	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
1,2-Dichloroethene (total)	- -	<50	<10 [37]	1.0 J	<10	NA	NA	<10	<10	NA	NA	NA	NA	<10	<10	NA	NA
2-Butanone	- -	<50	<10 [<10]	<10	<10	<10	<10 [<10]	<10	<10	<100	<100	NA	NA	<10	<10	<10	<10
2-Hexanone	50	<50	<10 [<10]	<10	<10	<10	<10 [<10]	<10	<10	<100	<100	NA	NA	<10	<10	<10	<10
4-Methyl-2-pentanone	- -	<50	<10 [<10]	<10	<10	<10	<10 [<10]	<10	<10	<100	<100	NA	NA	<10	<10	<10	<10
Acetone	50	600	<14 [<10]	<10	<10	<10	<10 [<10]	<10	23 JB	<100	<100	NA	NA	<10	7.0 JB	12	<10
Benzene	1	19 J	2.0 J [<10]	0.70 J	2.0 J	<5.0	<5.0 [<5.0]	8.0 J	<10	<50	4.0 J	1.8	<0.50	<10	<10	<5.0	<5.0
Bromodichloromethane	50	<50	<10 [<10]	<10	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	0.70 J	0.70 J	<5.0	<5.0
Bromoform	50	<50	<10 [<10]	0.40 J	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
Carbon Disulfide	- -	<50	<10 [<10]	0.80 J	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
Chloroform	7	<50	<10 [<10]	<10	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	3.0 J	<10	<5.0	<5.0
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	<5.0	<5.0 [<5.0]	NA	NA	<50	<50	NA	NA	NA	NA	<5.0	<5.0
Dibromochloromethane	50	<50	<10 [<10]	<10	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
Ethylbenzene	5	48 J	3.0 J [<10]	<10	1.0 J	<5.0	<5.0 [<5.0]	100	200	200	350	110	25	<10	3.0 J	<5.0	0.40 J
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<50	<10 [<10]	2.0 JB	<10	<5.0	<5.0 [<5.0]	<10	9.0 JB	19 JB	5.0 J	NA	NA	<10	<10	<5.0	<5.0
Styrene	5	<50	<10 [<10]	<10	<10	<5.0	<5.0 [<5.0]	100	440	130	1,400	NA	NA	<10	2.0 J	<5.0	1.0 J
Tetrachloroethene	5	<50	<10 [17]	<10	<10	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
Toluene	5	<50	2.0 J [<10]	<10	<10	<5.0	<5.0 [<5.0]	110	200	39 J	1,400	31	<1.0	8.0 J	8.0 J	<5.0	3.0 J
Trichloroethene	5	<50	<10 [16]	0.80 J	0.80 J	<5.0	<5.0 [<5.0]	<10	<10	<50	<50	NA	NA	<10	<10	<5.0	<5.0
Xylenes (total)	5	70	8.0 J [<10]	2.0 J	3.0 J	<5.0	<5.0 [<5.0]	400	1,100 B	780	1,300	430	19	<10	20 B	<5.0	3.0 J
Total BTEX	- -	140 J	15 J [<10]	2.7 J	6.0 J	<5.0	<5.0 [<5.0]	620 J	1,500	1,000 J	3,100 J	570	43	8.0 J	31 J	<5.0	6.4 J
Total VOCs	- -	740 J	15 J [130 J]	8.5 J	6.8 J	<10	<10 [<10]	720 J	2,000 J	1,200 J	4,500 J	570	43	12 J	41 J	12	7.4 J
Detected SVOCs																	
2,4-Dimethylphenol	50	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
2-Methylnaphthalene	- -	<10	<13 [0.60 J]	<10	<10	<11	<10 [<11]	160 J	420 J	230 J	590	290 J	<2.0	1.0 J	13	<11	<11
2-Methylphenol	- -	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
4-Chloro-3-Methylphenol	- -	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
4-Chloroaniline	5	<10	3.0 J [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
4-Methylphenol	- -	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
Acenaphthene	20	48	22 [24]	43	45	24	15 [17]	15 J	35 J	<500	22 J	17 J	26	<10	0.60 J	<11	<11
Acenaphthylene	- -	14	5.0 J [5.0 J]	11	11	3.0 J	2.0 J [2.0 J]	100 J	270 J	190 J	230 J	140 J	110	0.50 J	3.0 J	<11	<11
Anthracene	50	6.0 J	2.0 J [2.0 J]	6.0 J	5.0 J	3.0 J	2.0 J [2.0 J]	2.0 J	9.0 J	<500	<560	<400	3.6	0.10 J	<10	<11	<11
Benzo(a)anthracene	0.002	<10	0.40 J [0.40 J]	0.90 J	2.0 J	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0	<10	<10	<11	<11
Benzo(a)pyrene	0	<10	0.20 J [0.30 J]	0.50 J	1.0 J	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0 J	<10	<10	<11	<11
Benzo(b)fluoranthene	0.002	<10	<13 [<12]	0.40 J	1.0 J	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0	<10	<10	<11	<11
Benzo(g,h,i)perylene	- -	<10	<13 [<12]	0.30 J	1.0 J	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0	<10	<10	<11	<11
Benzo(k)fluoranthene	0.002	<10	<13 [<12]	0.40 J	1.0 J	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0	<10	<10	<11	<11
bis(2-Ethylhexyl)phthalate	5	<10	<13 [<12]	4.0 JB	14 B	<11	<10 [<11]	23 JB	<10	<500	<560	NA	NA	6.0 JB	10 B	<11	<11
Butylbenzylphthalate	50	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
Carbazole	- -	2.0 J	<13 [<12]	1.0 J	0.70 J	<11	<10 [<11]	5.0 J	<10	<500	<560	NA	NA	<10	<10	<11	<11
Chrysene	0.002	0.50 J	0.40 J [0.50 J]	1.0 J	2.0 J	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0	<10	<10	<11	<11
Dibenzo(a,h)anthracene	- -	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0 J	<10	<10	<11	<11
Dibenzofuran	- -	3.0 J	0.90 J [1.0 J]	2.0 J	3.0 J	<11	0.90 J [1.0 J]	4.0 J	<10	<500	<560	NA	NA	<10	<10	<11	<11
Diethylphthalate	50	<10	<13 [<12]	0.80 JB	1.0 JB	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	0.60 JB	1.0 JB	<11	<11
Dimethylphthalate	50	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	0.40 J	0.40 J	<11	<11
Di-n-Butylphthalate	50	<10	<13 [<12]	0.30 JB	0.30 JB	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	0.30 JB	1.0 JB	<11	<11
Di-n-Octylphthalate	50	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
Fluoranthene	50	2.0 J	0.70 J [0.80 J]	3.0 J	5.0 J	1.0 J	1.0 J [1.0 J]	<10	<10	<500	<560	<400	<2.0	0.10 J	<10	<11	<11
Fluorene	50	28	3.0 J [3.0 J]	11	11	6.0 J	3.0 J [4.0 J]	33 J	55 J	<500	43 J	33 J	<2.0	1.0 J	<10	<11	<11
Indeno(1,2,3-cd)pyrene	0.002	<10	<13 [<12]	0.20 J	1.0 J	<11	<10 [<11]	<10	<10	<500	<560	<400	<2.0 J	<10	<10	<11	<11
Naphthalene	10	14	4.0 J [4.0 J]	<10	1.0 J	<11	4.0 J [5.0 J]	1,100	2,700	3,000	4,200	2,600	21	5.0 JB	61	<11	1.0 J
N-Nitrosodiphenylamine	50	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
Phenanthrene	50	17	8.0 J [10 J]	20	6.0 J	0.90 J	0.40 J [0.50 J]	19 J	54 J	<500	39 J	30 J	27	0.60 J	0.40 J	<11	<11
Phenol	1	<10	<13 [<12]	<10	<10	<11	<10 [<11]	<10	<10	<500	<560	NA	NA	<10	<10	<11	<11
Pyrene	50	2.0 J	2.0 J [2.0 J]	4.0 J	8.0 J	2.0 J	1.0 J [2.0 J]	<10	<10	<500	<560	<400	0.43 J	0.20 J	<10	<11	<11
Total PAHs	- -	130 J	48 J [53 J]	100 J	100 J	40 J	28 J [34 J]	1,400 J	3,500 J	3,400 J	5,100 J	3,100 J	190 J	8.5 J	78 J	<11	1.0 J
Total SVOCs	- -	140 J	52 J [54 J]	110 J	120 J	40 J	29 J [35 J]	1,500 J	3,500 J	3,400 J	5,100 J	3,100 J	190 J	16 J	90 J	<54	1.0 J

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-8D						MW-9D1						MW-9D2			
Date Collected:	Guidance Values	08/30/95	11/15/95	07/08/97	09/09/97	11/06/02	01/28/03	07/09/97	09/08/97	11/06/02	01/21/03	04/10/08	01/31/13	07/10/97	09/08/97	11/06/02	01/21/03
Detected Inorganics																	
Aluminum	- -	3,310	634 [2,430]	144,000	2,800 *	427 JB	1,860 B [1,230 B]	330	532 B	<2,500 J	<12,500	NA	NA	547	<320 *	<12,500 J	<12,500
Antimony	3	<3.00	<27.0 [<27.0]	<8.00	<80.0	<100	<100 [<100]	<8.00	<80.0	<100	<500	NA	NA	<8.00	<80.0	<500	<500
Arsenic	25	<3.00	<2.00 [<2.00]	91.0	<30.0	<200	<200 [<200]	<3.00	<30.0	<200	<1,000	NA	NA	<3.00	<30.0	<1,000	<1,000
Available Cyanide	- -	NA	NA	NA	NA	NA	<2.00 [<2.00]	NA	NA	NA	<2.00	NA	NA	NA	NA	NA	<2.00
Barium	1,000	120 B	106 B [174 B]	993 N	88.2 B	121	127 [124]	54.6 B	26.6 B	25.3	32.2 B	NA	NA	40.7 BN	190 B	42.4 B	45.4 B
Beryllium	- -	<1.00	<1.00 [2.20 B]	7.30	<10.0	<25.0	<25.0 [<25.0]	<1.00	<10.0	<25.0	<125	NA	NA	<1.00 N	15.8 B	<125	<125
Cadmium	5	<1.00	<2.00 [<2.00]	34.3	<10.0 N	<50.0	<50.0 [<50.0]	<1.00	<10.0 N	<50.0	<250	NA	NA	1.20 BN	<10.0 N	<250	<250
Calcium	- -	149,000	320,000 [656,000]	2,690,000 E	200,000 E	308,000	367,000 [309,000]	481,000 E	985,000 E	1,070,000	1,310,000	NA	NA	1,550,000 E	1,640,000 E	1,910,000	1,970,000
Chloride	250,000	NA	NA	NA	NA	1,500,000	1,700,000 [1,700,000]	NA	NA	16,000,000	92,000,000	NA	NA	NA	NA	97,000,000	27,000,000
Chromium	50	7.30 B	3.80 B [6.30 B]	426	<10.0	<50.0	18.5 B [10.3 B]	26.3	<10.0	<50.0	<250	NA	NA	7.80 B	11.0 B	<250	<250
Cobalt	- -	4.00 B	<4.00 [9.30 B]	144 N	<10.0	<50.0	<50.0 [<50.0]	<9.00	<10.0	<50.0	<250	NA	NA	<9.00 N	<10.0	<250	<250
Copper	200	8.40 B	<20.2 [<33.6]	356	16.1 B	<50.0	18.3 B [20.9 B]	1.50 B	96.2 B	<50.0	<250	NA	NA	17.2 B	120 B	<250	86.9 B
Cyanide	200	<10.0	<20.0 [<50.0]	<0.0100	<0.0100	<10.0	3.40 B [3.40 B]	<0.0100	<0.0100	<10.0	<10.0	NA	NA	<0.0100	<0.0100	<10.0	<10.0
Iron	300	5,200	3,340 [6,530]	240,000 NE	6,060	1,960	5,060 [3,410]	328	513 B	<1,000	<5,000	NA	NA	1,940 NE	3,810	7,000	7,060
Lead	25	10.1	<8.40 [15.3]	138 N	<10.0	<50.0 J	<50.0 [<50.0]	2.10 B	<10.0	<50.0 J	<250	NA	NA	3.10 N	<10.0	<250 J	<250
Magnesium	- -	49,500	105,000 [236,000]	904,000 E	54,400 E	64,400	80,900 [68,000]	35,000 E	140,000 E	135,000	217,000	NA	NA	64,500 E	142,000 E	290,000	303,000
Manganese	300	494	1,150 [2,580]	7,460 NE	272	172	251 [191]	26.3	100 B	121	171 B	NA	NA	220 NE	215	879	757
Mercury	0.7	<0.200	<0.200 [<0.200]	0.740	<0.200 N	<0.200	<0.200 [<0.200]	<0.200	<0.200 N	<0.200	<0.200	NA	NA	<0.200	<0.200 N	<0.200	<0.200
Nickel	100	9.20 B	14.3 B [13.4 B]	293 N	<10.0	<50.0	11.5 B [<50.0]	1.40 B	<10.0	<50.0	<250	NA	NA	1.20 BN	<10.0	<250	<250
Nitrate Nitrogen	10,000	NA	NA	NA	NA	<100	67.0 B [69.0 B]	NA	NA	<500	<5,000	NA	NA	NA	NA	<5,000	<5,000
Potassium	- -	15,200	7,460 [8,160]	40,200	8,560 BE	13,600	15,900 [13,500]	72,300 E	66,500 E	78,600	111,000	NA	NA	99,200	724,000 E	443,000	417,000
Selenium	10	<2.00	<2.00 [<2.00]	<3.00	<30.0 N	<150 J	<150 [<150]	<3.00	<30.0 N	<150	<750	NA	NA	<3.00	<30.0 N	<750 J	<750
Silver	50	<1.00	<3.00 [<3.00]	<1.00	<10.0	<30.0	<30.0 [<30.0]	<1.00	<10.0	<30.0 J	<150	NA	NA	<1.00	<10.0	<150	<150
Sodium	- -	211,000	529,000 [518,000]	635,000	435,000 E	624,000	702,000 [685,000]	8,890,000	1,350,000 E	1,640,000	8,240,000	NA	NA	41,600,000	112,000 E	8,330,000 E	9,590,000
Sulfate	250,000	NA	NA	NA	NA	510,000	590,000 [590,000]	NA	NA	2,800,000	4,900,000	NA	NA	NA	NA	4,600,000	3,500,000
Sulfide	50	NA	NA	NA	NA	<1,000	<1,000 [<1,000]	NA	NA	8,600	<1,000	NA	NA	NA	NA	<1,000	2,000
Thallium	- -	<4.00	<2.00 [<2.00]	<3.00 N	<30.0	<200 J	<200 [<200]	<3.00 N	<30.0	<200 J	<1,000	NA	NA	<3.00 N	<30.0	<1,000 J	<1,000
Vanadium	- -	4.30 B	7.40 B [7.80 B]	222 N	<10.0	<30.0	<30.0 [<30.0]	<9.00	<10.0	<30.0	<150	NA	NA	<1.00 N	<10.0	<150	<150
Zinc	2,000	<32.4	<22.1 [102]	690	<60.0	<250	<250 [<250]	19.3 B	<60.0	<250	<1,250	NA	NA	25.4	70.6 B	<1,250	<1,250
Detected Inorganics-Filtered																	
Iron	300	NA	NA	NA	NA	885	756 [720]	NA	NA	<200	<1,000	NA	NA	NA	NA	2,900	4,900
Manganese	300	NA	NA	NA	NA	125	127 [124]	NA	NA	83.9	141	NA	NA	NA	NA	412	562
Detected PCBs																	
None Detected	- -	- -	- - [- -]	- -	- -	NA	NA	- -	- -	NA	NA	NA	NA	- -	- -	NA	NA
Detected Organochlorine Pesticides																	
4,4'-DDD	0.3	<0.10	<0.10 [<0.11]	<0.10	<0.10	<0.17	<0.15 [<0.16]	<0.10	<0.10	<0.15	<0.15	NA	NA	<0.10	<0.10	<0.15	<0.17
4,4'-DDE	0.2	0.030 JP	<0.10 [<0.11]	0.011 JP	0.016 JP	0.026 J	<0.10 [<0.11]	<0.10	<0.10	<0.10	<0.10	NA	NA	<0.10	<0.10	<0.10	<0.11
4,4'-DDT	0.2	<0.10	<0.10 [<0.11]	<0.10	<0.10	<0.11	<0.10 [<0.11]	0.019 JP	<0.10	<0.10	<0.10	NA	NA	<0.10	<0.10	<0.10	<0.11
Aldrin	0	<0.050	<0.050 [<0.060]	<0.050	<0.050	<0.056	<0.050 [<0.054]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Alpha-BHC	0.01	<0.050	<0.050 [<0.060]	0.0033 JP	<0.050	<0.056	0.063 J [0.062]	<0.050	0.021 JP	0.014 J	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Alpha-Chlordane	0.05	<0.050	<0.050 [<0.060]	<0.050	<0.050	<0.056	<0.050 [<0.054]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Beta-BHC	- -	<0.050	<0.050 [<0.060]	<0.050	<0.050	<0.056	<0.050 [<0.054]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Delta-BHC	- -	<0.050	<0.050 [<0.060]	0.0053 JP	0.025 JP	0.011 J	<0.050 [<0.054]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Dieldrin	0.004	0.0060 JP	<0.10 [<0.11]	<0.10	<0.10	<0.11	<0.10 [<0.11]	<0.10	<0.10	<0.10	<0.10	NA	NA	<0.10	<0.10	<0.10	<0.11
Endosulfan I	- -	<0.050	<0.050 [<0.060]	<0.050	<0.050	<0.056	<0.050 [<0.054]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Endosulfan II	- -	<0.10	<0.10 [<0.11]	<0.10	<0.10	<0.11	<0.10 [<0.11]	<0.10	<0.10	<0.10	<0.10	NA	NA	<0.10	<0.10	<0.10	<0.11
Endosulfan Sulfate	- -	<0.10	<0.10 [<0.11]	<0.10	0.013 JP	<0.11	<0.10 [<0.11]	<0.10	<0.10	<0.10	<0.10	NA	NA	<0.10	<0.10	<0.10	<0.11
Endrin	0	<0.10	<0.10 [<0.11]	<0.10	<0.10	<0.11	<0.10 [<0.11]	<0.10	<0.10	0.25	<0.10	NA	NA	<0.10	<0.10	<0.10	<0.11
Gamma-BHC (Lindane)	0.05	<0.050	<0.050 [<0.060]	<0.050	<0.050	<0.056	0.039 J [0.038 J]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Gamma-Chlordane	0.05	<0.050	<0.050 [<0.060]	<0.050	<0.050	<0.056	<0.050 [<0.054]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Heptachlor	0.04	<0.050	<0.050 [<0.060]	<0.050	<0.050	0.036 J	0.027 J [0.037 J]	<0.050	<0.050	0.045 J	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Heptachlor Epoxide	0.03	<0.050	<0.050 [<0.060]	<0.050	<0.050	0.052 J	<0.050 [<0.054]	<0.050	<0.050	<0.050	<0.050	NA	NA	<0.050	<0.050	<0.050	<0.056
Methoxychlor	35	<0.50	<0.50 [<0.56]	<0.50	<0.50	<0.56	<0.50 [<0.54]	<0.50	<0.50	<0.50	<0.50	NA	NA	<0.50	<0.50	<0.50	<0.56
Detected Miscellaneous																	
BOD (5 Day)	- -	3,000	6,000 [27,000]	29,000	NA	660 B	870 B [1,500 B]	3,000	NA	9,400	<2,000	NA	NA	5,000	NA	<2,000	4,800
CO2 by Headspace	- -	NA	NA	NA	NA	22,000	20,000	NA	NA	33,000	22,000	NA	NA	NA	NA	21,000	14,000
Carbon monoxide	- -	NA	NA	NA	NA	<400	<400	NA	NA	<400	<400	NA	NA	NA	NA	<400	<400
COD	- -	<61,600	<81,800 [<183,000]	36,500	NA	7,490 B	13,400 [12,700]	70,700	NA	101,000	920,000	NA	NA	502,000	NA	767,000	296,000
Chloride	250,000	1,100,000	931,000 [1,050,000]	999,000	NA	NA	NA	12,400,000	NA	NA	NA	NA	NA	63,200,000	NA	NA	NA
DOC	- -	NA	NA	NA	NA	440 B	670 B [400 B]	NA	NA	2,200	460	NA	NA	NA	NA	390 B	4,300
Hardness, Ca/CO3	- -	669,000	1,260,000 [2,880,000]	6,340,000	NA	NA	NA	1,350,000	NA	NA	NA	NA	NA	1,210,000	NA	NA	NA
Methane	- -	NA	NA	NA	NA	4	3,400	NA	NA	100	180,000	NA	NA	NA	NA	36	53,000
Nitrate Nitrogen	10,000	<100	<100 [<100]	<100	NA	NA	NA	<100	NA	NA	NA	NA	NA	210	NA	NA	NA
Nitrite Nitrogen	1,000	<5	9 [<5]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oil and Grease	- -	<1,000	<1,000 [<1,000]	3,200 N	NA	NA	NA	1,500	NA	NA	NA	NA	NA	<1,000 N	NA	NA	NA
pH, Standard Units	- -	7.4	7.72 [7.53]	7.76	NA	NA	NA	11.1	NA	NA	NA	NA	NA	6.82	NA	NA	NA
Sulfate	250,000	370,000	319,000 [461,000]	414,000	NA	NA	NA	53,600	NA	NA	NA	NA	NA	20,300	NA	NA	NA
Sulfide	50	<1,000	1,200 [<1,000]	<5,000	NA	NA	NA	<1,000	NA	NA	NA	NA	NA	<1,000	NA	NA	NA
Total Organic Carbon	- -	NA	NA	NA	NA	790 B	740 B [550 B]	NA	NA	2,300	270 B	NA	NA	NA	NA	<1,000	4,500
Total Dissolved Solids	1,000,000	157,000	2,010,000 [2,270,000]	2,920,000	NA	NA	NA	25,300,000	NA	NA	NA	NA	NA	110,000,000	NA	NA	NA

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-10S						MW-10D						MW-11D					
Date Collected:	Guidance Values	07/09/97	09/08/97	11/07/02	01/22/03	04/10/08	01/28/13	07/09/97	09/08/97	11/07/02	01/22/03	04/10/08	01/28/13	07/08/97	09/10/97	11/07/02	01/16/03	04/09/08	01/31/13
Detected VOCs																			
1,1,1-Trichloroethane	5	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	NA	NA	<10	<10	<5.0	<5.0	NA	NA
1,1,2,2-Tetrachloroethane	5	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	NA	NA	<10	<10	<5.0	<5.0	NA	NA
1,1-Dichloroethane	5	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	NA	NA	<10	<10	<5.0	<5.0	NA	NA
1,2-Dichloroethane	0.6	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	NA	NA	<10	<10	<5.0	<5.0	NA	NA
1,2-Dichloroethene (total)	- -	<10	<10	NA	NA	NA	NA	<10	<10	NA	NA	NA	NA	<10	<10	NA	NA	NA	NA
2-Butanone	- -	<10	<10	<10	<10	NA	NA	<10	3.0 JB	<20	<20	NA	NA	<10	<10	<10	<10	NA	NA
2-Hexanone	50	<10	<10	<10	<10	NA	NA	<10	<10	<20	<20	NA	NA	<10	<10	<10	<10	NA	NA
4-Methyl-2-pentanone	- -	<10	<10	<10	<10	NA	NA	<10	<10	<20	<20	NA	NA	<10	<10	<10	<10	NA	NA
Acetone	50	<10	<10	<10	<10	NA	NA	6.0 JB	17 JB	<20	<20	NA	NA	7.0 JB	<10	<10	<10	NA	NA
Benzene	1	<10	<10	<5.0	0.50 J	<1.0	<0.50	19	74	48	48	22	<0.50	<10	<10	13	19	27	1.7
Bromodichloromethane	50	<10	<10	<5.0	<5.0	NA	NA	3.0 J	<10	<10	<10	NA	NA	3.0 J	<10	<5.0	<5.0	NA	NA
Bromoform	50	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	NA	NA	<10	<10	<5.0	<5.0	NA	NA
Carbon Disulfide	- -	<10	<10	<5.0	<5.0	NA	NA	<10	2.0 J	<10	<10	NA	NA	<10	<10	<5.0	5.0 J	NA	NA
Chloroform	7	<10	<10	<5.0	<5.0	NA	NA	13	<10	<10	<10	NA	NA	13	7.0 J	<5.0	<5.0	NA	NA
cis-1,2-Dichloroethene	5	NA	NA	<5.0	<5.0	NA	NA	NA	NA	<10	<10	NA	NA	NA	NA	<5.0	<5.0	NA	NA
Dibromochloromethane	50	<10	<10	<5.0	<5.0	NA	NA	0.90 J	0.90 J	<10	<10	NA	NA	0.90 J	<10	<5.0	<5.0	NA	NA
Ethylbenzene	5	<10	<10	<5.0	1.0 J	0.41 J	<1.0	5.0 J	41	80	93	83	1.3	<10	2.0 J	12	12	20	1.5
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<10	<10	<5.0	<5.0	NA	NA	<10	3.0 JB	<10	1.0 J	NA	NA	<10	<10	<5.0	<5.0	NA	NA
Styrene	5	<10	<10	<5.0	7.0	NA	NA	15	200	380	400	NA	NA	<10	<10	14	30	NA	NA
Tetrachloroethene	5	2.0 J	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	NA	NA	<10	<10	<5.0	<5.0	NA	NA
Toluene	5	<10	<10	<5.0	5.0	0.28 J	<1.0	28	140	270	260	100	<1.0	<10	13	48	48	89	<1.0
Trichloroethene	5	<10	<10	<5.0	<5.0	NA	NA	<10	<10	<10	<10	NA	NA	<10	<10	<5.0	<5.0	NA	NA
Xylenes (total)	5	<10	1.0 JB	<5.0	9.0	1.6 J	<1.0	18	220 B	420	310	450	6.4	<10	10	77	75	110	1.2
Total BTEX	- -	<10	1.0 J	<5.0	16 J	2.3 J	<1.0	70 J	480	820	710	660	7.7	<10	25 J	150	150	250	4.4
Total VOCs	- -	2.0 J	1.0 J	<10	23 J	2.3 J	<1.0	110 J	700 J	1,200	1,100 J	660	7.7	24 J	32 J	160	190 J	250	4.4
Detected SVOCs																			
2,4-Dimethylphenol	50	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
2-Methylnaphthalene	- -	<10	<10	1.0 J	0.70 J	<10	<2.0	34 J	100	110 J	150 J	79 J	1.3 J	<10	22 J	67	48	11 J	5.4
2-Methylphenol	- -	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	0.80 J	<10	<45	<29	NA	NA
4-Chloro-3-Methylphenol	- -	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	3.0 J	<10	<45	<29	NA	NA
4-Chloroaniline	5	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
4-Methylphenol	- -	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	0.30 J	<10	<45	<29	NA	NA
Acenaphthene	20	<10	<10	<11	<11	<10	<2.0	0.90 J	<10	<220	<270	<200	<2.0	15 J	<10	<45	2.0 J	<40	<2.0
Acenaphthylene	- -	<10	<10	<11	<11	<10	<2.0	14 J	42 J	46 J	51 J	32 J	0.56 J	<10	6.0 J	15 J	10 J	3.2 J	1.5 J
Anthracene	50	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Benzo(a)anthracene	0.002	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Benzo(a)pyrene	0	<10	<10	<11	<11	<10	<2.0 J	<10	<10	<220	<270	<200	<2.0 J	<10	<10	<45	<29	<40	<2.0 J
Benzo(b)fluoranthene	0.002	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Benzo(g,h,i)perylene	- -	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	10 J	<10	<45	<29	<40	<2.0
Benzo(k)fluoranthene	0.002	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
bis(2-Ethylhexyl)phthalate	5	1.0 JB	2.0 JB	<11	<11	NA	NA	6.0 JB	4.0 JB	<220	<270	NA	NA	5.0 JB	3.0 JB	<45	<29	NA	NA
Butylbenzylphthalate	50	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
Carbazole	- -	<10	<10	<11	<11	NA	NA	2.0 J	6.0 J	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
Chrysene	0.002	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Dibenzo(a,h)anthracene	- -	<10	<10	<11	<11	<10	<2.0 J	<10	<10	<220	<270	<200	<2.0 J	<10	<10	<45	<29	<40	<2.0 J
Dibenzofuran	- -	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
Diethylphthalate	50	0.50 JB	0.70 JB	<11	<11	NA	NA	2.0 JB	<10	<220	<270	NA	NA	0.90 JB	<10	<45	<29	NA	NA
Dimethylphthalate	50	<10	<10	<11	<11	NA	NA	1.0 J	<10	<220	<270	NA	NA	0.20 J	<10	<45	<29	NA	NA
Di-n-Butylphthalate	50	0.30 JB	0.60 JB	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	0.70 JB	<10	<45	<29	NA	NA
Di-n-Octylphthalate	50	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
Fluoranthene	50	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Fluorene	50	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Indeno(1,2,3-cd)pyrene	0.002	<10	<10	<11	<11	<10	<2.0 J	<10	<10	<220	<270	<200	<2.0 J	<10	<10	<45	<29	<40	<2.0 J
Naphthalene	10	<10	<10	5.0 J	16	1.1 J	<2.0	220	780	1,200	1,500	920	9.0	100	230	270	170	110	65
N-Nitrosodiphenylamine	50	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
Phenanthrene	50	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Phenol	1	<10	<10	<11	<11	NA	NA	<10	<10	<220	<270	NA	NA	<10	<10	<45	<29	NA	NA
Pyrene	50	<10	<10	<11	<11	<10	<2.0	<10	<10	<220	<270	<200	<2.0	<10	<10	<45	<29	<40	<2.0
Total PAHs	- -	<10	<10	6.0 J	17 J	1.1 J	<2.0	270 J	920 J	1,400 J	1,700 J	1,000 J	11 J	130 J	260 J	350 J	230 J	120 J	72 J
Total SVOCs	- -	1.8 J	3.3 J	6.0 J	17 J	1.1 J	<2.0	280 J	930 J	1,400 J	1,700 J	1,000 J	11 J	140 J	260 J	350 J	230 J	120 J	72 J

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-10S						MW-10D						MW-11D					
Date Collected:	Guidance Values	07/09/97	09/08/97	11/07/02	01/22/03	04/10/08	01/28/13	07/09/97	09/08/97	11/07/02	01/22/03	04/10/08	01/28/13	07/08/97	09/10/97	11/07/02	01/16/03	04/09/08	01/31/13
Detected Inorganics																			
Aluminum	- -	9,900	35,500 *	<2,500 J	<2,500	NA	NA	598	<320 *	<12,500 J	4,550 B	NA	NA	238	<320 *	<12,500 J	<12,500	NA	NA
Antimony	3	<8.00	<80.0	<100	<100	NA	NA	<8.00	<80.0	<500	<500	NA	NA	<8.00	<80.0	<500	<500	NA	NA
Arsenic	25	4.60 B	<30.0	<200	<200	NA	NA	<3.00	<30.0	<1,000	<1,000	NA	NA	<3.00	<30.0	<1,000	<1,000	NA	NA
Available Cyanide	- -	NA	NA	NA	<2.00	NA	NA	NA	NA	NA	<2.00	NA	NA	NA	NA	NA	<2.00	NA	NA
Barium	1,000	158 BN	380 B	108	112	NA	NA	30.6 BN	42.9 B	42.6 B	53.5 B	NA	NA	18.2 B	30.3 B	40.2 B	41.0 B	NA	NA
Beryllium	- -	<1.00	<10.0	<25.0	<25.0	NA	NA	<1.00	<10.0	<125	<125	NA	NA	<1.00	<10.0	<125	<125	NA	NA
Cadmium	5	<1.00 N	<10.0 N	<50.0	<50.0	NA	NA	3.40 BN	<10.0 N	<250	<250	NA	NA	1.30 B	<10.0 N	<250	<250	NA	NA
Calcium	- -	166,000 E	263,000 E	207,000	210,000	NA	NA	243,000 E	1,440,000 E	1,940,000	1,690,000	NA	NA	111,000 E	986,000 E	1,700,000	1,730,000	NA	NA
Chloride	250,000	NA	NA	940,000	900,000	NA	NA	NA	NA	94,000,000	91,000,000	NA	NA	NA	NA	54,000,000	67,000,000	NA	NA
Chromium	50	14.6	45.0 B	<50.0	<50.0	NA	NA	9.00 B	13.8 B	<250	66.9 B	NA	NA	5.80 B	<10.0	<250	<250	NA	NA
Cobalt	- -	<9.00 N	39.6 B	<50.0	<50.0	NA	NA	<9.00 N	<10.0	<250	<250	NA	NA	<9.00	<10.0	<250	<250	NA	NA
Copper	200	21.6 B	101 B	<50.0	<50.0	NA	NA	10.9 B	26.8 B	<250	58.7 B	NA	NA	<1.00	14.8 B	<250	<250	NA	NA
Cyanide	200	<0.0100	<0.0100	<10.0	<10.0	NA	NA	<0.0100	<0.0100	<10.0	<10.0	NA	NA	<0.0100	<0.0100	<10.0	<10.0	NA	NA
Iron	300	16,700 NE	58,900	<1,000	<1,000	NA	NA	715 NE	3,210	7,850	13,300	NA	NA	259	<100	2,900 B	<5,000	NA	NA
Lead	25	9.60 N	40.2	<50.0 J	<50.0	NA	NA	25.9 N	<10.0	<250 J	<250	NA	NA	2.90 B	<10.0	<250 J	<250	NA	NA
Magnesium	- -	49,600 E	103,000 E	41,100	42,000	NA	NA	29,500 E	217,000 E	298,000	307,000	NA	NA	19,300 E	157,000 E	269,000	271,000	NA	NA
Manganese	300	1,730 NE	4,910	96.5	118	NA	NA	70.3 NE	385	803	797	NA	NA	10.0 B	151	331 B	250 B	NA	NA
Mercury	0.7	<0.200	0.250 N	<0.200	<0.200	NA	NA	<0.200	<0.200 N	<0.200	<0.200	NA	NA	<0.200	<0.200 N	<0.200	<0.200	NA	NA
Nickel	100	25.4 BN	85.1 B	<50.0	<50.0	NA	NA	3.70 BN	<10.0	<250	<250	NA	NA	2.50 B	<10.0	<250	<250	NA	NA
Nitrate Nitrogen	10,000	NA	NA	<100	<100	NA	NA	NA	NA	<5,000	<5,000	NA	NA	NA	NA	<5,000	<2,500	NA	NA
Potassium	- -	8,580	16,700 BE	12,800	12,500	NA	NA	17,700	392,000 E	439,000	410,000	NA	NA	30,500 E	148,000 E	323,000	308,000	NA	NA
Selenium	10	<3.00	<30.0 N	<150 J	<150	NA	NA	<3.00	<30.0 N	<750 J	<750	NA	NA	<3.00	<30.0 N	<750 J	<750	NA	NA
Silver	50	<1.00	<10.0	<30.0	<30.0	NA	NA	<1.00	<10.0	<150	<150	NA	NA	<1.00	<10.0	<150	<150	NA	NA
Sodium	- -	364,000	342,000 E	403,000	414,000	NA	NA	6,670,000	266,000 E	8,270,000 E	9,540,000	NA	NA	3,110,000	1,160,000 E	8,360,000 E	9,560,000	NA	NA
Sulfate	250,000	NA	NA	320,000	350,000	NA	NA	NA	NA	4,600,000	4,800,000	NA	NA	NA	NA	4,600,000	4,200,000	NA	NA
Sulfide	50	NA	NA	<1,000	<1,000	NA	NA	NA	NA	<1,000	<1,000	NA	NA	NA	NA	9,800	8,600	NA	NA
Thallium	- -	<3.00 N	<30.0	<200 J	<200	NA	NA	<3.00 N	<30.0	<1,000 J	<1,000	NA	NA	<3.00	<30.0	<1,000 J	<1,000	NA	NA
Vanadium	- -	15.6 BN	50.5 B	<30.0	<30.0	NA	NA	<1.00 N	<10.0	<150	<150	NA	NA	<9.00	<10.0	<150	<150	NA	NA
Zinc	2,000	75.4	205	<250	<250	NA	NA	51.2	<60.0	<1,250	<1,250	NA	NA	23.4	<60.0	<1,250	<1,250	NA	NA
Detected Inorganics-Filtered																			
Iron	300	NA	NA	1,350	<1,000	NA	NA	NA	NA	2,510	3,920	NA	NA	NA	NA	<200	<1,000	NA	NA
Manganese	300	NA	NA	283	89.7	NA	NA	NA	NA	363	490	NA	NA	NA	NA	128	152	NA	NA
Detected PCBs																			
None Detected	- -	- -	NA	NA	NA	NA	NA	- -	- -	NA	NA	NA	NA	- -	- -	NA	NA	NA	NA
Detected Organochlorine Pesticides																			
4,4'-DDD	0.3	<0.10	NA	<0.15	<0.17	NA	NA	<0.10	<0.10	<0.17	<0.17	NA	NA	<0.10	<0.10	<0.16	<0.20	NA	NA
4,4'-DDE	0.2	<0.10	NA	<0.10	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	NA	NA	<0.10	0.0013 JP	<0.11	<0.14	NA	NA
4,4'-DDT	0.2	<0.10	NA	<0.10	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	NA	NA	<0.10	0.028 JP	<0.11	<0.14	NA	NA
Aldrin	0	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	0.058	0.024 J	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Alpha-BHC	0.01	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Alpha-Chlordane	0.05	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Beta-BHC	- -	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Delta-BHC	- -	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Dieldrin	0.004	<0.10	NA	<0.10	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.14	NA	NA
Endosulfan I	- -	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Endosulfan II	- -	<0.10	NA	<0.10	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.14	NA	NA
Endosulfan Sulfate	- -	<0.10	NA	<0.10	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	NA	NA	0.019 J	<0.10	<0.11	<0.14	NA	NA
Endrin	0	<0.10	NA	<0.10	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.11	NA	NA	<0.10	<0.10	<0.11	<0.14	NA	NA
Gamma-BHC (Lindane)	0.05	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	0.034 J	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Gamma-Chlordane	0.05	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Heptachlor	0.04	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Heptachlor Epoxide	0.03	<0.050	NA	<0.050	<0.056	NA	NA	<0.050	<0.050	<0.056	<0.056	NA	NA	<0.050	<0.050	<0.054	<0.068	NA	NA
Methoxychlor	35	<0.50	NA	<0.50	<0.56	NA	NA	<0.50	<0.50	<0.56	<0.56	NA	NA	<0.50	<0.50	<0.54	<0.68	NA	NA
Detected Miscellaneous																			
BOD (5 Day)	- -	2,000	NA	<2,000	330 B	NA	NA	6,000	NA	360 B	1,800 B	NA	NA	4,000	NA	13,000	5,500	NA	NA
CO2 by Headspace	- -	NA	NA	16,000	14,000	NA	NA	NA	NA	17,000	15,000	NA	NA	NA	NA	13,000	11,000	NA	NA
Carbon monoxide	- -	NA	NA	<400	<400	NA	NA	NA	NA	<400	<400	NA	NA	NA	NA	<400	<400	NA	NA
COD	- -	12,800	NA	7,810 B	7,850 B	NA	NA	158,000	NA	889,000	1,090,000	NA	NA	43,800	NA	620,000	925,000	NA	NA
Chloride	250,000	715,000	NA	NA	NA	NA	NA	13,500,000	NA	NA	NA	NA	NA	4,860,000	NA	NA	NA	NA	NA
DOC	- -	NA	NA	550 B	470 B	NA	NA	NA	NA	1,300	280 B	NA	NA	NA	NA	490 B	640 B	NA	NA
Hardness, Ca/CO3	- -	630,000	NA	NA	NA	NA	NA	584,000	NA	NA	NA	NA	NA	357,000	NA	NA	NA	NA	NA
Methane	- -	NA	NA	2.3	4,200	NA	NA	NA	NA	33	55,000	NA	NA	NA	NA	120	90,000	NA	NA
Nitrate Nitrogen	10,000	<100	NA	NA	NA	NA	NA	540	NA	NA	NA	NA	NA	640	NA	NA	NA	NA	NA
Nitrite Nitrogen	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oil and Grease	- -	<1,000 N	NA	NA	NA	NA	NA	<1,000 N	NA	NA	NA	NA	NA	<1,000	NA	NA	NA	NA	NA
pH, Standard Units	- -	7.49	NA	NA	NA	NA	NA	7.84	NA	NA	NA	NA	NA	8.25	NA	NA	NA	NA	NA
Sulfate	250,000	138,000	NA	NA	NA	NA	NA	21,700	NA	NA	NA	NA	NA	127,000	NA	NA	NA	NA	NA
Sulfide	50	<1,000	NA	NA	NA	NA	NA	<1,000	NA	NA	NA	NA	NA	<1,000	NA	NA	NA	NA	NA
Total Organic Carbon	- -	NA	NA	300 B	220 B	NA	NA	NA	NA	1,900	840 B	NA	NA	NA	NA	750 B	510 B	NA	NA
Total Dissolved Solids	1,000,000	2,820,000	NA	NA	NA	NA	NA	24,600,000	NA	NA	NA	NA	NA	8,970,000	NA	NA	NA	NA	NA

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-12D						MW-13D			MW-14D				MW-15D			
Date Collected:	Guidance Values	07/08/97	09/08/97	11/07/02	01/16/03	04/10/08	01/30/13	11/07/02	01/22/03	04/10/08	11/08/02	01/16/03	04/11/08	01/30/13	11/12/02	01/21/03	04/10/08	01/30/13
Detected VOCs																		
1,1,1-Trichloroethane	5	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10 J	<10	NA	NA
1,1,2,2-Tetrachloroethane	5	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	0.40 J	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
1,1-Dichloroethane	5	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
1,2-Dichloroethane	0.6	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
1,2-Dichloroethene (total)	- -	<10	<10 [<10]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	- -	<10	<10 [<10]	<10	<10 [<10]	NA	NA	<10	<10	NA	<10	<10	NA	NA	5.0 J	<20	NA	NA
2-Hexanone	50	<10	<10 [<10]	<10	<10 [<10]	NA	NA	<10	<10	NA	<10	<10	NA	NA	<20 J	<20	NA	NA
4-Methyl-2-pentanone	- -	<10	<10 [<10]	<10	<10 [<10]	NA	NA	<10	<10	NA	<10	<10	NA	NA	<20	<20	NA	NA
Acetone	50	<10	3.0 JB [2.0 JB]	<10	<10 [<10]	NA	NA	<10	<10	NA	<10	<10	NA	NA	<20	<20	NA	NA
Benzene	1	<10	<10 [<10]	<5.0	<5.0 [<5.0]	0.63 J	0.81	<5.0	<5.0	<1.0	<5.0	<5.0	<1.0	<0.50	2.0 J	3.0 J	1.7	1.0
Bromodichloromethane	50	2.0 J	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
Bromoform	50	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10 J	<10	NA	NA
Carbon Disulfide	- -	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
Chloroform	7	10	<10 [1.0 J]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	0.20 J	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
cis-1,2-Dichloroethene	5	NA	NA	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
Dibromochloromethane	50	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
Ethylbenzene	5	<10	<10 [<10]	<5.0	<5.0 [<5.0]	0.57 J	0.55 J	<5.0	<5.0	<5.0	<5.0	0.60 J	<5.0	<1.0	72	110	49	30
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<10	<10 [0.90 JB]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	0.80 J	NA	NA
Styrene	5	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	1.0 J	NA	NA	240	300	NA	NA
Tetrachloroethene	5	0.80 J	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
Toluene	5	<10	<10 [<10]	<5.0	<5.0 [<5.0]	0.13 J	<1.0	<5.0	1.0 J	<5.0	<5.0	2.0 J	<5.0	<1.0	48	92	19	26
Trichloroethene	5	<10	<10 [<10]	<5.0	<5.0 [<5.0]	NA	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	NA	<10	<10	NA	NA
Xylenes (total)	5	<10	<10 [1.0 JB]	<5.0	<5.0 [<5.0]	<5.0	0.69 J	<5.0	<5.0	<5.0	<5.0	3.0 J	<5.0	<1.0	400	570	110	81
Total BTEX	- -	<10	<10 [1.0 J]	<5.0	<5.0 [<5.0]	1.3 J	2.1 J	<5.0	1.0 J	<5.0	<5.0	5.6 J	<5.0	<1.0	520 J	780 J	180	140
Total VOCs	- -	13 J	3.0 J [4.9 J]	<10	<10 [<10]	1.3 J	2.1 J	<10	1.6 J	<5.0	<10	6.6 J	<5.0	<1.0	770 J	1,100 J	180	140
Detected SVOCs																		
2,4-Dimethylphenol	50	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
2-Methylnaphthalene	- -	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	0.60 J	<11	<10	<11	<10	<10	<2.0	71 J	54 J	95 J	97
2-Methylphenol	- -	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
4-Chloro-3-Methylphenol	- -	1.0 J	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
4-Chloroaniline	5	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
4-Methylphenol	- -	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Acenaphthene	20	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	43 J	35 J	32 J	24
Acenaphthylene	- -	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	110 J	95 J	87 J	86
Anthracene	50	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Benzo(a)anthracene	0.002	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Benzo(a)pyrene	0	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0 J	<12	<11	<10	<11	<10	<10	<2.0 J	<260	<270	<400	<2.0 J
Benzo(b)fluoranthene	0.002	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Benzo(g,h,i)perylene	- -	0.30 J	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Benzo(k)fluoranthene	0.002	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
bis(2-Ethylhexyl)phthalate	5	6.0 JB	3.0 JB [4.0 JB]	<10	10 J [<11]	NA	NA	<12	1.0 J	NA	<11	<10	NA	NA	<260	<270	NA	NA
Butylbenzylphthalate	50	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Carbazole	- -	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	22 J	20 J	NA	NA
Chrysene	0.002	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Dibenzo(a,h)anthracene	- -	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0 J	<12	<11	<10	<11	<10	<10	<2.0 J	<260	<270	<400	<2.0 J
Dibenzofuran	- -	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Diethylphthalate	50	1.0 JB	1.0 JB [0.50 JB]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Dimethylphthalate	50	0.20 J	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Di-n-Butylphthalate	50	0.40 JB	1.0 JB [0.60 JB]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Di-n-Octylphthalate	50	0.70 J	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Fluoranthene	50	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Fluorene	50	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	9.5
Indeno(1,2,3-cd)pyrene	0.002	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0 J	<12	<11	<10	<11	<10	<10	<2.0 J	<260	<270	<400	<2.0 J
Naphthalene	10	0.20 J	0.80 J [0.60 J]	<10	<11 [<11]	0.63 J	1.1 J	<12	<11	0.52 J	<11	<10	<10	0.27 J	1,800	1,700	2,300	2,600 D
N-Nitrosodiphenylamine	50	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Phenanthrene	50	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Phenol	1	<10	<10 [<10]	<10	<11 [<11]	NA	NA	<12	<11	NA	<11	<10	NA	NA	<260	<270	NA	NA
Pyrene	50	<10	<10 [<10]	<10	<11 [<11]	<10	<2.0	<12	<11	<10	<11	<10	<10	<2.0	<260	<270	<400	<2.0
Total PAHs	- -	0.50 J	0.80 J [0.60 J]	<10	<11 [<11]	0.63 J	1.1 J	0.60 J	<11	0.52 J	<11	<10	<10	0.27 J	2,000 J	1,900 J	2,500 J	2,900
Total SVOCs	- -	9.8 J	5.8 J [5.7 J]	<50	10 J [<54]	0.63 J	1.1 J	0.60 J	1.0 J	0.52 J	<56	<50	<10	0.27 J	2,100 J	1,900 J	2,500 J	2,900

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-12D						MW-13D			MW-14D				MW-15D			
Date Collected:	Guidance Values	07/08/97	09/08/97	11/07/02	01/16/03	04/10/08	01/30/13	11/07/02	01/22/03	04/10/08	11/08/02	01/16/03	04/11/08	01/30/13	11/12/02	01/21/03	04/10/08	01/30/13
Detected Inorganics																		
Aluminum	- -	309	579 B* [610 B*]	<12,500 J	<12,500 [<12,500]	NA	NA	612 JB	1,610 B	NA	508 JB	681 B	NA	NA	4,090 JB	2,660 B	NA	NA
Antimony	3	<8.00	<80.0 [<80.0]	<500	<500 [<500]	NA	NA	<100	<100	NA	<100	<100	NA	NA	<500	<500	NA	NA
Arsenic	25	<3.00	<30.0 [<30.0]	<1,000	<1,000 [<1,000]	NA	NA	<200	<200	NA	<200	<200	NA	NA	<1,000	<1,000	NA	NA
Available Cyanide	- -	NA	NA	NA	<2.00 [<2.00]	NA	NA	NA	<2.00	NA	NA	3.00	NA	NA	NA	<2.00	NA	NA
Barium	1,000	33.0 BN	54.2 B [53.0 B]	<125	29.4 B [30.0 B]	NA	NA	81.8	102	NA	15.4 B	13.9 B	NA	NA	56.1 B	44.8 B	NA	NA
Beryllium	- -	<1.00	<10.0 [<10.0]	<125	<125 [<125]	NA	NA	<25.0	<25.0	NA	<25.0	<25.0	NA	NA	<125	<125	NA	NA
Cadmium	5	21.7 N	10.5 BN [<10.0 N]	<250	<250 [<250]	NA	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	NA	<250	<250	NA	NA
Calcium	- -	389,000 E	826,000 E [806,000 E]	1,310,000	1,730,000 [1,770,000]	NA	NA	228,000	235,000	NA	649,000	646,000	NA	NA	1,480,000	1,440,000	NA	NA
Chloride	250,000	NA	NA	42,000,000	67,000,000	NA	NA	600,000	700,000	NA	550,000	520,000	NA	NA	47,000,000	47,000,000	NA	NA
Chromium	50	11.4	<10.0 [<10.0]	<250	<250 [<250]	NA	NA	<50.0	8.10 B	NA	<50.0	<50.0	NA	NA	<250	<250	NA	NA
Cobalt	- -	<9.00 N	<10.0 [<10.0]	<250	<250 [<250]	NA	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	NA	<250	<250	NA	NA
Copper	200	20.6 BN	90.1 B [59.2 B]	<250	79.5 B [42.0 B]	NA	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	NA	65.5 B	<250	NA	NA
Cyanide	200	<0.0100	<0.0100 [<0.0100]	<10.0	<10.0 [<10.0]	NA	NA	<10.0	<10.0	NA	<10.0	<10.0	NA	NA	<10.0	<10.0	NA	NA
Iron	300	526 NE	1,840 [1,840]	5,140	6,800 [6,960]	NA	NA	1,780	2,900	NA	2,570	2,850	NA	NA	8,750	5,350	NA	NA
Lead	25	3.50 N	<10.0 [<10.0]	<250 J	<250 [<250]	NA	NA	<50.0 J	<50.0	NA	50.0 JB	<50.0	NA	NA	<250 J	<250	NA	NA
Magnesium	- -	39,000 E	34,400 BE [32,600 BE]	217,000	273,000 [284,000]	NA	NA	57,900	55,000	NA	65,400	64,500	NA	NA	285,000	267,000	NA	NA
Manganese	300	49.2 NE	70.2 B [67.1 B]	360 B	494 [440]	NA	NA	312	197	NA	105	94.3	NA	NA	429	325 B	NA	NA
Mercury	0.7	<0.200	<0.200 N [<0.200 N]	<0.200	<0.200 [<0.200]	NA	NA	<0.200	<0.200	NA	<0.200	<0.200	NA	NA	<0.200	<0.200	NA	NA
Nickel	100	5.60 BN	<10.0 [<10.0]	<250	<250 [<250]	NA	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	NA	<250	<250	NA	NA
Nitrate Nitrogen	10,000	NA	NA	<5,000	<2,500	NA	NA	940	1,100	NA	<100	<100	NA	NA	<5,000	<5,000	NA	NA
Potassium	- -	29,600	118,000 E [113,000 E]	181,000	295,000 [298,000]	NA	NA	12,300	13,300	NA	8,240	8,050	NA	NA	209,000	196,000	NA	NA
Selenium	10	<3.00	<30.0 N [<30.0 N]	<750 J	<750 [<750]	NA	NA	<150 J	<150	NA	<150 J	<150	NA	NA	<750 J	<750	NA	NA
Silver	50	<1.00	<10.0 [<10.0]	<150	<150 [<150]	NA	NA	<30.0	<30.0	NA	<30.0	<30.0	NA	NA	<150	<150	NA	NA
Sodium	- -	94,600	1,460,000 E [1,440,000 E]	8,140,000 E	9,590,000 [9,510,000]	NA	NA	338,000	353,000	NA	265,000	266,000	NA	NA	8,990,000	9,320,000	NA	NA
Sulfate	250,000	NA	NA	3,700,000	4,500,000	NA	NA	420,000	360,000	NA	1,500,000	1,300,000	NA	NA	3,700,000	3,900,000	NA	NA
Sulfide	50	NA	NA	<1,000	<1,000	NA	NA	<1,000	<1,000	NA	2,700	<1,000	NA	NA	400 B	200 B	NA	NA
Thallium	- -	<3.00 N	<30.0 N [<30.0 N]	<100 J	<1,000 [<1,000]	NA	NA	<200 J	<200	NA	<200 J	<200	NA	NA	<1,000 J	<1,000	NA	NA
Vanadium	- -	<1.00 N	<10.0 [<10.0]	<150	<150 [<150]	NA	NA	<30.0	<30.0	NA	<30.0	<30.0	NA	NA	<150	<150	NA	NA
Zinc	2,000	26.9	<60.0 [<60.0]	<1,250	<1,250 [<1,250]	NA	NA	<250	<250	NA	<250	<250	NA	NA	<1,250	<1,250	NA	NA
Detected Inorganics-Filtered																		
Iron	300	NA	NA	3,600	4,570 [4,550]	NA	NA	<200	<1,000	NA	1,400	1,450	NA	NA	<1,000	<1,000	NA	NA
Manganese	300	NA	NA	288	331 [346]	NA	NA	92.5	101	NA	71.2	67.3 B	NA	NA	144	139	NA	NA
Detected PCBs																		
None Detected	- -	- -	- - [- -]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Detected Organochlorine Pesticides																		
4,4'-DDD	0.3	<0.10	<0.10 [<0.10]	<0.16	<0.16 [<0.16]	NA	NA	<0.16	<0.16	NA	<0.17	<0.15	NA	NA	<0.16	<0.16	NA	NA
4,4'-DDE	0.2	<0.10	<0.10 [<0.10]	<0.11	<0.10 [<0.10]	NA	NA	<0.11	<0.11	NA	<0.11	<0.10	NA	NA	<0.11	<0.11	NA	NA
4,4'-DDT	0.2	0.0040 JP	<0.10 [<0.10]	<0.11	<0.10 [<0.10]	NA	NA	<0.11	<0.11	NA	<0.11	<0.10	NA	NA	<0.11	<0.11	NA	NA
Aldrin	0	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Alpha-BHC	0.01	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Alpha-Chlordane	0.05	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Beta-BHC	- -	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Delta-BHC	- -	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Dieldrin	0.004	<0.10	<0.10 [<0.10]	<0.11	<0.10 [<0.10]	NA	NA	<0.11	<0.11	NA	<0.11	<0.10	NA	NA	<0.11	<0.11	NA	NA
Endosulfan I	- -	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Endosulfan II	- -	<0.10	<0.10 [<0.10]	<0.11	<0.10 [<0.10]	NA	NA	<0.11	<0.11	NA	<0.11	<0.10	NA	NA	<0.11	<0.11	NA	NA
Endosulfan Sulfate	- -	<0.10	<0.10 [<0.10]	<0.11	<0.10 [<0.10]	NA	NA	<0.11	<0.11	NA	<0.11	<0.10	NA	NA	<0.11	<0.11	NA	NA
Endrin	0	<0.10	<0.10 [<0.10]	<0.11	<0.10 [<0.10]	NA	NA	<0.11	<0.11	NA	<0.11	<0.10	NA	NA	<0.11	<0.11	NA	NA
Gamma-BHC (Lindane)	0.05	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Gamma-Chlordane	0.05	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Heptachlor	0.04	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Heptachlor Epoxide	0.03	<0.050	<0.050 [<0.050]	<0.055	<0.052 [<0.052]	NA	NA	<0.053	<0.054	NA	<0.056	<0.050	NA	NA	<0.053	<0.054	NA	NA
Methoxychlor	35	<0.50	<0.50 [<0.50]	<0.55	<0.52 [<0.52]	NA	NA	<0.53	<0.54	NA	<0.56	<0.50	NA	NA	<0.53	<0.54	NA	NA
Detected Miscellaneous																		
BOD (5 Day)	- -	5,000	NA	<2,000	<2,000	NA	NA	<2,000	<2,000	NA	1,100 B	660 B	NA	NA	<4,000	330 B	NA	NA
CO2 by Headspace	- -	NA	NA	22,000	11,000	NA	NA	17,000	10,000	NA	44,000	38,000	NA	NA	19,000	53,000	NA	NA
Carbon monoxide	- -	NA	NA	<400	<400	NA	NA	<400	<400	NA	<400	<400	NA	NA	<400	<400	NA	NA
COD	- -	196,000	NA	715,000	902,000	NA	NA	5,860 B	7,200 B	NA	<10,000	<10,000	NA	NA	663,000	422,000	NA	NA
Chloride	250,000	13,300,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DOC	- -	NA	NA	750 B	320 B	NA	NA	680 B	600 B	NA	<1,000	480 B	NA	NA	550 B	490 B	NA	NA
Hardness, Ca/CO3	- -	822,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	- -	NA	NA	26	52,000	NA	NA	1	1,900	NA	0.66	1,600	NA	NA	29	19,000	NA	NA
Nitrate Nitrogen	10,000	470	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrite Nitrogen	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oil and Grease	- -	<1,000 N	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH, Standard Units	- -	8.07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250,000	43,800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfide	50	<1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	- -	NA	NA	750 B	440 B	NA	NA	850 B	880 B	NA	570 B	620 B	NA	NA	3,400	640 B	NA	NA
Total Dissolved Solids	1,000,000	27,500,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-16D				MW-17D					MW-18			
Date Collected:	Guidance Values	11/13/02	01/22/03	04/14/08	01/30/13	11/13/02	11/13/02	01/21/03	04/11/08	01/30/13	11/13/02	01/23/03	04/11/08	01/30/13
Detected VOCs														
1,1,1-Trichloroethane	5	<5.0 J	<5.0	NA	NA	<25 J [<25]	<25	<25	NA	NA	<5.0 J	<5.0	NA	NA
1,1,2,2-Tetrachloroethane	5	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
1,1-Dichloroethane	5	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
1,2-Dichloroethane	0.6	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
1,2-Dichloroethene (total)	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	- -	<10	<10	NA	NA	12 J [11 J]	12 J	<50	NA	NA	<10	<10	NA	NA
2-Hexanone	50	<10	<10	NA	NA	<50 [<50]	<50	<50	NA	NA	<10	<10	NA	NA
4-Methyl-2-pentanone	- -	<10	<10	NA	NA	<50 [<50]	<50	<50	NA	NA	<10	<10	NA	NA
Acetone	50	<10 J	<10	NA	NA	<50 J [11 J]	<50	<50	NA	NA	<10 J	<10	NA	NA
Benzene	1	<5.0	<5.0	<1.0	<0.50	6.0 J [6.0 J]	6.0 J	10 J	3.1	5.4	0.70 J	<5.0	0.72 J	<0.50
Bromodichloromethane	50	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
Bromoform	50	<5.0 J	<5.0	NA	NA	<25 J [<25]	<25	<25	NA	NA	<5.0 J	<5.0	NA	NA
Carbon Disulfide	- -	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
Chloroform	7	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
cis-1,2-Dichloroethene	5	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
Dibromochloromethane	50	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
Ethylbenzene	5	<5.0	<5.0	<5.0	<1.0	160 [160]	160	250	22	35	<5.0	<5.0	<5.0	<1.0
Methyl tert-butyl ether	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	<5.0	<5.0	NA	NA	<25 [6.0 J]	10 J	3.0 J	NA	NA	0.60 J	<5.0	NA	NA
Styrene	5	<5.0	<5.0	NA	NA	490 [500]	470	720	NA	NA	0.30 J	<5.0	NA	NA
Tetrachloroethene	5	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
Toluene	5	<5.0	<5.0	<5.0	<1.0	260 [250]	270	480	26	27	1.0 J	<5.0	0.20 J	<1.0
Trichloroethene	5	<5.0	<5.0	NA	NA	<25 [<25]	<25	<25	NA	NA	<5.0	<5.0	NA	NA
Xylenes (total)	5	<5.0	<5.0	<5.0	<1.0	810 [820]	790	850	78	120 J	1.0 J	<5.0	<5.0	<1.0
Total BTEX	- -	<5.0	<5.0	<5.0	<1.0	1,200 J [1,200 J]	1,200 J	1,600 J	130	180	2.7 J	<5.0	0.92 J	<1.0
Total VOCs	- -	<10	<10	<5.0	<1.0	1,700 J [1,800 J]	1,700 J	2,300 J	130	180	3.6 J	<10	0.92 J	<1.0
Detected SVOCs														
2,4-Dimethylphenol	50	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
2-Methylnaphthalene	- -	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
2-Methylphenol	- -	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
4-Chloro-3-Methylphenol	- -	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
4-Chloroaniline	5	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
4-Methylphenol	- -	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Acenaphthene	20	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Acenaphthylene	- -	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Anthracene	50	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Benzo(a)anthracene	0.002	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Benzo(a)pyrene	0	<10	<11	<11	<2.0 J	<110 [<220]	NA	<220	<220	<2.2 J	<11	<14	<10	<2.0 J
Benzo(b)fluoranthene	0.002	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Benzo(g,h,i)perylene	- -	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Benzo(k)fluoranthene	0.002	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
bis(2-Ethylhexyl)phthalate	5	<10 J	0.60 J	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Butylbenzylphthalate	50	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Carbazole	- -	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Chrysene	0.002	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Dibenzo(a,h)anthracene	- -	<10	<11	<11	<2.0 J	<110 [<220]	NA	<220	<220	<2.2 J	<11	<14	<10	<2.0 J
Dibenzofuran	- -	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Diethylphthalate	50	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Dimethylphthalate	50	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Di-n-Butylphthalate	50	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Di-n-Octylphthalate	50	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Fluoranthene	50	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Fluorene	50	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Indeno(1,2,3-cd)pyrene	0.002	<10	<11	<11	<2.0 J	<110 [<220]	NA	<220	<220	<2.2 J	<11	<14	<10	<2.0 J
Naphthalene	10	3.0 J	3.0 J	<11	1.4 J	710 J [1,600 J]	NA	1,700	990	80	3.0 J	0.80 J	<10	<2.0
N-Nitrosodiphenylamine	50	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Phenanthrene	50	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Phenol	1	<10	<11	NA	NA	<110 [<220]	NA	<220	NA	NA	<11	<14	NA	NA
Pyrene	50	<10	<11	<11	<2.0	<110 [<220]	NA	<220	<220	<2.2	<11	<14	<10	<2.0
Total PAHs	- -	3.0 J	3.0 J	<11	1.4 J	710 J [1,600 J]	NA	1,700	990	80	3.0 J	0.80 J	<10	<2.0
Total SVOCs	- -	3.0 J	3.6 J	<11	1.4 J	710 J [1,600 J]	NA	1,700	990	80	3.0 J	0.80 J	<10	<2.0

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Location ID:	NYSDEC TOGS 1.1.1 Water	MW-16D				MW-17D					MW-18			
Date Collected:	Guidance Values	11/13/02	01/22/03	04/14/08	01/30/13	11/13/02	11/13/02	01/21/03	04/11/08	01/30/13	11/13/02	01/23/03	04/11/08	01/30/13
Detected Inorganics														
Aluminum	- -	<12,500 J	<12,500	NA	NA	3,540 JB [3,420 JB]	NA	<12,500	NA	NA	<12,500	<12,500	NA	NA
Antimony	3	<500	<500	NA	NA	<500 [<500]	NA	<500	NA	NA	<500	<500	NA	NA
Arsenic	25	<1,000	<1,000	NA	NA	<1,000 [<1,000]	NA	<1,000	NA	NA	<1,000	<1,000	NA	NA
Available Cyanide	- -	NA	<2.00	NA	NA	NA	NA	<2.00	NA	NA	NA	<2.00	NA	NA
Barium	1,000	30.8 B	29.2 B	NA	NA	83.4 B [80.7 B]	NA	35.6 B	NA	NA	28.5 B	42.5 B	NA	NA
Beryllium	- -	<125	<125	NA	NA	<125 [<125]	NA	<125	NA	NA	<125	<125	NA	NA
Cadmium	5	<250	<250	NA	NA	<250 [<250]	NA	<250	NA	NA	<250	<250	NA	NA
Calcium	- -	919,000	929,000	NA	NA	1,780,000 J [1,780,000 J]	NA	1,780,000	NA	NA	809,000	1,520,000	NA	NA
Chloride	250,000	21,000,000	22,000,000	NA	NA	63,000,000 [64,000,000]	NA	68,000,000	NA	NA	52,000,000	61,000,000	NA	NA
Chromium	50	<250	<250	NA	NA	<250 [<250]	NA	<250	NA	NA	<250	<250	NA	NA
Cobalt	- -	<250	<250	NA	NA	<250 [<250]	NA	<250	NA	NA	<250	<250	NA	NA
Copper	200	56.3 B	80.7 B	NA	NA	51.9 B [50.1 B]	NA	<250	NA	NA	46.5 B	86.5 B	NA	NA
Cyanide	200	<10.0	<10.0	NA	NA	<10.0 [<10.0]	NA	<10.0	NA	NA	<10.0	3.40 B	NA	NA
Iron	300	<5,000	<5,000	NA	NA	9,640 [9,580]	NA	4,150	NA	NA	4,120 B	6,870	NA	NA
Lead	25	<250 J	<250	NA	NA	<250 J [<250 J]	NA	<250	NA	NA	<250	91.3 B	NA	NA
Magnesium	- -	204,000	202,000	NA	NA	323,000 [322,000]	NA	302,000	NA	NA	139,000	262,000	NA	NA
Manganese	300	247 B	194 B	NA	NA	451 [455]	NA	254 B	NA	NA	178 B	355 B	NA	NA
Mercury	0.7	<0.200	<0.200	NA	NA	<0.200 [<0.200]	NA	<0.200	NA	NA	<0.200	<0.200	NA	NA
Nickel	100	<250	<250	NA	NA	<250 [<250]	NA	<250	NA	NA	<250	<250	NA	NA
Nitrate Nitrogen	10,000	<5,000	<5,000	NA	NA	<5,000 [<5,000]	NA	<5,000	NA	NA	<5,000	<5,000	NA	NA
Potassium	- -	95,100	89,100	NA	NA	282,000 [283,000]	NA	260,000	NA	NA	117,000	247,000	NA	NA
Selenium	10	<750 J	<750	NA	NA	<750 J [<750 J]	NA	<750	NA	NA	<750	<750	NA	NA
Silver	50	<150	<150	NA	NA	<150 [<150]	NA	<150	NA	NA	<150	<150	NA	NA
Sodium	- -	7,370,000	7,190,000	NA	NA	8,860,000 J [8,890,000 J]	NA	9,580,000	NA	NA	7,830,000 E	9,610,000	NA	NA
Sulfate	250,000	2,500,000	2,500,000	NA	NA	4,800,000 [4,800,000]	NA	4,800,000	NA	NA	4,300,000	4,300,000	NA	NA
Sulfide	50	<1,000	<1,000	NA	NA	<1,000 [<1,000]	NA	<1,000	NA	NA	<1,000	<1,000	NA	NA
Thallium	- -	<1,000 J	<1,000	NA	NA	<1,000 J [1,000 J]	NA	<1,000	NA	NA	<1,000	<1,000	NA	NA
Vanadium	- -	<150	<150	NA	NA	<150 [<150]	NA	<150	NA	NA	<150	<150	NA	NA
Zinc	2,000	<1,250	<1,250	NA	NA	<1,250 [<1,250]	NA	<1,250	NA	NA	<1,250	<1,250	NA	NA
Detected Inorganics-Filtered														
Iron	300	<1,000	<1,000	NA	NA	1,040 [1,300]	NA	2,310	NA	NA	4,190	3,830	NA	NA
Manganese	300	205	172	NA	NA	198 [197]	NA	197 B	NA	NA	202	248	NA	NA
Detected PCBs														
None Detected	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Detected Organochlorine Pesticides														
4,4'-DDD	0.3	<0.16	<0.16	NA	NA	<0.16 [<0.15]	NA	<0.16	NA	NA	<0.15	<0.20	NA	NA
4,4'-DDE	0.2	<0.11	<0.11	NA	NA	<0.11 [<0.10]	NA	<0.11	NA	NA	<0.10	<0.13	NA	NA
4,4'-DDT	0.2	<0.11	<0.11	NA	NA	<0.11 [<0.10]	NA	<0.11	NA	NA	<0.10	<0.13	NA	NA
Aldrin	0	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Alpha-BHC	0.01	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Alpha-Chlordane	0.05	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Beta-BHC	- -	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Delta-BHC	- -	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Dieldrin	0.004	<0.11	<0.11	NA	NA	<0.11 [<0.10]	NA	<0.11	NA	NA	<0.10	<0.13	NA	NA
Endosulfan I	- -	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Endosulfan II	- -	<0.11	<0.11	NA	NA	<0.11 [<0.10]	NA	<0.11	NA	NA	<0.10	<0.13	NA	NA
Endosulfan Sulfate	- -	<0.11	<0.11	NA	NA	<0.11 [<0.10]	NA	<0.11	NA	NA	<0.10	<0.13	NA	NA
Endrin	0	<0.11	<0.11	NA	NA	<0.11 [<0.10]	NA	<0.11	NA	NA	<0.10	<0.13	NA	NA
Gamma-BHC (Lindane)	0.05	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Gamma-Chlordane	0.05	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Heptachlor	0.04	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Heptachlor Epoxide	0.03	<0.054	<0.054	NA	NA	<0.055 [<0.052]	NA	<0.053	NA	NA	<0.050	<0.067	NA	NA
Methoxychlor	35	<0.54	<0.54	NA	NA	<0.55 [<0.52]	NA	<0.53	NA	NA	<0.50	<0.67	NA	NA
Detected Miscellaneous														
BOD (5 Day)	- -	<2,000	<2,000	NA	NA	480 B [1,100 B]	NA	<2,000	NA	NA	<2,000	1,600 B	NA	NA
CO2 by Headspace	- -	28,000	21,000	NA	NA	21,000 [17,000]	NA	14,000	NA	NA	15,000	20,000	NA	NA
Carbon monoxide	- -	<400	<400	NA	NA	<40 [<40]	NA	<400	NA	NA	11,000	<400	NA	NA
COD	- -	235,000	295,000	NA	NA	497,000 [546,000]	NA	708,000	NA	NA	476,000	396,000	NA	NA
Chloride	250,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DOC	- -	660 B	590 B	NA	NA	710 B [570 B]	NA	470 B	NA	NA	800 B	520 B	NA	NA
Hardness, Ca/CO3	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	- -	24	27,000	NA	NA	60 [99]	NA	130,000	NA	NA	19	58,000	NA	NA
Nitrate Nitrogen	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrite Nitrogen	1,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oil and Grease	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH, Standard Units	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfide	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	- -	380 B	390 B	NA	NA	240 B [590 JB]	NA	460 B	NA	NA	180 B	400 B	NA	NA
Total Dissolved Solids	1,000,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 5
GROUNDWATER ANALYTICAL RESULTS (ppb)

NATIONAL GRID
ERIE BOULEVARD FORMER MGP

Notes:

1. Samples were collected by the following:
   - Engineering-Science from March 1995 to April 1995.
   - ARCADIS from August 1995 to present.
3. VOCs = Target Compound List (TCL) Volatile Organic Compounds.
4. BTEX = Benzene, toluene, ethylbenzene and xylenes.
5. SVOCs = TCL Semi-Volatile Organic Compounds.
2. PCBs = Polychlorinated Biphenyls.
3. Inorganics = Resource Conservation Recovery Act (RCRA) Metals and Cyanide.
4. Samples collected between 1995 and 1999 were analyzed by Industrial and Environmental Analysts, Inc. (IEA) of Monroe, Connecticut. Samples collected between 2000 and 2008 were analyzed by TestAmerica Laboratories, Inc. (TestAmerica) located in Shelton, Connecticut. Samples collected in 2013 were analyzed by Accutest Laboratories (Accutest) located in Marlborough, Massachusetts.
   - VOCs using United States Environmental Protection Agency (USEPA) SW-846 Method 8240 or 8260.
   - SVOCs using USEPA SW-846 Method 8270.
   - Inorganics using USEPA SW-846 Methods 6010, 7470/7471, 9012A, and USEPA Method 335.4.
   - Available cyanide using USEPA OIA-1677.
   - PCBs using USEPA SW-846 Method 8082.
   - Pesticides using USEPA SW-846 Method 8080/8081.
   - Wet Chemistry parameters (including Hardness [CaCO3], Oil & Grease, and Total Dissolved Solids) by the following:
     - Biochemical Oxygen Demand (BOD) using USEPA Method 405.1.
     - Chloride using USEPA Method 9250.
     - Chemical Oxygen Demand (COD) using USEPA SW-846 Method 410.1.
     - Dissolved Organic Carbon (DOC) using USEPA Method 9060.
     - Nitrate/Nitrite using USEPA SW-846 Method 9200.
     - Sulfate using USEPA Method 9036.
     - Sulfide using USEPA Method 9031.
   - Dissolved Gas Analysis (CO, CO_2, and CH_4) using Method AM-15.01.
   - Natural Attenuation parameters (dissolved iron and manganese) using USEPA SW-846 Method 6010.
5. Samples collected between 1995 and 1999 were analyzed by Exygen Research (Exygen) located in State College, Pennsylvania for:
   - Available cyanide using USEPA OIA 1677.
6. With the exception of waste characterization parameters, only those constituents detected in one or more samples are summarized.
7. Concentrations reported in parts per billion (ppb), which is equivalent to micrograms per liter (µg/L).
8. Field duplicate sample results are presented in brackets.
9. Data qualifiers are defined as follows:
   < - Constituent not detected at a concentration above the reported detection limit.
   B (Organic) - Compound was found in blank.
   B (Inorganic) - Indicates an estimated value between the instrument detection limit and the Reporting Limit (RL).
   D - Compound quantitated using a secondary dilution. Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis.
   E (Organic) - Result exceeded calibration range; a secondary dilution required.
   E (Inorganic) - Serial dilution exceeds the control limits.
   H - Alternate peak selection upon analytical review.
   J - Indicates that the associated numerical value is an estimated concentration.
   M - Manually integrated compound.
   * - LCS or LCSD exceeds the control limits.
10. NYSDEC groundwater standards/guidance values are from the NYSDEC Division of Water, Technical and Operational Guidance Series (TOGS) document titled "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (TOGS 1.1.1) dated June 1998, revised April 2000 and June 2004.
11. - - = No TOGS 1.1.1 Water Quality Standard/Guidance Value listed.
12. NA = Not Analyzed.
13. The samples collected July 9, 1997 from wells MW-3S and MW-7S appear to have been inadvertently switched during the preliminary site assessment. Results for wells have been switched (corrected) for this table.
14. The data has been validated in accordance with USEPA National Functional Guidelines of October 1999.

ARCADIS

Attachment A

Groundwater Field Sampling Logs

Groundwater Stabilization Parameter Log

Well No. MW-1S
Key No.
PID Background (ppm) 0.0
Well Headspace (ppm) 0.0

Site Erie Blvd. National Grid Syracuse, NY
Sampling Personnel Will Stephens
Date 1-29-13
Weather Raining 40's

WELL INFORMATION

Reference Point Marked? (Y) N
Height of Reference Point ______ Meas. From ______
Well Diameter 2"
Screen Interval Depth 18-28 Meas. From bgs
Water Table Depth 23.00 Meas. From TIC
Well Depth 29.05 Meas. From TIC
Length of Water Column 6.05
Volume of Water in Well 0.98 gal
Intake Depth of Pump/Tubing 26 Meas. From TIC

EVACUATION INFORMATION

Pump Start Time 1335
Pump Stop Time 1430
Minutes of Pumping 55
Volume of Water Removed 5.08 gal
Did Well Go Dry? Y (N)

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer (✓) Bladder Pump ( )
Peristaltic Pump ( ) Submersible Pump (✓) Other/Specify ( )
Pump Type: Monsoon

Water Quality Meter Type(s) / Serial Numbers: 08D101922 YSI / 011638 HACH

	Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
	1345	.350		23.12	13.78	6.99	2.28	6.433	48.1	45.1
	1350	.360		23.06	13.82	6.96	2.04	6.398	52.7	22.8
	1355	.350		23.09	14.07	6.96	1.81	6.406	57.4	11.8
	1400	.350		23.10	14.02	6.95	1.52	6.340	61.4	5.20
	1405	.360		23.10	14.06	6.95	1.40	6.300	65.4	3.43
	1410	.350		23.09	14.05	6.95	1.21	6.236	66.1	3.67
	1415	.350		23.10	14.60	6.95	1.22	6.239	66.0	2.42
	1420	.350		23.10	14.01	6.95	1.19	6.229	66.0	2.76
Sample	1425	—								
	2 VOA	BTEX								
	2 Amber	PAHs								

Hydrometer (Density) Reading: 1.001 Hydrometer Testing Water Temperature (Deg C): 13.86

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS Initial: turbid, no odor
Final: clear, colorless, no odor

Field Sampling Coordinator: ______

Samples taken @ 1425

Groundwater Stabilization Parameter Log

Well No. MW 2
Key No. flush
PID Background (ppm) 0.0
Well Headspace (ppm) 0.0

Site ERIE Blvd
Sampling Personnel RN / LCH
Date 1/29/2013
Weather Overcast → Light Rain

WELL INFORMATION

Reference Point Marked? (Y) N
Height of Reference Point ~6 in Meas. From Grade
Well Diameter 2 in
Screen Interval Depth 22-32 Meas. From TIC
Water Table Depth 23.44 Meas. From TIC
Well Depth 33.44 Meas. From TIC
Length of Water Column 10.00
Volume of Water in Well 1.632
Intake Depth of Pump/Tubing 27.06 Meas. From TIC

EVACUATION INFORMATION

Pump Start Time 1305
Pump Stop Time 1350
Minutes of Pumping 45
Volume of Water Removed ~3 gal
Did Well Go Dry? Y (N)

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer (✓) Bladder Pump ( )
Peristaltic Pump ( ) Submersible Pump (X) Other/Specify (X)
Pump Type: Monsoon

Water Quality Meter Type(s) / Serial Numbers: YSI 12904 / Hatch

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
1310	100	23.51 → 11.20		11.20	8.19	2.81	.906	-26.5	66.9
1315	300	23.53 →		14.62	7.76	1.64	0.828	-12.2	39.5
1320	150	23.53 →		14.66	7.75	1.52	0.827	-12	18.5
1325	300	1	23.53	14.46	7.77	1.37	0.816	-13.3	6.85
1330	300		23.53	15.08	7.76	1.22	0.820	-13.9	3.31
1335	150		23.54	14.90	7.77	1.14	0.814	-14.1	3.31
1340	150	2	23.53	15.03	7.77	1.17	0.812	-15.2	3.31
1345	-	- - -	- - -	SAM	PLE	- -	- - - -	- - 1345	
2 Ambers		PAHs							
2 VoA		BTEX							

Hydrometer (Density) Reading: 1.00
Hydrometer Testing Water Temperature (Deg C): 15.03

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS
Final Purge Clear, Odorless, 0.0 ppm
Final Purge Same as Initial

Field Sampling Coordinator:

Groundwater Stabilization Parameter Log

Well No. MW-4S
Key No.
PID Background (ppm) 0.1
Well Headspace (ppm) 267

Site Erie Blvd. National Grid Syracuse, NY
Sampling Personnel Will Stephens
Date 1/29/13
Weather Raining 40s

WELL INFORMATION

Reference Point Marked? (Y) N
Height of Reference Point ______ Meas. From ______
Well Diameter 2"
Screen Interval Depth 18-28 Meas. From bgs
Water Table Depth 21.21 Meas. From TIC
Well Depth 29.81 Meas. From TIC
Length of Water Column 8.60
Volume of Water in Well 1.4 gal
Intake Depth of Pump/Tubing 23 Meas. From TIC

EVACUATION INFORMATION

Pump Start Time 1530
Pump Stop Time 1645
Minutes of Pumping 75
Volume of Water Removed 7.93 gal
Did Well Go Dry? Y (N)

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer (✓) Bladder Pump (✓) Peristaltic Pump ( ) Submersible Pump (✓) Other/Specify ( )
Pump Type: Monsoon

Water Quality Meter Type(s) / Serial Numbers: 08D101922 YSI / 011638 HACH

	Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
	1540	400		21.31	14.45	7.11	0.47	11.30	-256.4	56.9
	1545	.400		21.27	13.57	7.15	0.31	10.58	-270.1	48.4
	1550	.400		21.26	14.17	7.14	0.27	10.31	-285.1	36.3
	1555	.400		21.28	14.32	7.15	0.25	9.938	-296.3	28.7
	1600	.375		21.29	14.59	7.15	0.22	9.766	-312.8	25.1
	1605	.400		21.24	14.58	7.18	0.21	9.132	-321.6	13.60
	1610	.400		21.28	14.60	7.20	0.20	8.754	-326.9	9.79
	1615	.400		21.28	14.65	7.20	0.19	8.080	-329.5	6.58
	1620	.400		21.28	14.61	7.21	0.19	7.527	-332.6	6.17
	1625	.400		21.29	14.59	7.22	0.18	7.384	-332.9	5.83
	1630	.400		21.29	14.60	7.22	0.18	7.376	-333.3	5.58
	1635	.400		21.28	14.57	7.22	0.18	7.369	-334.1	4.17
Sample	1640									
	2 Ambers		PAH							
	2 VOA		BTEX							

Hydrometer (Density) Reading: 1.000
Hydrometer Testing Water Temperature (Deg C): 14.60

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS initial purge: black, slightly oily sheen, strong odor (no product indication with interface probe) Final: clear, colorless, odor
DUP-1-012913 taken @ MW-4S well location
Samples taken @ 1640

Field Sampling Coordinator: ______

Groundwater Stabilization Parameter Log

Well No. MW-6
Key No. 2738
PID Background (ppm) 0.0
Well Headspace (ppm) .2 PPM

Site ERIE Blvd
Sampling Personnel R. Hensel C. Healy
Date 1/29/13
Weather Over cast 30s

WELL INFORMATION

Reference Point Marked? (Y) N
Height of Reference Point 2 ft Meas. From Grade
Well Diameter 2 in
Screen Interval Depth 28-38 Meas. From TIC
Water Table Depth 33.11 Meas. From TIC
Well Depth 41.56 Meas. From TIC
Length of Water Column 8.45
Volume of Water in Well 1.38
Intake Depth of Pump/Tubing 23.33 Meas. From TIC

EVACUATION INFORMATION

Pump Start Time ~~1515~~ 1520
Pump Stop Time 1625
Minutes of Pumping 65
Volume of Water Removed 4 gal
Did Well Go Dry? Y (N)

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer (X) Bladder Pump ( )
Peristaltic Pump ( ) Submersible Pump (X) Other/Specify ( )
Pump Type: Monsoon

Water Quality Meter Type(s) / Serial Numbers: Hach 15373 / YSI 12904

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
1525	300		33.11	13.22	8.44	7.49	0.627	14.9	96.8
1530	300		33.11	14.07	8.35	6.76	0.655	22.0	53.7
1535	300	1 gal	33.11	14.67	8.26	5.78	0.693	25.3	35.2
1540	300		33.11	14.67	8.19	5.06	0.730	26.6	23.5
1545	300		33.11	14.79	8.14	4.32	0.773	26.9	13.1
1550	300	2 gal	33.11	14.58	8.11	4.14	0.782	27.4	15.3
1555	300		33.11	15.19	8.06	3.31	0.833	26.5	11.3
1600	300		33.11	15.03	8.03	2.99	0.855	25.8	8.64
1605	300	3 gal	33.11	15.00	7.98	2.55	0.880	25.1	6.88
1610	300		33.11	14.85	7.95	2.28	0.895	24.6	5.06
1615	300		33.11	14.84	7.93	2.20	0.904	24.4	3.99
1620	300	4 gal	33.11	14.81	7.92	2.07	0.914	24.3	3.34
1625	---	---	---	SAMPLE	---	---	---	---	
2 VOA BTEX									
2 Amber PAHs									

Hydrometer (Density) Reading: 1.0 **Hydrometer Testing Water Temperature (Deg C):** 14.81

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS Initial - Yellowish hue PID 1.8 ppm No odor
final purge Same as inital.

Field Sampling Coordinator:

Groundwater Stabilization Parameter Log

Well No. MW-7S
Key No. flush
PID Background (ppm) 0.0
Well Headspace (ppm) ~~0.0~~ 5.6

Site ERIE Blvd
Sampling Personnel R. Hensel, C Henley
Date 1/29/2013
Weather Overcast 40s

WELL INFORMATION

Reference Point Marked? Y (N)
Height of Reference Point -3 in Meas. From Grade
Well Diameter 2 in
Screen Interval Depth 18-28 Meas. From T/C
Water Table Depth 20.30 Meas. From T/C
Well Depth 27.73 Meas. From T/C
Length of Water Column 7.43
Volume of Water in Well 1.213
Intake Depth of Pump/Tubing 23 Meas. From T/C

EVACUATION INFORMATION

Pump Start Time 905
Pump Stop Time 1055
Minutes of Pumping 115
Volume of Water Removed ~9 gal
Did Well Go Dry? Y (N)

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer (Ø) Bladder Pump ( )
Peristaltic Pump ( ) Submersible Pump (X) Other/Specify ( )
Pump Type: Monsoon

Water Quality Meter Type(s) / Serial Numbers: YSI 12904 Hatch 15373

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
905	300		20.44	13.54	6.87	1.09	13.28	-62.8	142
910	150		20.39	13.85	6.85	.72	13.61	-80.6	97.2
915	150		20.36	13.05	6.84	.46	13.52	-99.5	64.7
920	150		20.34	~~12~~.86	6.84	.37	13.66	-105.6	47.2
925	200		20.41	13.40	6.81	.37	15.38	-109.4	47.9
930	300		20.41	13.59	6.84	.31	15.42	-113.4	34.2
935	300		20.46	13.82	6.85	.28	15.55	-119.0	30.1
940	100		20.40	14.11	6.88	.36	15.32	-118.5	19.8
945	100		20.36	13.69	6.89	.34	14.65	-126.6	12.2
950	200		20.38	13.3	6.9	.32	13.92	-132.3	19.1
955	200		20.41	13.32	6.84	.33	17.74	-131.9	~~45.8~~ 475
1000	100		20.35	13.77	6.86	.39	17.77	-132.4	45.1
1005	100		20.41	13.8	6.91	.34	15.73	-136.7	31.1
1010	100		20.42	14.3	6.93	.3	14.52	-140.4	23.2
1015	300		20.37	13.97	6.94	.28	14.07	147.2	19.8
1020	300		20.41	14.17	6.95	.28	13.38	-153.2	14.4
1025	300		20.41	14.4	6.98	.25	12.42	-159.1	13.8
1030	300		20.41	14.38	7.00	.22	11.23	-168.8	6.93
1035	300		20.89	14.23	7.01	.21	10.75	-174.5	5.03

Hydrometer (Density) Reading: 1.00
Hydrometer Testing Water Temperature (Deg C): 14.29

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

Initial Purge Black, Mild odor 1.7ppm
Final Purge Clear Slight odor

Field Sampling Coordinator:

Groundwater Stabilization Parameter Log

Well No. MW7S
Key No. flush
PID Background (ppm)
Well Headspace (ppm)

Site ERIE Blvd
Sampling Personnel R. Hensel C. Healy
Date
Weather

WELL INFORMATION

Reference Point Marked? Y N
Height of Reference Point ______ Meas. From ______
Well Diameter ______
Screen Interval Depth ______ Meas. From ______
Water Table Depth ______ Meas. From ______
Well Depth ______ Meas. From ______
Length of Water Column ______
Volume of Water in Well ______
Intake Depth of Pump/Tubing ______ Meas. From ______

EVACUATION INFORMATION

Pump Start Time ______
Pump Stop Time ______
Minutes of Pumping ______
Volume of Water Removed ______
Did Well Go Dry? Y N

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer ( ) Bladder Pump ( )
Peristaltic Pump ( ) Submersible Pump ( ) Other/Specify ( )
Pump Type:

Water Quality Meter Type(s) / Serial Numbers:

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
1040	300		20.39	14.03	7.02	.20	10.49	-179.1	4.03
1045	300	~9gal	20.39	14.29	7.02	.2	10.67	-171.1	4.01
→ SAMPLED									
2 PAHs Ambers									
2 BTEX VOA									
4 MS/MSD PAHs Ambers									
4 MS/MSD BTEX VOA									

Hydrometer (Density) Reading: 1.00 Hydrometer Testing Water Temperature (Deg C): 14.29

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

Field Sampling Coordinator:

Groundwater Stabilization Parameter Log

Well No. MW-85
Key No. flush
PID Background (ppm) 0.0
Well Headspace (ppm) 0.0

Site National Grid Erie Blvd Syracuse, NY
Sampling Personnel Will Stephens
Date 1-29-13
Weather Cloudy 30's F

WELL INFORMATION

Reference Point Marked? (Y) N
Height of Reference Point ____ Meas. From ____
Well Diameter 2"
Screen Interval Depth 28-38 Meas. From bgs
Water Table Depth 30.25 Meas. From TIC
Well Depth 37.75 Meas. From TIC
Length of Water Column 7.50
Volume of Water in Well 1.22 gal
Intake Depth of Pump/Tubing 32 Meas. From bgs

EVACUATION INFORMATION

Pump Start Time 0930
Pump Stop Time 1020
Minutes of Pumping 50
Volume of Water Removed 5.2 gal
Did Well Go Dry? Y (N)

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer (✓) Bladder Pump ( )
Peristaltic Pump ( ) Submersible Pump (✓) Other/Specify ( )
Pump Type: Monsoon

Water Quality Meter Type(s) / Serial Numbers: 08D101922 YSI / 011638 HACH

	Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
	935	.400		30.48	12.86	7.29	1.12	5.420	11.6	107
	940	.375		30.48	13.42	7.55	0.61	3.718	-67.1	29.6
	945	.400		30.49	13.51	7.74	0.46	2.745	-87.2	17.8
	950	.400		30.49	13.54	7.80	0.38	2.420	-105.6	9.77
	955	.400		30.49	13.62	7.83	0.32	2.188	-109.6	6.43
	1000	.400		30.49	13.67	7.84	0.29	2.191	-114.9	5.44
	1005	.400		30.49	13.68	7.86	0.28	2.180	-114.9	3.92
SAMPLE	1015									

Hydrometer (Density) Reading: 1.00 **Hydrometer Testing Water Temperature (Deg C):** 13.68

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS Initial purge: Turbid, slight odor
* Vacuuming/air lifting sediment from sewage lines

Sample time 1015

Field Sampling Coordinator: ____

Groundwater Stabilization Parameter Log

Well No. MW-9D,
Key No. ——
PID Background (ppm) 0.0 ppm
Well Headspace (ppm) 1.0

Site Erie Blvd
Sampling Personnel C. Cummings W. Stevens
Date 1/31/13
Weather Cloudy, snowing, 30°

WELL INFORMATION

Reference Point Marked? Y (N)
Height of Reference Point ____ Meas. From ____
Well Diameter 2"
Screen Interval Depth ~~75-85'~~ Meas. From T/C
Water Table Depth 30.00 Meas. From TIC
Well Depth 84.84 Meas. From TIC
Length of Water Column 54.98
Volume of Water in Well 8.94
Intake Depth of Pump/Tubing 80' Meas. From T/C

EVACUATION INFORMATION

Pump Start Time 920
Pump Stop Time 1100
Minutes of Pumping 100
Volume of Water Removed ~6.5 gal.
Did Well Go Dry? Y (N)

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer (X) Bladder Pump ( )
Peristaltic Pump ( ) Submersible Pump (X) Other/Specify ( )
Pump Type: Monsoon

Water Quality Meter Type(s) / Serial Numbers: YSI 08D 101922 / 011638 Hatch

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
930	300		30.15	11.95°	7.28	5.59	7.007	16.0	27.8
935	190		30.16	10.77	7.24	5.20	7.393	32.1	32.2
940	190		30.16	12.48	7.25	4.48	7.735	30.1	31.0
945	240		30.17	11.79	7.87	3.90	7.812	-1.3	31.3
950	200		30.18	11.86	7.22	3.74	8.002	-27.8	19.2
955	200		30.19	10.05	7.17	2.55	9.223	-128.4	18.2
1000	200		30.19	11.78	7.08	1.17	14.19	-200.9	9.65
1005	250		30.19	10.48	7.25	11.52	7.312	-212.6	8.76
1010	250		30.19	11.52	7.11	0.85	15.96	-244.6	8.46
1015	250		30.19	12.33	7.09	0.67	16.55	-257.6	8.76
1020	250		30.18	9.78	7.10	0.60	15.79	-282.1	6.82
1025	250		30.20	9.85	7.10	0.49	15.78	-291.0	6.23
1030	250		30.20	11.74	7.08	0.52	16.64	-299.1	4.88
1035	250		30.20	10.76	7.07	0.42	16.01	-307.6	4.50
1040	250		30.19	10.97	7.07	0.42	16.03	-305.6	5.08
1045	250		30.18	10.98	7.07	0.39	16.00	-305.1	4.55
1050	—	—	SAMPLED	—	—	—	—	—	—
2 Ambers		PAH							
2 VoA	BTEX								

Hydrometer (Density) Reading: 1.003 **Hydrometer Testing Water Temperature (Deg C):** 10.98

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

*initial purge; clear, colorless; slight odor
-pump couldn't maintain 200 ml/min flow rate due to backflow

Field Sampling Coordinator: ____

Groundwater Stabilization Parameter Log

Well No. 10S
Key No. flush
PID Background (ppm) 0.0
Well Headspace (ppm) 0.0

Site Erie Blvd
Sampling Personnel C. Cummings / R. Hensel
Date 1/28/13
Weather Rain/snow

WELL INFORMATION

Reference Point Marked? Y (N)
Height of Reference Point -1 in Meas. From Grade
Well Diameter 2 in
Screen Interval Depth 18-28 Meas. From T/C
Water Table Depth 26.54 Meas. From T/C
Well Depth 40.47 Meas. From T/C
Length of Water Column 13.93
Volume of Water in Well 2.27
Intake Depth of Pump/Tubing 23 Meas. From T/C

EVACUATION INFORMATION

Pump Start Time 1410
Pump Stop Time 1520
Minutes of Pumping 70
Volume of Water Removed ~ 9 gal
Did Well Go Dry? Y (N)

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer (X) Bladder Pump ( )
Peristaltic Pump ( ) Submersible Pump (X) Other/Specify ( )
Pump Type: MoonSoon

Water Quality Meter Type(s) / Serial Numbers:

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
1435	—	—	26.54	—	—	—	—	—	—
1440	200		26.53	12.93	7.56	1.62	1.303	80.2	—
1445	200		26.53	13.03	7.55	1.22	1.234	80.1	—
1450	200		26.54	13.01	7.54	1.14	1.300	82.3	—
1455	200		26.54	13.17	7.54	1.02	1.351	85.0	—
1500	300*		26.53	14.07	7.54	0.86	1.273	83.7	—
1505	↓		26.53	14.08	7.54	0.77	1.215	82.6	—
1510			26.54	13.32	7.55	0.72	1.175	82.4	—
1515			26.54	13.84	7.54	0.76	1.234	82.2	
1520	↓	SAMPLED							
		~9 gal							

Hydrometer (Density) Reading: 1.0
Hydrometer Testing Water Temperature (Deg C): 11.36

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

initial purge: slightly turbid; odorless Final Same Odorless, Clear
* = high rate of flow but at lowest setting to keep H2O in cell
- casing busted → no road box

Field Sampling Coordinator:

Sampled 2 Ambers and 2 40 mL VOA

Groundwater Stabilization Parameter Log

Well No. 10D
Key No. —
PID Background (ppm) 0.0
Well Headspace (ppm)

Site Erie Blvd
Sampling Personnel C. Healey/ W. Stephens
Date 1/28/13
Weather Rain/snow/overcast

WELL INFORMATION

Reference Point Marked? Y (N)
Height of Reference Point -1 Meas. From Grade
Well Diameter 2in
Screen Interval Depth 115-125 Meas. From Grade
Water Table Depth 24.23 Meas. From T/C
Well Depth 125.7 Meas. From T/C
Length of Water Column 101.47
Volume of Water in Well 16.56
Intake Depth of Pump/Tubing 120 Meas. From T/C

EVACUATION INFORMATION

Pump Start Time 1535
Pump Stop Time 1640
Minutes of Pumping
Volume of Water Removed
Did Well Go Dry? Y (N)
Depth to bottom: 125.51

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer (X) Bladder Pump ( )
Peristaltic Pump ( ) Submersible Pump (X) Other/Specify ( )
Pump Type: Moonsoon

Water Quality Meter Type(s) / Serial Numbers:

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
1535	~~FOC~~		24.87	11.41	10.77	1.26	~~23.38~~ 18.58	101.2	—
1540	~~[illegible]~~-90		24.94	10.01	10.59	0.76	19.38	72.3	—
1545	100		25.05	7.47	10.57	0.71	18.13	51.9	—
1550	90		25.10	7.54	10.55	0.68	18.22	35.3	—
1555	80		25.26	7.87	10.53	0.61	18.42	24.8	—
1600	80		25.35	8.29	10.52	0.65	18.62	19.9	—
1605	70		25.49	7.85	10.51	0.68	18.54	12.8	—
1610	100		25.57	9.8	10.50	0.61	19.52	74	—
1615	100		25.61	8.55	10.52	0.61	19.06	4.5	—
1620	80		25.69	7.31	10.52	0.51	18.31	3.2	—
1625	80		27.77	7.35	10.51	0.56	18.36	0.5	14.0
1630	80		26.24	7.66	10.50	0.59	18.48	-1.4	13.2
1635	80		25.90	7.53	10.50	0.57	18.44	-3.4	13.4
1640	—		SAMPLED						

Hydrometer (Density) Reading: 1.002 Hydrometer Testing Water Temperature (Deg C): 7.53

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

Inital purge: slightly cloudy; no odor, final purge same as initial
No Botts,
Sampled PAHs, BTEX

Field Sampling Coordinator:

Groundwater Stabilization Parameter Log

Well No. MW-11D
Key No. ~~23~~ 2537
PID Background (ppm) 0.0
Well Headspace (ppm) 0.0

Site ERIE Bvd
Sampling Personnel R. Hensel / C. Healy
Date 1/31/13
Weather 30s overcast windy

WELL INFORMATION

Reference Point Marked? Y (N)
Height of Reference Point 3ft Meas. From Grade
Well Diameter 2 in
Screen Interval Depth 80-90 Meas. From TIC
Water Table Depth 27.74 Meas. From TIC
Well Depth 93.00 Meas. From TIC
Length of Water Column 65.26
Volume of Water in Well 10.65
Intake Depth of Pump/Tubing 85 Meas. From TIC

EVACUATION INFORMATION

Pump Start Time 855
Pump Stop Time 1025
Minutes of Pumping 90
Volume of Water Removed 5 gal
Did Well Go Dry? Y (N)

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer (X) Bladder Pump ( )
Peristaltic Pump ( ) Submersible Pump (X) Other/Specify ( )
Pump Type: Monsoon

Water Quality Meter Type(s) / Serial Numbers: YSI 556 # 12904 Hatch #

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
900	80		27.77	11.17	6.64	2.21	48.19	-6.0	21.9
905	80		27.77	10.35	6.78	.53	47.62	-66.7	12.0
910	70		27.77	10.28	6.76	.37	48.45	-92.8	9.22
915	60		27.77	9.77	6.72	.35	50.21	-104.3	8.42
920	200		27.77	10.18	6.67	0.28	54.50	-112.5	9.15
925	150		27.77	10.63	6.62	.27	58.20	-118.7	8.31
930	150		27.78	10.33	6.61	.27	58.67	-127.3	7.89
935	120		27.77	10.16	6.60	.27	58.54	-143.1	8.72
940	80		27.76	9.82	6.61	.32	58.03	-159.6	8.54
945	120		27.76	7.50	6.62	.34	55.02	-170.9	8.12
950	120		27.74	8.17	6.62	.28	55.87	-175.9	7.43
~~1000~~ 955	120		27.76	9.25	6.62	.29	57.31	-181.9	6.89
1000	150		27.96	9.49	6.61	.27	58.15	-189.4	5.04
1005	250		27.76	10.96	6.60	.28	59.43	-193.8	5.26
1010	250		27.76	11.30	6.59	.21	60.15	-207.1	6.52
1015	250		27.76	11.25	6.59	.21	60.04	-209.8	2.45
1020	250	~5 gal	27.76	11.14	6.59	.18	59.85	-213.8	4.95
1025	---	Sampled							

Adjusted flow up because it stopped (annotation at 920, arrows to 945 and 1005)

Hydrometer (Density) Reading: 1.03
Hydrometer Testing Water Temperature (Deg C): 11.33

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS
Inital purge Clear, Mild odor 0.0 ppm
final same as initial

Field Sampling Coordinator:

Groundwater Stabilization Parameter Log

Well No. MW-12D
Key No.
PID Background (ppm) 0.0
Well Headspace (ppm) 0.0

Site Erie Blvd National Grid Syracuse, NY
Sampling Personnel Will Stephens / Casey Cummings
Date 1-30-13
Weather Cloudy 50's

WELL INFORMATION

Reference Point Marked? (Y) N
Height of Reference Point ______ Meas. From ______
Well Diameter 2"
Screen Interval Depth 90-100 Meas. From ______
Water Table Depth 31.02 Meas. From TIC
Well Depth 99.42 Meas. From TIC
Length of Water Column ~~[illegible]~~ 68.4
Volume of Water in Well ~~[illegible]~~ gal
Intake Depth of Pump/Tubing 95' Meas. From TIC

EVACUATION INFORMATION

Pump Start Time 915
Pump Stop Time 1035
Minutes of Pumping 80
Volume of Water Removed 8.5 gal.
Did Well Go Dry? Y (N)

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer (✓) Bladder Pump ( )
Peristaltic Pump ( ) Submersible Pump (✓) Other/Specify ( )
Pump Type: Monsoon

Water Quality Meter Type(s) / Serial Numbers: 08A01922 YSI / 011638 HACH

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
925	600	[illegible]	31.12	12.40	7.33	8.20	37.01	51.1	199
930	500		31.28	12.45	7.12	4.40	54.35	41.2	155
935	400		31.27	12.25	7.09	3.30	56.77	33.9	221
940	400		31.30	12.28	7.20	4.47	37.12	27.2	521
945	400		31.29	12.27	7.18	4.98	49.50	32.5	168
950	400		31.30	12.58	7.19	4.61	44.60	28.2	97
955	400		31.30	12.61	7.07	2.39	60.58	28.6	82
1000	400		31.29	12.57	7.13	2.72	54.08	23.9	130
1005	400		31.32	12.68	7.12	2.52	~~58~~ .24	22.1	135
1010	400		31.36	12.75	7.06	1.91	61.66	20.2	158
1015	300		31.31	12.86	7.04	1.61	62.84	17.4	152
1020	300		31.31	12.86	7.04	1.54	63.65	15.1	115
1025	300		31.30	12.58	7.03	1.47	63.82	13.3	109
~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~
1035	—	—	SAMPLED	—	—	—	—	—	—
2 Amber		PAH							
2 VOA	BTEX								

Hydrometer (Density) Reading: 1.03 Hydrometer Testing Water Temperature (Deg C): 13.61

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS initial purge: turbid, no odor
*J plug ~~not on~~ partially on - well filled w/ water & debris
- dark brown sediment
- lowest flow rate w/out backflow was 300 ml/min
- Turbidity was taken b/c it wasn't dropping & all other parameters were stable

Field Sampling Coordinator: ______

Groundwater Stabilization Parameter Log

Well No. MW-14D
Key No. ~~23~~ 2537
PID Background (ppm) 0.0
Well Headspace (ppm) 2.4

Site ERIE Blvd
Sampling Personnel R. Hensel, C Healy
Date 1/30/13
Weather ~~50~~ 50s Overcast Gusty Wind

WELL INFORMATION

Reference Point Marked? Y (N)
Height of Reference Point 1.5 Meas. From Grade
Well Diameter 2in
Screen Interval Depth 78-88 Meas. From T/C
Water Table Depth 25.59 Meas. From TIC
Well Depth 93.64 Meas. From TIC
Length of Water Column 67.81
Volume of Water in Well 11.067
Intake Depth of Pump/Tubing 83 Meas. From T/C

EVACUATION INFORMATION

Pump Start Time 1430
Pump Stop Time 1530
Minutes of Pumping ~~3~~ 60
Volume of Water Removed ~~30~~ ~3 gals. (MSH)
Did Well Go Dry? Y (N)

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer ( ) Bladder Pump ( )
Peristaltic Pump ( ) Submersible Pump (X) Other/Specify ( )
Pump Type: MonSoon

Water Quality Meter Type(s) / Serial Numbers: YSI 556 #12901 Latch #

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
1435	250		25.70	12.71	7.09	4.02	3.527	35.6	51.9
1440	300		25.71	12.43	6.40	1.34	3.394	-38.7	52.0
1445	120		25.61	12.59	6.17	.85	3.379	-42.6	49.6
1450	120		25.58	12.58	6.04	.62	3.395	-44.5	81.9
1455	120		25.52	12.64	5.96	.55	3.414	-39.8	99.0
1500	100		25.54	12.48	5.90	.51	3.421	-38.7	121
1505	100		25.53	12.52	5.85	.47	3.425	-38.7	132
1510	100		25.51	12.54	5.81	.45	3.429	-38.7	110
1515	100		25.51	12.57	5.74	.43	3.432	-38.2	91.2
1520	100		25.51	12.49	5.73	.39	3.426	-38.0	69.9
1520	100		25.52	12.48	5.71	.39	3.427	-38.4	58.5
1525	100	~3	25.51	12.53	5.72	.39	3.431	-39.4	48.6
1530	SAmple	—	—	—	—	—	—	—	—
2 VOA BTEx									
2 Ambers ~~VO~~ PAHs									

Hydrometer (Density) Reading: 1
Hydrometer Testing Water Temperature (Deg C): 12.48

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

Initial Purge Clear odorless 4ppm ~~Final Purge Same as~~
Final Purge odorless Slightly Cloudy

Field Sampling Coordinator:

Groundwater Stabilization Parameter Log

Well No. MW-15D
Key No.
PID Background (ppm) 0.0 ppm
Well Headspace (ppm) 0.8 ppm

Site Erie Blvd National Grid Syracuse, NY
Sampling Personnel Casey Cummings / Will Stephens
Date 1/30/13
Weather cloudy; 50s

WELL INFORMATION

Reference Point Marked? Y (N)
Height of Reference Point ______ Meas. From ______
Well Diameter 2"
Screen Interval Depth 80-90' Meas. From ______
Water Table Depth 31.60 Meas. From TIC
Well Depth 92.05 Meas. From TIC
Length of Water Column ______
Volume of Water in Well ______
Intake Depth of Pump/Tubing 85' Meas. From TIC

EVACUATION INFORMATION

Pump Start Time 12:05
Pump Stop Time 1315
Minutes of Pumping 70
Volume of Water Removed ~7 gal.
Did Well Go Dry? Y (N)

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer (X) Bladder Pump ( )
Peristaltic Pump ( ) Submersible Pump (X) Other/Specify ( )
Pump Type: Monsoon

Water Quality Meter Type(s) / Serial Numbers: 08D101922 YSI / 011638 HACH

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
12:05	300		31.60	12.80	7.22	1.55	53.98	-163.7	209
1210	200		31.61	13.27	7.28	0.49	57.01	-214.9	173
1215	200		31.61	13.36	7.28	0.36	57.98	-243.9	130
1220	200		31.61	13.51	7.30	0.37	58.15	-250.4	~~[illegible]~~ 127
1225	200		31.61	13.74	7.32	0.31	58.48	-262	117
1230	200		31.61	13.90	7.32	0.31	58.53	-263	122
1235	200		31.61	13.79	7.33	0.32	58.16	-269	165
1240	200		31.61	13.41	7.33	0.30	57.83	-276	152
1245	200		31.61	13.36	7.33	0.27	57.23	-258.4	137
1250	200		31.61	13.38	7.32	0.25	57.36	-289.3	80.3
1255	200		31.61	13.32	7.30	0.22	57.46	-288.5	53.8
~~1250~~ 1300	200		31.61	13.34	7.28	0.20	57.68	-279.8	53.8
1305	200		31.61	13.40	7.25	0.21	57.88	-284.8	~~32.2~~ 51.8
1310	200		31.61	13.38	7.25	0.20	57.91	-284.5	32.2
1315	—	—	SAMPLED	—	—	—	—	—	—
2	Amber	PAH							
2	VOA	BTex							

Hydrometer (Density) Reading: 1.038 Hydrometer Testing Water Temperature (Deg C): 13.38

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

initial purge: clear, colorless w/ slight odor

Field Sampling Coordinator: ______

Groundwater Stabilization Parameter Log

Well No. MW-16D
Key No. Flush
PID Background (ppm) 0.0 ppm
Well Headspace (ppm) 0.0 ppm

Site Erie Blvd National Grid Syracuse, NY
Sampling Personnel Will Stephens / Casey Cummings
Date 1/30/13
Weather Cloudy; 50s

WELL INFORMATION

Reference Point Marked? (Y) N
Height of Reference Point ____ Meas. From ____
Well Diameter 2"
Screen Interval Depth 80-90 Meas. From ____
Water Table Depth 31.61 Meas. From TIC
Well Depth 92.86 Meas. From TIC
Length of Water Column 61.25'
Volume of Water in Well 9.98 gal
Intake Depth of Pump/Tubing 85' Meas. From TIC

EVACUATION INFORMATION

Pump Start Time 1415
Pump Stop Time 1520
Minutes of Pumping 65
Volume of Water Removed 3.4 gal
Did Well Go Dry? Y (N)

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer (X) Bladder Pump ( )
Peristaltic Pump ( ) Submersible Pump (X) Other/Specify ( )
Pump Type: Monsoon

Water Quality Meter Type(s) / Serial Numbers: 08D101922 YSI / 011638 HACH

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
1425	300		31.61	14.23	7.16	0.62	33.54	-233.9	32.2
1430	180		31.70	14.40	7.14	0.44	33.69	-259.4	47.2
1435	180		31.71	14.73	7.13	0.45	34.15	-280.1	43.5
1440	200		31.72	14.37	7.12	0.48	33.76	-292.5	45.3
1445	200		31.72	14.47	7.13	0.51	33.83	-298.1	48.9
1450	200		31.73	14.54	7.12	0.34	33.83	-306.0	49.9
1455	200		31.74	14.24	7.11	0.25	33.58	-293.0	47.6
1500	200		31.74	14.46	7.11	0.25	33.79	-302.3	49.5
1505	200		31.74	14.73	7.10	0.23	33.96	-308	49.6
1510			SAMPLED						
2 Ambers		BAH							
2 VOA		BTEX							

Hydrometer (Density) Reading: 1.02 Hydrometer Testing Water Temperature (Deg C): 14.73

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

initial purge: clear, colorless, slight odor

Field Sampling Coordinator: ____

2,
80
50
76

Groundwater Stabilization Parameter Log

Well No. MW-17D
Key No. —
PID Background (ppm) 0.0 ppm
Well Headspace (ppm) 0.0 ppm

Site Erie Blvd
Sampling Personnel RH / LCH
Date 1/30/2013
Weather Strong Gusts mid 50s

WELL INFORMATION

Reference Point Marked? Y (N)
Height of Reference Point 9-8 in Meas. From GS
Well Diameter 2"
Screen Interval Depth 80-90 Meas. From TIC
Water Table Depth 20.54 Meas. From TIC
Well Depth 92.3 Meas. From TIC
Length of Water Column 71.76
Volume of Water in Well 11.71
Intake Depth of Pump/Tubing 85 Meas. From TIC

EVACUATION INFORMATION

Pump Start Time 1135
Pump Stop Time 1230
Minutes of Pumping 55
Volume of Water Removed 2 gal
Did Well Go Dry? Y (N)

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer (X) Bladder Pump ( )
Peristaltic Pump ( ) Submersible Pump (X) Other/Specify ( )
Pump Type: Monsoon

Water Quality Meter Type(s) / Serial Numbers: YSI 556 12904 / Hatch 40.4

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
1140	120		20.47	12.62	7.09	4.92	77.89	120	34.6
1145	150		20.49	12.22	6.53	.68	77.42	-18.4	42.2
1150	100		20.51	12.23	6.39	.43	80.12	-41.6	40.4
1155	150		20.51	12.24	6.44	.39	80.89	-51.8	45.1
1200	120		20.53	12.34	6.38	.37	81.23	-56.6	53.3
1205	100		20.55	12.33	6.31	.36	81.29	-61.9	71.6
1210	80		20.56	12.27	6.28	.33	81.27	-64.7	74.7
1215	60	2.20	20.56	12.28	6.27	.31	81.54	-69.3	75.9
1220	-----		SAMPLE	-----	-----	-----	-----		
2 VOA	BTEx								
2 Ambers	PAHs								

Hydrometer (Density) Reading: 1.03
Hydrometer Testing Water Temperature (Deg C): 12.28

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

Initial Purge Clear odorless 0.0 final purge Cloudy Odorless
• Historic Turbidity 7100 NTU sample taken at Turbidity between 50 and 100 NTU
• Variable Pump rate despite consistant voltage reading in control box

Field Sampling Coordinator:

Groundwater Stabilization Parameter Log

Well No. MW-18
Key No. flush
PID Background (ppm) 0.0
Well Headspace (ppm) 0.0

Site Erie Blvd
Sampling Personnel R. Hensel / C Healy
Date 1/30/13
Weather Overcast 40s

WELL INFORMATION

Reference Point Marked? Y (N)
Height of Reference Point -3 in Meas. From Grade
Well Diameter 2"
Screen Interval Depth 60-70 Meas. From TIC
Water Table Depth 9.67 Meas. From TOC
Well Depth 72.0 Meas. From TIC
Length of Water Column 62.33
Volume of Water in Well 10.17
Intake Depth of Pump/Tubing 65 Meas. From T/C

EVACUATION INFORMATION

Pump Start Time 910
Pump Stop Time 1005
Minutes of Pumping 55
Volume of Water Removed ~3.25
Did Well Go Dry? Y (N)

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Evacuation Method: Bailer ( ) Bladder Pump ( ) Peristaltic Pump ( ) Submersible Pump (X) Other/Specify ( )
Pump Type: Monsoon

Water Quality Meter Type(s) / Serial Numbers: YSI 556 # 12904, Hatch 15373

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	DO (mg/l) [10% or 0.1 mg/l]*	Sp. Cond. (mS/cm) [3%]*	ORP (mV) [10 mV]*	Turbidity (Ntu)
915	300		9.65	13.01	10.31	1.35	73.98	-65.4	39.1
920	90		9.65	12.97	9.87	.44	75.90	-91.2	31.7
925	100		9.67	13.16	9.43	.41	79.20	-90.4	33.7
930	100		9.66	12.79	9.2	.37	84.50	-75.9	53.2
935	90		9.66	13.05	8.92	.35	89.6	-63.4	69.2
940	100		9.68	12.79	8.77	.31	91.7	-61.1	69.9
945	100		9.67	13.20	8.55	.29	94.66	-70.5	299
950	225		9.67	13.11	8.46	.29	95.24	-72.0	525
955	225		9.69	13.48	8.2	.28	97.32	-63.4	532
1000	225	~3gal	9.70	13.49	8.16	.28	97.66	-59.3	414
1005	225	3.25	9.70	13.47	8.14	.26	97.70	-58.2	323
-Sampled @ 1005									
2 VOA BTEX									
2 Ambers PAHs									

Hydrometer (Density) Reading: 1.03 **Hydrometer Testing Water Temperature (Deg C):** 13.47

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

Initial purge 0.0 ppm Clear & odorless final Cloudy odorless
Sampled w/ high Turbidity Historically Very High turbidity
Field Sampling Coordinator:
Tried to Nail down flow Rate set at Lowest Setting

B0036694.0.3

April 16, 2013 Letter from National Grid to NYSDEC – Erie Boulevard Bridge Rehabilitation & Building D Handicap Entrance Ramp Construction Soil Investigation Summary

James F. Morgan
Lead Senior Environmental Engineer
Environmental Department

April 16, 2013

Mr. Anthony Karwiel
Remedial Bureau C, 11th Floor
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7014

Re: National Grid
Erie Boulevard Former MGP Site, Syracuse, New York
NYSDEC Site No. 734060
Erie Boulevard Bridge Rehabilitation &
Building D Handicap Entrance Ramp Construction
Soil Investigation Summary

Dear Mr. Karwiel:

This letter summarizes the findings of the August 2012 soil investigation performed at the Erie Boulevard former manufactured gas plant (MGP) site (the "site") in support of two anticipated construction projects. The site location is shown on Figure 1 and the site layout is shown on Figure 2. The investigation was performed to assess conditions directly within the footprint of the two proposed construction areas, as follows:

- An approximately 0.2 acre area along the southern boundary of the site (between Building B and Onondaga Creek) where excavation will be performed in connection with the rehabilitation of the Erie Boulevard bridge over Onondaga Creek. The schedule for this construction work has not yet been determined.

- An approximately 200 square foot area immediately south of Building D where excavation will be performed to build a new handicap accessible entrance ramp into Building D. Ground-breaking for this project is scheduled to begin possibly as early as April 22, 2013.

The soil investigation was performed during the weeks of August 6 and 13, 2012 and involved drilling and sampling borings within the two areas identified above. The investigation was conducted by ARCADIS in accordance with the work plan contained in a July 30, 2012 letter from National Grid to the New York State Department of Environmental Conservation (NYSDEC), which was conditionally approved by the NYSDEC on July 31, 2012.

As summarized herein, the soil recovered from the borings did not exhibit visible staining, sheens, or obvious odors, with one exception. The soil recovered from the one-foot interval at the bottom of a boring south of Building D (interpreted to be just inside the former gasholder, above its floor) was observed to be discolored (black/brown) and exhibited a sheen. No non-aqueous phase liquid (NAPL) was identified in perched water withdrawn from a temporary well subsequently installed at that location. However, trace NAPL blebs were observed on the tip of an interface probe lowered to the bottom of the well.

Selected chemical constituents were identified in the soil samples recovered from the borings at concentrations slightly exceeding the commercial use soil cleanup objectives (SCOs) presented in Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375-

6.8(b). Based on the investigation findings, project-specific material handling and health and safety requirements have been identified (refer to Section IV of this letter) and will be communicated to the Contractors who will be performing the construction work. Community air monitoring will be performed by an independent third party during intrusive subsurface construction activities by the Contractors.

The fieldwork performed as part of the soil investigation is summarized below, followed by the investigation findings, summary/conclusions, and proposed environmental requirements for the construction projects. For further information regarding the proposed construction projects, including the reasons for the work and the proposed excavation limits, refer to the work plan contained in the July 30, 2012 letter from National Grid to the NYSDEC.

I. SOIL INVESTIGATION ACTIVITIES

The August 2012 soil investigation fieldwork consisted of drilling and sampling soil borings within the onsite footprint of the two proposed construction projects. The drilling was performed by Parratt-Wolff of East Syracuse, New York, as a subcontractor to ARCADIS. Soil samples recovered from the borings were visually characterized and field-screened (as described below) by an ARCADIS geologist. Air monitoring was performed during the intrusive field activities by the geologist. Volatile organic vapor and particulate levels in the immediate work area (the worker breathing zone) were continuously monitored during drilling and sampling. The air monitoring readings were well-below the action levels presented in the New York State Department of Health (NYSDOH) generic Community Air Monitoring Plan (Appendix 1A to the NYSDEC document titled "DER-10 / Technical Guidance for Site Investigation and Remediation", dated May 2010).

Details of the soil investigation conducted in support of each construction project are provided below.

Soil Investigation for Erie Boulevard Bridge Rehabilitation

Soil borings were drilled at four locations within the proposed bridge project excavation limits on National Grid's property (locations SB-22 through SB-25, as shown on Figure 2). Soil borings SB-22, SB-23, and SB-24 were drilled at approximately equidistant locations along the proposed alignment of a new 60-foot long, 12-inch diameter subsurface drainage pipe between proposed new manhole "DS-9" (at the southwest corner of National Grid's property, just west of the existing "ESS Control Station No. 1) and existing catch basin "DS-10" to the north (between Building B and Onondaga Creek). Soil boring SB-25 was drilled at the approximate location of proposed new manhole "DS-9". Refer to Attachment A for a drawing (Design Drawing SDR-1) showing the project work limits and proposed drainage pipe alignment.

Prior to drilling, subsurface utility clearance was performed by vacuum excavation to approximately 5 feet below ground surface (bgs) at locations SB-22, SB-23, and SB-24 and to 10 feet bgs at location SB-25. The vacuum excavation was deeper at location SB-25 than at the other locations because of the extensive utilities in this area as shown on available utility mapping and as marked in the field in response to a Dig-Safe request. The soil borings were drilled using the following techniques after the utilities were cleared:

- Direct-push methods (macro-core advanced by a tripod rig) at locations SB-22, SB-23, and SB-24, where terrain was uneven (steep slope) and/or access was difficult.

- Conventional hollow-stem auger (HSA) drilling methods at location SB-25 where access was possible using a truck-mounted rig.

The soil borings were completed to depths of between approximately 11 and 16 feet bgs. The soil boring depths in relation to the proposed drainage pipe invert elevations and anticipated excavation depths are summarized in the table below.

Soil Boring ID	Proposed Drainage Pipe Invert Elevation (feet)	Existing Ground Surface Elevation (feet)	Proposed Drainage Pipe Invert Depth (feet bgs)	Anticipated Excavation Depth (feet bgs)	Soil Boring Depth (feet bgs)
SB-22	26.4	29.5	3.1	4.5	16
SB-23	26.9	33.0	6.1	7.5	8
SB-24	27.2	40.0	12.8	14.0	15.5
SB-25	27.5	40.0	12.5	14.0	11
Note: Elevations are based on information provided by C&S Companies and referenced to a site-specific datum.					

The NYSDEC's July 31, 2012 conditional approval letter requested that one of the soil borings in this area be drilled to a depth of 50 feet bgs to further assess the presence of NAPL in the subsurface. Because soil boring locations SB-23 through SB-25 are directly over the easternmost of the three parallel culverts that comprise the Erie Boulevard Bridge over Onondaga Creek, a deep boring was not possible at these three locations (only an estimated 8 to 15.5 feet of soil is present above the culvert). Therefore, ARCADIS planned to make soil boring SB-22 the deep boring. However, the boring at location SB-22 could only be advanced to a depth of 16 feet bgs, where refusal was encountered.

ARCADIS had planned to drill the southernmost soil boring (SB-25) to below the proposed 12.5-foot bgs drainage pipe invert depth. However, refusal was encountered at 11 feet bgs at this location. Although the borings at locations SB-22 and SB-25 were not drilled as deep as planned, the data from the borings provides useful information regarding subsurface conditions.

Soil recovered from each 2-foot interval of the four borings was visually characterized for color, texture, and moisture content. A portion of the soil from each 2-foot interval was placed in plastic bags for headspace screening using a photoionization detector (PID). Conditions encountered in each boring are documented on the soil boring logs included in Attachment B. As indicated by the boring logs, the soil recovered from the borings consisted mainly of fill material (cobbles, silt, sand, red brick, concrete debris, etc.). No visible staining, NAPL, obvious odors, or elevated PID headspace screening results were encountered in any of the recovered soil samples. In accordance with the work plan, one composite soil sample was collected from each soil boring for laboratory analysis. The composite sample was formed using soil obtained from each 2-foot interval and analyzed by TestAmerica Laboratories of Amherst, New York for the following constituents:

- Target Compound list (TCL) semi-volatile organic compounds (SVOCs) using United States Environmental Protection Agency (USEPA) SW-846 Method 8270.

- Target Analyte list (TAL) inorganic constituents using USEPA SW-846 Methods 6010, 7471, and 9012.

- Polychlorinated biphenyls (PCBs) using USEPA SW-846 Method 8082.

In addition, one discrete grab sample from each boring location was analyzed for TCL volatile organic compounds (VOCs) using USEPA SW-846 Method 8260. Because there were no observable impacts in the borings (no NAPL, staining, odors, elevated PID headspace screening readings), the samples for VOC analysis were collected from 1-foot or 2-foot intervals that were randomly selected.

Soil Investigation for Handicap Entrance Ramp Construction Project

Soil borings were proposed at three locations along the alignment of the proposed concrete support wall and underlying foundation for the proposed new handicap entrance ramp (locations SB-26, SB-27, and SB-28). Prior to drilling using a conventional HSA drill rig in this area, vacuum excavation was performed to assess the potential presence of subsurface utilities at the proposed boring locations. Concrete and/or brick foundations were encountered at depths of between approximately 1.3 and 2.0 feet bgs at locations SB-26 and SB-28, respectively (immediately below the asphalt-paved surface). The vacuum excavations at these two locations were lengthened, resulting in two trenches each approximately 4-foot long and less than 1-foot wide. Concrete and/or brick interpreted to be part of the former holder wall (Holder No. 3) were exposed over the full length of each trench at depths of approximately 1.3 feet and 2.0 feet bgs. Based on the findings at these two locations, vacuum excavation was performed at an additional location (SB-28A). However, refusal due to a concrete/brick surface was also encountered at 2.0 feet bgs at location SB-28A. No further vacuum excavation or drilling was performed at these three locations. The final locations/extent of the trenches at SB-26 and SB-28 and the location of vacuum boring SB-28A are shown on Figure 2. Refer to Attachment C for a drawing (Design Drawing ST4-01) showing the holder foundation (ring) and the proposed entrance ramp location.

At boring location SB-27, vacuum excavation was completed to a depth of 5 feet bgs, followed by HSA drilling and sampling to the depth of refusal at 21 feet bgs. The final boring depth was 15 feet deeper than the anticipated 6-foot excavation depth for the proposed entrance ramp foundation. The boring was drilled beyond the anticipated excavation depth as requested by the NYSDEC in the July 31, 2012 conditional approval letter (i.e., to further assess subsurface conditions in the area).

Concrete was visible along the southwest "side" of the boring and assumed to be part of the former holder foundation wall. The refusal depth was consistent with the approximate depth of the former holder as shown on historical mapping. Therefore, the boring was interpreted to be located just inside the former holder. Soil was recovered from each 2-foot depth interval of the boring for visual characterization and headspace screening using a PID. The material recovered from the boring at location SB-27 consisted of fill material (gravel, cobbles, sand, brick fragments). The material within the upper 20 feet exhibited no visible staining or elevated PID readings. However, the material from the bottom one-foot interval was observed to be black and exhibited a coal-tar-like odor, sheen, and PID headspace reading of 91 ppm. Perched water was encountered in the borehole at a depth of 20.8 feet bgs, which was approximately 3 feet higher than the groundwater table as determined based on a water level measurement/elevation at nearby monitoring well MW-4S. Conditions encountered within the boring are documented on the soil boring log included in Attachment B.

A composite soil sample was collected to characterize the visibly clean fill within the top 20 feet of boring SB-27 for TCL SVOCs, TAL inorganic constituents, and PCBs. In addition, discrete grab samples were collected from 3 to 4 feet bgs (i.e., clean fill within the future construction/excavation limits) and 20 to 21 feet bgs (where black-colored soil was encountered) to characterize the fill for TCL VOCs. Laboratory analysis of the samples was performed by TestAmerica Laboratories using the analytical methods identified in the preceding subsection of this letter.

As discussed with the NYSDEC during an August 13, 2012 telephone conference call, coring was not performed through the holder bottom because coring could create a potential pathway for the perched water or NAPL (if present) in the holder bottom to migrate into the underlying soil. Instead, a temporary well was installed on Friday, August 10, 2012 to monitor conditions within the holder, including the potential presence of NAPL. The well was constructed using 2-inch diameter polyvinyl chloride (PVC) well casing with a 5 foot long screen (0.020-inch slot size) at the bottom of the borehole. The water in the temporary well was allowed to equilibrate over the weekend. Upon returning to the site on August 13, 2012, ARCADIS measured approximately 1.3 feet of water in the well. NAPL was not detected by the interface probe. However blebs were observed on the probe, and the water removed from the well using a bailer exhibited a slight sheen. Based on the absence of measureable NAPL in the well, Parratt-Wolff decommissioned the well on August 13, 2012 and tremi-grouted the borehole to the surface.

II. INVESTIGATION FINDINGS

The laboratory analytical results for the August 2012 soil investigation were validated by ARCADIS and found to be of good quality and useable, as intended. The validated soil analytical results are presented in Table 1. This table also compares the data to the commercial use SCOs presented in 6 NYCRR Part 375-6.8(b). Figure 3 summarizes the soil analytical results that exceed the SCOs. The full laboratory analytical data report (NYSDEC Analytical Services Protocol Category B data deliverables package), electronic data deliverables (EDDs), and the data validation report for the August 2012 monitoring event are provided on the attached CD. The EDDs will be separately e-mailed to the NYSDEC for upload to the NYSDEC's EQuIS database.

The analytical results for the August 2012 soil investigation are summarized below.

Analytical Results for Soil Samples from Proposed Bridge Rehabilitation Construction Footprint

Analytical results for the soil samples collected from sampling locations SB-22 through SB-25 are summarized below:

- No VOCs were identified above laboratory detection limits in any of the discrete grab samples.

- One or more SVOCs were identified in the composite soil samples collected from sampling locations SB-22, SB-24, and SB-25 at concentrations slightly exceeding the commercial use SCOs. The individual SVOCs that were identified in the samples and the maximum concentrations and corresponding commercial use SCOs are summarized in the table below.

Compound	Commercial Use SCO (ppm)	Maximum Detected Concentration (ppm)	Location Exhibiting Maximum Concentration	Number of Locations Where SCO was Exceeded
Benzo(a)anthracene	5.6	7.8	SB-24	2 of 4
Benzo(a)pyrene	1	7.5	SB-24	3 of 4
Benzo(b)fluoranthene	5.6	9.7	SB-24	2 of 4
Dibenzo(a,h)anthracene	0.56	0.98 J	SB-22	1 of 4

Notes:
ppm = parts per million.
J = indicates an estimated value.

- No inorganic constituents were identified in the composite soil samples at concentrations exceeding the commercial use SCOs, other than two inorganic constituents in the sample from location SB-25. Arsenic and barium were detected in the composite sample from SB-25 at concentrations of 20.4 ppm and 441 ppm, respectively, which slightly exceed the corresponding SCOs (16 ppm and 400 ppm).

- PCBs were not detected above laboratory detection limits in the composite soil samples, except for the sample from location SB-22. The 2.3 ppm PCB concentration in that sample exceeds the 1 ppm commercial use SCO.

Analytical Results for Soil Samples from Proposed Building D Handicap Entrance Ramp Footprint

VOCs and PCBs were not detected above laboratory detection limits in the discrete grab and composite soil samples collected from sampling location SB-27. One SVOC and one inorganic constituent were identified in the composite sample at concentrations slightly exceeding the corresponding commercial use SCOs, as follows:

- Benzo(a)pyrene was identified at a concentration of 2.6 ppm vs. the 1 ppm commercial use SCO.

- Cyanide was identified at a concentration of 27.4 ppm vs. the 27 ppm commercial use SCO.

III. SUMMARY/CONCLUSIONS

Based on the data summarized above, soil recovered from the borings within the proposed excavation limits for both construction projects did not exhibit visible NAPL, staining, sheens, or obvious odors. However, soil within the proposed excavation limits for both projects contains chemical constituents at concentrations slightly exceeding the commercial use SCOs. The actions to be taken during the proposed construction projects in response to these analytical results are outlined below.

IV. PROPOSED ENVIRONMENTAL CONSTRUCTION REQUIREMENTS

Based on the investigation findings, the following minimum environmental requirements will be established for each construction project:

1. *Health & Safety:* The selected Contractors will be required to prepare a site-specific Health and Safety Plan (HASP) that meet the requirements of Title 29 of the Code of Federal Regulations (29 CFR) 1910 and 29 CFR 1926 and cover Contractor and subcontractor personnel who will be performing intrusive work (e.g., excavation and material handling) during implementation of the projects. Contractor staff performing subsurface work activities (excavation, formwork, etc.) shall also have OSHA 40 hour HAZWOPER training, including 8 hour annual refresher course updates, and medical clearance in accordance with 29 CFR 1910.120.

2. *Dust/Vapor/Emissions Controls & Community Air Monitoring:* The Contractors will be required to implement dust, vapor, and odor control measures, as needed, based on air monitoring and visual assessment during intrusive and material handling activities to maintain particulate and volatile organic vapor levels below the action limits identified in the NYSDOH's generic CAMP (Appendix 1A to DER-10). Air monitoring will be performed upwind and downwind (and at the nearest receptor location, as appropriate) in accordance with the protocols presented in the generic CAMP. The 15-minute average air monitoring readings will be recorded by data loggers and will be available to the NYSDEC and NYSDOH upon request. Instantaneous readings used to make decisions will also be documented and made available.

3. *Excavation/Material Handling:* Asphalt pavement and concrete cover materials will be removed and transported offsite for crushing/recycling. The soil removed from the excavation for the ramp construction project will be direct-loaded into one or more rolloff waste containers and then characterized as required by the proposed disposal facility. The Contractor will cover rolloff waste containers with a water-tight tarp at the end of each work day, during precipitation events, and after filling the containers. Following receipt of the waste characterization analytical results, the rolloffs will be taken to a disposal facility approved by National Grid where the soil will be disposed.

Some of the soil removed from the excavation for the bridge rehabilitation project may be stockpiled onsite in a lined staging area for potential re-use as subsurface fill material (i.e., below 1 foot bgs provided that the soil meets project geotechnical requirements and exhibits no visible NAPL, staining, or obvious odors when excavated). Surplus soil from the excavation for the bridge project rehabilitation will be placed in a lined material staging area or direct-loaded into waste transport containers (rolloffs, dump trucks/trailers, etc.) for offsite transportation and disposal. Additional characterization sampling will be performed, as required by the proposed disposal facility. The excavated soil/waste material stockpiles shall be covered using a low-permeability liner at all times (10-mil polyethylene sheeting or equivalent), except when soil is actively being managed in the staging area(s), to minimize potential migration/siltation of material to areas beyond the staging area(s).

Waste soil/debris generated by the excavations will be shipped from the site under bills-of-lading or manifests. The shipping documents will be signed by National Grid or an agent for National Grid.

4. *Water Management:* The proposed excavation limits are well above the groundwater table. Water that accumulates with the excavations, such as precipitation (if any), will be pumped into an appropriate container (e.g., 55-gallon drums or portable storage tank), characterized, and then transported to an industrial wastewater treatment facility for offsite treatment/discharge, as appropriate based on the characterization sampling results.

5. *Erosion and Sedimentation Control Measures:* The proposed excavation for the ramp construction project is immediately adjacent to Building D. The ground surface in this area is higher than elsewhere around the parking lot. Therefore, there should be little or no storm water "run-in" to the excavation. In addition, excavated materials will be direct-loaded into rolloff waste containers, which will be covered at the end of each workday (meaning that there will be no stockpiling of materials in a staging area and associated concerns over runoff). To address the potential for soil to migrate beyond the excavation area via stormwater runoff (e.g., spillage from the excavator bucket during work in rain), the Contractor will be required to provide inlet protection (e.g., Siltsacks) at the nearest stormwater catch basins within the flow path from the excavation area. Erosion and sedimentation control measures for the bridge rehabilitation project are anticipated to include silt curtains around the work area and inlet protection at nearby catch basins.

6. *Imported Fill:* Before imported fill material is brought onsite, the fill will be sampled and analyzed in accordance with the requirements outlined in Section 5.4(e) of DER-10. The allowable constituent levels for imported fill are presented in Appendix 5 of DER-10. Sampling will not be required if less than 10% (by weight) passes through a size 80 sieve and the imported fill is "gravel, rock or stone, consisting of virgin material from a permitted mine or quarry." The imported backfill proposed for the ramp construction project consists of Type 2 subbase (crusher run) from the Hanson quarry in Jamesville, New York. This backfill is considered virgin material from a NYSDEC-permitted quarry. The sieve analysis for the backfill shows that less than 10% of the material by weight passes through the size 80 sieve. Therefore, no testing of the fill is proposed for the ramp construction project. Copies of the sieve analysis report and a letter from the proposed fill source are included in Attachment D.

7. *Demarcation:* A demarcation layer will be placed at the interface of the imported clean fill that meets commercial use SCOs and the underlying soil. The demarcation layer will consist of a permeable non-woven geotextile or orange construction fence. The demarcation layer will be placed in the excavation for the ramp foundation upon reaching the excavation limits. It will also provide a physical barrier to remaining soil for workers who will be entering the excavation to install formwork for the concrete foundation. The demarcation will be placed in the excavation for the bridge rehabilitation project after re-use soil is placed in the excavation.

V. SCHEDULE

As previously indicated, the schedule for the Erie Boulevard bridge construction project has not yet been determined. Mobilization for the Building D handicap accessible entrance ramp construction project is scheduled for April 22, 2013, weather permitting. The proposed excavation and material handling work for the ramp construction project will be performed Op-Tech. Because the excavation within the proposed entrance ramp footprint will involve the removal of only 50 cubic yards of material (or less depending on the extent of the existing holder foundation), the excavation work is anticipated to take only a couple days to complete. The excavated materials placed within the rolloff will be transported for offsite disposal following receipt of waste characterization analytical results (anticipated to be approximately one week following sampling). ARCADIS will provide full-time onsite construction/engineering oversight and community air monitoring during the construction project.

Please do not hesitate to call me at (315) 428-3101 or Mr. John C. Brussel, P.E., of ARCADIS at (315) 671-9441 if you have any questions or require additional information regarding the proposed investigation activities.

Sincerely,

James F. Morgan
Lead Senior Environmental Engineer

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Table

TABLE 1
SOIL ANALYTICAL RESULTS (ppm)

ERIE BOULEVARD BRIDGE REHABILITATION & BUILDING D HANDICAP RAMP CONSTRUCTION PROJECTS
NATIONAL GRID
ERIE BOULEVARD FORMER MGP
SYRACUSE, NEW YORK

		Bridge Rehabilitation Construction Area								Building D Handicap Ramp Construction Area		
Location ID:	Commercial-Use	SB-22	SB-22	SB-23	SB-23	SB-24	SB-24	SB-25	SB-25	SB-27	SB-27	SB-27
Sample Depth(feet bgs):	SCOs	0-16*	13 - 15	0-5*	3 - 4	0-15.5*	12 - 13	0-11*	8 - 10	0-20*	3 - 4	20 - 21.2
Date Collected:	(Shaded)	08/10/12	08/10/12	08/10/12	08/10/12	08/13/12	08/13/12	08/13/12	08/13/12	08/13/12	08/13/12	08/10/12
Detected Volatile Organics												
Benzene	44	NA	<0.0057	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062 J	NA	<0.0053	1.9
Ethylbenzene	390	NA	<0.0057	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062 J	NA	<0.0053	24
Isopropylbenzene	- -	NA	<0.0057	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	10
Methylcyclohexane	- -	NA	<0.0057	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062	NA	<0.0053	0.99 J
Toluene	500	NA	<0.0057	NA	<0.0053	NA	<0.0054 [<0.0056]	NA	<0.0062 J	NA	<0.0053	0.43 J
Xylenes (total)	500	NA	<0.011	NA	<0.011	NA	<0.011 [<0.011]	NA	<0.012	NA	<0.011	5.6
Total BTEX	- -	NA	<0.011	NA	<0.011	NA	<0.011 [<0.011]	NA	<0.012	NA	<0.011	32 J
Total VOCs	- -	NA	<0.028	NA	<0.026	NA	<0.027 [<0.028]	NA	<0.031	NA	<0.026	32 J
Detected Semivolatile Organics												
2-Methylnaphthalene	- -	0.16 J	NA	0.013 J	NA	0.080 J [0.29 J]	NA	0.079 J	NA	0.44 J	NA	NA
Acenaphthene	500	0.48 J	NA	0.027 J	NA	0.12 J [0.46 J]	NA	0.21 J	NA	0.27 J	NA	NA
Acenaphthylene	500	1.2 J	NA	0.035 J	NA	0.44 J [0.45 J]	NA	0.49 J	NA	1.6 J	NA	NA
Anthracene	500	3.0 J	NA	0.082 J	NA	1.6 [1.8]	NA	1.8	NA	0.90 J	NA	NA
Benzo(a)anthracene	5.6	7.2	NA	0.32	NA	6.5 [7.8]	NA	4.8	NA	2.4	NA	NA
Benzo(a)pyrene	1	6.9	NA	0.43	NA	7.0 [7.5]	NA	4.0	NA	2.6	NA	NA
Benzo(b)fluoranthene	5.6	9.4	NA	0.56	NA	7.9 [9.7]	NA	5.0	NA	3.4	NA	NA
Benzo(g,h,i)perylene	500	2.5 J	NA	0.16 J	NA	2.7 J [2.9 J]	NA	1.7 J	NA	1.7 J	NA	NA
Benzo(k)fluoranthene	56	3.7	NA	0.18	NA	4.5 [4.0]	NA	2.4	NA	1.7 J	NA	NA
Biphenyl	- -	<3.6	NA	<0.18	NA	<0.91 [0.086 J]	NA	<0.92	NA	<2.1	NA	NA
bis(2-Ethylhexyl)phthalate	- -	<3.6	NA	0.076 J	NA	2.7 [0.71 J]	NA	<0.92	NA	<2.1	NA	NA
Carbazole	- -	0.20 J	NA	0.034 J	NA	0.18 J [0.80 J]	NA	0.35 J	NA	0.37 J	NA	NA
Chrysene	56	7.8	NA	0.34	NA	6.4 [6.9]	NA	4.5	NA	2.4	NA	NA
Dibenzo(a,h)anthracene	0.56	0.98 J	NA	0.056 J	NA	<0.91 [<0.91]	NA	<0.92	NA	<2.1	NA	NA
Dibenzofuran	350	0.18 J	NA	0.014 J	NA	0.097 J [0.59 J]	NA	0.32 J	NA	0.32 J	NA	NA
Di-n-Butylphthalate	- -	<3.6	NA	<0.18	NA	<0.91 [<0.91]	NA	1.5	NA	<2.1	NA	NA
Fluoranthene	500	16	NA	0.55	NA	10 [13]	NA	9.0	NA	4.6	NA	NA
Fluorene	500	0.94 J	NA	0.025 J	NA	0.24 J [0.68 J]	NA	0.62 J	NA	0.51 J	NA	NA
Indeno(1,2,3-cd)pyrene	5.6	2.3 J	NA	0.15 J	NA	2.6 [2.8]	NA	1.5	NA	1.4 J	NA	NA
Naphthalene	500	<3.6	NA	0.023 J	NA	0.22 J [0.71 J]	NA	0.14 J	NA	<2.1	NA	NA
Phenanthrene	500	8.6	NA	0.31	NA	2.5 [7.2]	NA	5.7	NA	2.8	NA	NA
Pyrene	500	11	NA	0.45	NA	8.6 [10]	NA	7.4 J	NA	4.1	NA	NA
Total PAHs	- -	82 J	NA	3.7 J	NA	61 J [76 J]	NA	49 J	NA	31 J	NA	NA
Total SVOCs	- -	83 J	NA	3.8 J	NA	64 J [78 J]	NA	52 J	NA	32 J	NA	NA
Detected Inorganics												
Aluminum	- -	6,070 J	NA	7,020 J	NA	7,600 J [6,260 J]	NA	5,590 J	NA	8,460 J	NA	NA
Arsenic	16	7.90	NA	6.40	NA	7.00 J [6.60 J]	NA	20.4 J	NA	10.9 J	NA	NA
Barium	400	53.0	NA	149	NA	108 [109]	NA	441	NA	50.5	NA	NA
Beryllium	590	0.300	NA	0.420	NA	0.470 [0.390]	NA	0.650	NA	0.550	NA	NA
Cadmium	9.3	0.310 J	NA	0.390 J	NA	0.310 [0.330]	NA	0.310	NA	0.150 J	NA	NA
Calcium	- -	101,000 J	NA	38,900	NA	26,100 [40,500]	NA	19,200	NA	85,200	NA	NA
Chromium	- -	12.8	NA	11.2	NA	13.7 [12.6]	NA	13.6	NA	16.3	NA	NA
Cobalt	- -	5.70 J	NA	6.60	NA	7.40 [6.40]	NA	4.70	NA	7.50	NA	NA
Copper	270	31.9 J	NA	24.5 J	NA	42.2 J [39.5 J]	NA	60.4 J	NA	21.7 J	NA	NA
Cyanide	27	0.91 J	NA	<0.81 J	NA	<1.1 J [0.52 J]	NA	<1.1 J	NA	27.4 J	NA	NA
Iron	- -	15,400	NA	13,800	NA	17,000 [14,700]	NA	13,600	NA	19,000	NA	NA
Lead	1,000	35.8	NA	53.0	NA	294 [341]	NA	872	NA	22.6	NA	NA
Magnesium	- -	21,800	NA	15,300	NA	8,770 [13,900]	NA	4,910	NA	15,300	NA	NA
Manganese	10,000	448	NA	255	NA	302 [265]	NA	177	NA	290	NA	NA
Mercury	2.8	0.140 J	NA	0.190 J	NA	0.350 J [0.350 J]	NA	0.160 J	NA	0.0650 J	NA	NA
Nickel	310	16.5	NA	18.5	NA	18.8 [16.4]	NA	12.7	NA	18.3	NA	NA
Potassium	- -	1,200 J	NA	1,040 J	NA	987 J [1,140 J]	NA	852 J	NA	1,120 J	NA	NA
Selenium	1,500	0.650 J	NA	0.810 J	NA	<4.20 [0.920 J]	NA	1.40 J	NA	0.920 J	NA	NA
Sodium	- -	175	NA	91.6 J	NA	93.9 J [102 J]	NA	163	NA	1,760	NA	NA
Vanadium	- -	13.3	NA	14.5	NA	16.7 [13.6]	NA	15.1	NA	24.7	NA	NA
Zinc	10,000	50.0	NA	72.4	NA	261 [171]	NA	747	NA	42.3	NA	NA
Detected PCBs												
Aroclor-1260	- -	2.3	NA	<0.24	NA	<0.23 [<0.21]	NA	<0.25	NA	<0.23	NA	NA
Total PCBs	1	2.3	NA	<0.24	NA	<0.23 [<0.21]	NA	<0.25	NA	<0.23	NA	NA

TABLE 1
SOIL ANALYTICAL RESULTS (ppm)

ERIE BOULEVARD BRIDGE REHABILITATION & BUILDING D HANDICAP RAMP CONSTRUCTION PROJECTS
NATIONAL GRID
ERIE BOULEVARD FORMER MGP
SYRACUSE, NEW YORK

Notes:

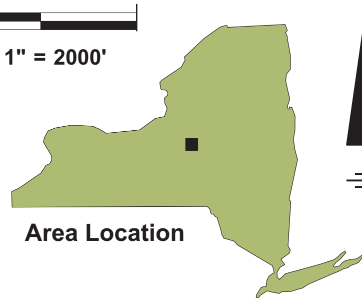
1. Samples were collected by ARCADIS on the dates indicated.
2. PCBs = Polychlorinated biphenyls.
3. VOCs = Target Compound List (TCL) Volatile Organic Compounds.
4. BTEX = Benzene, toluene, ethylbenzene and xylenes.
5. SVOCs = TCL Semi-Volatile Organic Compounds.
6. PAHs = Polycyclic aromatic hydrocarbons.
7. Samples were analyzed by TestAmerica Laboratories, Inc. (TestAmerica) located in Buffalo, New York for:
   - PCBs using United States Environmental Protection Agency (USEPA) SW-846 Method 8082.
   - VOCs using USEPA SW-846 Method 8260B.
   - SVOCs using USEPA SW-846 Method 8270C.
   - Inorganic constituents using USEPA SW-846 Method 6010, 7471, and 9012A.
8. Only those constituents detected in one or more samples are summarized.
9. All concentrations reported in dry weight parts per million (ppm), which is equivalent to milligrams per kilogram
10. Field duplicate sample results are presented in brackets.
11. Data qualifiers are defined as follows:
    < - Constituent not detected at a concentration above the reported detection limit.
    B (Inorganic) - Indicates an estimated value between the instrument detection limit and the Reporting Limit (RL).
    J - Indicates that the associated numerical value is an estimated concentration.
12. 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs) are from Title 6 of the Official Compilation of Codes, Rules, and Regulations of the State of New York (6 NYCRR) Part 375-6.8 (b), effective December 14,2006.
13. Shading indicates that the result exceeds the 6 NYCRR Part 375 Commercial Use SCO.
14. - - = No 6 NYCRR Part 375 SCO listed.
15. * = Sample was collected and composited for analysis.
16. NA = Not Analyzed.
17. The data has been validated in accordance with USEPA National Functional Guidelines of October 1999.

Figures

REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., SYRACUSE WEST, NEW YORK, 1973, PHOTOREVISED 1978.

2000' 0 2000'

Approximate Scale: 1" = 2000'



Area Location

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK

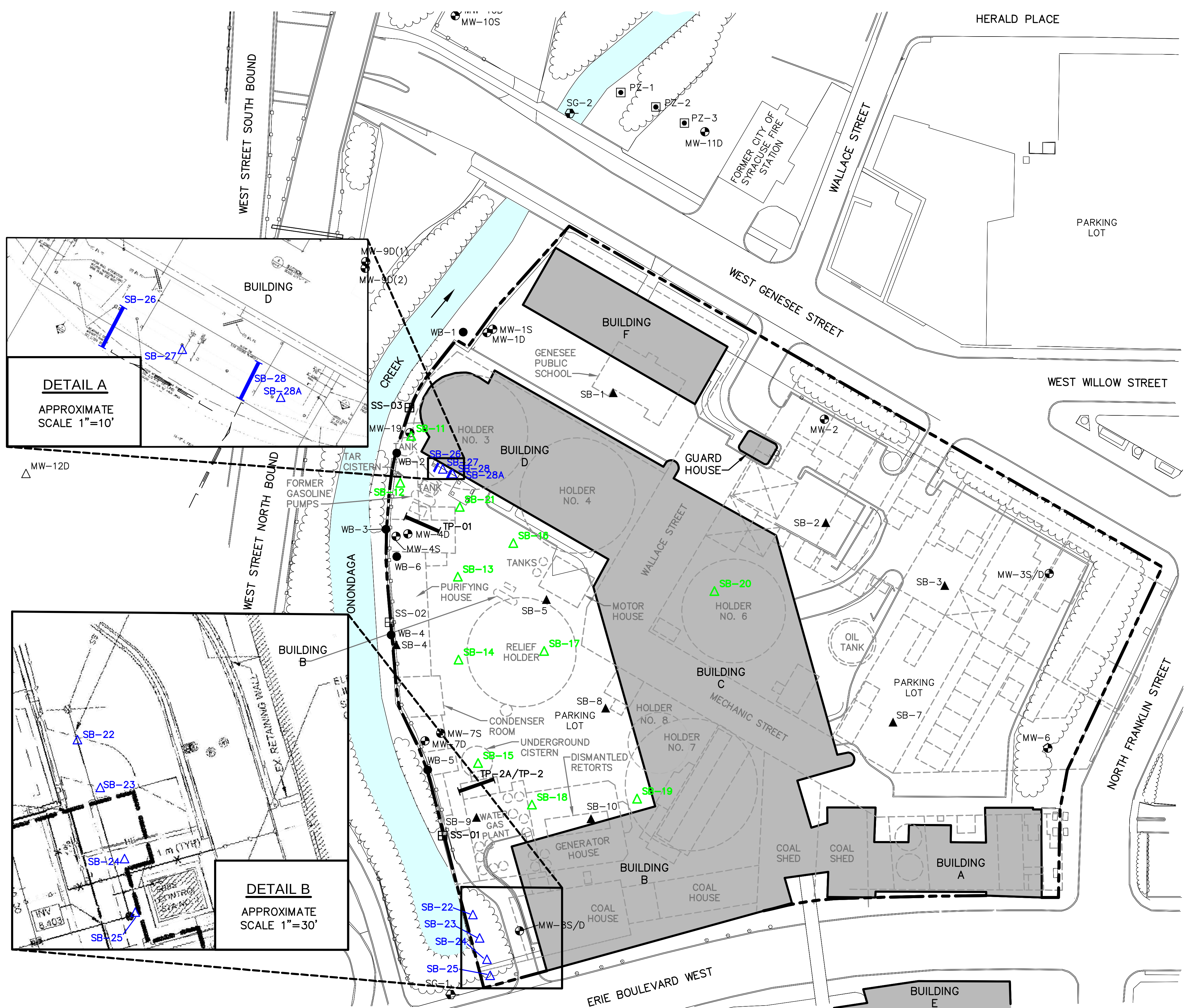
ERIE BOULEVARD BRIDGE REHABILITATION & BUILDING D HANDICAP ENTRANCE RAMP CONSTRUCTION PROJECTS

SITE LOCATION MAP

ARCADIS

FIGURE
1

10/02/2012 SYRACUSE ENV-DJHOWES
B0036694/0000/00004/CDR/36694N01.CDR



LEGEND:

SB-27△	CONSTRUCTION PROJECT INVESTIGATION SOIL BORING (2012)
SB-26 ▬	CONSTRUCTION PROJECT SOIL BORING UTILITY CLEARANCE TRENCH (2012)
SB-11△	FINAL RI SOIL BORING (2008)
SB-5 ▲	PSA SOIL BORING (1995)
MW-1S/D	EXISTING MONITORING WELL LOCATION
PZ-2	EXISTING PIEZOMETER LOCATION
SG-2	EXISTING STAFF GAUGE LOCATION
SS-02	SURFACE SOIL SAMPLING LOCATION
WB-1 ●	FORMER WALL BORING LOCATION
TP-01 ▬	TEST PIT LOCATION
— — —	FORMER MGP SITE BOUNDARY (APPROXIMATE)
	TREES/VEGETATION
	GUARD RAIL

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
2. FORMER MANUFACTURED GAS PLANT (MGP) STRUCTURES, WITH THE EXCEPTION OF HOLDERS NO. 7 AND NO. 8, ARE FROM THE FORMER SYRACUSE LIGHTING COMPANY GAS PLANT, AS SHOWN ON SANBORN MAPPING DATED 1911. HOLDER NO. 7 IS FROM PLOT PLAN PREPARED BY MELVIN L. KING ARCHITECT, DATED SEPTEMBER 2, 1931. HOLDER NO. 8 IS FROM SANBORN MAPPING DATED 1892.
3. LOCATIONS OF CONSTRUCTION PROJECT INVESTIGATION SOIL BORINGS, FINAL RI SOIL BORINGS, RETAINING WALL, MONITORING WELLS, PIEZOMETERS, AND STAFF GAUGES ARE BASED ON SURVEY PERFORMED BY NATIONAL GRID.
4. PRELIMINARY SITE ASSESSMENT (PSA) SOIL BORING, TEST PIT, AND SURFACE SOIL SAMPLING LOCATIONS ARE APPROXIMATE.
5. LOCATIONS OF FORMER GASOLINE UNDERGROUND STORAGE TANKS AND FORMER GASOLINE PUMPS ARE APPROXIMATED FROM SITE PLAN PREPARED BY KING AND KING ARCHITECTS, DATED MARCH 31, 1972.
6. DETAIL "A" IS FROM A PORTION OF FIGURE ST4-01, TITLED "EXTERIOR RAMP", BY ST. GERMAIN & AUPPERLE, DATED 1/16/12. DETAIL "B" IS FROM A PORTION OF FIGURE SD4-1, TITLED "DRAINAGE PLAN", BY C&S ENGINEERS INC., DATED OCTOBER 2011.

0 100' 200'
GRAPHIC SCALE

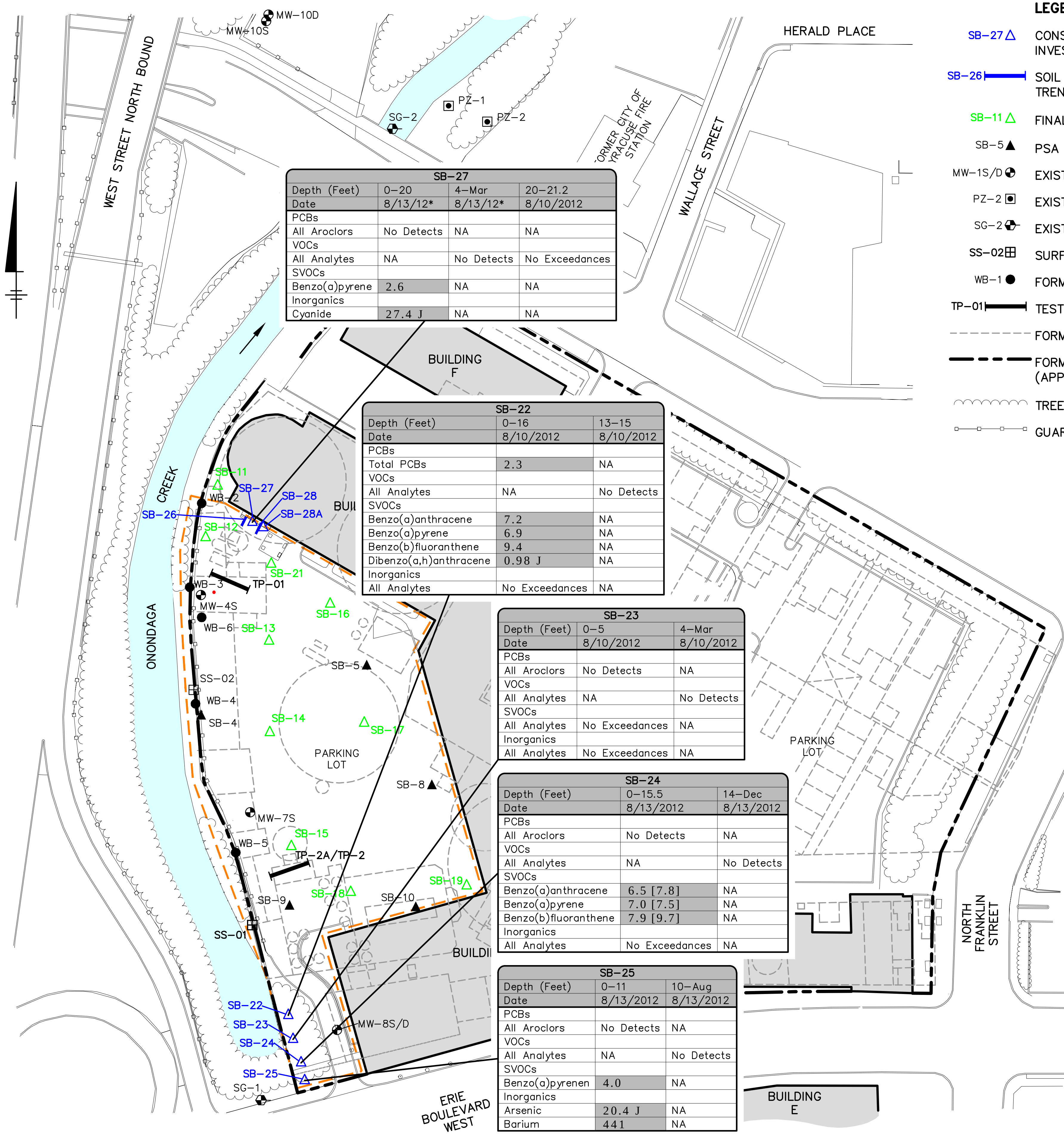
NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK
ERIE BOULEVARD BRIDGE REHABILITATION AND BUILDING D HANDICAP ENTRANCE RAMP CONSTRUCTION PROJECTS

SOIL BORING LOCATIONS

ARCADIS

FIGURE
2

CITY: SYRACUSE, NY DIV/GROUP: ENV/REM-WIM-DV DB: R. ALLEN, E. KRAMMER, P. LISTER PM/TM: J. BRUSSEL TR: L. HEALY LYR: ON=*;OFF=REF (FR2)
G:\ENVCAD\SYRACUSE\ACT\B0036694\0000\00004\DWG\36694B01.DWG LAYOUT: 2 SAVED: 4/11/2013 11:24 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/11/2013 11:24 AM BY: LISTER, PAUL
XREFS: 36694X01 36694XBL IMAGES: 36693X01.jpg 36693X02.jpg PROJECTNAME: ----



SB–27			
Depth (Feet)	0–20	4–Mar	20–21.2
Date	8/13/12*	8/13/12*	8/10/2012
PCBs			
All Aroclors	No Detects	NA	NA
VOCs			
All Analytes	NA	No Detects	No Exceedances
SVOCs			
Benzo(a)pyrene	**2.6**	NA	NA
Inorganics			
Cyanide	**27.4 J**	NA	NA

SB–22		
Depth (Feet)	0–16	13–15
Date	8/10/2012	8/10/2012
PCBs		
Total PCBs	**2.3**	NA
VOCs		
All Analytes	NA	No Detects
SVOCs		
Benzo(a)anthracene	**7.2**	NA
Benzo(a)pyrene	**6.9**	NA
Benzo(b)fluoranthene	**9.4**	NA
Dibenzo(a,h)anthracene	**0.98 J**	NA
Inorganics		
All Analytes	No Exceedances	NA

SB–23		
Depth (Feet)	0–5	4–Mar
Date	8/10/2012	8/10/2012
PCBs		
All Aroclors	No Detects	NA
VOCs		
All Analytes	NA	No Detects
SVOCs		
All Analytes	No Exceedances	NA
Inorganics		
All Analytes	No Exceedances	NA

SB–24		
Depth (Feet)	0–15.5	14–Dec
Date	8/13/2012	8/13/2012
PCBs		
All Aroclors	No Detects	NA
VOCs		
All Analytes	NA	No Detects
SVOCs		
Benzo(a)anthracene	**6.5 [7.8]**	NA
Benzo(a)pyrene	**7.0 [7.5]**	NA
Benzo(b)fluoranthene	**7.9 [9.7]**	NA
Inorganics		
All Analytes	No Exceedances	NA

SB–25		
Depth (Feet)	0–11	10–Aug
Date	8/13/2012	8/13/2012
PCBs		
All Aroclors	No Detects	NA
VOCs		
All Analytes	NA	No Detects
SVOCs		
Benzo(a)pyrenen	**4.0**	NA
Inorganics		
Arsenic	**20.4 J**	NA
Barium	**441**	NA

LEGEND:

- SB–27 △ CONSTRUCTION PROJECT INVESTIGATION SOIL BORING (2012)
- SB–26 SOIL BORING UTILITY CLEARANCE TRENCH (2012)
- SB–11 △ FINAL RI SOIL BORING (2008)
- SB–5 ▲ PSA SOIL BORING (1995)
- MW–1S/D EXISTING MONITORING WELL LOCATION
- PZ–2 EXISTING PIEZOMETER LOCATION
- SG–2 EXISTING STAFF GAUGE LOCATION
- SS–02 SURFACE SOIL SAMPLING LOCATION
- WB–1 ● FORMER WALL BORING LOCATION
- TP–01 TEST PIT LOCATION
- FORMER MGP STRUCTURES
- FORMER MGP SITE BOUNDARY (APPROXIMATE)
- TREES/VEGETATION
- GUARD RAIL

NOTES:

1. BASE MAP DEVELOPED FROM PHOTOGRAMMETRIC SURVEY PERFORMED BY LOCKWOOD MAPPING IN SPRING 1995.
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5. LOCATIONS OF FORMER GASOLINE UNDERGROUND STORAGE TANKS AND FORMER GASOLINE PUMPS ARE APPROXIMATED FROM SITE PLAN PREPARED BY KING AND KING ARCHITECTS, DATED MARCH 31, 1972.
6. FIGURE SHOWS SOIL ANALYTICAL RESULTS ONLY FOR SAMPLING LOCATIONS WHERE ONE OR MORE CONSTITUENTS WERE IDENTIFIED IN UNSATURATED SOIL AT CONCENTRATIONS EXCEEDING THE SCOs.
7. SCOs = SOIL CLEANUP OBJECTIVES FOR COMMERCIAL LAND USE AS PRESENTED 6 NYCRR PART 375–6.8(b).
8. BOLDED AND SHADED VALUE INDICATES THAT THE DETECTED CONCENTRATION EXCEEDS THE COMMERCIAL LAND USE SCO.
9. ALL CONCENTRATIONS ARE PRESENTED IN PARTS PER MILLION (ppm), WHICH IS EQUIVALENT TO MILLIGRAMS PER KILOGRAM (mg/kg).
10. FIELD DUPLICATE SAMPLE RESULTS ARE PRESENTED IN BRACKETS [].
11. J = INDICATES THAT THE ASSOCIATED NUMERICAL VALUE IS AN ESTIMATED CONCENTRATION.
12. NA = NOT ANALYZED
13. < = CONSTITUENT NOT DETECTED AT A CONCENTRATION ABOVE THE REPORTED DETECTION LIMIT.
14. PCBs = POLYCHLORINATED BIPHENYLS.
15. VOCs = VOLATILE ORGANIC COMPOUNDS.
16. SVOCs = SEMI–VOLATILE ORGANIC COMPOUNDS.
17. * = SAMPLES COLLECTED FROM EACH 2–FOOT INTERVAL FROM SB–27 WERE CONTAINERIZED FOR HEADSPACE SCREENING ON 8/10/12. THE SAMPLES WERE COMPOSITED ON 8/13/12 (AFTER THE SOIL BORING WAS TERMINATED) FOR LABORATORY ANALYSIS FOR PCBs, SVOCs, AND INORGANIC CONSTITUENTS. THE VOC SAMPLE WAS A DISCRETE GRAB SAMPLE AFTER THE SOIL BORING WAS TERMINATED.

0 100' 200'

GRAPHIC SCALE

NYSDEC Part 375 Commercial–Use SCOs	
Constituent	SCO (ppm)
Total PCBs	1
Benzo(a)anthracene	5.6
Benzo(a)pyrene	1
Benzo(b)fluoranthene	5.6
Dibenzo(a,h)anthracene	0.56
Arsenic	16
Barium	400
Cyanide	27

NATIONAL GRID
ERIE BOULEVARD FORMER MGP SITE
SYRACUSE, NEW YORK

ERIE BOULEVARD BRIDGE REHABILITATION AND BUILDING D HANDICAP ENTRANCE RAMP CONSTRUCTION PROJECTS

SOIL ANALYTICAL RESULTS FOR PCBs, VOCs, SVOCs AND INORGANICS EXCEEDING SCOs (ppm)

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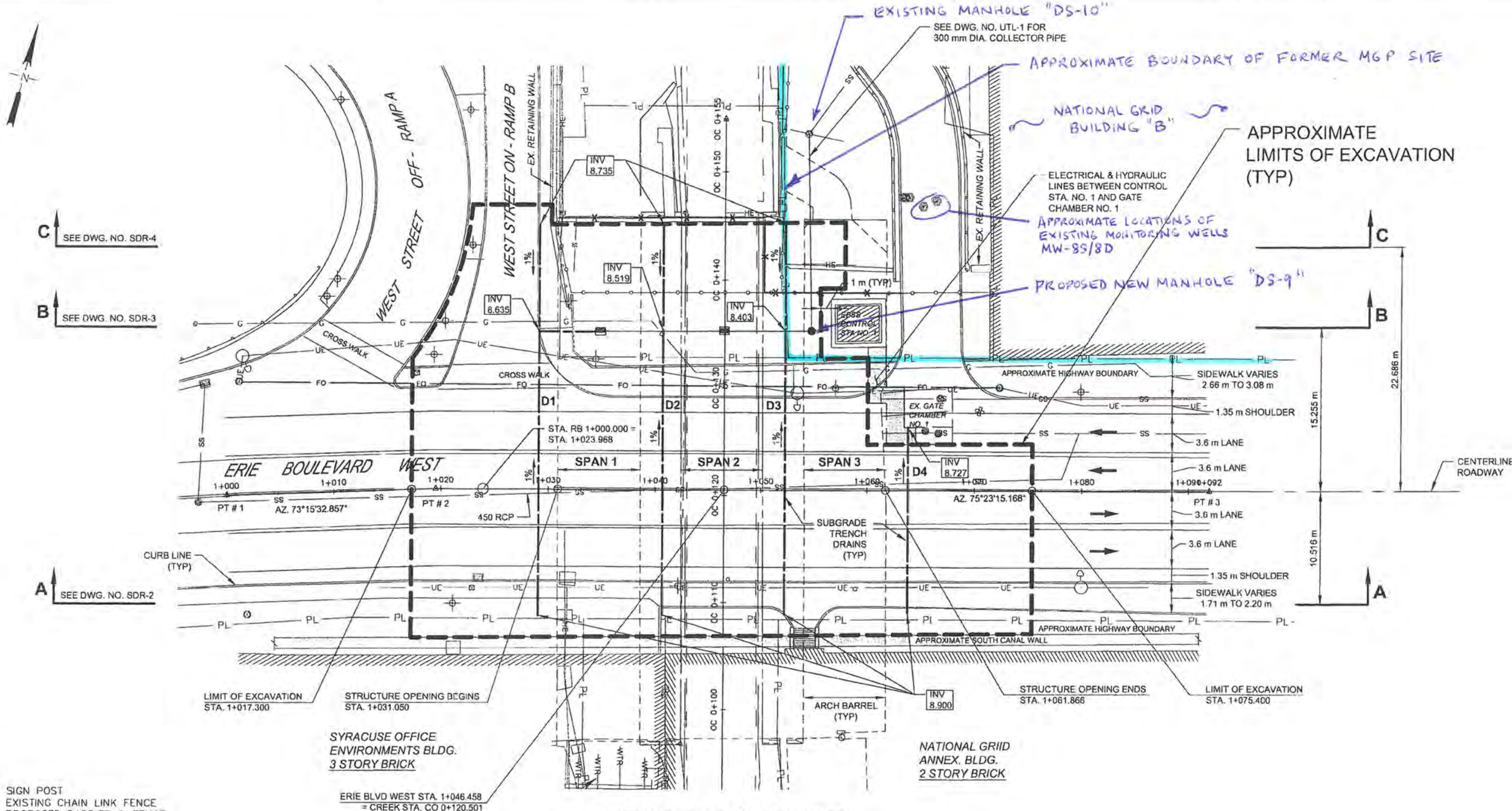
FIGURE 3

ARCADIS

Attachment A

Bridge Rehabilitation Project –
Design Drawing SDR-1
(Proposed Project Limits)



SUBGRADE DRAINAGE PLAN

2 0 5 m 10 m

LEGEND

	SIGN POST
	EXISTING CHAIN LINK FENCE
	PROPOSED BARRIER & FENCE
	STREET LIGHT
	ELECTRIC MANHOLE
	TRAFFIC CONTROL PULLBOX
	ELECTRIC CONTROL BOX
	GUIDERAIL
	WATER VALVE
	UNKNOWN VALVE
	GAS VALVE
	GAS METER
FF 9.123 +	FINISH FLOOR (LOCATION)
	FIRE HYDRANT
—FO—	FIBER OPTIC
—HE—	HANGING ELECTRIC
—OHG—	OVERHEAD GAS
—OHUU—	OVERHEAD UTILITY (UNKNOWN)
—PL—	PROPERTY LINE
—SS—	STORM SEWER
—UE—	UNDERGROUND ELECTRIC
—W—	UNDERGROUND WATER
—G—	UNDERGROUND GAS
	BUILDING LINE
	B-X BORING
	EXISTING TREES
CONC. S.W.	CONCRETE SIDEWALK

NOTES

1. THE SOUTH END OF SUBGRADE TRENCH DRAINS SHALL BE LOCATED AS CLOSE AS POSSIBLE TO THE SOUTH CANAL WALL.
2. DRAINAGE PIPES D1, D2, AND D3 CONNECT TO DS-7 THRU DS-9 AS SHOWN ON DWG. NO. UTL-1.
3. PAYMENT FOR CONNECTIONS OF D1, D2 AND D3 TO 300 mm PVC PIPE WILL BE MADE UNDER ITEM 605.1602.

Oct 07, 2011 – 2:11pm – CITY OF SYRACUSE\119358001 – Rehab of Erie Blvd over Onondaga Creek\CADD\Project Files\303484_SDR-1.dwg
F:\Project\119A

C&S COMPANIES
C&S Engineers, Inc.
499 Col. Eileen Collins Blvd
Syracuse, New York 13212
Phone: 315-455-2000
Fax: 315-455-9667
www.cscos.com

ADP
NOT FOR CONSTRUCTION

MARK | DESCRIPTION | DATE

PROJECT MGR: CFS
DESIGNED BY: JPG
DRAWN BY: JBK
CHECKED BY: SHG
ESTIMATED BY: JPG

PROJECT NO.: 119.358.001
DATE: OCTOBER 2011
SCALE: AS SHOWN
CADD FILE NO.: 303484_SDR-1.DWG

CITY OF SYRACUSE
DEPARTMENT OF ENGINEERING

FED. ROAD REG. NO. 1 | STATE NY
REHABILITATION OF ERIE BLVD. WEST OVER ONONDAGA CREEK
CITY OF SYRACUSE, NEW YORK
ONONDAGA COUNTY
P.I.N. 3034.84 | B.I.N. 2208550

DRAINAGE PLAN

DWG. REFERENCE NO.
SDR-1
SHEET OF

Attachment B

Soil Boring Logs –
August 2012 Soil Investigation

Date Start/Finish: 8/8/12 - 8/10/12 **Drilling Company:** Parratt-Wolff **Driller's Name:** Lee Penrod/ Layne Pech **Drilling Method:** Driven Rods **Sampling Method:** Macrocore in Steel Rods **Rig Type:** Tripod	**Northing:** 1111944.878 **Easting:** 933963.917 **Casing Elevation:** NA **Borehole Depth:** 16 ft bgs **Surface Elevation:** 389.861 **Descriptions By:** K. Roe	**Well/Boring ID: SB-22** **Client:** National Grid **Location:** 300 Erie Boulevard West Syracuse, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	390							Grass with rootlets.	Grass Turf Sand (0.25-1' bgs)
		1	0-2.5		0.3			COBBLES, rounded to angular (up to 1 ft diameter), includes concrete 'rubble', some f/m/c gravel, rounded to angular (up to 3" diameter), little to trace f/m/c sand and silt, dry.	
		2	2.5-5		0.4			COBBLES, rounded to angular, up to 1 ft diameter, includes concrete 'rubble' and whole bricks, some f/m/c gravel, rounded to angular (to 3"), little to trace f/m/c sand and silt, dry.	
5	385	3	5-8	1.2	1.3			SILT and SAND, brown to dark brown f/m, some angular to subrounded f/m/c gravel, includes red and yellow brick, concrete slag, (up to 2" diameter), dry, loose.	
10	380	4	8-12	1.2	2.2			SILT and SAND, brown f/m, some angular to subrounded f/m/c gravel, includes red brick, concrete slag, (up to 2" diameter), dry, loose.	Bentonite Chips (1-16' bgs)
15	375	5	12-16	1.8	2.9	X		SILT and SAND, brown to dark brown f/m, some angular to subrounded f/m/c gravel, includes red and yellow brick, concrete slag, (up to 2" diameter), dry, loose. Refusal @ 16 ft bgs.	

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: f = fine, m = medium, c = coarse, bgs = below ground surface, ft = feet, MC = Macrocore, NA = Not Applicable/Available. Surface Elevation is referenced to NAVD 88.

Air knife/ hand clear to 5 ft bgs.
Composite sample collected from 0-16 ft bgs and VOC grab sample collected from 13-15 ft bgs.

Date Start/Finish: 8/9/12 - 8/10/12
Drilling Company: Parratt-Wolff
Driller's Name: Lee Penrod/ Layne Pech
Drilling Method: Driven Rods
Sampling Method: Macrocore in Steel Rods
Rig Type: Tripod

Northing: 1111929.826
Easting: 933968.680
Casing Elevation: NA

Borehole Depth: 8 ft bgs
Surface Elevation: 392.511

Descriptions By: K. Roe

Well/Boring ID: **SB-23**

Client: National Grid

Location: 300 Erie Boulevard West
Syracuse, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
	395								
0								Grass with rootlets.	Grass Turf; Sand (0.25-1' bgs)
		1	0-2.5		9.3			GRAVEL and COBBLES, rounded to angular (up to 3" diameter), includes concrete and brick fragments, limestone and shale, some m/c sand and silt, dry, loose.	
	390	2	2.5-5		0.6	X		GRAVEL and COBBLES, rounded to angular (up to 3" diameter), includes concrete and brick fragments, limestone and shale, some m/c sand and silt, dry, loose.	Bentonite Chips (1-8' bgs)
5		3	5-8	0				No recovery except a few pieces of c gravel. Refusal @ 8 ft bgs.	
	385								
10									
	380								
15									

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Remarks: f = fine, m = medium, c = coarse, bgs = below ground surface, ft = feet, NA = Not Applicable/Available. Surface Elevation is referenced to NAVD 88.

Composite sample collected from 0-5 ft bgs and VOC grab sample collected from 3-4 ft bgs.

Date Start/Finish: 8/9/12 - 8/13/12 **Drilling Company:** Parratt-Wolff **Driller's Name:** Lee Penrod/ Layne Pech **Drilling Method:** Driven Rods **Sampling Method:** Macrocore in Steel Rods **Rig Type:** Tripod	**Northing:** 1111909.270 **Easting:** 933975.689 **Casing Elevation:** NA **Borehole Depth:** 15.5 ft bgs **Surface Elevation:** 401.331 **Descriptions By:** K. Roe	**Well/Boring ID:** **SB-24** **Client:** National Grid **Location:** 300 Erie Boulevard West Syracuse, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0								Grass with rootlets.	Grass Turf
	400							SILT and SAND, brown f/m/c, some f/m/c gravel, rounded to angular (up to 3" diameter), little rounded to sub rounded cobbles (up to 8" diameter), dry, loose.	Sand (0.25-1' bgs)
		1	0.25-5		0.5			GRAVEL , brown to gray, f/m/c, angular to rounded (up to 3" in diameter), some f/m/c sand and silt, little angular to subrounded cobbles (up to 10" in diameter), dry, loose.	
5	395	2	5-8	1.5	0.8				Bentonite Chips (1-15.5' bgs)
10	390	3	8-10	2.5	0.6				
						X			
15		4	3	2.1	0.5			Refusal @15.5 ft bgs.	

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: f = fine, m = medium, c = coarse, bgs = below ground surface, ft = feet, MC = Macrocore, NA = Not Applicable/Available. Surface Elevation referenced to NAVD 88.

Air knife/ hand clear to 5 ft bgs.
Composite sample collected from 0-15.5 ft bgs and VOC grab sample collected from 12-13 ft bgs.

Date Start/Finish: 8/9/12 - 8/13/12 **Drilling Company:** Parratt-Wolff **Driller's Name:** Lee Penrod/ Layne Pech **Drilling Method:** Driven Rods **Sampling Method:** Macrocore in Steel Rods **Rig Type:** Tripod	**Northing:** 1111893.788 **Easting:** 933978.793 **Casing Elevation:** NA **Borehole Depth:** 11 ft bgs **Surface Elevation:** 400.727 **Descriptions By:** K. Roe	**Well/Boring ID: SB-25** **Client:** National Grid **Location:** 300 Erie Boulevard West Syracuse, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Stratigraphic Description	Well/Boring Construction
0							Grass.	Grass Turf
	400	1	0-2		1.5		SILT, medium brown, little clay, trace f/m/c sand, trace subangular f/m gravel (up to 2" diameter), trace rootlets, dry.	Sand (0.25-1' bgs)
		2	2-4		1.9		SILT, medium brown, little clay, trace f/m/c sand, trace to little cobbles (up to 8" diameter), trace subangular f/m gravel (to 2"), dry.	
5		3	4-6		1.2		SILT, medium brown, some to little sub angular to rounded f/m/c gravel (up to 1" diameter), trace f/m/c sand and clay, dry.	
	395	4	6-8				GRAVEL, COBBLES and BOULDERS, medium brown m/c, including red and yellow brick and slag fragments, angular to sub rounded (up to 3" diameter), angular to subrounded cobbles (up to 0.7' diameter) and boulders (up to 1.2' diameter), some silt, trace f/m/c sand, dry.	Bentonite Chips (1-11' bgs)
		5	8-10	1.1	1.4	X		
10	390	6	10-11	0.9	0.8		SILT, dark brown, some to little f/m/c angular to subangular gravel (brick and slag), little f/m/c sand, dry, trace shells/shell fragments.	
							Macrocore / drive / auger refusal at 11.0 ft bgs.	
15	385							

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Infrastructure · Water · Environment · Buildings

Remarks: f = fine, m = medium, c = coarse, bgs = below ground surface, ft = feet, MC = Macrocore, NA = Not Applicable/Available. Surface Elevation is referenced to NAVD 88.

Air knife/ hand clear to 10 ft bgs.
Composite sample collected from 0-11 ft bgs and VOC grab sample collected from 8-10 ft bgs.

Date Start/Finish: 8/8/12
Drilling Company: Parratt-Wolff
Driller's Name: Lee Penrod
Drilling Method: NA
Sampling Method: Sample not collected
Rig Type: NA

Northing: 1112381.590
Easting: 933925.499
Casing Elevation: NA

Borehole Depth: 1.5 ft bgs
Surface Elevation: 390.193

Descriptions By: K. Roe

Well/Boring ID: **SB-26**

Client: National Grid

Location: 300 Erie Boulevard West
Syracuse, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	390							Asphalt.	Asphalt
		1	0.5-1.5		0.0			COBBLES and GRAVEL, angular to rounded, includes shale, concrete and brick, dry. Refusal at 1.5 ft bgs, brick layer encountered.	Sand (0.5-1' bgs); Bentonite Chips (1-1.5' bgs)
5	385								
10	380								
15	375								

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Remarks: f = fine, m = medium, c = coarse, bgs = below ground surface; NA = Not Applicable/Available. Surface Elevation referenced to NAVD 88.

Air knife/ hand clear to 1.5 ft bgs.
Brick layer encountered at 1.5 ft bgs.

Date Start/Finish: 8/8/12 - 8/13/12
Drilling Company: Parratt-Wolff
Driller's Name: Layne Pech
Drilling Method: Air Knife/ Hollow Stem Auger
Sampling Method: Split-spoon (2"x1.5')
Rig Type: IR A-300

Northing: 1112381.197
Easting: 933933.171
Casing Elevation: NA

Borehole Depth: 21.2 ft bgs
Surface Elevation: 390.555

Descriptions By: K. Roe

Well/Boring ID: **SB-27**

Client: National Grid

Location: 300 Erie Boulevard West
Syracuse, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	390							Asphalt.	Asphalt
		1	0.5-2	1.5	0.3			GRAVEL, light and dark gray, f/m/c, little f/mc sand, trace silt, dry.	Sand (0.5-1' bgs)
		2	2-5	3.0	0.8	X		COBBLES, including brick, concrete fill, some m/c, angular to sub rounded gravel (up to 3" diameter), little to trace sand and silt, dry.	
5	385	3	5-6	0				NO RECOVERY except red brick fragment.	
		4	6-8	0.3	2.6			GRAVEL and SILT, medium brown f/m, little f/m sand, dry to moist.	
		5	8-10	0.8	2.3			GRAVEL and SILT, red and yellow f/m mostly brick fragments, little f/m sand, dry to moist.	
10	380	6	10-12	0.3	2.7			GRAVEL, dark red f/m/c brick fragments, angular to sub-angular, little to trace medium brown silt and f/m sand, moist.	Bentonite Chips (1-21' bgs)
		7	12-14	0.4	1.6				
15	375	8	14-16	0.3	4.0				

Remarks: f = fine, m = medium, c = coarse, bgs = below ground surface; SS = Split Spoon, NA = Not Applicable/Available. Surface Elevation is referenced to NAVD 88.

Air knife/ hand clear to 5 ft bgs.
Composite sample collected from 0-20 ft bgs and VOC grab samples collected from 3-4 ft bgs and from 20-21.2 ft bgs.

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Client: National Grid

Well/Boring ID: **SB-27**

Borehole Depth: 21.2 ft bgs

Site Location:
300 Erie Boulevard West
Syracuse, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		9	16-18	0.3	4.4			GRAVEL, dark red f/m/c brick fragments and mortar, angular to sub-angular, little to trace medium brown silt and f/m sand, moist.	
		10	18-20	0.2	7.4			GRAVEL, dark red f/m brick, concrete and mortar fragments, angular to sub-angular, some f/m/c sand, moist.	
20	370	11	20-21	0.4	90.5	X		SAND and SILT, black f/m/c, trace f/m subangular gravel (up to 0.5'' diameter), wet, CTL odors and sheen. Refusal @ 21.2 ft bgs.	
25	365								
30	360								
35	355								

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Remarks: f = fine, m = medium, c = coarse, bgs = below ground surface; SS = Split Spoon, NA = Not Applicable/Available. Surface Elevation is referenced to NAVD 88.

Air knife/ hand clear to 5 ft bgs.
Composite sample collected from 0-20 ft bgs and VOC grab samples collected from 3-4 ft bgs and from 20-21.2 ft bgs.

Date Start/Finish: 8/8/12
Drilling Company: Parratt-Wolff
Driller's Name: Lee Penrod
Drilling Method: NA
Sampling Method: Sample not collected
Rig Type: NA

Northing: 1112380.079
Easting: 933940.515
Casing Elevation: NA

Borehole Depth: 2.0 ft bgs
Surface Elevation: 390.802

Descriptions By: K. Roe

Well/Boring ID: **SB-28**

Client: National Grid

Location: 300 Erie Boulevard West
Syracuse, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0								Asphalt.	Asphalt
	390	1	0.7-2					GRAVEL, angular to rounded, little silt, trace f/m/c sand, dry.	Sand (0.5-1' bgs)
								Refusal at 2.0 ft bgs, concrete layer angled at 45 degrees encountered.	Bentonite Chips (1-2' bgs)
5									
	385								
10									
	380								
15									
	375								

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Remarks: f = fine, m = medium, c = coarse, bgs = below ground surface; NA = Not Applicable/Available. Surface Elevation is referenced to NAVD 88.

Air knife/ hand clear to 1.5 ft bgs.
Brick layer encountered at 1.5 ft bgs.

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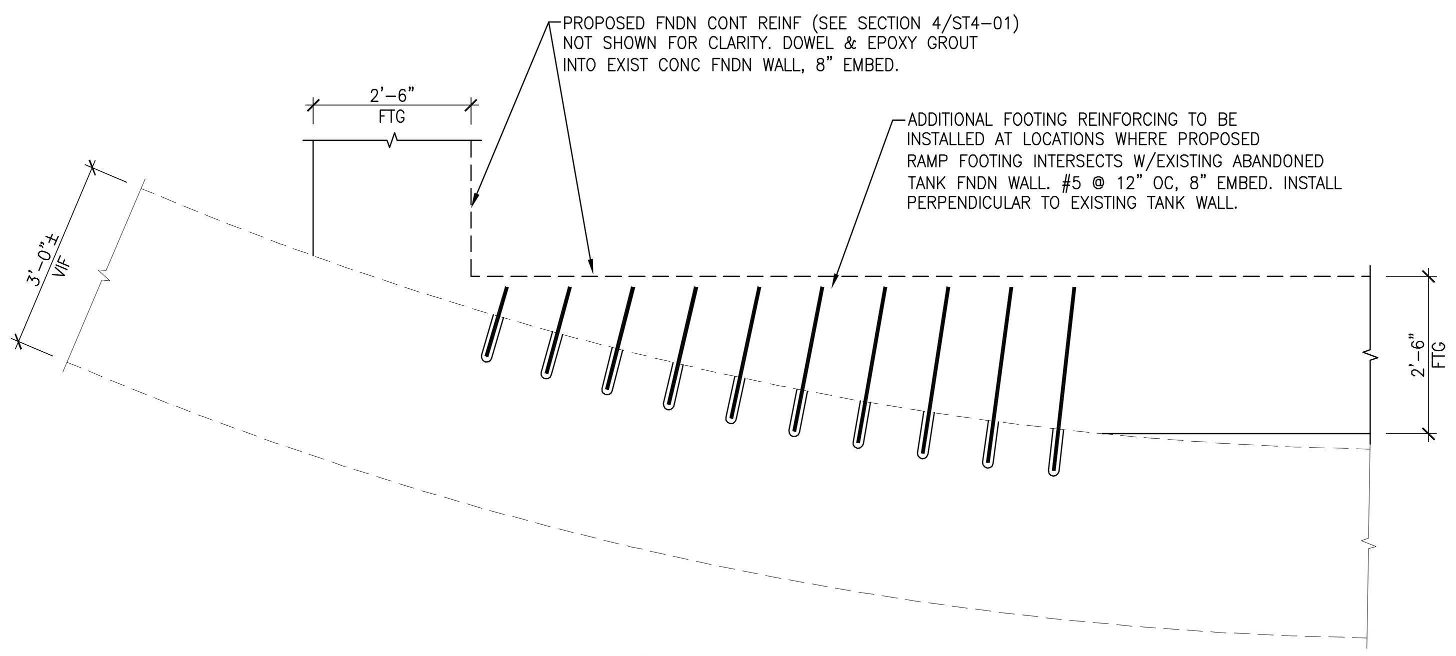
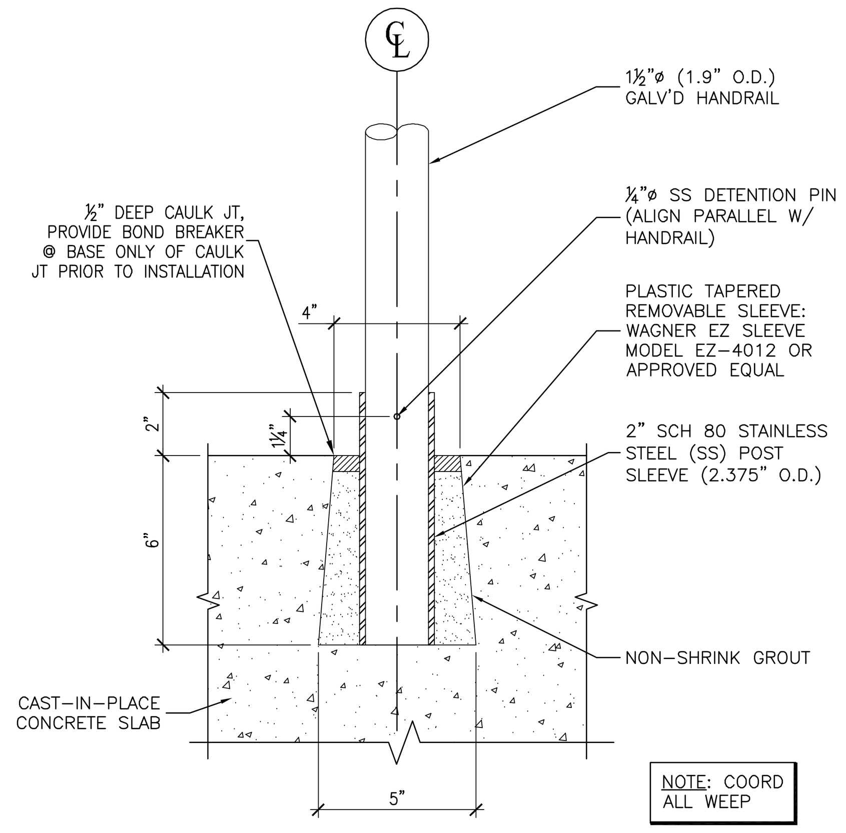
Attachment C

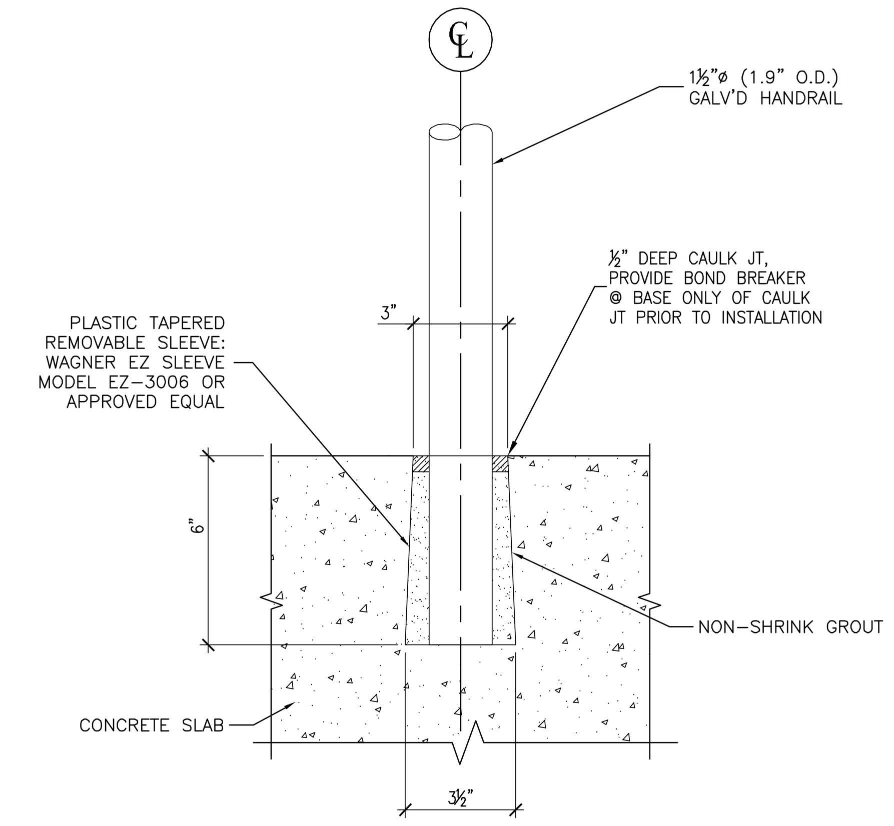
Building D Handicap Accessible
Entrance Ramp Construction Project
Design Drawing ST4-01
(Project Limits)



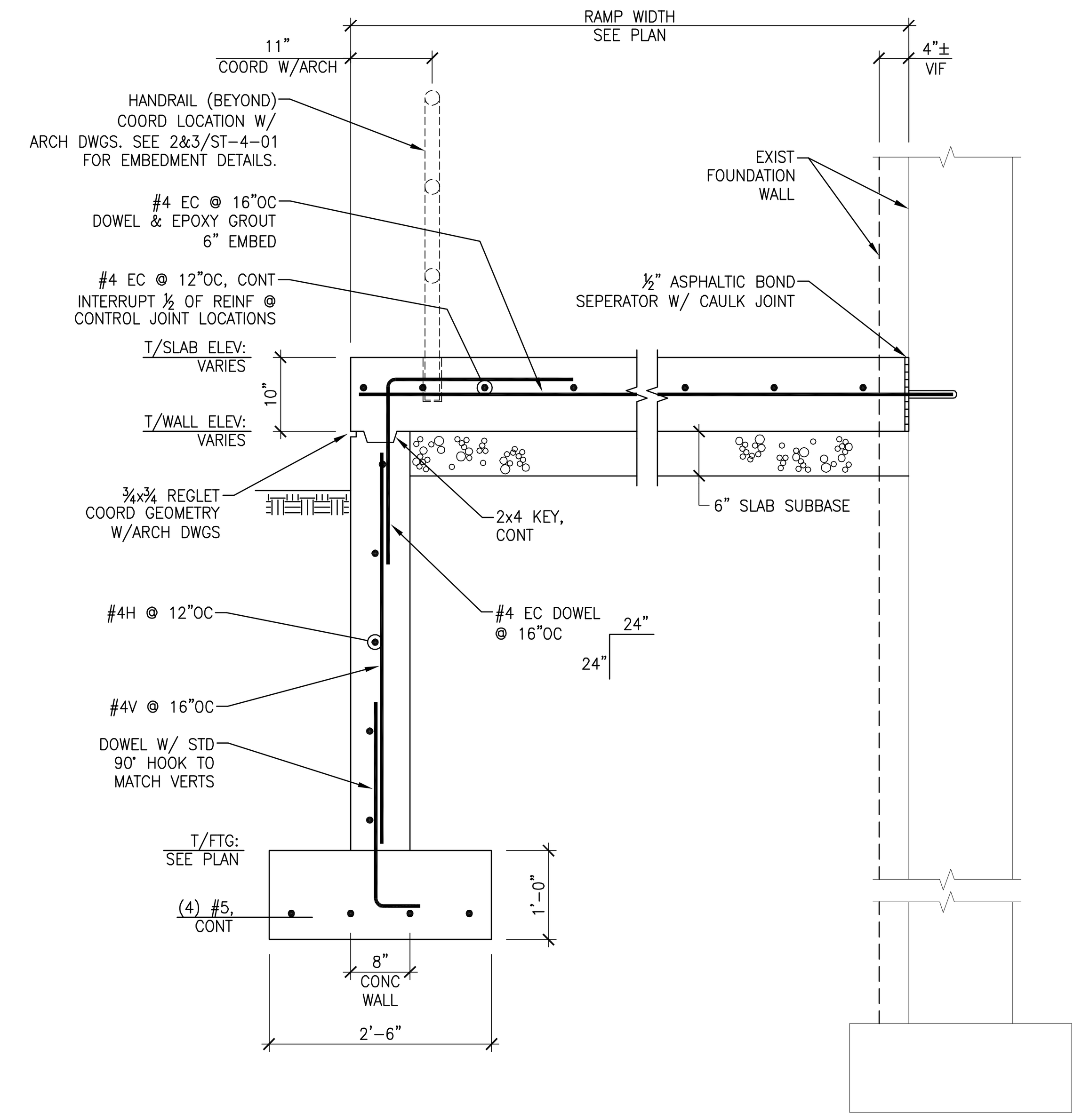
5 PARTIAL PLAN
ST4-01 SCALE: 1/2"=1'-0"



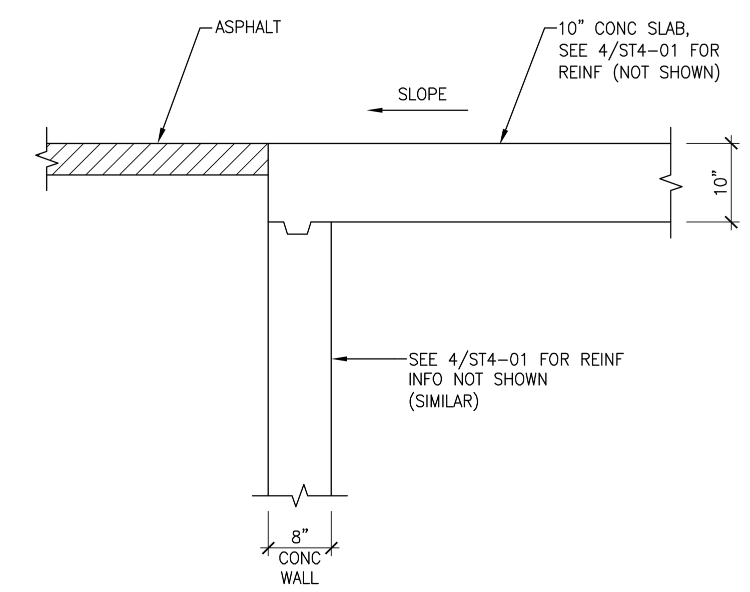
2 SECTION DETAIL - REMOVEABLE CORE MOUNTED POST
ST4-01 SCALE: 3"=1'-0"



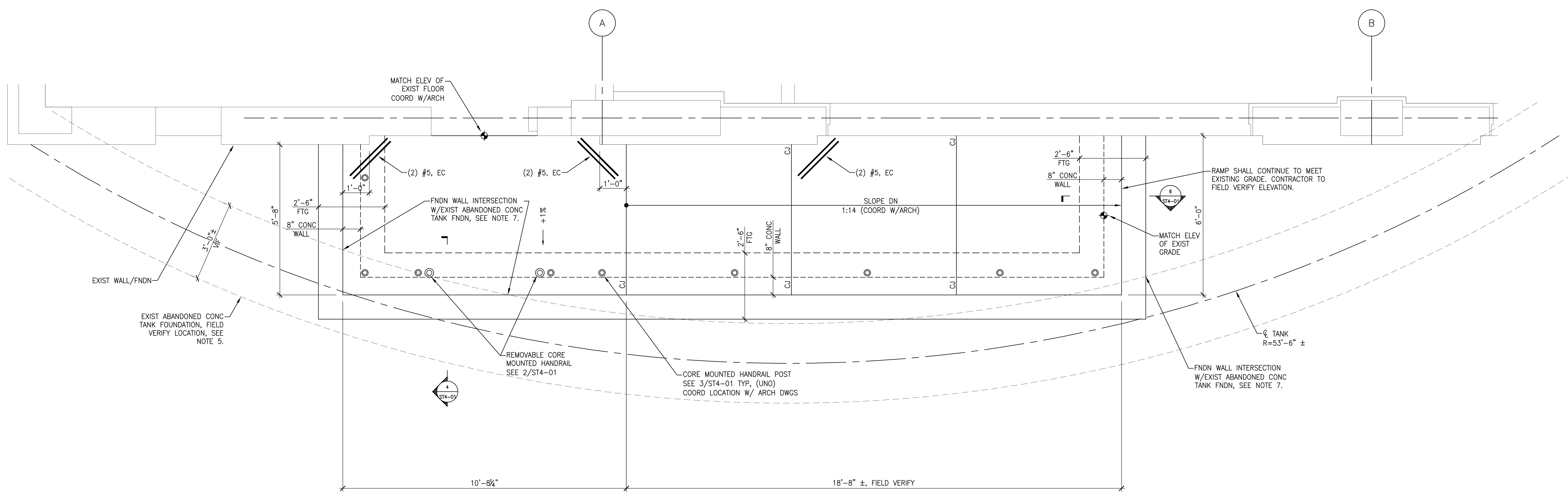
3 SECTION DETAIL - CORE MOUNTED POST
ST4-01 SCALE: 3"=1'-0"



4 SECTION
ST4-01 SCALE: 3/4"=1'-0"



6 SECTION
ST4-01 SCALE: 3/4"=1'-0"



1 RAMP PLAN
ST4-01 SCALE: 1/2"=1'-0"

1. COORDINATE TOP OF RAMP ELEVATIONS WITH ARCHITECTURAL DRAWINGS. TOP OF CONCRETE AT FINISHED FLOOR ELEVATION: +(0'-0") UNLESS NOTED (+) OR (-) THEREFROM ON PLAN.
2. TOP OF FOOTING ELEVATION, TFE, -(4'-0") FROM FINISH FLOOR ELEVATION UNLESS NOTED OTHERWISE ON PLAN.
3. FOOTINGS SHALL REST ON UNDISTURBED INORGANIC SOIL OR CONTROLLED FILL. ASSUMED ALLOWABLE SOIL BEARING PRESSURE = 1500 PSF.
4. DIMENSIONS SHOWN ARE TO FACE OF FOUNDATION WALLS.
5. EXISTING ABANDONED CONCRETE TANK: TANK LOCATION SHOWN IS APPROXIMATE. FIELD VERIFY LOCATION AND TOP OF CONCRETE PRIOR TO CONSTRUCTION OF CONCRETE RAMP. CONTACT OWNER'S REPRESENTATIVE IF DISCREPANCIES BETWEEN EXISTING TANK AND PRESUMED DETAILS EXIST PRIOR TO THE START OF CONSTRUCTION.
6. COORDINATE LOCATION OF HANDRAIL VERTS W/ ARCH DWGS.
7. FNDN AND WALL INTERSECTION W/ EXIST ABANDONED CONCRETE TANK FNDN - DOWEL AND EPOXY GROUT ALL NEW REINF STEEL (H & V) INTO SIDE/TOP OF EXIST CONCRETE. FNDN REINF: 8" MIN EMBED. WALL REINF: 6" MIN EMBED. SEE 5/ST4-01 FOR ADD'L REINF DOWELS AT LOCATIONS WHERE NEW FNDN INTERSECTS ABANDONED TANK AT A SKEWED ANGLE, TYP.

SPECIAL INSPECTIONS & TESTING

1. ALL TESTING AND INSPECTIONS TO CONFORM TO CHAPTER 17 OF THE NEW YORK STATE BUILDING CODE LATEST EDITION.
2. THE OWNER SHALL EMPLOY AN INDEPENDENT TESTING COMPANY TO PERFORM THE FOLLOWING ON-SITE INSPECTIONS AND TESTING: (S&A RECOMMENDATION: KENNEY GEOTECHNICAL SERVICES. PHONE 315-243-3882)

FOUNDATIONS: PER SECTION 1704.7

1. ALL FOOTING SUB-GRADES TO BE APPROVED BY A GEOTECHNICAL ENGINEER LICENSED IN NEW YORK STATE.
2. COMPACTION: (1) TEST EVERY 500 S.F., EACH LIFT. PROVIDE 95% COMPACTION BELOW STRUCTURAL ELEMENTS.

STRUCTURAL CONCRETE: PER TABLE 1704.4

1. STANDARD 6"x12" CYLINDERS (ASTM C39) IN SETS OF 4. BREAK 2 @ 7 DAYS AND 2 @ 28 DAYS.
   a. ONE SET FOR EACH MIX DESIGN.
   b. ONE SET FOR EACH 50 YDS. OR FRACTION THEREOF PLACED PER DAY.
2. SLUMP - EACH BATCH MINIMUM.
3. AIR CONTENT (ASTM C231) EACH BATCH MINIMUM.

ST. GERMAIN & AUPPERLE
CONSULTING ENGINEERS, LLP
CAMILLUS STATION, SUITE 100
6000 WEST GENESEE STREET
CAMILLUS, NEW YORK 13031
PHONE: (315) 488-3550
FAX: (315) 488-3505

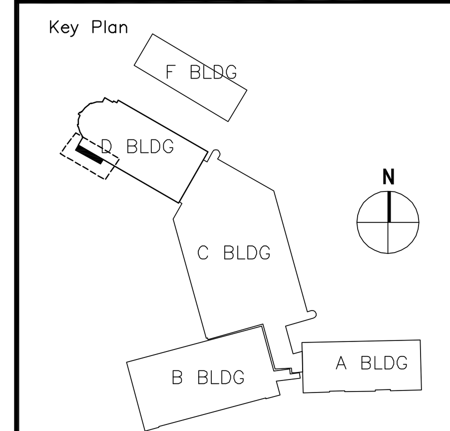
SASAKI
sasaki architects, landscape architects and PE, PC
64 Pleasant Street, Watertown, Massachusetts 02472 USA
t 617 926 3300 f 617 924 2748 w www.sasaki.com

No.	Description	Date

DWG ISSUE & REVISION HISTORY

Stamp

Key Plan



Project Title:

nationalgrid

SYRACUSE OFFICE COMPLEX
BUILDING D RENOVATIONS

Drawing Title:

EXTERIOR RAMP

Project No. 74664.14 Scale: AS NOTED
Drawn By: BW/KG
Checked By: GM
Approved By:
Date: 2012-01-16

Drawing No. ST4-01

ARCADIS

Attachment D

Imported Fill Material Submittal –
Hanson Aggregates

Hanson Aggregates
P.O. Box 513
Jamesville, NY 13078

AGGREGATE GRADATION REPORT

Jamesville Quarry
NYSDOT SOURCE 3-3RS Limestone

Specific Gravities

Bulk (SSD)	Bulk	Apparent	ABS	HFA	BAL
2.70	2.688	2.728	0.5	NO	NY#

MATERIAL
Type 2 Subbase (Crusher Run)
Average Gradation

Sieve Size	% Passing
2”	100
1 ½”	100
1”	97.7
¾”	90.5
½”	74.8
1/4”	53.6
1/8”	42.3
#10	32.2
#20	19.3
#40	12.9
#80	9.0
#200	6.8

2/5/2013

Hanson Aggregates New York LLC
4800 Jamesville Rd., PO Box 513
Jamesville, NY 13078-0513
(315) 469-5501
(315) 469-3133

March 18, 2013

Bette & Cring
18438 US Route 11
Watertown, NY 13601

Subject: LEED® Information – SOC Bldg "D" & "C" Renovation Projects

The following is in response to your request for information about how aggregate including Type 2 Subbase from Hanson Aggregates New York at our Jamesville Quarry is evaluated for credits under the USGBC LEED® green building rating system.

- MR Credit 5. The Jamesville manufacturing facility is located at (4800 Jamesville Rd. Dewitt, NY). One hundred percent (100%) of the raw materials are virgin extracted, and manufactured at this location which is within 500 miles of the project.

If you have any questions please contact me at (315) 469 5501.

Sincerely,

Wayne Curtis

Wayne Curtis
Sales Representative

June 26, 2013 Letter from the NYSDEC to National Grid – Summary of Nature and Extent of NAPL

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau C, 11th Floor
625 Broadway, Albany, New York 12233-7014
Phone: (518) 402-9662 • **Fax:** (518) 402-9679
Website: www.dec.ny.gov

Joe Martens
Commissioner

June 26, 2013

Mr. James Morgan
Lead Environmental Engineer
Environmental Department
National Grid Company
300 Erie Boulevard West
Syracuse, New York 13202

Re: National Grid
Erie Boulevard Former MGP Site, Syracuse, New York
NYSDEC Site No. 734060
Summary of Nature and Extent of NAPL

Dear Mr. Morgan:

The New York State Department of Environmental Conservation (Department) has reviewed the Erie Boulevard Former MGP Site "Summary of Nature and Extent of NAPL" report. The report adequately presents the nature and extent of NAPL in the subsurface soils based on the re-evaluation of past and current conditions. The Department is in agreement with National Grid in evaluating a limited action remedy which will be further described in the revised Feasibility Study. The Department's decision to evaluate the limited action remedy is based on the information presented in the "Summary of Nature and Extent of NAPL" report and the associated periodic groundwater reports provided by National Grid's consultant (ARCADIS).

The information, provided by National Grid/ARCADIS indicates:

1. Existing conditions are currently protective of human health and the environment.
2. The former MGP property is owned by National Grid and public access is restricted.
3. No complete exposure pathway exists due to the depth of NAPL.
4. The dissolved phase plume is in the deep saline aquifer which is not used for drinking.
5. A substantial steel sheet pile wall, backed up with flowable fill extends along the western property boundary providing a physical barrier to impacted subsurface soil.
6. No site related impacts are present in Onondaga Creek.
7. The vapor intrusion investigation demonstrated no impacts to on-site buildings.
8. No NAPL has been recoverable in any of the many monitoring wells installed on site.
9. Site investigation data indicate that no former MGP subsurface structures contain pooled NAPL.

Based on this information, the Department will evaluate a limited action remedy, to be further described in the revised Feasibility Study.

If you have any questions regarding this decision, please contact me at (518) 402-9662.

Sincerely,

Anthony Karwiel

Anthony Karwiel
Project Manager

Ec: A. Omorogbe
J. Brussel, ARCADIS

ARCADIS

July 25, 2014 Letter from the NYSDEC to James Morgan of National Grid – Approval of the Revised Draft Feasibility Study Report

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau C, 11th Floor
625 Broadway, Albany, New York 12233-7014
Phone: (518) 402-9662 • **Fax:** (518) 402-9679
Website: www.dec.ny.gov

Joe Martens
Commissioner

July 25, 2014

Mr. James Morgan
Lead Environmental Engineer
Environmental Department
National Grid Company
300 Erie Boulevard West
Syracuse, New York 13202

Re: National Grid
Erie Boulevard Former MGP Site, Syracuse, New York
NYSDEC Site No. 734060
"Draft" Feasibility Study Report

Dear Mr. Morgan:

The New York State Department of Environmental Conservation and the New York State Department of Health have reviewed the revised "draft" Feasibility Study Report for the Erie Boulevard former MGP site, and find it acceptable. Please issue a final version with the stamp and signature of a licensed professional engineer.

If you have any questions regarding this decision, please contact me at (518) 402-9662.

Sincerely,

Anthony Karwiel
Project Manager

Ec: A. Omorogbe
R. Jones, NYSDOH
J. Brussel, ARCADIS