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New York State Electric & Gas Corporation

Site Characterization Work Plan

Newark Former Manufactured Gas Plant Site
(Site No. 859021)
Newark, New York

March 2010

ARCADIS

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1. Introduction

1.1 General

At the request of NYSEG (New York State Electric & Gas Corporation), ARCADIS has prepared this Work Plan for conducting a Site Characterization (SC) at the Newark Former Manufactured Gas Plant (MGP) site (the "site") in Newark, New York. This SC Work Plan was prepared in response to the New York State Department of Environmental Conservation's (NYSDEC's) letter to NYSEG requesting submittal of a SC Work Plan for the Newark Former MGP site. This SC Work Plan was prepared in general conformance with the NYSDEC's DER-10 Technical Guidance for Site Investigation and Remediation.

A Conceptual SC Work Scope was submitted to the NYSDEC on December 18, 2009 and the NYSDEC provided comments on the Scope that were documented in the following correspondence:

- January 27, 2010 comment letter from the NYSDEC
- March 10, 2010 teleconference to discuss the January 27 comments and NYSEG's proposed approach
- March 19, 2010 letter from NYSEG to the NYSDEC, which provided formal responses to the NYSDEC's January 27, 2010 comments
- NYSDEC's March 22**,** 2010 email providing approval of the March 19th responses and requesting that NYSEG submit an SC Work Plan

The scope of work detailed in this SC Work Plan incorporates the agreements made during the above correspondence and supersedes the scope detailed in the December 18, 2009 Conceptual SC Work Scope. A copy of the above correspondence is provided in Appendix A.

This SC Work Plan is organized as follows:

- **Section 1: Introduction** — Discusses the SC Objectives, Site Description and History, and a Summary of Previous Investigations and Remedial Activities.

- **Section 2: Preliminary Groundwater Assessment** — Describes the tasks to be performed and general methods to be followed to evaluate usability, gauging and sampling of existing monitoring wells.

- **Section 3: Soil Investigation** — Describes the tasks to be performed and general methods to be followed to meet the soil investigation objectives.

- **Section 4: Groundwater Investigation** — Describes the tasks to be performed and general methods to be followed to meet the groundwater investigation objectives.

- **Section 5: Survey, Decontamination, and Waste Handling** — Describes general field procedures for survey, waste handling, and decontamination.

- **Section 6: Project Schedule and Reporting** — Provides the anticipated schedule for completing the SC field work and submitting the SC Report.

- **Table 1: Site Characterization Field Activities** — Provides a discussion of the rationale for each of the investigative field activities.

- **Appendix A: NYSDEC Correspondence** — Contains correspondence that helped form the scope of work detailed herein.

- **Appendix B: Field Sampling Plan (FSP)** — Contains detailed field procedures and protocols that will be followed during the SC.

- **Appendix C: Quality Assurance/Sampling and Analysis Project Plan (QA/SAPP)** — Presents the analytical methods and procedures that will be used to analyze soil and groundwater samples collected during the SC.

- **Appendix D: Health and Safety Plan (HASP)** — Presents the health and safety procedures, methods, and requirements that will apply to field personnel during implementation of the field work.

- **Appendix E: DNAPL Contingency Plan** — Describes procedures to be followed during drilling to limit the potential for remobilizing dense non-aqueous phase liquid (DNAPL), if encountered.

1.2 SC Objectives

The overall objectives of the SC are to accomplish the following:

- determine whether MGP-related residual materials are present at the site.
- determine whether MGP-related residual materials, if present at the site, have a potential to pose a significant threat to public health or the environment.
- determine whether a Remedial Investigation (RI) of the site is appropriate.

The balance of this section describes the site and its history, previous investigations performed at the site, and the site's geologic setting. Together these form the conceptual site model, or CSM. The CSM provides a standard means to summarize what is known about the site, and to identify what additional information is necessary to characterize the nature and extent of any site-related constituents of interest (COIs), and, if necessary, the risks posed to receptors (if any).

The CSM was used to develop the technical approach to address the above objectives. The CSM identifies potential source areas, such as the former holders, and subsurface hydrogeologic conditions which could play a role in the fate and transport of MPG-related constituents. The technical approach is provided in Sections 2, 3, and 4, and in Table 1.

1.3 Site Setting

The following sources were consulted to research the site setting:

- Published geological data
- Interviews with Village of Newark officials
- Sanborn Fire Insurance Maps
- Site Screening Report provided by NYSEG (Atlantic, 1991)
- Historical aerial photographs
- Environmental database search

1.3.1 Site Description

For the purposes of this SC Work Plan, the site consists of land that the former MGP structures occupy. The site is located on the western side of the intersection of West

Shore Boulevard and North Main Street in Newark, Wayne County, New York (Figure 1). Based on historical mapping, the site (i.e., former MGP structures) is on the following properties:

- The northern half of the property occupied by a Quality Inn Hotel
- A portion of West Shore Boulevard adjacent to the Quality Inn property
- Possibly the southern portion of two commercial properties on the north side of West Shore Boulevard

The site is located in a mixed commercial and residential area. The southern boundary of the site roughly bisects the Quality Inn property, with the New York State Barge Canal passing approximately 250 feet to the south. The northern site boundary is located on the north side of West Shore Blvd and appears to encroach onto two commercial properties, one of which is an active gasoline station. The site is bordered to the east by North Main Street, to the west by a vacant field and by a small parcel (approximately 6,000 square feet) owned by NYSEG to the southwest (see Figure 2). The northern portion of a two-story Quality Inn Hotel is located on the site, with the majority of the site occupied by the Hotel Structure, paved parking surrounding the hotel building and West Shore Boulevard. The site is generally flat-lying with a gentle slope to the south.

1.3.2 Site History

Ten Masters Hotels, Inc. currently owns the hotel property portion of the site (Wayne County, Real Property Tax), while the Village owns the portion of the site overlain by West Shore Blvd. The MGP reportedly operated from circa 1900 into the 1920's (AES, 1991). During its peak operation, the MGP consisted of two gas holders (which for the purpose of this Work Plan are referred to as the eastern and western holders), a retort house, a purifier house, a coal shed, two tar wells and two "pressure tanks. Based on a review of Sanborn Fire Insurance Maps for the period of 1885 through 1963, historical aerial photographs dated 1938, 1954, 1963, 1974, 1985 and 1990, and information provided by NYSEG, the site chronology is summarized as follows:

1906 – The first evidence of MGP structures. Structures include the eastern gas holder, and a building labeled "retorts" and "purifying" along the northern portion of the site. A tar well is shown just south of the building at a location now covered by the footprint of the existing Quality Inn (see Figure 2).

1912 – A small creek named Military Brook passes south of the former MGP site. Figure 2 shows the approximate location of Military Brook and former MGP structures. MGP structures include an engine room, two "pressure tanks" at the east end of the building, and a coal shed at the west end of the building, a second tar well adjacent to the south side of the purifying building. The former MGP structures all existed on the north side of Military Brook.

1912 – The NY State Barge (Erie) Canal was re-routed to the north.

1924 – The western gas holder is present while both tar wells and one of the pressure tanks are no longer present. Military Brook is no longer present. Military Brook was possibly filled in during re-routing of the Barge Canal.

1938 – Aerial photography shows both holders are still present.

1941 – The eastern gas holder is no longer present, the single remaining tank at the east end of the building is labeled as "not in use" and the "purifier" and "retorts" labels are no longer on the building.

1946 – The western gas holder is still present. The building is labeled as "storage", "garage", "auto storage", "boiler room", "oil room", "shop", "natural gas equipment". Neither tank is present.

1947 – Building labeled as "Warehouse".

1952 – The western gas holder is still shown.

1954 – Aerial photography shows only the western holder and building still exists.

1963 – Western gas holder no longer shown. Building labeled as "Warehouse".

1974 – The entire site and adjoining parcels to the east and south appear to be cleared of all buildings.

1985 – Aerial photography shows the current Quality Inn Hotel as well as the beginning of construction on what would become West Shore Blvd.

1990 – West Shore Boulevard is present.

Coal was the primary feedstock for the manufactured gas process at the site. The Newark MGP produced gas using the coal carbonization process and later the carbureted water gas process (Atlantic, 1991). The coal carbonization method, consisted of heating bituminous coal in a sealed chamber (i.e., retorts), with destructive distillation of gas from the coal and the formation of coke. The gases were collected, cleaned (or purified), and distributed while coke was removed and sold or used. The main byproducts of the coal carbonization method were tars, oils, coke, ammoniacal liquor, ash and clinker, and residuals associated with the gas purification process (purifier wastes). The tars were generally viscous and contained higher concentrations of phenols and base nitrogen organics when compared to the tars generated from the later carbureted water-gas process. Coal carbonization also produced cyanide in the gas, which was removed during gas purification and often appears in wastes such as lime and wood chips. The carbureted water process involved a thermochemical reaction whereby high-pressure steam was passed over hot coal and reacted with carbon monoxide in the coke gas. The reaction produced carbon dioxide and pure hydrogen which was passed through water vapor leaving the hydrogen.

1.4 Summary of Previous Investigation and Remediation Activities

1.4.1 Site Screening Report

In 1991, Atlantic Environmental Services, Inc. (AES) completed a Manufactured Gas Plant Site Screening Report (Screening Report). The AES Screening Report contained substantial historical information and is referenced in Section 1.3 above. In addition to the historical review, the Screening Report included surface soil, surface water and streambed sampling and analyses and a sensitive habitat survey. Three surface water, three streambed sediment and five surface soil samples were collected and analyzed for VOCs, SVOCs, Metals, chromium and cyanide.

Analytical results showed that no VOCs, SVOCs, cyanide or elevated metals were detected in the surface water samples. The streambed sediment samples collected from the Barge Canal contained no detectable VOCs, carcinogenic polycyclic aromatic hydrocarbons (C-PAHs) or cyanide, although the non-carcinogenic PAH pyrene was detected at relatively low concentrations. Arsenic was detected in all 3 streambed samples at concentrations above local background. Arsenic concentrations decreased from upstream to downstream suggesting an off-site source. Surface soil samples were non-detect for VOCs and cyanide. PAHs and C-PAHs were detected in several of the soil samples and could be associated with former MGP operations or petroleum-based fuels. The majority of surface soil samples contained elevated (compared with local

background) concentrations of arsenic, beryllium, calcium, mercury and nickel. Elevated metals could have originated from other sources and may not be associated with MGP residues.

1.4.2 Soil Vapor Evaluation

A soil vapor evaluation was conducted inside the Quality Inn Hotel in April 2008. Results were submitted to the NYSDEC on June 30, 2008. The work involved the collection of six subslab soil gas samples, seven indoor air samples and one outside (ambient) air sample. The work was conducted in general conformance with procedures outlined in the NYSDOH document Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006, Final. Samples were analyzed by a NY State ELAP certified laboratory for VOCs by USEPA Method TO-15 plus N-Alkanes and selected tentatively identified compounds. Subslab and coupled indoor air samples were located at various locations within the building with two sample sets placed to be in proximity to the reported locations of the former gas holders. The results showed that volatile organic compounds (VOCs) typical of petroleum-based fuels as well as chlorinated VOC solvents were present in subslab samples. The concentrations of VOCs detected in indoor air samples appear to be within the range expected based on the experience of the NYSDOH. Therefore, it does not appear that vapor intrusion is occurring, or that MGP residues have affected the quality of air inside the hotel.

1.4.3 Unknown Investigation

Four existing monitoring wells were observed on the site by ARCADIS during a site visit in October 2009. These wells were reportedly installed in the early 1990's, although no regulatory documentation or records pertaining to the wells were found. NYSEG suspects that these wells were installed as part of a commercial property transfer or re-finance (i.e. a Phase I ESA) and not driven by regulatory requirement. As discussed in Section 2, NYSEG plans to access these well during the Preliminary Groundwater Assessment.

1.5 Geologic Setting

The Village of Newark is located along the northern edge of the Erie-Ontario Plain of the Interior Lowlands physiographic province of New York State. The area is characterized by low plains with little relief. Glacial processes have shaped the geomorphology of the region. The area was buried by glacial ice during the Wisconsin glaciation, which ended approximately 12,500 years ago. During the glaciations and

subsequent glacial retreats, glacial ice eroded soil material and bedrock, which were ultimately re-deposited as a mixture of unconsolidated glacial sediment.

The surficial glacial sediments in the area of the site have been mapped as a transitional area between glacio-lacustrine or glacial till deposits which are primarily composed of silts and clays, and outwash sand and gravel deposited by proglacial fluvial processes (Cadwell, et al., 1986). Dense till was reportedly encountered below fill materials in some of the previous borings at depths of approximately 5 to 22 feet below grade. The permeability of glacial till is expected to be low due to their fine-grained nature, however, sand and gravel (if present beneath the site) would be expected to have a relatively high permeability. The bedrock beneath the overburden glacial deposits has been mapped as the Upper Silurian age (formed 410 million years ago) Camillus Shale (Rickard and Fisher 1970). The bedrock surface can be locally uneven. Previous soil borings were completed to depths of 22 feet below grade. As such, bedrock is expected to be encountered at greater depths.

Topographic relief at the site is slight, with local surface drainage to the south toward the Barge Canal. The land-surface elevation is approximately 440 feet above mean sea level (AMSL). Given the proximity to the canal and the relatively flat, low-lying topography, the depth to water at the site is expected to be approximately 12 to 15 feet below ground surface. Discussions with a vendor who installed the existing monitoring wells in the early 1990's indicated the presence of saturated soils at these depths. Given the proximity to the Barge Canal, groundwater flow from the site would be expected to be toward the south, in the direction of the canal; however, historical information suggests that the previously existing Military Brook flowed toward the northeast, thus the actual groundwater flow characteristics beneath the site are difficult to infer.

2. Preliminary Groundwater Assessment

Since some uncertainty exists regarding groundwater flow direction, the first field task of the SC will be to locate the four existing monitoring wells, evaluate their integrity, and if found to be useable, measure water levels and collect groundwater samples for laboratory analyses. If the existing wells are deemed to be unusable, then replacement wells will be installed as necessary and sampled during the Remedial Investigation (RI) phase, and these existing wells will not be sampled during the SC.

Assuming the wells are found to be usable, NYSEG will collect one round of groundwater samples from them to determine the presence/absence of MGP-related constituents dissolved in groundwater. Groundwater samples will be collected from the monitoring wells using the low-flow sampling techniques described in the FSP. Groundwater samples will be submitted to a NYSDOH Environmental Laboratory Approval Program (ELAP) approved laboratory and analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), TAL metals and total cyanide. Field parameters measured during groundwater sampling will include pH, turbidity, temperature, conductivity, dissolved oxygen, and oxidation-reduction potential (ORP).

In order to assist with the Preliminary Groundwater Assessment and with future gauging of existing and proposed wells, two stream gauges will be installed at the approximate locations shown on Figure 2. The stream gauges and existing monitoring wells (assumed to be usable) will be surveyed so that an initial groundwater contour map can be prepared. The results of the laboratory analyses and groundwater contouring will be used to better refine the locations of proposed borings and monitoring wells to be installed during the Soil and Groundwater Investigations. The results of the Preliminary Groundwater Assessment will be submitted to the NYSDEC prior to initiating the Soil and Groundwater Investigations. Alternate boring and well locations will also be presented in the submittal to NYSDEC, if necessary. The technical approach and rationale for the Preliminary Groundwater Assessment is provided in Table 1.

3. Soil Investigation

3.1 Soil Investigation Objectives

The objectives of the soil investigation are to accomplish the following:

- assess whether MGP-related residual materials are present in subsurface soil in and around former MGP structures.
- preliminarily assess the depths of former MGP structures and the presence/absence of potential MGP-related residual materials within/near these structures and the location of former Military Brook.
- characterize the nature and distribution of the upper approximately 20 to 30 feet of underlying geologic materials.

The approach to address each of these objectives is briefly discussed below. Details of the Soil Investigation are presented in Table 1 and the proposed soil boring locations are shown on Figure 2.

3.2 Geophysical Survey

In support of the Soil Investigation, a geophysical survey will be performed using electromagnetic (EM-31) and Ground Penetrating Radar (GPR) surveys in accessible areas of the site and along and to the immediate north of West Shore Blvd, adjoining the site to the north. The objectives of the geophysical survey are to:

- locate below-grade remnants of former MGP structures (particularly the former holders).
- assess the location of possible underground utilities.
- fine-tune the locations of soil borings and monitoring wells to be installed during the SC.

3.3 Soil Boring Drilling and Sampling

NYSEG proposes to drill 26 soil borings during the SC. The purpose of the borings will be to collect soil data for assessing the presence of MGP-related impacts in various

areas of the site and to facilitate installation of four monitoring wells. The specific rationale and methods for drilling the borings is presented in Table 1 and the proposed locations are shown on Figure 2.

All soil borings will be drilled using a conventional drilling rig and standard hollow-stem auger and split-spoon sampling techniques. Soil samples will be collected continuously at each boring location from grade to their final depth using a 2-inch diameter by 2-feet long split-spoon samplers. Soil recovered from each 2-foot interval will be visually characterized for color, texture, and moisture content in general accordance with NYSDEC's Soil and Contaminant descriptions consistent with standards as previously submitted to NYSEG; however, the field geologist will likely not use the term "coated" to describe soils containing non-aqueous phase liquid (NAPL). Soil samples will be headspace-screened with a photoionization detector (PID). The presence of visible staining, NAPL, and obvious odors encountered in the soil will be noted.

Soil borings will be advanced to a depth no less than 10 feet below the elevation of the bottom of the holder, 10 feet below the soil/groundwater interface, or 10 feet below the deepest encountered visible contamination (whichever is greatest). Drilling will not be performed through any subsurface structures or confining layers where significant quantities of NAPL are encountered, in an effort to limit the potential downward migration of NAPL.

Up to two soil samples from each boring will be submitted for laboratory analysis for TCL VOCs, TCL SVOCs, and total cyanide. Laboratory analyses will be performed in accordance with USEPA SW-846 methodologies. Analytical test methods, detection and reporting limits are described in the QA/SAPP. One sample from each boring will also be analyzed for free cyanide. Samples will be collected based on visual/olfactory observations and photoionization detector (PID) screening results and submitted to an ELAP- certified laboratory.

3.4 NAPL Monitoring Wells

NAPL monitoring wells may be installed at up to two soil boring locations if potentially pooled NAPL is encountered. The length of the NAPL monitoring well screens will be dependent on the stratigraphic interval that the NAPL is found to occupy (see Table 1). The screen slot size will be a minimum of 0.02-inches. Two-foot long sumps (grouted-in) will also be installed at the base of each NAPL monitoring well. Groundwater sampling will not be performed at any wells containing NAPL.

3.5 Tar Well Beneath Hotel

After completing the exterior Site Characterization activities and evaluating analytical results, NYSEG will remobilize with equipment appropriate to advance borings through the lowest floor slab inside the Quality Inn Hotel. The primary objective will be to investigate the tar well reportedly located beneath the footprint of the northern portion of the Hotel building. Other locations within the building may also be identified for investigation based on the results of the exterior Site Characterization. Borings conducted through the building slab will be advanced to the target depths previously discussed. See Table 1 for a description of the proposed work.

4. Groundwater Investigation

4.1 Groundwater Investigation Objectives

The objectives of the groundwater investigation are to:

- characterize the general shape of the water table, and develop an understanding of shallow groundwater flow patterns at the site.
- assess the hydraulic characteristics of the materials screened by the wells.
- determine the presence/absence of MGP-related constituents dissolved in groundwater and if present, whether they are at a concentration in excess of NYSDEC Class GA Groundwater Standards.

The approach to address each of these objectives is briefly discussed below. Details of the Groundwater Investigation are presented in Table 1 and the proposed monitoring well locations are shown on Figure 2.

4.2 Groundwater Flow Patterns/Hydraulic Characteristics

The groundwater flow patterns and hydraulic characteristics beneath the site will be evaluated by:

- reviewing data generated during the Preliminary Groundwater Assessment discussed in Section 2 (assuming the four existing wells are useable).
- installing and developing four overburden water-table monitoring wells, using the methods described in the FSP.
- installing two stream gauges in the Barge Canal at approximate locations as shown on Figure 2.
- performing specific-capacity tests on the new monitoring wells during low-flow sampling (discussed below).
- measuring two comprehensive fluid-level rounds from the new and existing wells and the surface water gauges.

The locations of the proposed monitoring wells are shown on Figure 2 and the rationale for the proposed work described above is discussed in Table 1.

4.3 Groundwater Quality Analysis

One round of groundwater samples will be collected from the four new monitoring wells to evaluate the presence/absence of MGP-related constituents dissolved in groundwater. Groundwater samples will be collected from the monitoring wells using the low-flow sampling techniques described in the FSP. As directed by NYSDEC, monitoring wells will be purged using submersible pumps with flow rates regulated by adjusting pump speed, rather than restricting flow rate with valves. Groundwater samples will be submitted to an ELAP- certified laboratory and analyzed for TCL VOCs, TCL SVOCs, total and free cyanide using USEPA SW-846 methodologies. Analytical test methods, detection and reporting limits are detailed in the QA/SAPP. Field parameters measured during groundwater sampling will include pH, turbidity, temperature, conductivity, dissolved oxygen, and ORP.

5. Survey, Decontamination, and Waste Handling

5.1 Survey

While completing the SC field work, field personnel will mark all investigation locations. A New York State licensed surveyor will then survey the marked locations. Horizontal coordinates will be tied to New York State Plane Central (3102) coordinate system (NAD 83). All elevations will be established with respect to NAVD 1988.

For each soil boring, the surveyor will determine its location and the ground surface elevation. For each monitoring well, the surveyor will determine the location, ground-surface elevation, and measuring-point elevation (defined as the top of the inner casing).

5.2 Decontamination

All equipment will be decontaminated following the procedures outlined in the FSP. In general, all non-disposable equipment, in particular all drilling tools and groundwater-sampling equipment, will be decontaminated prior to first use on site, between each investigation location, and prior to demobilization. The integrity of decontamination will be checked periodically with equipment rinse blanks, as required by the QA/SAPP.

5.3 Waste Handling

All investigation-derived waste will be contained on-site for appropriate characterization and disposal. Soil cuttings, drilling mud (if any), personal protective equipment, and spent disposable sampling materials will be segregated by waste type and placed in DOT-approved 55 gallon steel drums. All decontamination water, purged groundwater, and drilling water will be stored in polyethylene tanks or 55-gallon drums. Field staff will maintain an inventory of all waste vessels. All storage vessels will be appropriately labeled with the contents, generator, location, and date.

6. Project Schedule and Reporting

NYSEG estimates that the field tasks outlined in this SC Work Plan will take approximately eight weeks to complete. The Preliminary Groundwater Assessment will be completed first, followed by soil borings, monitoring well installation, groundwater sampling, and water-level measurement.

As agreed to during the March 10, 2010 teleconference, NYSEG plans to submit a data package to the NYSDEC to present the SC Results. If the SC data indicate that an RI is warranted, the data package will also include a scope of work for an RI. The scope of work would be in the form of a figure showing the proposed RI investigation locations and a table summarizing the rationale for the proposed investigations. The means and methods detailed in this SC Work Plan will be used to conduct all future RI activities. We would propose to hold a conference call with the NYSDEC to discuss the SC Results and RI scope of work (if warranted) shortly after the data submittal.

Given this approach the table below shows the approximate project schedule. The actual project starting date will depend on obtaining NYSDEC's approval of this Work Plan.

Work Activity	Date	Duration
SC Work Plan Approval	April 2010	--
Implement SC Work Plan	April-May 2010	8 weeks
SC Data Submittal/RI Work Scope to NYSDEC	July 2010	--
Call to Discuss SC Results/RI Work Scope	August 2010	--
Final RI Work Scope Approval	September 2010	--
Implement RI Fieldwork	Fall 2010	--

7. References

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TABLE

Table 1. Site Characterization Field Activities, NYSEG, Newark Former MGP Site

Location/Activity	Action	Rationale
PRELIMINARY GROUNDWATER ASSESSMENT		
Assess Integrity and Sample Existing Wells	The integrity of four existing monitoring wells will be assessed to determine whether the wells need to be redeveloped. Existing wells will be redeveloped if necessary. Groundwater samples will be collected from the four existing monitoring wells using low-flow sampling techniques. Wells will be purged using a bladder pump or other pump whereby flow can be regulated by adjusting pump speed. Analyze samples for Target Compound List (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), Target Analyte List (TAL) metals, and total cyanide. Analytes, detection limits and analytical methods are described in the Quality Assurance Sampling and Analysis Project Plan. Data Usability Summary Reports will be prepared for all laboratory data packages.	These monitoring wells were reportedly installed in the early 1990's and will be evaluated for integrity and usability. Assuming the wells are useable, the sampling results will be evaluated to establish baseline groundwater quality and to assess whether the former MGP has adversely affected groundwater quality in the area of the wells.
Barge Canal Surface Water Gauges ***RG-1 Upstream*** ***RG-2 Downstream***	Two surface water gauges will be established along the NY State Barge Canal at locations upstream and downstream from the site.	Water-level information obtained from the proposed gauges will be used to develop a preliminary assessment of groundwater/surface-water interaction near the site.
Survey	The locations and top of casing elevations of existing monitoring wells and measuring point elevations of the two surface water gauges in the Barge Canal will be surveyed. Horizontal locations will be referenced to NYS Plane Coordinates (NAD83) and elevations will be referenced to USGS elevation (NAVD88).	Survey data will be used to convert water-level measurements to water elevations.
Water-Level Measurement	One round of water-level s will be measured at existing monitoring wells and the new surface water gauges.	Water-level information obtained from the existing monitoring wells and proposed surface water gauges will be used to develop a preliminary assessment of the shallow groundwater direction at the site. This information will be used to fine-tune the locations of soil borings and monitoring wells to be installed during the Soil and Groundwater Investigations.

Table 1. Site Characterization Field Activities, NYSEG, Newark Former MGP Site

Location/Activity	Action	Rationale
SOIL AND GROUNDWATER INVESTIGATIONS		
Conduct Ground-Penetrating Radar (GPR) Survey	A GPR survey will be conducted in accessible areas of the site (not inside buildings). The GPR survey will also include that portion of West Shore Blvd and adjoining property adjacent to the north side of the site where former MGP structures may have been located.	The GPR survey results will be used to assist with utility clearance and to help identify and delineate former MGP structures such as gas holder remnants, building foundations and potential abandoned tanks. These results will be used to fine-tune the locations of proposed borings and monitoring wells to be installed during the SC.
Soil Borings ***SB-1 through SB-4*** inside former gas holder footprints ***SB-5 through SB-9*** vicinity of retorts, purifier, tank and tar well ***SB-10 through SB-13*** outside of former holders ***SB-14, SB-15,SB-16***, **SB-21, SB-22, SB-25 and SB-26** Along a transect within the presumed location of former Military Brook ***SB-17 through SB-20*** eastern and southern portions of the site **SB-23 and SB-24** Contingency borings on north side of West Shore Blvd.	Soil borings will be completed prior to monitoring well installations. Observations made during soil boring advancement will be used to determine monitoring well depth (i.e., monitoring wells will be installed to screen intervals where impacted soils were observed). Twenty-six continuously-sampled soil borings will be drilled using a conventional drill rig (hollow stem augers and split-spoon sampling). Soil samples will be collected using a 2-inch diameter by 2-feet long split-spoon samplers. Soil recovered from each 2-foot interval will be visually characterized for color, texture, and moisture content. The presence of visible discoloration, NAPL, and obvious odors encountered in the soil will be noted. Two additional contingency borings may be advanced on property along the north side of West Shore Blvd. if GPR survey indicates possible MGP structures to be present. Soil borings shall be advanced to a depth no less than 10 feet below the elevation of the bottom of the holder, 10 feet below the soil/groundwater interface, or 10 feet below the deepest encountered visible contamination (whichever is greatest). Drilling will not be performed through any subsurface structures (e.g., concrete slabs), or other vertical barriers such as fine-grained soils, where significant quantities of NAPL are encountered, in an effort to limit the potential downward migration of NAPL. Up to two soil samples from each boring will be submitted for laboratory analysis for TCL VOCs, TCL SVOCs, and total cyanide. One sample from each boring will also be submitted for free cyanide analysis. Analytes, detection limits and analytical methods are described in the Quality Assurance Sampling and Analysis Project Plan. All laboratory analyses will be performed by an ELAP-certified laboratory. One sample from each boring will also be submitted for free cyanide analysis. Samples will be collected from the most-heavily impacted interval(s), based on visual/olfactory observations and PID screening results. Samples will also be collected from apparently “clean” intervals to provide	Field observations and characterization of the soil samples obtained from these borings will be used to assess the potential presence of MGP-related impacts at the site. As discussed under “Monitoring Wells”, four of these borings will be converted to monitoring wells.

Table 1. Site Characterization Field Activities, NYSEG, Newark Former MGP Site

Location/Activity	Action	Rationale
	information to define the "bottom" or the lateral extent of impacted areas. Data Usability Summary Reports will be prepared for all laboratory data packages.	
<u>Monitoring Wells</u> ***MW-1/SB-11*** west of hotel building, downgradient from former holder ***MW-2/SB-13*** north of hotel building, downgradient from former holder ***MW-3/SB-16*** courtyard of hotel, near bed of Military Brook and downgradient from tar well ***MW-4/SB-19*** downgradient edge of site	Monitoring well locations and screened intervals will be based on the results of the Preliminary Groundwater Assessment and observations made while drilling soil borings. It is assumed that the groundwater flow direction is toward the Barge Canal. As such, monitoring wells are proposed to be installed downgradient (south) from former MGP structures. Should the Preliminary Groundwater Assessment work suggest a different groundwater flow direction, monitoring well locations will be altered accordingly. Four soil borings (SB-11, SB-13, SB-16, and SB-19) will be converted to groundwater monitoring wells. Monitoring wells will be constructed using two-inch diameter, schedule 40 PVC and 10-foot long wells screens. Screen slot size and sand pack grain size will be determined based on the grain size of the material being screened. Grouted sumps will be installed at well bottoms if NAPL is observed near the screened interval in quantities that suggest that it may be pooled. Monitoring wells are anticipated to be installed with screens in the upper approximately 10 feet of saturated overburden (i.e., approximately 20 feet below grade); however, final well depths will be determined based on the depths of potentially impacted soils observed while drilling soil borings. Monitoring wells will be developed by surging/purging the saturated portion of the screened interval. A minimum of 10 well volumes of groundwater will be removed from each well, if well yield is sufficient; otherwise, each well will be purged to dryness three times. In the case of the latter, the water level in each well will be allowed to recover to within 75% of its initial level between purgings.	Assess the potential presence of dissolved-phase MGP-related constituents in groundwater at and near the former MGP site. Evaluate shallow groundwater flow direction at the site.
<u>Groundwater Sampling</u>	One round of groundwater samples will be collected from the four new monitoring wells using low-flow sampling techniques. Specific-capacity test data will be collected at the new monitoring wells as they are sampled. Groundwater samples will be analyzed for TCL VOCs, TCL SVOCs, total and free cyanide. Analytes, detection limits and analytical methods are described in the Quality Assurance Sampling and Analysis Project Plan. All laboratory analyses will be performed by a New York State Environmental Laboratory	Analytical results will be evaluated to better understand the presence and level of MGP-related constituents in groundwater and soil downgradient from former MGP structures. Specific-capacity data will be used to estimate the hydraulic conductivity of the saturated material screened by the monitoring wells. The geochemical parameters indicated are needed to develop an understanding of the viability of natural attenuation as a potential

Table 1. Site Characterization Field Activities, NYSEG, Newark Former MGP Site

Location/Activity	Action	Rationale
	Approval Program (ELAP) certified laboratory. Temperature, pH, specific conductance, turbidity, dissolved oxygen, and oxidation-reduction potential will be measured during sampling. Data Usability Summary Reports will be prepared for all laboratory data packages	remedial alternative (if necessary).
NAPL Monitoring Well(s)	NAPL monitoring wells may be installed at up to two soil boring locations if potentially pooled NAPL is encountered. The length of the NAPL monitoring well screens will be dependent on the stratigraphic interval that the NAPL is found to occupy. For example, if a two-foot interval of soil is observed to contain NAPL, then a two-foot well screen will be installed at the interval of the observed NAPL. NAPL monitoring wells, if required, will be installed with 2-inch diameter schedule 40 PVC risers, screens, and sumps. The screen slot size will be a minimum of 0.02-inches. Two-foot long sumps (grouted-in) will also be installed at the base of each NAPL monitoring well. Groundwater sampling will not be performed at any wells containing NAPL.	Assess the potential mobility of NAPL encountered in the subsurface and gather important information necessary for a potential NAPL remedy (if necessary).
Investigate Tar Well Beneath Hotel	NYSEG will evaluate a scope of work for investigating the tar well located beneath the building after the exterior Site Characterization work has been completed.	The exterior Site Characterization work might identify other locations in the hotel where intrusive investigation might be necessary. Former tar wells are typically a source of residual impacts. NYSEG plans to postpone investigation of this tar well until we better understand whether additional impacts could be present under the hotel. We would then plan to investigate all potential impacts during one interior mobilization, thus lessening the disruption to the hotel.
Water-Level Measurements	Obtain two synoptic rounds of fluid level measurements – spaced approximately 1 month apart. Fluid-level measurements will be made at new and existing monitoring wells, and the surface-water gauging locations.	Hydraulic head data will be used to: • assess shallow groundwater flow direction; • check for NAPL accumulation in wells; and • develop a preliminary understanding of the groundwater/surface-water interaction at the site.
Barge Canal Bank Reconnaissance	The bank of the canal will be observed to look for evidence of pipes and/or NAPL seeps. Observations will be photo-documented.	The purpose of this task would be to observe the bank of the canal and look for potential pipes and/or NAPL seeps that could indicate that MGP related compounds (if present) have a pathway for migration into the Barge Canal.

Table 1. Site Characterization Field Activities, NYSEG, Newark Former MGP Site

Location/Activity	Action	Rationale
Survey	Locations and/or top of casing elevations of soil borings and new monitoring wells will be surveyed. Horizontal locations will be referenced to NYS Plane Coordinates (NAD83) and elevations will be referenced to USGS elevation (NAVD88).	Survey data will be used to locate borings and wells on a site base map and convert water-level measurements to water elevations.

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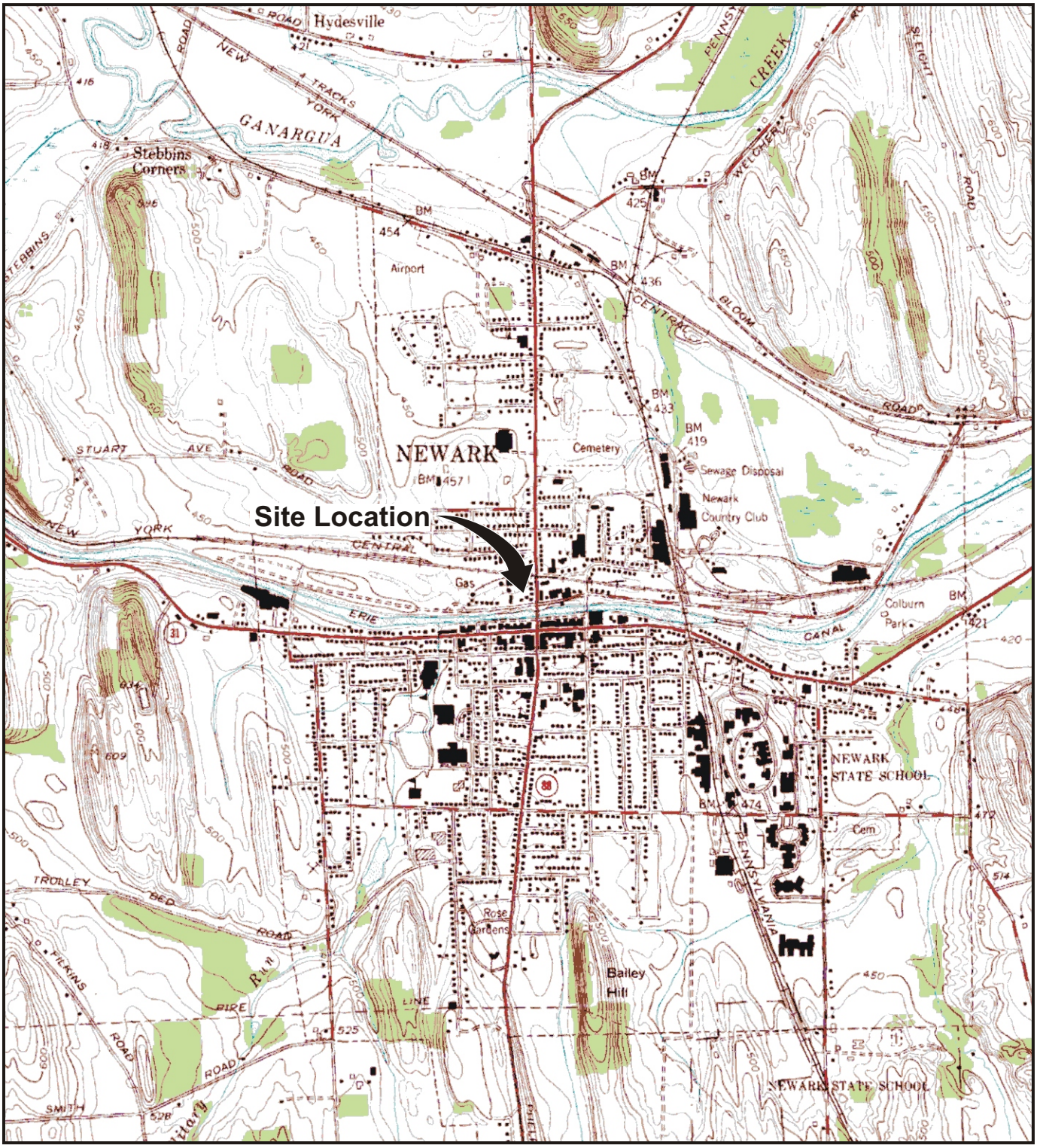
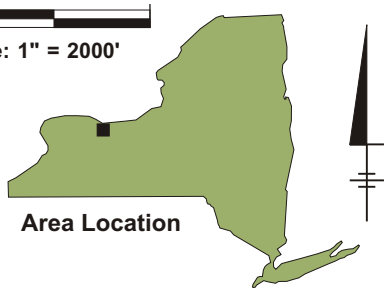
FIGURES



REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., NEWARK, NY, 1952, PHOTOREVISED 1952.

2000' 0 2000'

Approximate Scale: 1" = 2000'



NEW YORK STATE ELECTRIC & GAS CORPORATION
NEWARK FORMER MANUFACTURED GAS PLANT SITE
SITE NO. 85-9-021
SITE CHARACTERIZATION

SITE LOCATION MAP

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FIGURE
1

11/02/09 SYRACUSE, NY-ENV/CAD-DJHOWES
B0013094/0000/00001/CDR/13094N01.CDR

LEGEND:

- FORMER MGP STRUCTURES
- APPROXIMATE FORMER LOCATION OF MILITARY BROOK (PRE 1924)
- MW-1/SB-11 — PROPOSED MONITORING WELL
- SB-20 — PROPOSED SOIL BORING
- SB-23 — CONTINGENT UPON INDICATIONS OF MGP STRUCTURES BEING PRESENT
- SB-4 — PROPOSED SOIL BORING INSIDE GAS HOLDER
- RG-1 — PROPOSED RIVER GAUGE

NOTES:

1. BASE MAP PREPARED FROM DWG FILE PROVIDED BY NYSEG TITLED "LOCATION MAP NEWARK MGP SITE VILLAGE OF NEWARK WAYNE COUNTY, NEW YORK", REVISED 6/03/99, AT A SCALE OF 1"=200'.
2. AERIAL DOWNLOADED FROM NYS GIS CLEARINGHOUSE, DATED 2005. COORDINATES ARE STATE PLANE NAD 83.
3. FORMER MGP SITE FEATURES FROM DWG FILE PROVIDED BY NYSEG TITLED "NEWARK FORMER MGP SITE VILLAGE OF NEWARK TOWN OF ARCADIA WAYNE COUNTY, NEW YORK", REVISED 12/18/02, AT A SCALE OF 1"=40'. FORMER MGP SITE FEATURE LOCATIONS ARE APPROXIMATE.

0 100' 200'
GRAPHIC SCALE

NEW YORK STATE ELECTRIC AND GAS CORPORATION
NEWARK FORMER MANUFACTURED GAS PLANT SITE
SITE NO. 85-9-021
SITE CHARACTERIZATION

PROPOSED SOIL BORING AND MONITORING WELL LOCATION MAP

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FIGURE
2

APPENDICES

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Appendix A

NYSDEC Correspondence

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Appendix B

Field Sampling Plan

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Appendix C

Quality Assurance Sampling and Analysis Project Plan

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Appendix D

Health and Safety Plan

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Appendix E

DNAPL Contingency Plan