Thomas J. Campbell
Project Manager

July 21, 2008

Mr. Charles Post
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7010

Re: Far Rockaway Former Manufactured Gas Plant
Remedial Investigation Addendum Work Plan
Far Rockaway, New York
Site No. 2-41-032

Dear Mr. Post:

Per our phone call on June 24, 2008, this Remedial Investigation Work Plan Addendum for the Far Rockaway Former Manufactured Gas Plant Site has been prepared to summarize the agreed upon Scope of Work to further assess shallow and deep groundwater quality and soil vapor adjacent to and downgradient of the former gas holder area. Specific field methods, quality assurance/quality control (QA/QC) procedures, community air monitoring program (CAMP) activities, and the citizen participation plan (CPP) are summarized in detail in the Remedial Investigation Work Plan (RIWP) prepared for this site by National Grid (formerly KeySpan) dated November 2007.

Background

The Site is being investigated in accordance with Order on Consent #D1-0001-99-05 between KeySpan Corporate Service, LLC (KeySpan) and the New York State Department of Environmental Conservation (NYSDEC). The initial RI work, performed by ENSR on behalf of KeySpan between November 2007 and January 2008, was designed to be an extension of the preliminary site assessment (PSA) performed by Paulus, Sokolowski, and Sartor, Engineering, PC in December 2002. Results of the initial RI work indicated additional delineation of shallow and deep groundwater impacts is required in the area adjacent to and downgradient of the former gas holder area. In addition, additional soil vapor data is required southwest of the former holder adjacent to the building located at 1250 Brunswick Avenue.

Objectives

Based on the operation of an MGP at the Site between the mid-1890's and 1909 and the results of the PSA and initial RI activities, the goals for the RI addendum are to fill data gaps to determine the nature and extent of MGP impacts at the Site and offsite in accordance with NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation. Specifically, the goals are to delineate the areal and vertical extent of groundwater impacts adjacent to and downgradient of the former gas holder and further evaluate soil vapor conditions southwest of the holder adjacent to the nearest commercial building at 1250 Brunswick Avenue. Once this work is complete, results will be compiled with existing RI results and a Remedial Investigation Report will be submitted to NYSDEC for review.

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Scope of Work

The additional investigative work outlined in this RIWP Addendum includes the following field tasks:

- Pre-investigation coordination/meetings to facilitate access and work implementation
- Locating underground utilities in the investigation areas
- Community air monitoring during invasive drilling activities
- Advancement of direct-push groundwater tooling to allow collection of groundwater grab samples from the shallow and deep portions of the site aquifer to aid in the location of permanent monitoring well locations
- Monitoring well installation
- Monitoring well development
- Groundwater sampling
- Collection and analysis of soil vapor samples adjacent to the commercial building located at 1250 Brunswick Avenue between this building and the former gas holder location
- Surveying of all new sampling points and wells
- Investigation derived waste residuals management

All field work will follow methods and guidelines provided in the RIWP, the QAPP, HASP, and Field Sampling Procedures presented in the RIWP dated November 2007, unless otherwise specified in this document.

A summary of the proposed field investigation activities is included in the following section.

Field Investigation Activities

Following pre-investigation access coordination with the site and adjacent property owners, the following field tasks will be performed:

- **Underground utility clearance -** Prior to the initiation of intrusive field work, ENSR will contact Dig Safely New York to arrange for the location and marking of all underground utilities in the vicinity of the proposed soil boring and monitoring well locations. Copies of available city sewer and water maps from the Site vicinity will also be obtained and reviewed during underground utility clearance procedures. Following review of the utilities in the Site area, all sampling locations will be scanned using ground penetrating radar (GPR) and electromagnetic (EM) survey methods to confirm the location of marked utilities or to identify other unmarked utilities. Lastly, prior to advancing subsurface tooling, each investigation location will be hand or vacuum excavated to a depth of 5 feet to check for any utilities not located by Dig Safely prior to deeper investigative drilling/sampling.
- **Community air monitoring –** Community air monitoring will include real-time monitoring for VOCs, particulates (i.e., dust), and MGP related odors at the downwind perimeter of each designated work area when certain activities are in progress at the Site. The Community Air Monitoring Plan provided in Appendix D of the RIWP (November 2007) specifies action levels which require increased monitoring, corrective actions to abate emissions, and/or work shutdown for the RI. Perimeter air monitoring will be conducted in accordance with the New York State Department of Health Generic Community Air Monitoring Plan (CAMP). In addition, worker zone

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air monitoring will be conducted and shall include, at a minimum, use of hand held equipment to monitor for VOCs and particulates as specified in Section 4.3 of the HASP.

- **Groundwater investigation** – Additional groundwater investigation will be performed through the collection of temporary groundwater grab samples and the installation and sampling of up to 14 monitoring wells. Five to six wells will be shallow wells screened to intersect the water table in tentative areas shown on Figure 1. An additional five to eight wells will be screened at depth (approximately 25-35 feet bgs), with the base of the screen at the "20-foot" clay layer interface in areas outlined on Figure 2. Rationale for the proposed wells is provided on Table 1. The final number of well locations will be based on field findings and the results of the groundwater profiling work. Alternate or additional investigation locations, if required, will be selected in the field after consultation with the NYSDEC and National Grid.

  Groundwater grab sample profiles will be collected using a temporary screenpoint system in which the tooling is advanced to the desired sampling interval and retracted to expose temporary stainless steel screen. Tubing is then connected to this interval and the interval purged with a peristaltic pump until relatively free of sediment. Grab samples of groundwater will then be collected for benzene, toluene, ethylbenzene, xylenes (BTEX), styrene, and naphthalene using EPA Method 8260B. Upon completion, the tooling is removed, decontaminated, and advanced to the next deeper sampling interval. Rapid laboratory turnaround times (24-48 hours) will be requested to allow use of this data to direct the location of permanent well locations in the proposed "transect" arrows shown on Figures 1 and 2. It is anticipated that up to two locations will be performed at each transect shown to cover both the shallow interval and the deeper interval above the 20-foot clay layer.

  Once the permanent well locations are selected in consultation with NYSDEC, the wells will be installed using either HSAs or direct-push methods in accordance with monitoring well installation and development procedures provided in Appendix C of the RIWP. All wells will be constructed of two inch schedule 40 PVC with 10-foot, 10-slot (0.01-inch) well screens with a two-foot sump at the base of the well to collect any denser than water non-aqueous phase liquid (DNAPL) that may be present. Pre-packed screens may be used. If pre-packed screens are not used, quartz sand appropriately sized for the screen slot size will be emplaced to a minimum of one-foot above the screened interval of the well and a two-foot bentonite seal will be emplaced above the sand pack. Grout will be emplaced above the bentonite seal to grade. Expandable locking caps will be emplaced at the top of each monitoring well. Flush-mounted, limited access road boxes will be used at the ground surface to complete the wells and the surface will be restored to pre-existing conditions.

  Following installation, all monitoring wells will be developed to evacuate silts and other fine-grained sediments which may have accumulated within the well during its installation. Following development, wells will be allowed to stabilize for two weeks or more prior to groundwater sampling. The wells will be sampled in accordance with the groundwater sampling procedures provided in the November 2007 RIWP.

  Groundwater samples from all new wells will be analyzed for volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method 8260B, semi-volatile organic compounds (SVOCs) by USEPA Method 8270C, RCRA 8 metals plus iron, copper, and zinc using USEPA Methods 6010 and 7000-series, and total cyanide by USEPA Method 9012.

- **Soil vapor sampling –** One soil vapor sample will be collected in the parking area adjacent to the building located at 1250 Brunswick Avenue. The proposed sample (SV-8) is designed to assess soil vapor impacts detected at SV-4 adjacent to the former gas holder area and the western property boundary at 1224 Brunswick Avenue. The soil vapor sample will be collected in accordance with Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH, 2006). The

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proposed sampling location for SV-8 is shown on attached Figure 1 and sampling rationale is provided on attached Table 1. The sample will be collected in a 6-liter Summa canister over an eight-hour duration in accordance with the methods outlined in the RIWP.

- **Site survey –** A site survey of the investigation sampling points will be conducted at the end of the fieldwork by a New York State-licensed surveyor under the direct supervision of ENSR. Vertical elevations will be surveyed to an accuracy of 0.01 of a foot. The horizontal locations of each point will be established from directly measuring from site features with an accuracy of 0.1 foot. Elevations will be referenced to the North American Vertical Datum of 1988 (NAVD88) and horizontal locations will be based upon the North American Datum of 1983 Long Island Grid of the New York State Coordinate System (NAD83 N.Y.L.I. – 3104).
- **Investigation residuals management –** All development and purge water and any soils or PPE/plastic generated during the investigation will be drummed in properly labeled USDOT approved storage containers (55-gallon drums) and grouped by environmental matrix (soil, water, PPE/plastic, construction debris). The drums will be stored at a nearby National Grid facility. Subsequently, the drums will be characterized by laboratory analyses for full TCLP, corrosivity, ignitability, reactivity, TPH, and PCBs. Waste transportation and disposal of all contaminated wastes will be managed by National Grid within 60 days of completing the field activities.

Project Schedule

Once access has been obtained from adjacent property owners, it is envisioned that the field work proposed in this RI Addendum can be performed over a one-month period in late summer/early fall 2008, inclusive of the approximate two-week wait between well installation and sampling.

Remedial Investigation Report

An RI report including all data collected during the RI work will be compiled at the completion of the field investigation and after review and compilation of all field results. A detailed summary of the report contents are outlined in the November 2007 RIWP.

If you have any questions, or require any additional information, feel free to contact me at (516) 545-2555.

Sincerely,


for
Thomas J. Campbell
Environmental Department
tjc/

Enclosure

cc: S. Selmer, NYSDOH (1 copy)
L. Eckhaus, NYSDEC, Albany (w/o enclosure)
V. Brevdo, NYSDEC, Region 2 (w/o enclosure)
C. Willard, National Grid (w/o enclosure)
F. Murphy, National Grid (1 CD)

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Tables

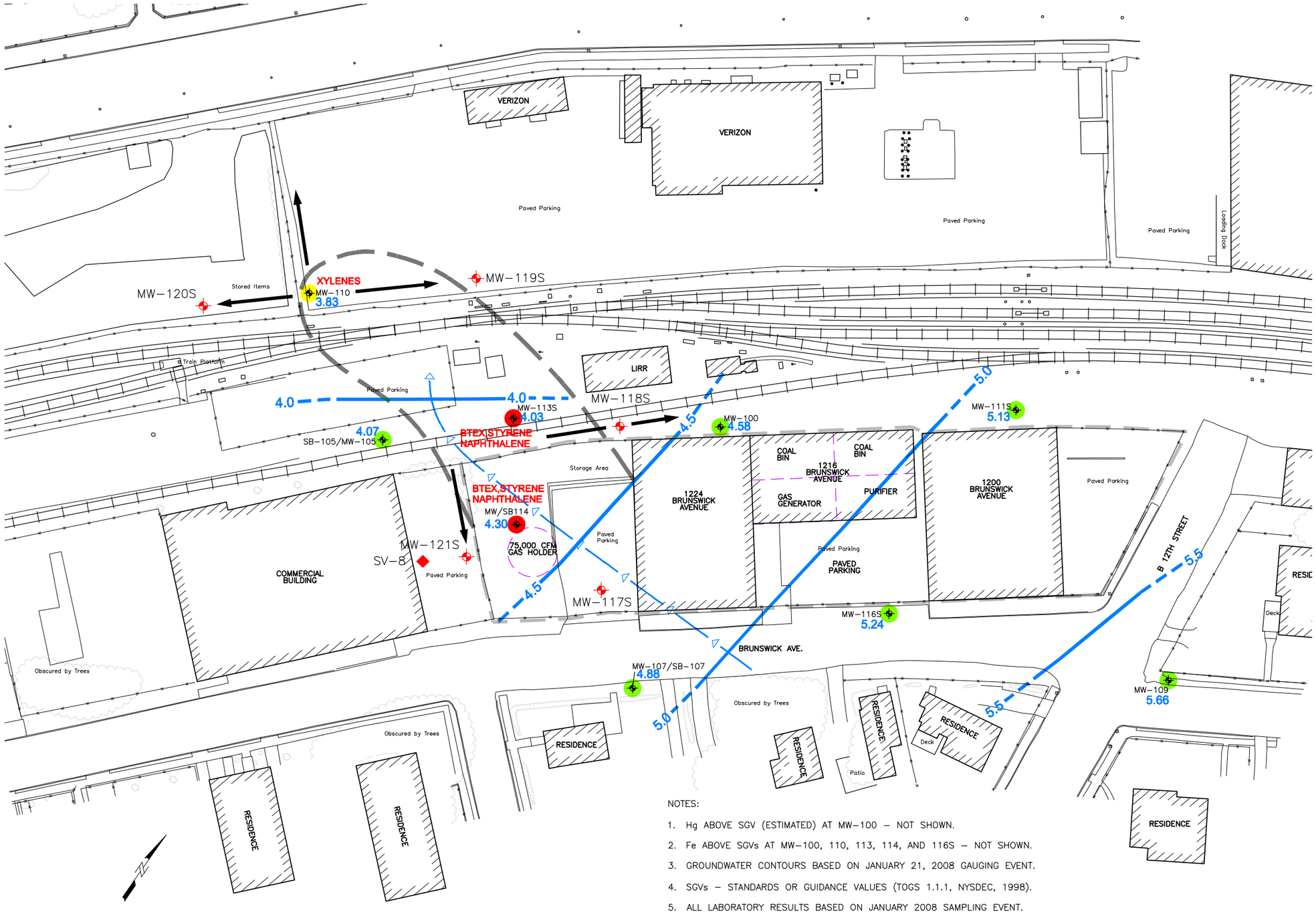
Table 1
Proposed RI Addendum Sample Location, Rationale, and Analytical Sample Summary
Former MGP, Far Rockaway, New York

Location ID	Sample ID	Completion Depth	Sample Depth	No. of Samples	Analyses	Rationale
Groundwater						
MW-110D	MW-110D	Minimum 5 ft into 20 ft clay or 45 feet max.	Above 20-foot clay (or at 35 to 45 feet if clay not present)	1	VOCs, SVOCs, RCRA 8 Metals (+ Fe, Cu, & Zn), and Total Cn	Downgradient delineation in deep groundwater of BTEX and napthalene detected at MW-113D.
MW-105D	MW-105D	Minimum 5 ft into 20 ft clay or 45 feet max.	Above 20-foot clay (or at 35 to 45 feet if clay not present)	1	VOCs, SVOCs, RCRA 8 Metals (+ Fe, Cu, & Zn), and Total Cn	Western delineation in deep groundwater of BTEX and naphthalene detected at MW-113D . Vertical profiling may be used to determine location of permanent well.
MW-117 S/D	MW-117 S/D	Minimum 5 ft into 20 ft clay or 45 feet max.	Across the water table and above 20-foot clay (or at 35 to 45 feet if clay not present)	2	VOCs, SVOCs, RCRA 8 Metals (+ Fe, Cu, & Zn), and Total Cn	Upgradient delineation in both shall and deep groundwater of BTEX, styrene, and naphthalene detected at MW-114.
MW- 118 S/D	MW-118 S/D	Minimum 5 ft into 20 ft clay or 45 feet max.	Across the water table and above 20-foot clay (or at 35 to 45 feet if clay not present)	2	VOCs, SVOCs, RCRA 8 Metals (+ Fe, Cu, & Zn), and Total Cn	Eastern delineation in shallow groundwater of BTEX, styrene and napthalene detected at MW-113S . Eastern delineation in deep groundwater of BTEX and napthalene detected at MW-113D Vertical profiling may be used to determine location of permanent wells.
MW- 119S	MW-119S	Minimum 10 feet below water table	Across the water table	1	VOCs, SVOCs, RCRA 8 Metals (+ Fe, Cu, & Zn), and Total Cn	Eastern downgradient delineation of xylenes detected at MW-110 and BTEX, styrene and naphthalene detected at MW-113S . Vertical profiling may be used to determine location of permanent well.
MW- 120S	MW-120S	Minimum 10 feet below water table	Across the water table	1	VOCs, SVOCs, RCRA 8 Metals (+ Fe, Cu, & Zn), and Total Cn	Western downgradient delineation of xylenes detected at MW-110 and BTEX, styrene and naphthalene detected at MW-113S . Vertical profiling may be used to determine location of permanent well.
MW- 121 S/D	MW-121 S/D	Minimum 5 ft into 20 ft clay or 45 feet max.	Across the water table and above 20-foot clay (or at 35 to 45 feet if clay not present)	2	VOCs, SVOCs, RCRA 8 Metals (+ Fe, Cu, & Zn), and Total Cn	Eastern delineation in shallow and deep groundwater of BTEX, styrene and naphthalene detected at MW-114 . Vertical profiling may be used to determine location of permanent wells.
Soil Vapor						
SV-8	SV-8	Approximately 2 feet above the water table		1	VOCs + Naphthalene	Satisfy the requirements of the NYSDOH Soil Vapor Intrusion Guidance. The sample will be collected in the parking lot adjacent to the 1250 Brunswick building to better delineate soil vapor impacts detected at SV-4.

Notes

1. No. - number
2. ID - identification
3. NA - Not applicable
4. NYSDOH - New York State Department of Health
5. MGP - Manufactured Gas Plant
6. RCRA - Resource Conservation and Recovery Act
7. MW - Monitoring Well (Groundwater Sample)
8. SV - Soil Vapor
9. VOCs - volatile organic compounds
10. SVOCS - semi-volatile organic compounds
11. Cn - cyanide
12. B(a)A - Benzo(a)anthracene
13. B(a)P - Benzo(a)pyrene
14. B(b)F - Benzo(b)fluoranthene
15. B(k)F - Benzo(k)fluoranthene
16. D(a,h)A - Dibenzo(a,h)anthracene
17. I(1,2,3-cd)P - Indeno(1,2,3-cd)pyrene
18. Fe - Iron
19. Cu - Copper
20. Zn - Zinc

Figures



NOTES:

1. Hg ABOVE SGV (ESTIMATED) AT MW-100 – NOT SHOWN.
2. Fe ABOVE SGVs AT MW-100, 110, 113, 114, AND 116S – NOT SHOWN.
3. GROUNDWATER CONTOURS BASED ON JANUARY 21, 2008 GAUGING EVENT.
4. SGVs – STANDARDS OR GUIDANCE VALUES (TOGS 1.1.1, NYSDEC, 1998).
5. ALL LABORATORY RESULTS BASED ON JANUARY 2008 SAMPLING EVENT.

LEGEND

- GUY ANCHOR
- FLAG POLE
- UTILITY POLE
- MANHOLE
- FIRE HYDRANT
- INLET SINGLE
- INLET DOUBLE
- ROUND INLET
- VALVE
- TREE
- SHRUB
- LIGHT POLE
- UTILITY POLE & LIGHT
- SIGN
- POST
- MISC FEATURE
- 98.5 SPOT ELEVATION
- BUILDING
- CURB
- DEPRESSED CURB
- CONCRETE
- DRIVEWAY PAVED
- DRIVEWAY UNPAVED
- DIRT ROAD / TRAIL
- EDGE OF PAVEMENT
- FENCE
- MISCELLANEOUS LINE
- MISCELLANEOUS OBJECT
- RAILROAD
- SIDEWALK
- SHRUB LINE
- WOODS LINE
- RETAINING WALL
- FORMER MGP SITE BOUNDARY
- HISTORIC STRUCTURE
- 5.0 GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION
- MW-109 5.66 MONITORING WELL LOCATION GROUNDWATER ELEVATION
- ALL COMPOUNDS < SGVs
- 1 COMPOUND > SGVs
- 2 OR MORE COMPOUNDS > SGVs
- ESTIMATED PLUME AREA > SGVs BASED ON INITIAL RI RESULTS
- DIRECT PUSH GRAB SAMPLE TRANSECT TO DELINEATE OR LOCATE PROPOSED WELLS
- PROPSED MONITORING WELL LOCATION (MAY BE ADJUSTED BASED ON GRAB SAMPLE RESULTS)
- PROPOSED SOIL VAPOR SAMPLING LOCATION

ENSR | AECOM

30 0 60

1"=60'

KEYSPAN CORPORATION
FAR ROCKAWAY FORMER MGP SITE

PROPOSED SHALLOW GROUNDWATER INVESTIGATION LOCATIONS

DATE: 07/21/08 | DRWN: RCW/WSF | | | **FIGURE 1**

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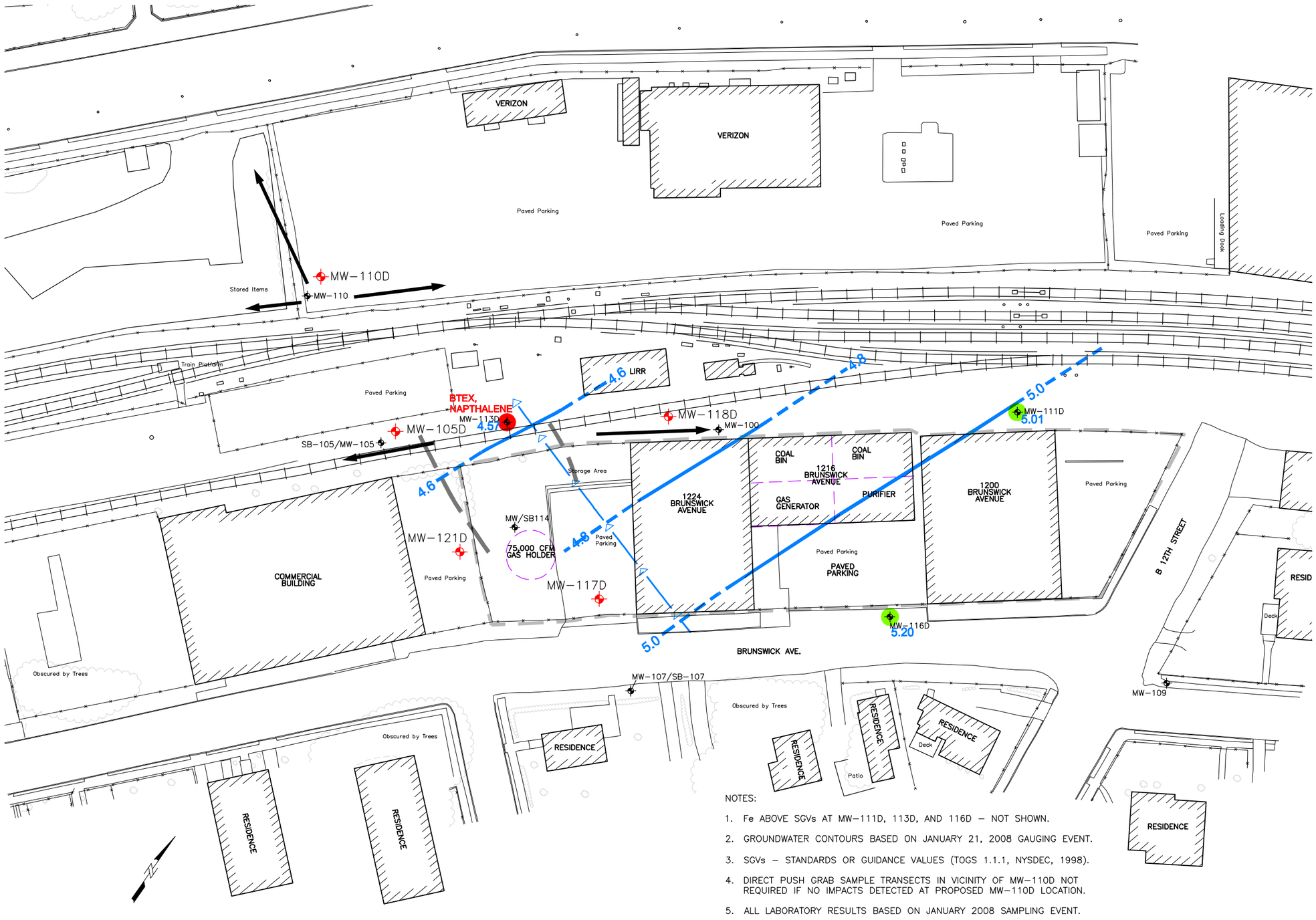

LEGEND

- GUY ANCHOR
- FLAG POLE
- UTILITY POLE
- MANHOLE
- FIRE HYDRANT
- INLET SINGLE
- INLET DOUBLE
- ROUND INLET
- VALVE
- TREE
- SHRUB
- LIGHT POLE
- UTILITY POLE & LIGHT
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- SIDEWALK
- SHRUB LINE
- WOODS LINE
- RETAINING WALL
- FORMER MGP SITE BOUNDARY
- HISTORIC STRUCTURE
- 5.0 GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION
- MW-111D 5.01 MONITORING WELL LOCATION GROUNDWATER ELEVATION
- ALL COMPOUNDS < SGVs
- 1 COMPOUND > SGVs
- 2 OR MORE COMPOUNDS > SGVs
- ESTIMATED PLUME AREA > SGVs BASED ON INITIAL RI RESULTS
- DIRECT PUSH GRAB SAMPLE TRANSECT TO DELINEATE OR LOCATE PROPOSED WELLS
- PROPSED MONITORING WELL LOCATION (MAY BE ADJUSTED BASED ON GRAB SAMPLE RESULTS)

NOTES:

1. Fe ABOVE SGVs AT MW-111D, 113D, AND 116D – NOT SHOWN.
2. GROUNDWATER CONTOURS BASED ON JANUARY 21, 2008 GAUGING EVENT.
3. SGVs – STANDARDS OR GUIDANCE VALUES (TOGS 1.1.1, NYSDEC, 1998).
4. DIRECT PUSH GRAB SAMPLE TRANSECTS IN VICINITY OF MW-110D NOT REQUIRED IF NO IMPACTS DETECTED AT PROPOSED MW-110D LOCATION.
5. ALL LABORATORY RESULTS BASED ON JANUARY 2008 SAMPLING EVENT.

ENSR | AECOM

30 0 60

1"=60'

KEYSPAN CORPORATION
FAR ROCKAWAY FORMER MGP SITE

PROPOSED DEEP GROUNDWATER INVESTIGATION LOCATIONS

DATE: 07/21/08 | DRWN: RCW/WSF | | | **FIGURE 2**

File: F:\PROJECTS\Keyspan\For Rockaway\01765-067\CADD\01765-067-C03.dwg Layout: Prop GW Inv Deep User: rwarren Plotted: Jul 21, 2008 - 10:22am Xref's: