Remedial Investigation Work Plan

for the

Babylon Former MGP Site
West Babylon, Suffolk County, New York

Prepared for

KEYSPAN

(a National Grid Company)

Prepared by

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1.0 Introduction

KeySpan Corporation (KeySpan), a National Grid Company, will be conducting a remedial investigation at the location of the Babylon Former Manufactured Gas Plant (MGP) Site (the Site). The property was sold by a KeySpan predecessor company (LILCO) in the early 1960's, and was recently used by a fuel-oil storage and distribution company (Park Avenue Fuel Oil, Inc.). The Site is located in a mixed commercial, residential area in West Babylon, Town of Babylon, Suffolk County, New York (see Figure 1). The production of MGP water gas (Lowe Process) began at the Site during January 1911 and continued through 1917, under the ownership of the South Shore Gas Company. According to Brown's Directory, after the Long Island Lighting Company (LILCO) was founded in 1910 it absorbed the South Shore Gas Company. Gas production data for the Site was attributed to LILCO in 1918, and there is no information available regarding any gas production data after 1918. According to Brown's Directory, LILCO was the owner of the Site from 1915 until 1961.

Based on the 2003 VHB, Inc. Preliminary Site Assessment (PSA), Park Avenue Fuel Oil, Inc. (a recent business at the Site) first occupied the Site in 1980. Prior to Park Avenue Fuel Oil, Inc., the property was occupied by a manufacturer of fluorescent lights (Crown Light Manufacturing). The precise dates of ownership and or occupancy of the Site by Crown Light Manufacturing are not known. The Site is currently owned by the same proprietor that owned the Park Avenue Fuel Oil, Inc., and a boat related business operated at the Site in 2006. Access to the Site is through a gated perimeter fence.

KeySpan signed an Order on Consent D1-001-99-05 with the New York State Department of Environmental Conservation (NYSDEC) to conduct a Preliminary Site Assessment (PSA) of the former MGP Site. The PSA was conducted in 2002, and the results were documented and submitted to the NYSDEC in the February 2003 report entitled Preliminary Site Assessment Report (VHB, 2003). This Remedial Investigation Work Plan (RIWP) provides the planned work scope for additional investigation proposed at the Site. Based on the data from the 2003 PSA, the RI work scope will be focused on completing the site characterization to further assess the nature and extent of MGP related impacts both on and off-site, and to evaluate the potential closure of the MGP related issues.

1.1 Purpose

The purpose of this RIWP is to provide the RI work scope that will be used to complete the MGP related site characterization in conjunction with the data from the Preliminary Site Assessment Report (VHB, 2003). The RI data will be used to further assess the nature and extent of MGP related impacts both on and off-site, and to evaluate the potential closure of the MGP related issues. The RIWP includes the methodologies and approach for soil borings and monitoring well installation, groundwater, soil, and soil vapor sampling, and preparation of the Remedial Investigation Report, which will include

a Qualitative Human Health Exposure Assessment (QHHEA) and a Fish and Wildlife Resources Impact Analysis (FWRIA). Field activities will be conducted in accordance with the requirements of the Quality Assurance Project Plan (QAPP) and the Health and Safety Plan (HASP).

1.2 General Site Conditions

The physical address of the Site is 29 Evergreen Street and the property is approximately 0.79 acres. The Site is located in a mixed commercial, residential area of West Babylon, Suffolk County, New York. The Site is currently bounded to the south/southwest by the Long Island Railroad (LIRR) tracks, to the west/northwest by residential dwellings, and to the east/northeast by an assisted-living facility. The Site is secured by a gated perimeter fence, and the surface cover is asphalt paving.

1.3 Site Geology and Hydrology

1.3.1 Site Geology

According to the 2003 PSA, the Site is essentially flat and has an elevation of approximately 20 feet above mean sea level (msl). Review of the soil boring logs from the activities conducted during the PSA identify an asphalt surface underlain by a silt and sand backfill underlain by fine sands with occasional gravel.

1.3.2 Site Hydrology

Review of the soil boring logs from the activities conducted during the PSA identify a shallow groundwater table between 10 and 11 feet beneath ground surface.

1.4 Previous Investigations at the Site

KeySpan completed a PSA at the Site and submitted the results to the NYSDEC in a PSA Report in February 2003. The PSA was comprehensive, and it included a detailed record review, site reconnaissance, field survey, sample collection, sample analysis, and reporting. Site sampling activities included surface soil, subsurface soil (borings and test trenches), groundwater, and soil vapor sampling and analysis.

2.0 Scope of Work

This section describes the tasks to be performed as part of the Remedial Investigation. The investigation activities presented herein will be performed in accordance with the QAPP and HASP. The QAPP and HASP will be included as appendices to this work plan.

2.1 Installation of Soil Borings

Four soil borings will be installed on site to delineate the lateral and vertical extent of MGP-related impacts in the vicinity of WBSB-04. Results from the PSA indicated that NAPL impacts and naphthalene odors were observed in this boring. In addition, soil samples collected from this boring exhibited elevated levels of PAHs, with compounds that are potentially attributable to MGP activities. The soil borings will be completed to the northwest, north, southwest, and southeast of WBSB-04. Borings will be completed using direct-push technology, and will be advanced to 20 to 25 feet below ground surface. Additional soil borings may be installed to delineate this area depending on the extent of potential MGP-related impacts observed in the borings.

Per request from NYSDEC, three soil borings will be installed on the downgradient property to the south to assess whether off-site migration of MGP contaminants has occurred. These borings will be completed using direct push technology, and will be advanced a minimum of 40 feet below ground surface.

Soil samples will be collected from 0 to 2 inches (for assessment of human health and ecological risks), and at the interval showing the greatest potential of MGP impacts, based on visual examination and photoionization detector (PID) readings (Table 1). Other samples may be collected depending on field observations. Should visual examination and PID screening indicate no evidence of impacts, a sample would be collected at a depth corresponding to impacted depths at adjacent borings.

Soil samples will be analyzed for the Target Compound List (TCL) Volatile Organic Compounds (VOCs), TCL Semi-volatile Organic Compounds (SVOCs), Total Organic Carbon (TOC), and cyanide (CN). Three soil samples will also be analyzed for geotechnical parameters (grain size, porosity, specific gravity, and bulk density).

Discrete groundwater grab samples (e.g., Groundwater Probe samples) will be collected from each of the three borings installed on the downgradient property to the south. These samples will be collected from the interval showing the greatest potential for MGP impacts (based on visual examination and PID readings). Should visual examination and PID screening indicate no evidence of impacts, a groundwater sample would be collected from the top two feet of the water table. The discrete groundwater grab samples will be analyzed for TCL VOCs, TCL SVOCs, and CN.

Table 1: Soil Sampling and Analysis Plan

Parameter	Interval(s)	No. of Soil Borings	No. of Samples	QA/QC
TCL VOCs	0 to 2 inches, and potentially impacted interval	7	14	1 duplicate, 1 MS/MSD
TCL SVOCs	0 to 2 inches, and potentially impacted interval	7	14	1 duplicate, 1 MS/MSD
CN	0 to 2 inches, and potentially impacted interval	7	14	1 duplicate, 1 MD
TOC	0 to 2 inches, and potentially impacted interval	7	14	NA
Grain Size	potentially impacted interval or lithologically representative interval	3	3	NA
Porosity	potentially impacted interval or lithologically representative interval	3	3	NA
Specific Gravity	potentially impacted interval or lithologically representative interval	3	3	NA
Bulk Density	potentially impacted interval or lithologically representative interval	3	3	NA

2.2 Installation of Overburden Monitoring Wells

Three monitoring wells will be installed on site to further assess water quality and to support further evaluation of groundwater flow direction and gradient. One location will be upgradient near the property line at the northwest corner of the Site. A second will be installed along the southern Site boundary, down gradient of WBSB-04, to assess conditions near the WBSB-04 area. The third monitoring well will be installed north of the existing building. Additionally, if visual or olfactory evidence of MGP contamination is found in the soil borings completed on the downgradient property to the south, one or more of these borings may be converted to monitoring wells.

The permanent wells will be installed as 2-inch PVC wells with 10-foot screened intervals and flushmount casings (4 inch diameter wells will be installed if potentially recoverable NAPL is encountered). The monitoring well soil profile will be logged by a geologist during installation. If any visual impacts or PID readings above background are encountered during installation, a soil sample will be collected and submitted for TCL

VOCs, TCL SVOCs, and cyanide. The monitoring well locations are presented on Figure 2.

Table 2 presents the nomenclature and location rationale for each proposed monitoring well. Installation will be via direct push methods and borings will be advanced to approximately 15 feet bgs.

Table 2: Monitoring Well Installation Detail and Rationale

Well ID	Location	Type	Rationale
MW-1	On site	Flushmount	Upgradient location – northwest corner of site
MW-2	On site	Flushmount	Downgradient of WBSB-04
MW-3	On site	Flushmount	Assessment of gradient and flow direction

2.3 Low-flow Groundwater Sampling

The monitoring wells will be sampled two weeks after installation to generate site-specific hydrogeologic data and evaluate groundwater quality. A full round of synoptic groundwater level measure measurements will be collected from the monitoring wells prior to sampling. If NAPL is observed in any of the monitoring wells it will be noted in the field notebook. Table 3 presents a Sampling and Analysis Plan. Each monitoring well will be screened with a PID immediately upon opening the casing.

Groundwater sampling will be performed following low-flow sampling techniques using a peristaltic pump, and the following parameters will be recorded via field instrumentation until stabilization requirements are met: temperature, redox potential, dissolved oxygen, pH and turbidity. Groundwater samples will be collected using a dedicated bailer and analyzed for TCL VOCs, TCL SVOCs and CN at a NYSDOH/ELAP certified lab. A duplicate and trip blank will also be collected for QA/QC purposes. Purge water will be collected in 5-gallon buckets and transferred to 55-gallon steel drums for disposal.

Table 3: GW Sampling and Analysis Plan

ID	GW Level	Sampling Method	Sampling Analysis
MW-1	X	Low-Flow	TCL VOCs, TCL SVOCs, CN
MW-2	X	Low-Flow	TCL VOCs, TCL SVOCs, CN
MW-3	X	Low-Flow	TCL VOCs, TCL SVOCs, CN

2.4 Soil Vapor Sampling

Four soil vapor samples will be collected and analyzed for TO-15 volatiles. Three soil vapor samples will be collected on site. One to the north of WBSB-04, one along the northern Site boundary between the Site boundary and the approximate location of the former gas holder, and one at the eastern edge of the site property, between the site building and the assisted-living facility. The fourth soil vapor sample will be collected off-site on the downgradient property to the south. The soil vapor samples will be collected as 1-hour samples using evacuated 6-liter stainless steel Summa® canisters. The soil vapor points will be installed using a PRT direct push method. One canister blank will also be analyzed. Field conditions will be documented (e.g., weather, etc.) The installation of the temporary or permanent soil vapor points will be in general accordance with Section 2.7.1 of the New York State Department of Health (NYSDOH) *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, dated October 2006 (see Appendix A for soil vapor sampling details).

2.5 Surveying

A New York State licensed land surveyor will survey the vertical and horizontal locations of the new overburden monitoring wells, soil boring locations, soil vapor points, and other pertinent site features/information essential for completion of the RIR. The elevation of the reference point of each monitoring well (the top of the well casing) will be surveyed for aid in determining groundwater elevations and corresponding flow direction.

3.0 Remedial Investigation Report

Upon completion of the remedial investigation activities discussed above, a Remedial Investigation Report (RIR) will be prepared for KeySpan submission to the NYSDEC. The RIR will describe the nature and extent, as well as the fate and transport of contaminants associated with the former MGP Site, and will identify specific contaminant concentrations throughout each media (e.g., soil, groundwater, etc). The RIR will also provide recommendations for next steps, and further investigation if any is warranted. A QHHEA and FWRIA will be included in the RIR. The RIR will integrate the PSA data into the tables, figures, etc.

The QHHEA will be completed to identify any potential exposure pathways and/or risks to human receptors from those site contaminants of concern identified during the PSA and Remedial Investigation, and will include:

- Characterization of the exposure setting (including the physical environment and potentially exposed human populations);
- Identification of exposure pathways;
- Evaluation of contaminant fate and transport, and;

- Determination of potential exposure of human receptors relative to site related contaminants of concern.

The FWRIA will be completed to identify any potential impacts to fish and wildlife resources from those site contaminants of ecological concern identified during the PSA and Remedial Investigation. The FWRIA will consist of:

- Identification of fish and wildlife resources;
- Identification of contaminant migration pathways and fish and wildlife exposure pathways;
- Description of the resources on and within one-half mile of the Site;
- Identification of contaminants of ecological concern, and;
- Provide conclusions regarding the actual or potential adverse impacts to fish and wildlife resources.

4.0 Schedule

The field program is anticipated to begin in March or April of 2008 pending written Work Plan approval from the NYSDEC, and following the receipt of the required access agreements from the current property owner, and the downgradient property to the south. The field program will take approximately four weeks from installation of soil borings through groundwater sampling.

5.0 References

Vanasse Hangen Brustlin, Inc. Preliminary Site Assessment (PSA) report for the former Babylon MGP Site, February 2003.