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Hudson (Water Street) Site
Hudson, New York

Operation, Maintenance, and Monitoring Plan

Remedial Action Implementation For Operable Unit 1

January 2007

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Table of Contents

Table of Contents

1. Introduction

This *Operation, Maintenance, and Monitoring Plan* (OM&M Plan) describes the requirements associated with the operation, maintenance, and monitoring of the Remedial Action (RA) at Operable Unit (OU) 1 of the Hudson (Water Street) Former Manufactured Gas Plant (MGP) Site located in Hudson, New York (the Site) (see Figure 1 for site location). OU 1 includes the former MGP area and Embayment #1, an embayment of the Hudson River. This OM&M Plan was prepared by ARCADIS BBL, on behalf of National Grid (formerly Niagara Mohawk, a National Grid Company) in accordance with the 2003 Order on Consent for the Site (Index # A4-0473-0203; Site # 4-11-005), entered into by National Grid with the New York State Department of Environmental Conservation (NYSDEC).

Previously, the NYSDEC had issued a Record of Decision (ROD) (NYSDEC, 2001) for the entire Site in March 2001, which called for selected source area soil excavation, including sediment removal for treatment and/or disposal. As presented in the ROD (NYSDEC, 2001), the remedial goals for the Site are to:

- eliminate, to the extent practicable, human exposures to the contaminants present at the Site;
- eliminate, to the extent practicable, the migration of contaminants from onsite soils and source areas to the site groundwater and sediments in Embayment #1;
- eliminate, to the extent practicable, the exposure of fish and wildlife to contaminants within Embayment #1 and restore embayment sediments;
- eliminate contravention of surface water standards in the embayment and Hudson River resulting from the discharge of nonaqueous phase liquids (NAPLs) from the coal-tar-contaminated sediments in Embayment #1; and
- eliminate, to the extent practicable, offsite migration of contaminants of potential concern (COPCs) within the site groundwater.

A summary of the RA at OU 1 is presented in Section 2 of this OM&M Plan, while the remainder of this section presents important background information for OU 1 and the organizational structure of this OM&M plan.

1.1 Project Setting

The Site is located on Water Street on the east bank of the Hudson River in the City of Hudson (City), Columbia County, New York, as shown on Figure 1. The Site consists of approximately 2 acres of land, including Lots 15 and 16.2, which are divided by Water Street, and an embayment of the Hudson River (Embayment #1) along the western edge of the Site. The Site is bounded on the north by a City recreational park (Lot 10) and vacant Lot 13, on the east by CSX Transportation (CSXT) property (railroad tracks) (Lot 14), on the south by a former CSXT maintenance yard (Lot 16.1), and on the west by the Hudson River (Figure 2).

OU 1 consists of the former MGP area (Lots 15 and 16.2) and Embayment #1 (Figure 2), while OU 2 includes the Hudson River and Embayment #2 sediments. OU 2 is being addressed separate from OU 1.

1.2 Historical Operations

On the eastern portion of the Site (Lot 15), a former MGP was operated from approximately 1853 to 1949. From 1949 until 1954, the Site was operated by the Philadelphia Transformer Company. The previous owner, SBD Warehouse/Dunn Builders Supply, had used the property since 1989 for storing construction materials. Currently, both the western and eastern portions of the Site are owned by the City.

The western portion of the Site (Lot 16.2) was vacant prior to the RA. A commercial storage building served by a railroad spur was present on Lot 16.2 from the early 1900s to at least the 1920s. Railroad spurs also were present to the end of the peninsula of land between Embayment #1 and Embayment #2 from the 1870s.

1.3 Previous Environmental-Related Activities

Highlights of the previous environmental-related activities undertaken at the Site are briefly discussed below; a comprehensive discussion of these previous activities will be presented in the *Final Engineering Report* for OU 1 and is also provided in other appropriate reports, as referenced throughout this section.

In July 1986, the NYSDEC identified an oil spill and sheens in an embayment (subsequently identified as Embayment #1) on the east bank of the Hudson River along the western edge of the Site. The NYSDEC noticed oil sheens again in Embayment #1 in September 1988. Absorbent booms were installed to prevent

migration of oil sheens from Embayment #1 into the Hudson River. Analysis of samples collected by the NYSDEC revealed the presence of polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs).

In 1988, at the direction of the NYSDEC, an earthwork contractor excavated impacted soil and sediments from the riverbank, Embayment #1, and a former brick-lined gas holder foundation located east of Water Street. The material was stockpiled in an area between Embayment #1 and Water Street and covered. A groundwater treatment system was installed along the northwestern portion of the stockpile, but reportedly failed during the summer of 1989, causing sheens to reoccur in the river. In response, the NYSDEC installed booms along the shoreline.

On July 9, 1993, the NYSDEC requested that the United States Environmental Protection Agency (USEPA) conduct a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Removal Action at the Site. The USEPA completed a Removal Site Evaluation in August 1994 and determined that a CERCLA Removal Action was warranted to mitigate potential threats to the environment, human health, and wildlife.

In 1995, National Grid entered into an Administrative Order on Consent for Removal Action (Index Number II - CERCLA-95-0204) with the USEPA. Later that same year, National Grid removed and disposed of the stockpiled materials, a work plan was prepared for an initial site investigation (Parsons, 1995), and the initial site investigation activities were conducted. In 1998, the NYSDEC listed the Site on the Registry of Inactive Hazardous Waste Sites as the Hudson Coal Tar Site (Site Number 411005).

From 1996 through 1999, several subsequent site investigation activities were also conducted at the Site and are summarized in the Site Investigation Summary Report (SISR) (BBL, 2000a). These additional activities included the following:

- **Phase I Investigation** (Fall 1995) – This investigation is summarized in the *Site Investigation Data Report* (BBL, 1996).

- **Phase II Investigation** (August and September 1996) – The Phase II Investigation is summarized in the *Phase II Site Investigation Data Report* (BBL, 1997a). The results of both the Phase I and II Investigations were summarized in the *Site Investigation Report* (BBL, 1997b).

- **Phase III Sediment Investigation** (March and April 1998) – The Phase III Sediment Investigation is summarized in the revised *Site Investigation Report* (BBL, 1998).

- **Phase IV Investigation** (Summer 1999) – The Phase IV Investigation is summarized in the *Phase IV Investigation Data Report* (BBL, 1999a).

- **Sediment Pre-Design Investigation** (August 1999) – The Sediment Pre-Design Investigation is summarized in the *Sediment Pre-Design Investigation Data Report* (BBL, 1999b).

- **Sediment Dewatering and Stabilization Treatability Study** (Fall 1999) – The Sediment Dewatering and Stabilization Treatability Study is presented in the *Draft Embayment #1 Removal Evaluation Report and Preliminary Removal Action Design Work Plan* (BBL, 2000b).

Upon completion of the investigation activities listed above, two supplemental investigation programs were undertaken at the Site:

- **Supplemental Geotechnical Investigation** (Summer and Fall 2001) – The results of this investigation were presented in a January 17, 2002 letter report to National Grid.

- **Waterline Replacement/Utility Corridor Investigation** (Spring and Fall 2001) – The results of the Waterline Replacement/Utility Corridor Investigation were presented in August 27, 2001 and January 17, 2002 letter reports to National Grid.

In January 2001, an *Engineering Evaluation/Cost Analysis for Operable Unit 1* (EE/CA) (BBL, 2001a) for implementation of the RA in OU 1 was submitted to the USEPA and NYSDEC. The EE/CA recommended Soil/Groundwater Alternative 3 - Removal, Offsite Disposal, and Annual Groundwater Monitoring, as the soil/groundwater remedy, and Sediment Alternative 3 - Removal and Offsite Disposal, as the Embayment #1 and east bank sediment/soil remedy. Later that month, after review of the EE/CA, the NYSDEC and USEPA issued a Proposed Remedial Action Plan (PRAP) for OU 1, which combined the recommended soil/groundwater and sediment alternatives from the EE/CA into a single proposed remedy for OU 1.

Following the public comment period for the PRAP, the NYSDEC issued the ROD for OU 1 on March 26, 2001. The subsequent *Remedial Design Work Plan for Operable Unit 1* (RD Work Plan) (BBL, 2001b) described the proposed remedial design activities for the remedy as identified in the EE/CA and the ROD. Following the NYSDEC's approval of the RD Work Plan, the *Preliminary (30%) Remedial Design – Basis of Design Report* (Preliminary BOD) (BBL, 2001c) was submitted to the NYSDEC in October 2001. In March 2003, the *Final 100% Remedial Design – Basis of Design Report* (Final BOD) (BBL, 2003a) and accompanying plans were prepared and revised to incorporate NYSDEC comments and submitted as final.

The Technical Specifications and Drawings from the Final BOD were incorporated into the *Final Remedial Design – Remedial Action for Operable Unit 1 - Contract No. 1 - General* (Contract Documents) (BBL, 2003b) which, along with a Supplemental Information Package (SIP), were distributed to prospective bidding contractors in July 2003. Following a comprehensive contractor selection and bid evaluation process, the remedial contractor was selected in early 2004 and mobilization to the Site was initiated in March 2004. RA activities are summarized in Section 2.

1.4 OM&M Plan Organization

This OM&M Plan has been organized into the following sections:

Section	Description
1 – Introduction	Presents general site information, as well as information about this OM&M Plan.
2 – Summary of Remedial Action Activities	Identifies remedial activities that have been implemented at the Site.
3 – Inspections	Identifies items to be evaluated during routine site inspections.
4 – Maintenance	Discusses the maintenance activities necessary to properly maintain the RA at the Site.
5 – Monitoring	Discusses the proposed monitoring activities.
6 – Reporting and Certification	Discusses requirements for properly documenting OM&M activities.

Section	Description
7 – Contact List	Identifies the key personnel associated with the OM&M activities.
8 – References	Lists select sources consulted as references.

2. Summary of Remedial Action Activities

The RA activities implemented at the Site since early 2004 generally included the following major work tasks:

- Installation of approximately 11,940 linear feet of steel sheetpiling along the perimeter of the Embayment #1 Sediment Removal Area (including the SD-54 Cell) and the East Bank Soil Removal Area. The steel sheetpiling remained in-place following the completion of RA activities to provide additional protection against the possible lateral migration of residual NAPL potentially remaining at depth in Embayment #1, if any, to the Hudson River and/or surrounding bank soils.

- Installation of two steel steetpile wing walls adjacent to Embayment #1 to provide additional protection against the possible lateral migration of residual NAPL potentially remaining at the Site to the Hudson River.

- Excavation, offsite transportation, and thermal treatment/disposal of impacted soils from the Peninsula Soil and Surface Soil Removal Areas. Following excavation activities, these areas were backfilled and restored to pre-excavation conditions.

- Excavation, offsite transportation, and thermal treatment/disposal of impacted sediments and soils from the Embayment #1 Sediment Removal Area (including the SD-54 Cell) and the East Bank Soil Removal Area.

- Installation of an engineered containment system within the SD-54 Cell to serve as a barrier between underlying native sediments and imported backfill materials. The engineered containment system consists of (from bottom to top) a layer of bedding sand, a 60-mil linear low-density polyethylene (LLDPE) geomembrane liner, a non-woven geotextile, and a bentonite seal (placed around the perimeter of the LLDPE geomembrane liner).

- Installation of an engineered containment system within the southwest corner of Embayment #1 to encapsulate an isolated area of impacted sediments that remained in-place (below the designed excavation depth of 10 feet below ground surface [bgs]) following excavation activities. The engineered containment system covers approximately 400 square feet (20 feet by 20 feet) and consists of (from bottom to top) a 6-inch layer of wood chips, a layer of

bedding sand, an LLDPE geomembrane liner, a non-woven geotextile, and a bentonite seal (placed around the perimeter of the LLDPE geomembrane liner).

- Placement (from bottom to top) of an approximate 5-foot-thick sand layer, a 3-foot-thick isolation layer, a non-woven geotextile, a layer of erosion protection stone, and a layer of armor stone (along the Embayment #1 shoreline) within Embayment #1 and the SD-54 Cell. In addition, along the south bank of Embayment #1, an Organoclay Reactive Core Mat (RCM) was placed beneath the non-woven geotextile.

- Restoration of the East Bank Soil Removal Area and surrounding property located west of Water Street, including the installation of clean backfill, topsoil and sod, asphalt/concrete walkways, utilities, and several park features (e.g., benches, light poles, trash bins, trees), as shown on Figure 3.

- Installation of two dense nonaqueous phase liquid (DNAPL) observation/collection wells (RW-1 and RW-2), as shown on Figure 3, adjacent to Embayment #1 for the observation/collection of mobile DNAPL, if any, that may be present within these areas.

- Excavation, offsite transportation, and thermal treatment/disposal of impacted soils from the Former Tar Separator and Former Gas Holder Soil Removal Areas.

- Restoration of the Former Tar Separator and Former Gas Holder Soil Removal Areas, including the installation of clean backfill, topsoil and sod, crushed stone, and a chain link fence along the perimeter of the Former Gas Holder Soil Removal Area, as shown on Figure 3.

- Restoration of the north wall (including the northeast corner) of the existing brick warehouse building located east of Water Street.

- Replacement of DNAPL collection well CW-01 in the Former Gas Holder Soil Removal Area, with DNAPL collection well CW-01A for recovery of mobile DNAPL that may be present at depths below the completed excavation depths, as shown on Figure 3.

- Investigation of additional areas beyond the removal limits identified in the Final BOD and Contract Documents, as identified and referred to by the NYSDEC as Areas of Concern (AOCs).

- Excavation and offsite transportation and thermal treatment/disposal of observed impacted soils from several of the AOCs identified by the NYSDEC.

Following completion of these activities and the contractor's initial demobilization from the Site in fall 2005, National Grid submitted a work plan for additional remedial activities at OU 1 (i.e., additional excavation activities within AOC #3, utility installation activities at the existing brick warehouse building, modifications to the northern wing wall at Embayment #1, and installation of additional soil borings east of the CSXT railroad tracks). The NYSDEC approved the November 10, 2005 Work Plan in a letter to National Grid dated November 28, 2005. National Grid performed the activities identified in the work plan (excluding the installation of the soil borings east of the CSXT railroad tracks) between February and December 2006. Following completion of these activities, the RA at OU 1 was deemed substantially complete in December 2006.

3. Inspections

National Grid will conduct annual inspections of the Site, in addition to groundwater/DNAPL monitoring (as discussed in Section 5), to monitor the effectiveness and integrity of the RA and identify areas of the Site that require maintenance (if any). Site inspections will include, but may not be limited to, the following:

- Inspecting the surface cover areas (e.g., grass, gravel, concrete, pavement) for evidence of excessive settlement, cracks or potholes, depressions and/or rutting, exposed subbase materials, or other conditions that may affect the effectiveness/integrity of the surface cover.

- Inspecting the erosion controls (e.g., armor and erosion protection stone) for evidence of exposed or damaged underlying geotextile layer(s), excessive settlement, or other conditions that may affect the effectiveness/integrity of the erosion controls.

- Inspecting the steel sheetpile retaining wall (located north of Embayment #1) for signs of excessive settlement, subsidence or cracking of soils behind the wall, cracking or separation of wall joints, and overall wall stability.

- Inspecting the existing site monitoring wells to monitor the condition of the ground seal, protective casing, and locking caps.

- Inspecting the vegetated surfaces for evidence of bare spots and/or erosion (for the first year only, following completion of the RA).

- Inspecting trees, shrubs, and other planting materials to confirm that they are still in a live, healthy, and presentable growing condition (for the first 2 years only, following initial planting).

- Observing the water, rip rap, and sheeting surfaces within Embayment #1 to identify signs of impacts (e.g., sheens on the water surface) that may indicate a deficiency in the effectiveness and integrity of the RA.

Annual site inspections will be conducted concurrently with annual groundwater/DNAPL monitoring activities (as described in Section 5) for a period of 5

years. Results of the inspections will be recorded on the Site Inspection Log (Appendix A) to be maintained by National Grid.

Please note, however, the properties subject to the RA are currently owned and operated by the City. The annual inspections described above, and the maintenance activities described in Section 4, will be focused solely on identifying and repairing potential deficiencies associated with the RA implemented by National Grid. National Grid will not perform inspection and maintenance activities to supplement or replace routine inspection and maintenance activities associated with the operation of the park and general maintenance of the properties, which are the responsibility of the City.

4. Maintenance

Maintenance activities necessary to maintain the effectiveness and integrity of the RA will be conducted to repair/replace items identified during the annual site inspections (as described in Section 3). Maintenance activities will generally consist of, but may not be limited to, the following:

- Filling cracks, depressions, etc. within surface cover areas.
- Repairing/replacing damaged and/or deficient erosion controls.
- Performing necessary repairs to the steel sheetpile retaining wall, as warranted.
- Repairing/replacing ground seals, protective casings, and locking caps to groundwater monitoring and DNAPL collection/monitoring wells.
- Placing additional topsoil and seeding in areas of excessive erosion or settlement, as well as reseeding areas with sparse vegetation (for the first year only, following installation of seed or sod). Mowing of the restored park is not the responsibility of National Grid and is not included in this OM&M Plan.
- Removing and replacing trees, shrubs, and other planting materials found to be dead or in an unhealthy condition (for the first 2 years only, following initial planting).

4.1 Contingency Plan

If surface water quality impacts are observed within Embayment #1, and are believed to be associated with the former MGP, National Grid will coordinate with the NYSDEC to develop an appropriate contingency plan.

National Grid will conduct maintenance activities to correct items identified during the site inspection that are necessary to maintain the effectiveness and integrity of the RA. Required maintenance activities as a result of vandalism, normal wear and tear, and routine operations that are unrelated to the RA will be the responsibility of the City. Normal wear and tear will be determined (if necessary) by an independent Professional Engineer. In addition, National Grid will conduct maintenance activities on the landscaping items (e.g., trees, shrubs, etc.) for a period of 2 years following their installation.

5. Long Term Monitoring Plan

National Grid will conduct groundwater/DNAPL monitoring, as discussed below, to monitor the effectiveness and integrity of the RA. Groundwater and DNAPL monitoring activities are described below in Sections 5.1 and 5.2, respectively.

5.1 Groundwater Monitoring

The groundwater monitoring program will consist of collecting groundwater level and groundwater quality analytical data. The monitoring data will then be reviewed to: 1) characterize post-remedy groundwater flow patterns (because the RA may have altered historical flow patterns); and 2) assess the quality of shallow groundwater in the native silt-and-clay unit as it leaves the Site.

Historically, groundwater was mounded beneath the Former Gas Holder Soil Removal Area, which resulted in groundwater moving radially outward in all directions from the Former Gas Holder Soil Removal Area. Due to this flow pattern, the entire perimeter of the Former Gas Holder Soil Removal Area is "downgradient" and no offsite groundwater enters the Site. The groundwater monitoring program contained in this OM&M Plan assumes that groundwater flow patterns have not changed following the RA; however, groundwater levels will be collected to characterize the post-RA groundwater flow patterns and the groundwater monitoring program will be modified as necessary.

Groundwater and river levels will be monitored quarterly for the first year of the proposed 5-year monitoring period, as initially identified in the NYSDEC-approved BOD, so that current groundwater flow conditions can be evaluated. The water-level monitoring network will consist of the following locations: MW-02, MW-03, MW-05, MW-06, MW-07, MW-08A, MW-09A, MW-10, MW-11, OW-2, OW-4, and the Hudson River. A table depicting the well identifications, coordinates, and elevations is included in Appendix B. The river-level gauging point will be established near the mouth of Embayment #1. During the initial water-level monitoring round, all monitoring wells will be inspected for integrity and usability for this program. Findings of the inventory will be recorded on the Well Inspection Checklist included in Appendix B. Water levels will be measured according to the Water-Level/Oil Thickness Measurement procedures included in Appendix C. Construction logs for these wells are contained in Appendix D.

Four monitoring wells will constitute the groundwater quality monitoring network: MW-03, MW-05, MW-06, and MW-11 (Figure 3). Based on the historical groundwater flow patterns described above, all of these wells will constitute downgradient wells. The sampling frequency will be annual, and sampling will not be conducted until two rounds of water-level data have been collected and flow patterns evaluated. The groundwater quality monitoring program will be modified based on that evaluation so that the new flow pattern (if identified) is properly monitored. Given the length of time since these monitoring wells were last sampled, they will be redeveloped by surging and purging with a bailer according to the Monitoring Well Development procedures, included in Appendix E. Purge water will be contained and transported offsite for disposal at an appropriate waste disposal facility by National Grid.

As discussed in Section 1, several investigations were conducted at the Site prior to the RA, during which the quality of shallow groundwater beneath the Site was characterized. Groundwater samples will be collected following the procedures described in "Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells," included in Appendix F. Based on Table 1 of the ROD, benzene, toluene, ethybenzene, and xylenes (BTEX) and naphthalene have been identified as COPCs for the groundwater monitoring program. Consequently, groundwater samples will be analyzed for BTEX and naphthalene by USEPA Methods 8260 and 8270, respectively. The water quality standard for each compound is listed below.

Compound	Water Quality Standard (µg/l)
Benzene	1
Toluene	5
Ethylbenzene	5
Xylene (total)	5
Naphthalene*	10

*This is a guidance value only

After the initial 5-year monitoring period, the collected data will be evaluated to determine whether the program should be continued and, if so, whether modifications are necessary. The program will be deemed complete if the data demonstrate that COPCs are not migrating offsite in groundwater at concentrations exceeding applicable ambient water-quality standards (as identified in 6 NYCRR 703.5). Specifically, the program may be discontinued if the concentrations of COPCs in samples collected

from the groundwater quality monitoring network are below the above-referenced standards for 2 consecutive years, starting with year 4 of the 5-year program. If this condition is not met, the program will be continued until concentrations of COPC are below the applicable standards for 2 consecutive years.

5.2 DNAPL Monitoring and Collection

The DNAPL monitoring program is designed to monitor for pooled DNAPL in areas where DNAPL-containing soils, if any, may have remained following the RA, and/or in areas where DNAPL may accumulate behind the in-place steel sheetpile walls. If pooled DNAPL is identified (i.e., DNAPL accumulates in one or more DNAPL monitoring wells), the DNAPL will be removed before it overtops the sump of the well to reduce DNAPL accumulations.

During the RA, three DNAPL monitoring/collection wells (CW-01A, RW-1, and RW-2) were installed to monitor for the presence of pooled DNAPL at the Site. Construction logs for these wells are contained in Appendix D. These wells will be monitored for accumulated DNAPL quarterly for a period of 1 year following the procedures presented in the SOP titled Water-Level/Oil Thickness Measurement (Appendix C). If present, the depth to the DNAPL surface from the top of the well casing will be measured using an oil/water interface probe and recorded. Accumulated DNAPL will be removed before its thickness reaches 75% of the height of the well sump. If the DNAPL thickness remains constant for two consecutive quarterly readings but is below the 75% threshold, it will be removed. Evacuated DNAPL will be collected, contained, and stored onsite until it is disposed at an appropriate offsite waste disposal facility by National Grid.

Following the initial 1-year period, the DNAPL monitoring program will be evaluated to determine whether the program must be continued or modified. The program will be terminated if DNAPL does not accumulate in any of the DNAPL monitoring wells at a thickness exceeding 0.1 foot. If the program requires continuation after the 1-year period, it will be deemed complete when:

- DNAPL does not accumulate in any DNAPL monitoring well at a thickness exceeding 0.1 foot for a period of 1 year; or

- The rate of DNAPL production for each producing well does not exceed 2 gallons per year, with the rate measured over a 1-year period.

6. Certification and Reporting

Consistent with the Order on Consent, a yearly certification by a Professional Engineer is required to document the continued effectiveness of institutional and/or engineering controls. The certification will identify the required controls and evaluate whether the controls should remain in-place and are effective for protection of public health and the environment. The certification will be included in an annual report that will be submitted to the NYSDEC by the 1st day of the month following the anniversary of the start of OM&M activities (which will be documented via correspondence from National Grid to NYSDEC). In addition, the annual report will include (but may not be limited to) a summary of OM&M activities conducted and analytical results and data generated during the reporting period.

7. Project Contact List

Personnel associated with OM&M activities at the Site are indicated in the table below.

Company/ Organization	Title	Name	Contact Information
NYSDEC	Project Manager	Anthony Karwiel	New York State Department of Environmental Conservation Division of Environmental Remediation Remedial Bureau "C" 625 Broadway Albany, NY 12233 Phone: (518) 402-9669 alkarwie@gw.dec.state.ny.us
City of Hudson	Superintendent – Department of Public Works	Michael Sassi	City of Hudson 520 Warren Street Hudson, NY 12534 Phone: (518) 828-9458 hudsondpw@mhcable.com
National Grid	Project Manager	Terry W. Young, P.E.	National Grid 300 Erie Blvd. West Syracuse, NY 13202 Phone: (315) 428-5731 Terry.Young@us.ngrid.com
ARCADIS BBL	Project Officer	Frederick J. Kirschenheiter, P.E.	ARCADIS BBL 6723 Towpath Road, P.O. Box 66 Syracuse, NY 13214 Phone: (315) 671-9203 Fred.Kirschenheiter@arcadis-us.com

8. Institutional Controls

As indicated in the BOD and ROD, at the conclusion of the RA, institutional controls (i.e., deed restrictions) will be implemented at the site for any future subsurface excavation/disturbance and to prohibit residential and groundwater uses. To that end, National Grid and the City of Hudson have executed an Agreement and Declaration of Covenants and Restrictions (see Appendix G).

9. References

BBL. 1996. *Site Investigation Data Report. Hudson (Water Street) Site. Hudson, New York*. June 1996.

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BBL. 2001b. *Remedial Design Work Plan for Operable Unit 1. Hudson (Water Street) Site. Hudson, New York*. September 2001.

BBL. 2001c. *Preliminary (30%) Remedial Design Basis of Design Report. Hudson (Water Street) Site. Hudson, New York*. October 2001.

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Parsons Engineering Science, Inc. 1995. *Work Plan for a Removal Action and Site Investigation at the Hudson (Water Street) Site*. *Hudson, New York.* June 1995.

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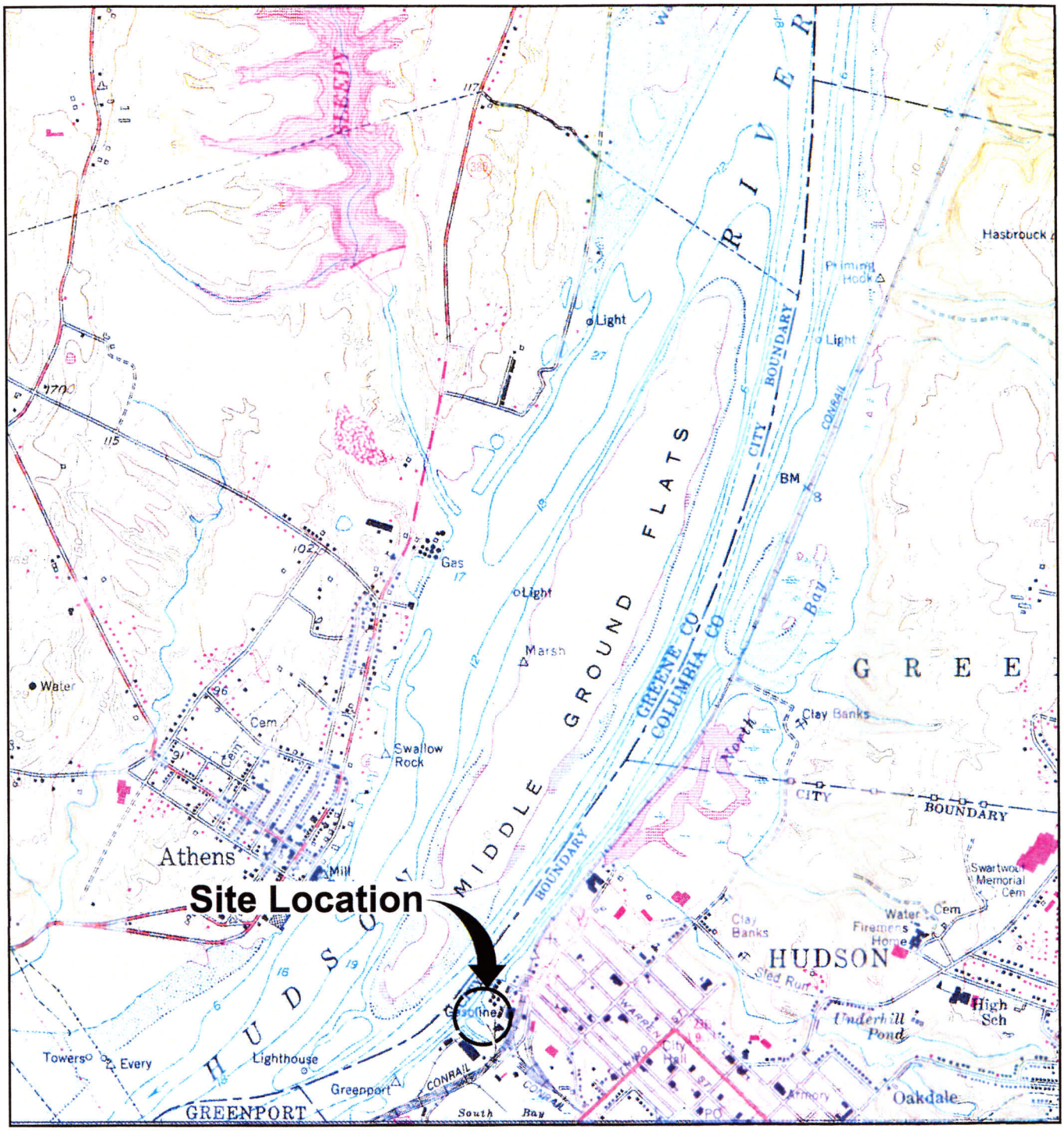
Figures



REFERENCE: Base Map Source: USGS 7.5 Min. Topo. Quad., Hudson North, NY.

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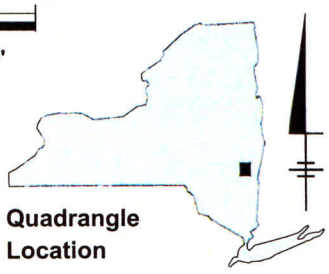
Approximate Scale: 1" = 2000'



Quadrangle Location

NATIONAL GRID
HUDSON (WATER STREET) SITE
HUDSON, NEW YORK
OPERATION, MAINTENANCE, AND MONITORING PLAN

SITE LOCATION MAP

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE 1

01/08/07 SYR-D85-DJH KLS
36651010/36651N01.CDR

LEGEND:

- PROPERTY LINE
- MAJOR CONTOUR LINE
- MINOR CONTOUR LINE
- APPROXIMATE EDGE OF WATER (VARIES WITH TIDE)
- EXISTING UTILITY LINE
- EXISTING CHAIN-LINK FENCE
- EXISTING IRON FENCE
- RAILROAD LINE
- RAILROAD TIE RETAINING WALL
- CONCRETE RETAINING WALL
- SEWER MANHOLE
- BOLLARD
- VEGETATION/TREES
- RIPRAP

GENERAL NOTES:

1. BASE MAP INFORMATION WAS COMPILED FROM A COMBINATION OF A PLAN PREPARED BY ROBERT J. IHLENBERG, LAND SURVEYOR ENTITLED "AREA SITE MAP WATER STREET AND BROAD STREET" PERFORMED AUGUST 2001 AND A LIMITED SURVEY PERFORMED BY BLASLAND, BOUCK & LEE IN OCTOBER AND NOVEMBER 2001.
2. PROPERTY LINES SHOWN WERE ESTABLISHED FROM DEEDS OF RECORD AND EXISTING MONUMENTATION.
3. ELEVATIONS SHOWN ARE REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM (NGVD 1988).

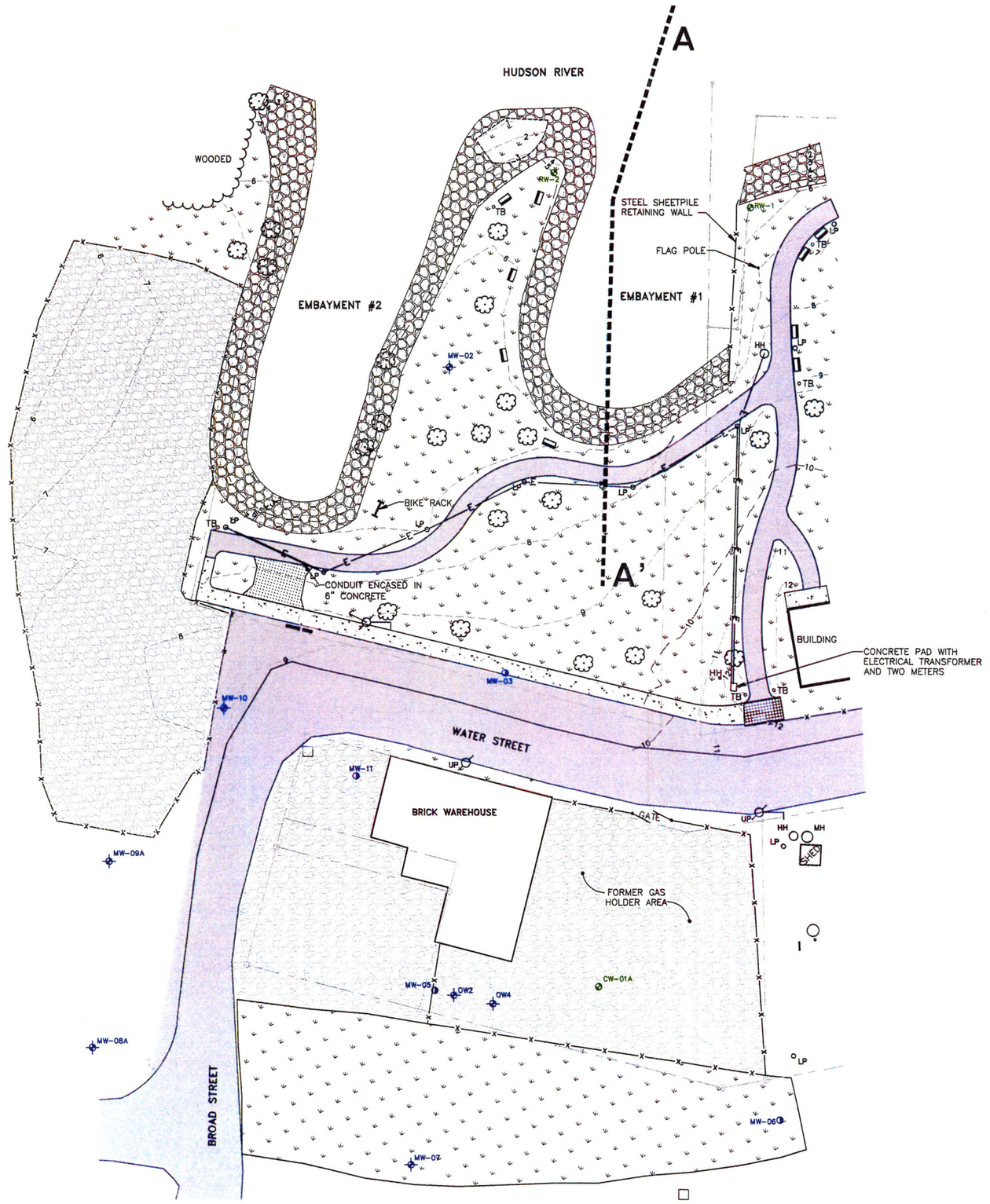
0 40' 80'
GRAPHIC SCALE

NATIONAL GRID
HUDSON (WATER STREET) SITE
HUDSON, NEW YORK
OPERATION, MAINTENANCE, AND MONITORING PLAN

PRE-REMEDIATION SITE CONDITIONS

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
2



LEGEND:

- PROPERTY LINE
- MAJOR CONTOUR LINE
- MINOR CONTOUR LINE
- APPROXIMATE EDGE OF WATER (VARIES WITH TIDE)
- CHAIN-LINK FENCE
- IRON FENCE
- ELECTRICAL LINE
- RIPRAP
- CRUSHED STONE
- CONCRETE
- ASPHALT/PAVEMENT
- VEGETATED AREA
- STAMPED CONCRETE
- GRASSCRETE PAVING
- DECIDUOUS TREE
- MW-02 GROUNDWATER WATER-LEVEL MONITORING WELL
- MW-05 GROUNDWATER QUALITY MONITORING WELL
- RW-1 NAPL COLLECTION/RECOVERY WELL
- BENCH
- TB TRASH BIN
- HH HANDHOLE
- MH MANHOLE
- UP UTILITY POLE
- LP LIGHT POLE
- A' APPROXIMATE CROSS SECTION LOCATION

NOTE:

1. SURVEY DATA WAS OBTAINED FROM SURVEYS BY C.T. MALE ASSOCIATES, DATED AUGUST 23, 2005 AND NOVEMBER 15, 2005, DRAWING FILES E-ASBUILT.DWG AND W-ASBUILT.DWG, RESPECTIVELY.

0 30' 60'
GRAPHIC SCALE

NATIONAL GRID
HUDSON (WATER STREET) SITE
HUDSON, NEW YORK
OPERATION, MAINTENANCE, AND MONITORING PLAN

POST-REMEDIATION SITE CONDITIONS

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
3

WEST
A

EAST
A'

ELEVATION IN FEET

20
10
0
-10
-20
-30
-40
-50

SHIPPING CHANNEL (EASTERN LIMIT)

EMBAYMENT #1 | SD-54 CELL | EAST BANK | PARK AREA (WESTERN LIMIT)

SHEETPILE

APPROXIMATE DEPTH OF OBSERVED NAPL (10–12' BGS)

OBSERVED NAPL AT EXCAVATION BOTTOM (SEE NOTE 4)

VERTICAL EXAGGERATION = 3X
ALL LOCATIONS ARE APPROXIMATE.

SIDEWALK

APPROXIMATE LOCATION OF FORMER VERTICAL CMP SUMP

APPROXIMATE DEPTH OF OBSERVED NAPL (10–17' BGS)

(SEE NOTE 5)

RIVER BOTTOM

BOTTOM OF EXCAVATION

APPROXIMATE DEPTH INTERVAL OF OBSERVED IMPACTS (10–18' BGS)

(SEE NOTE 6)

LEGEND:

- ARMOR STONE
- BENTONITE
- EROSION PROTECTION STONE
- GEOMEMBRANE LINER
- GRAVEL BACKFILL
- ISOLATION LAYER
- GEOTEXTILE
- SAND LAYER
- PERMANENT IN–PLACE SHEETPILE WALL
- WOOD CHIPS
- PAVED SURFACE
- VEGETATED SURFACE
- NATIVE MATERIAL
- APPROXIMATE WATER LEVEL (VARIES)
- APPROXIMATE LOCATION OF NAPL

NOTES:

1. CROSS SECTION INFORMATION WAS OBTAINED FROM SURVEYS BY C.T. MALE ASSOCIATES FROM THE FOLLOWING DRAWING FILES DATED 3/3/05: HUD–LINER, HUD–CUT, HUD–SAND, AND HUD–CLAY. FINAL SITE GRADING WAS OBTAINED FROM A SURVEY BY C.T. MALE ASSOCIATES, DRAWING FILE W–ASBUILT, DATED 11/15/05.
2. SURVEY DATA SHOWING LIMITS OF TOPSOIL, EROSION PROTECTION STONE AND ARMOR STONE, WERE NOT AVAILABLE AT THIS TIME. AS SUCH, LIMITS OF TOPSOIL, EROSION PROTECTION STONE AND ARMOR STONE, ARE APPROXIMATE.
3. TOP OF NATIVE MATERIAL ELEVATIONS WEST OF EMBAYMENT #1 WAS OBTAINED FROM BATHYMETRIC SURVEY CONDUCTED BY OCEAN SURVEYS, INC., ON MAY 26, 2002. DASHED LINE SHOWS INFERRED ELEVATIONS OF NATIVE MATERIAL.
4. UPON OBSERVATION OF POCKETS OF NONAQUEOUS PHASE LIQUID (NAPL) AT APPROXIMATELY 10 FEET BELOW GROUND SURFACE (BGS), ADDITIONAL EXCAVATION ACTIVITIES WERE CONDUCTED TO APPROXIMATELY 12 FEET BGS. EXCAVATION ACTIVITIES WERE NOT CONDUCTED BELOW 12 FEET BGS DUE TO HEALTH AND SAFETY CONCERNS. POCKETS OF NAPL WERE ENCOUNTERED, ALONG THE INSIDE OF THE SHEETING, DURING EXCAVATION ACTIVITIES FROM APPROXIMATELY 10 TO 12 FEET BGS. AS SUCH, CONSISTENT WITH THE CONTINGENCY ACTIONS IDENTIFIED IN THE FINAL (100%) REMEDIAL DESIGN – BASIS OF DESIGN REPORT (BBL, MARCH 2003), AN ENGINEERED SEDIMENT CONTAINMENT SYSTEM WAS INSTALLED.
5. DURING EXCAVATION OF A PORTION OF THE CMP SUMP (CONSISTING OF AN 18–INCH–DIAMETER PIPE SURROUNDED BY 6–INCH–DIAMETER STONES), A SHEEN WAS ENCOUNTERED ALONG THE INSIDE OF THE SHEETING, AT APPROXIMATELY 10 FEET BGS EXTENDING TO APPROXIMATELY 17 FEET BGS. EXCAVATION ACTIVITIES WERE NOT CONDUCTED BELOW 17 FEET BGS DUE TO HEALTH AND SAFETY CONCERNS. THE MATERIAL REMAINING AT THE EXCAVATION BOTTOM CONSISTED OF A SILVERY–GRAY MATERIAL THAT COATED THE 6–INCH–DIAMETER STONES, WHICH WAS OBSERVED WITHIN AN APPROXIMATE 4– TO 5–FOOT DIAMETER AREA AT A DEPTH OF APPROXIMATELY 17 FEET BGS.
6. DURING THE REMEDIAL INVESTIGATION, IMPACTS WERE OBSERVED IN SEDIMENT BORING SD–54 AT DEPTHS RANGING FROM 10 TO 18 FEET BGS. BECAUSE THE EXCAVATION OF SEDIMENTS AT DEPTHS UP TO 18 FEET BGS WAS BELIEVED TO PRESENT ISSUES ASSOCIATED WITH TECHNICAL PRACTICABLILITY (GIVEN SITE CONSTRAINTS) AT THE TIME OF THE REMEDIAL DESIGN, THE SD–54 CELL ENGINEERED CONTAINMENT SYSTEM WAS DESIGNED AND CONSTRUCTED TO PREVENT POTENTIAL MIGRATION OF MOBILE NAPL FROM THE UNDERLYING SEDIMENTS TO THE OVERLYING CLEAN BACKFILL.

VERTICAL EXAGGERATION = 3X

0 30' 60'

HORIZONTAL GRAPHIC SCALE

NATIONAL GRID
HUDSON (WATER STREET) SITE
HUDSON, NEW YORK
OPERATION, MAINTENANCE, AND MONITORING PLAN

EMBAYMENT #1 CROSS SECTION A-A'

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
4

Appendices

ARCADIS BBL

Appendix A

Site Inspection Log

Site Inspection Log

Operation, Maintenance and Monitoring Plan
Operable Unit 1

Inspector: _____ Inspection Date/Time: _____ Weather Conditions: _____

Inspection Item	Observation		Comments
	Yes	No	
Surface Cover Areas			
• Excessive Settlement Observed	___	___	
• Cracks or Potholes Observed	___	___	
• Depressions and/or Rutting Observed	___	___	
• Exposed Subbase Materials Observed	___	___	
Erosion Controls (Rip Rap or Sod)			
• Exposed or Damaged Geotextile Layer(s) Observed	___	___	
• Excessive Settlement Observed	___	___	
• Stressed Vegetation Observed	___	___	
Steel Sheetpile Retaining Wall			
• Settlement of Wall	___	___	
• Subsidence or Cracking of Soils Behind the Wall	___	___	
• Cracking or Separation of Wall Joints	___	___	
Site Monitoring Wells			
• Ground Seal	___	___	
• Casing	___	___	
• Locking Caps	___	___	
Trees, Shrubs, and Other Planting Materials			
• Strong Growth Observed	___	___	
Surface Water Quality			
• Sheens Observed on Rip-Rap, Sheetpile Wall, or on Water Surfaces	___	___	
Miscellaneous Items			
•	___	___	
•	___	___	

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Appendix B

Well Inspection Checklist and Well Coordinates and Elevations

Well No. _____ Date: _____

Personnel: _____

Exterior	Yes	No	Remarks
1. Cement seal			
Intact			
Cracked			
Missing			
2. Flush Mount well?			
a. Ponding of water around cement seal?			
b. If flush mount, is it in a depression so that puddling could occur over the well head?			
c. Is surface cap secured by bolts/can it be removed?	/	/	/
d. Is there any surface water in the annular space surrounding the casing?			
3. Protective steel pipe and lock (if used)			
Pipe - Intact			
Lock - Intact			
4. Well casing (stick-up) straight			
5. Designated leveling point clearly marked (TOC or TIC)			
6. Well cap vented properly			
a. What type of cap			
7. Well is protected			
8. Well is clearly marked			
9. Any surface obstruction (e.g., dumpster, soil, debris)?			
10. Bottom soft or hard?			
11. Obstruction in well?			

Interior	
1. Depth to bottom from marked measuring point	
2. Stick-up height	
a. Material (PVC, stainless) / diameter	/
3. Bottom of well below grade	
4. Remarks on integrity	
5. Depth to water from measuring point	
6. PID reading	
7. Product layer, e.g., NAPL (circle)	

8 Additional Comments:

NATIONAL GRID
HUDSON (WATER STREET) SITE
HUDSON, NY

SITE INSPECTION LOG

WELL INSPECTION CHECKLIST

09/22/06 SYR-KLS
36651010/36651N02.CDR

BBL
an ARCADIS company

	MONITORING WELLS & GAUGING STATIONS
PROJECT:	NATIONAL GRID - WATER STREET - HUDSON, NY
JOB NO.:	36651.010
DATE:	Thursday, September 14, 2006
Notes:	Coordinates are based on the North American Datum of 1983, New York East Zone.
	Elevations are based on the North American Vertical Datum of 1988.

WELL ID	COORDINATES (US ft)		ELEVATION (US ft)			REMARKS
	NORTHING	EASTING	PROTECTIVE CASING	WELL*	GROUND	
MW-02	1246862.7	681665.8	6.42	6.10	XXXXX	Flush mount
MW-03	1246810.8	681812.8	9.37	8.97	XXXXX	Flush mount
MW-05	1246701.2	681934.3	12.85	12.57	10.8	Stick-up
MW-06	1246820.1	682075.0	12.29	11.84	9.9	Stick-up
MW-07	1246647.2	682003.5	9.17	8.94	8.4	Stick-up
MW-08A	1246536.8	681874.4	7.15	6.36	XXXXX	Flush mount
MW-09A	1246590.1	681797.1	8.73	8.40	7.6	Stick-up
MW-10	1246663.6	681814.9				Covered with asphalt pavement
MW-11	1246719.5	681820.9	9.82	9.57	XXXXX	Flush mount
MW-CW-01A	1246774.3	681971.6	XXXXX	9.67	10.1	No protective casing
MW-OW-2	1246709.0	681941.1	13.06	12.82	10.8	Stick-up
MW-OW-4	1246723.3	681954.4	13.33	12.66	10.9	Stick-up
MW-RW-1	1247034.0	681671.2	5.34	5.09	XXXXX	Flush mount
MW-RW-2	1246956.6	681607.5	5.18	4.96	XXXXX	Flush mount
River Gauge	XXXXX	XXXXX	5.29	XXXXX	XXXXX	Chiseled square on top of steel pile wall on north side of Embayment #1. Chiseled square is adjacent to the 8th railing post from the east end.

* Top of inner casing (TIC)

ARCADIS BBL

Appendix C

Water-Level/Oil Thickness Measurement

Appendix C

Water-Level/Oil Thickness Measurement

I. Scope and Application

Monitoring well water levels and oil thicknesses will be determined, as appropriate, to develop piezometric maps and monitor NAPL accumulation (if any). The water levels and oil thickness will be obtained using an oil/water interface probe. The Operations and Maintenance (O&M) Manual for the probe should be reviewed prior to commencing work for safe and accurate operation. Operating procedures for determining water levels and oil thicknesses in monitoring wells are presented herein.

II. Personnel Qualifications

BBL field sampling personnel will have current health and safety training, including 40-hour HAZWOPER training, site supervisor training, site-specific training, first aid, and CPR, as needed. In addition, BBL field sampling personnel will be versed in the relevant SOPs and possess the required skills and experience necessary to successfully complete the desired field work.

III. Equipment List

- oil/water interface probe and O&M Manual;
- photoionization detector (PID) to measure headspace vapors;
- health and safety equipment, as required by the site Health and Safety Plan (HASP);
- cleaning equipment;
- plastic sheeting;
- measuring tape;
- non-phosphate soap;
- distilled/deionized water;
- hacksaw;
- waterproof markers;
- watch (to record time and day);
- field notebook;
- absorbent pads;
- appropriate disposable containers;
- appropriate log forms; and
- monitoring well keys.

IV. Cautions

Water-level measurements will be recorded within 24 hours of monitoring well development. However, water-level measurements will be recorded within 12 hours when the aquifer is influenced by tides, river stages, bank storage, impoundments, and/or unlined ditches. Finally, aquifers stressed by intermittent pumping and aquifers recharged from confined or semi-confined aquifers may demonstrate significant water-level fluctuations.

V. Health and Safety Considerations

Volatile organics present in the monitoring well headspace should be measured with a PID to evaluate potential hazards and recorded in the field notebook. Well covers and casings should be carefully removed to avoid potential contact with insects or animals nesting in the well casings.

VI. Procedures

Calibration Procedures

The water-level probe cable will be checked once prior to use to assess if the meter has been correctly calibrated by the manufacturer.

1. Measure the lengths between each increment marker on the cable with a measuring tape. The first 50 feet of the cable will be checked.

2. If the markers are incorrect, the probe will be sent back to the manufacturer.

3. Record verification in the field notebook.

Measurement Procedures

A detailed procedure for obtaining fluid levels will be as follows. All field notations on logs will be treated as secured documentation and indelible ink will be used.

1. Identify site and well number in the field log or notebook, along with other appropriate information collected during water-level measurement.

2. Don personal protective equipment (PPE), as required by the HASP.

3. Clean the oil/water interface probe and cable in accordance with the appropriate cleaning procedures.

4. If oil is likely to be present in the well, place absorbent pads beside the well to absorb oil that may drip from the oil/water interface probe as it is removed from the well.

5. Unlock and open the well cover while standing upwind of the well. Remove well cap. Check breathing zone air with the PID. If the PID reading in the breathing zone meets the limits specified in the HASP, proceed. If the PID reading is above the specified limits, move upwind from the well for 5 minutes to allow the volatiles to dissipate. Repeat the breathing zone test. If the reading is still above 5 PID units, don appropriate respiratory protection in accordance with the requirements of the HASP. Record all PID readings.

6. Locate a measuring reference point on the well casing. If one is not found, create a reference point by notching the inner casing with a hacksaw or by using a waterproof marker. All down-hole measurements will be taken from the reference point.

7. Lower the oil/water interface probe into the well to determine the existence of any light immiscible layer. Carefully record the depths of the air/light-phase and light-phase/water interfaces (to the nearest 0.01 foot) to determine the thickness of the light-phase immiscible layer (if present). The probe will emit a different reading (whether audible or visual) to discern between oil and water interfaces. If no light-phase immiscible layer is present, record the depth of the air/water interface.

8. Lower the oil/water interface probe to the bottom of the well and carefully record the dense-phase/water interface (if present) and the depth at which the bottom of the well is encountered. Record all interface and well depth measurements in the field notebook to the nearest 0.01 foot.

9. Remove cable or tape and probe from the well and place on a clean surface.

10. Between wells, when obtaining water-level/oil thickness measurements at more than one location, clean the instrument with a non-phosphate soap and water wash followed by a distilled/deionized water rinse. Use an appropriate solvent rinse, if necessary, to remove oil deposits.

11. Close the well when all activities are completed.

12. Collect all PPE and other wastes generated for disposal.

VII. Waste Management

Materials generated during water-level/oil thickness measurement procedures, including disposable equipment, will be disposed of in appropriate containers that are properly labeled. Containerized waste will be disposed of by National Grid.

VIII. Data Recording and Management

Groundwater-level measurements should be documented in the field notebook. The following information will be documented:

- sample identification;
- measurement time;
- total well depth;
- depth to water;
- depth to product, if encountered; and
- product thickness, if encountered.

IX. Quality Assurance

The oil-water indicator tape may need to be weighted for deeper monitoring wells. The amount of weight added should be sufficient enough to keep the oil-water indicator tape straight. Standing water-level measurement devices are usually not appropriate for accurately recording the depth of monitoring wells.

X. References

Not Applicable.

ARCADIS BBL

Appendix D

Well Construction Logs

Date Start/Finish: 10/31/95 / 11/01/95
Drilling Company: Parratt Wolff
Driller's Name: Mark Eaves
Drilling Method: Hollow Stem Auger
Bit Size: N/A Auger Size : 3.75, 8.25-in
Rig Type: Mobile B-57
Spoon Size: 2-in.

Northing: 9805.092
Easting: 50143.336
Well Casing Elev.: 8.74 ft.
Corehole Depth:
Borehole Depth: 20.0 ft.
Ground Surface Elev.: 7.1 ft.

Geologist: Hilary E. Hollister-Hinge

Well No. MW-02

Client:
Niagara Mohawk Power Corporation

Site:
Hudson, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID (ppm) Headspace	Analytical Sample	Geologic Column	Stratigraphic Description	Well Construction
gs elevation 7.1 ft.										
									GROUND SURFACE	
5	(0-2')		14 8 9 15	17	1.5	3.3			Dark brown medium dense fine to coarse SAND (GM), trace fine Gravel, clinker fragments, black brittle coal fragments, cement fragments, dry to moist (FILL).	8-in. diameter steel protective casing installed from 2.04' above grade to 6.5' below grade, locking cap installed.
	(2-4')		4 5 4 6	9	1.0	3.1				Type I Portland cement/bentonite grout 0.0' to 5.5' below grade.
0	(4-6')		2 1 2 1	3	1.9	0.6			Bluish-gray soft mottled CLAY (OH).	Type I Portland cement/bentonite grout 0.0' to 6.5' below grade.
	(6-8')		2 1 1 1	2	1.7	0.5			Silt and fine Sand seam, moist (5.9' below grade).	Bentonite seal 6.5' to 8.0' below grade.
-5	(8-10')		2 2 2 2	4	1.2	0.6			Gray-brown Silt (MH), trace fine Sand, wet. Dark gray brown SILT and fine SAND, little Clay, moist.	2-in. diameter Sch. 40 PVC well casing 1.64' above grade to 10.0' below grade.
	(10-12')		4 5 6 8	11	1.8	0.7			SAA, trace Clay, wood, and shell fragments.	
-10	(12-14')		4 4 5 6	9	1.8	0.5			SAA, no wood, no shells.	Grade #0 silica sand pack 8.0' to 20.0 below grade.
	(14-16')		3 4	9	2.0	0.8			SAA, trace coarse Sand and fine Gravel.	
-15										

BBL
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Remarks:
Augered to 5.5' below grade, approximately 1' into the clay. Set 8-in. casing to 5.5' below grade and grouted. Pushed 8-in. casing to 6.5' below grade.

Water Levels

Date / Time	Elevation	Depth
12/04/95 08:31	1.99	5.11 ▼
04/01/96 08:04	-0.36	7.46 ▼

Site:
Hudson, NY

Well No. MW-02

Total Depth = 20.0 ft.

Client:
Niagara Mohawk Power Corporation

Depth / Elevation	Sample Run Number	Sample Int/Type	Blows/6 in.	N	Recovery (ft.)	PID (ppm) Headspace	Analytical Sample	Geologic Column	Stratigraphic Description	Well Construction
	(14-16')		5 6	9	2.0	0.8				2-in. diameter 0.10 slot Sch. 40 PVC screen 10.0' to 20.0' below grade.
-10	(16-18')		24 10 10 10	20	1.8	0.8				
	(18-20')		3 4 4 5	8	1.5	0.7				
-20									Total depth of boring 20.0 ft. below grade.	
-5										
25										
-20										
30										
-25										
35										

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
ppm=parts per million

Water Levels

Date / Time	Elevation	Depth
12/04/95 08:31	1.90	6.1 ▼
04/01/96 08:04	-0.36	7.48 ▼

Project: 364.68

Script: BBL-wel3
Date: 04/15/96

Date Start/Finish: 10/31/95 / 11/03/95
Drilling Company: Parratt Wolff
Driller's Name: Mark Eaves
Drilling Method: Hollow Stem Auger
Bit Size: N/A Auger Size : 3.75, 6.25-in
Rig Type: Mobile B-57
Spoon Size: 2-in.

Northing: 9843.507
Easting: 50294.501
Well Casing Elev.: 11.10 ft.
Borehole Depth: 24.5 ft.
Ground Surface Elev.: 9.2 ft.

Geologist: Hilary E. Hollister-Hinge

Well No. MW-03

Client:
Niagara Mohawk Power Corporation

Site:
Hudson, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In	N	Recovery (ft.)	PID (ppm) Headspace	Analytical Sample	Geologic Column	Stratigraphic Description	Well Construction
	gs elevation 9.2 ft.									**GROUND SURFACE**	8-in. diameter steel protective casing installed from 2.2' above grade to 6.5' below grade, locking cap installed.
		(0-2')		3 12 41 29	53	1.5	1.4			Dark brown gray dense fine to coarse SAND (GM), trace fine gravel, red brick fragments, moist (FILL).	Type 1 Portland cement/bentonite grout 0.0' to 5.5' below grade.
		(2-4')		25 50/ 0.4	>50	1.0	0.8			SAA with dense light brown, white, yellow Sand and Slag.	
5	5	(4-6')		2 1 2 2	3	1.2	0.2			SAA, no slag. Olive gray soft CLAY (OH), some varving, moist, weathered wood fragments.	Type 1 Portland cement/bentonite grout 0.0' to 9.5' below grade. 2-in diameter Sch. 40 PVC well casing 1.90' above grade to 14.5' below grade.
		(6-8')		2 2 1 1	3	1.8	0.3			A 0.2' thick Gray-brown Silt Seam with some fine Sand, moist to wet (5.8'-6.0' below grade). A 0.1' seam of gray brown Silt, some fine Sand, wet, (6.9-7.0' below grade).	
10	0	(8-10')		3 4 4 6	8	1.5	0.1			Dark brown Silt and fine Sand seam with trace medium to coarse Sand, moist (9.00'-9.02' below grade).	
		(10-12')		3 3 3 3	6	1.4	51.7			Dark brown SILT (MH), some fine to coarse Sand, trace red brick and wood fragments, trace Clay, moist, slight organic odor.	Bentonite seal 9.5' to 12.5' below grade.
		(12-14')		4 6 6 4	12	1.0	0.7			Dark brown SILT and fine SAND (MH), trace Clay, slight organic odor, moist.	Grade #0 silica sand pack 12.5' to 24.5' below grade.
15	-5	(14-16')		4 6	12	1.8	0.2				

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
Augered to 5.5', one foot into the clay. Set 8-in. casing to 5.5', pushed 8-in. casing to 6.5' below grade. Set grout.

Water Levels

Date / Time	Elevation	Depth
02/04/96 08:40	7.25	1.95 ▼
04/01/96 08:12	6.80	2.60 ▼

Site:
Hudson, NY

Well No. MW-03

Total Depth = 24.5 ft.

Client:
Niagara Mohawk Power Corporation

DEPTH / ELEVATION	Sample Run Number	Sample Int./Type	Blows/6 in.	N	Recovery (ft.)	PID (ppm) Headspace	Analytical Sample	Geologic Column	Stratigraphic Description	Well Construction
	(14-16')		6 7	12	1.8	0.2			(@14.0' below grade) SAA, no odor, trace wood fragments.	
	(16-18')		4 6 6 5	12	1.3	0.4			SAA, trace shell fragments.	2-in diameter Sch. 40 PVC 0.10 slot screen 14.5' to 24.5' below grade.
-10	(18-20')		3 3 5 6	8	1.7	3.1				
-20	(20-22')		5 5 7 8	12	2.0	0.0				
	(22-24')		3 4 4 5	8	2.0	0.0				
-15									Total depth of boring 24.5 feet below grade.	
-25										
-20										
-30										
-25										
35										

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
ppm=part per million. SAA=same as above.

Water Levels

Date / Time	Elevation	Depth
12/04/95 08:40	7.25	1.95 ▼
04/01/96 08:12	6.60	2.60 ▼

Project: 364.68

Script: BBL-wel3
Date: 04/15/96

Date Start/Finish: 10/31/95 / 11/01/95
Drilling Company: Parratt Wolff
Driller's Name: Mark Eayes
Drilling Method: Hollow Stem Auger
Bit Size: N/A Auger Size: 3.75, 6.25-in
Rig Type: Mobile B-57
Spoon Size: 2-in.

Northing: 9819.245
Easting: 50455.944
Well Casing Elev.: 13.37 ft.
Corehole Depth:
Borehole Depth: 24.5 ft.
Ground Surface Elev.: 11.7 ft.

Geologist: Hillary E. Hollister-Hinge

Well No. MW-05

Client:
Niagara Mohawk Power Corporation

Site:
Hudson, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Analytical Sample	Geologic Column	Stratigraphic Description	Well Construction
GS elevation 11.7 ft.									**GROUND SURFACE**	8-in diameter steel protective casing installed from 1.95' above grade to 6.0' below grade, locking cap installed.
0 / 10	(0-2')		6 5 4 5	9	1.4	4.0			Dark brown fine to coarse SAND (GM), trace fine Gravel, red brick fragments, black slag fragments, light gray clinker fragments, dry to moist (FILL).	
	(2-4')		3 2 3 3	5	1.3	13.4			Some gray ash, wet.	Type I Portland cement/bentonite grout 0.0' to 6.0' below grade.
5	(4-6')		3 2 3 2	5	1.2	184	X		Black brittle Coal fragments, organic odor, wet. Olive gray CLAY (OH), moist. Black staining within Clay from 4.5'-4.6' below grade, strong organic odor.	Type I Portland cement/bentonite grout 0.0' to 9.5' below grade.
5	(6-8')		NA	NA	NA	484			Black stained seam of fine Sand (4.5'-4.6' below grade). At 4.8' below grade, trace viscous black NAPL pocketed within Clay.	2-in diameter Sch. 40 PVC well casing 1.67' to 16.5' below grade.
	(8-10')		5 5 4 4	9	1.6	82.1			No black staining or NAPL. Wet, some sheens, little black NAPL, strong organic odor.	
10 / 0	(10-12')		3 3 4 3	7	1.2	102			SAA, trace sheens, no pocketed NAPL. Brown fine Sand, some Silt, wet, trace pocketed NAPL, strong organic odor, no sheens.	Bentonite seal 9.5' to 14.5' below grade.
	(12-14')		3 2 3 2	5	2.0	1.0	X		Olive gray CLAY (OH), moist, slight organic odor, no visible NAPL.	
15	(14-16')		5 4	8	2.0	0.2			Dark brown SILT and fine SAND, trace Clay and roots, moist, no visible NAPL, and no odor.	

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Remarks:
Augered to 5.0' below grade, set 8-in. casing to 5.0' and pushed casing to 6.0'. Grouted casing in place.

Water Levels

Date / Time	Elevation	Depth
12/04/95 08:51	7.55	4.15 ▼
04/01/96 06:06	7.12	4.58 ▼

Site:
Hudson, NY

Well No. MW-05

Total Depth = 24.5 ft.

Client:
Niagara Mohawk Power Corporation

DEPTH / ELEVATION	Sample / Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Analytical Sample	Geologic Column	Stratigraphic Description	Well Construction
	(14-16')		4 5	8	2.0	0.2			SAA, trace wood fragments.	Grade #0 silica sand pack 14.5' to 26.5' below grade.
-5	(16-18')		4 5 6 8	11	2.0	0.2				
	(18-20')		5 5 6 7	11	2.0	0.2				
-20	(20-22')		4 5 5 6	10	2.0	0.3				2-in diameter Sch. 40 PVC 0.10 slot screen 16.5' to 26.5' below grade.
-10	(22-24')		4 4 5 6	9	2.0	0.2				
-25	(24-26')		4 5 5 5	10	2.0	NA				
-5									End of boring at 26.5' below grade.	
30										
-20										
35										

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
NA=not applicable. ppm=parts per million.
NAPL=non-aqueous phase liquid.

Water Levels

Date / Time	Elevation	Depth
12/04/95 08:51	7.55	4.15 ↧
04/01/96 08:08	7.12	4.58 ↧

Project: 384.68
Script: BBL-wel3
Date: 04/15/96

Date Start/Finish: 08/15/96 / 08/19/96 **Drilling Company:** Parratt Wolff **Driller's Name:** Doug Richmond **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A **Auger Size:** 3.75, 6.25-in **Rig Type:** IER 300 **Spoon Size:** 2-in.	**Northing:** 9996.556 **Easting:** 50508.17036 **Well Casing Elev.:** 12.68 ft. **Corehole Depth:** 26.0 ft. **Borehole Depth:** 26.0 ft. **Ground Surface Elev.:** 10.6 ft. **Geologist:** Jeff D. Conrad	**Well No.** MW-08 **Client:** Niagara Mohawk Power Corporation **Site:** Hudson, NY

DEPTH / ELEVATION	Sample Run Number	Sample Int/Type	Blows/6 in.	N	Recovery (ft.)	PID (ppm) Headspace	Analytical Sample	Geologic Column	Stratigraphic Description	Well Construction
gs elevation 10.6 ft.										8-in diameter steel protective casing installed from 2.54' above grade to 7.8' below grade, locking cap installed.
									GROUND SURFACE	
10	(0-2')		8 18 43 52	61	1.0	0.5			Dark brown and black fine to medium SAND (GM), some fine to medium angular gravel, trace fibrous organics, dry (FILL).	Sand drain and weep hole installed in steel protective casing, above grade.
	(2-4')		12 28 41 26	69	2.0	1.0			Fine angular GRAVEL, some brown fine to course Sand, little white Gravel fragments, dry. Orange BRICK, brown silty Sand (2.7-2.9' below grade), moist (FILL).	Type I Portland cement/bentonite grout 0.0' to 6.8' below grade.
5	(4-6')		2 3 3 3	6	1.0	0.0			Fine to medium GRAVEL-sized coal fragments, and little brown fine to medium SAND, moist (FILL). Olive brown CLAY, some black staining, and fine SAND, fine Gravel, and red Brick, no odor (FILL).	Type I Portland cement/bentonite grout 0.0' to 9.0' below grade.
5	(6-8')		2 3 2 3	5	2.0	0.0			Olive-brown CLAY (OH), trace shells, moist.	2-in diameter Sch. 40 PVC well casing 2.08' above grade to 13.15' below grade.
	(8-10')		3 4 3 3	7	1.1	0.0			Tan (8.8-9.3' below grade). SAA, olive gray.	
10	(10-12')		5 6 7 8	13	2.0	0.0			SAA, trace medium Gravel, moist. Seam of dark brown Silt (11.2-11.3' below grade).	Bentonite seal 9.0' to 12.0' below grade.
	(12-14')		NA	NA	0.0	NA			Stiff dark brown SILT (MH), trace organic fibers, trace spherical fine Gravel and fine Sand, dry to moist, 12.0-14.0' not sampled due to driller error.	
15	(14-16')		3 4	10	2.0	0.0				

Remarks:

Augered to 6.8' below grade, set 8-in. casing to 6.8' and pushed casing to 7.8'. Tremie-grouted casing in place. PVC well fittings were hand tightened.

Water Levels

Date / Time	Elevation	Depth
09/16/96 14:22	5.82	4.78 ⧫
10/12/96 09:46	7.27	3.33 ⧫

Site:
Hudson, NY

Well No. MW-06

Total Depth = 26.0 ft.

Client:
Niagara Mohawk Power Corporation

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Analytical Sample	Geologic Column	Stratigraphic Description	Well Construction
-5		(14-16')		6 7	10	2.0	0.0			(At 14.0' below grade) dark brown SILT, trace wood fibers and slices, wet.	Grade #0 silica sand pack 12.0' to 24.0' below grade.
		(16-18')		3 4 4 4	8	2.0	0.0			SAA, grades to moist.	
		(18-20')		2 3 2 2	5	2.0	0.0			SAA, trace organics.	
-20	-10	(20-22')		2 2 3 2	5	2.0	0.0				2-in diameter Sch. 40 PVC 0.10 slot screen 13.15- to 22.65' below grade.
		(22-24')		3 4 4 4	8	2.0	0.0			Seam of fine Sand, (21.60-21.62' below grade). SAA, slight organic odor.	2-in diameter Sch. 40 PVC sump 22.65-24.0' below grade.
-25	-5	(24-26')		3 5 5 5	10	2.0	0.0			Gray CLAY (OH), wet.	Native material/sand fill from last 2" split spoon.
										End of boring at 26.0' below grade. Terminated boring to fit well screen and packing materials beneath clay/silt interface.	
-30	-20										
35											

Remarks:
SAA=same as above, NA=not applicable, ppm=parts per million.

Water Levels

Date / Time	Elevation	Depth
09/19/96 14:22	5.82	4.78 ▼
10/12/96 09:46	7.27	3.33 ▼

364.68

Script: BBL-NWSW
Date: 12/17/96

Date Start/Finish: 08/15/96 / 08/20/96 **Drilling Company:** Parratt Wolff **Driller's Name:** Doug Richmond **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A **Auger Size :** 3.75, 6.25-in **Rig Type:** IER 300 **Spoon Size:** 2-in.	**Northing:** 9812.535 **Easting:** 50543.858 **Well Casing Elev.:** 9.76 ft. **Corehole Depth:** 24.8 ft. **Borehole Depth:** 24.8 ft. **Ground Surface Elev.:** 9.4 ft. **Geologist:** Jeff D. Conrad	**Well No.** MW-07 **Client:** Niagara Mohawk Power Corporation **Site:** Hudson, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID (ppm) Headspace	Analytical Sample	Geologic Column	Stratigraphic Description	Well Construction
gs elevation 9.4 ft.											
										GROUND SURFACE	
		(0-2')		7 8 12 9	20	0.5	0.0			Brown and black fine to medium SAND (GM), some roots, trace red Brick and Wood slices, dry (FILL).	8-in diameter steel protective casing installed from 0.59' above grade to 10.8' below grade, locking cap installed.
		(2-4')		5 5 6 5	11	1.0	0.0			Brown fine Sand, some Silt, trace fine Gravel, moist to wet (FILL).	Type I Portland cement/bentonite grout 0.0' to 9.8' below grade.
5	5	(4-6')		3 3 2 2	5	0.3	0.0			Increasing Silt and Clay fractions.	Type I Portland cement/bentonite grout 0.0' to 8.8' below grade.
		(6-8')		2 2 2 2	4	1.8	0.0			Brown Silty CLAY (OH), little fine rounded and angular gravel, wet.	2-in diameter Sch. 40 PVC well casing 0.36' above grade to 13.80' below grade.
										Brown wet medium to coarse SAND, fine rounded Gravel.	
	0	(8-10')		1 WOH WOH WOH	1	1.0	0.0			SAA, grades to medium Sand, no Gravel.	
10		(10-12')		2 WOH WOH WOH	1	2.0	0.0			Very soft dark brown CLAY (OH), little staining, wet.	Bentonite seal 8.8' to 12.1' below grade.
										Brown SILT (MH), trace wood fibers.	
		(12-14')		2 2 2 2	4	2.0	0.0			Dark brown SILT (MH), trace wood fibers, fine Gravel-sized Wood.	
	-5	(14-16')		2 2	4	2.0	0.0			Piece of angular fine Gravel.	
15											

Remarks:

Augered to 9.8' below grade, set 8-in. casing to 9.8' and pushed casing to 10.8'. Tremie-grouted casing in place. PVC well fittings were hand tightened.

Water Levels

Date / Time	Elevation	Depth
09/16/96 14:11	4.85	4.65 ↧
10/12/96 09:43	6.10	3.33 ↧

Site:
Hudson, NY

Well No. MW-07

Total Depth = 24.8 ft.

Client:
Niagara Mohawk Power Corporation

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Analytical Sample	Geologic Column	Stratigraphic Description	Well Construction
	(14-16')		2 2	4	2.0	0.0				Grade #0 silica sand pack 12.1' to 24.8' below grade.
	(16-18')		3 3 5 5	8	1.6	0.0			SAA, trace flat Coarse SAND (Shale-derived) fragments (17.6-17.8' below grade).	
-10	(18-20')		2 4 2 2	6	2.0	0.0			SAA, moist. Solid, degraded wood (18.8-20.0' below grade).	
20	(20-22')		WOH 2 3 2	5	1.5	0.0			SAA, moist to wet, trace rounded fine Gravel (21.7-21.9' below grade).	2-in diameter Sch. 40 PVC 0.10 slot screen 13.80 to 23.30' below grade.
	(22-24')		NA	NA	1.0	0.0				
-15	(24-24.8')		NA	NA	0.5	NA			(At 24.0' below grade) SAA, wet (From 3" split spoon used to clean out augers).	2-in diameter Sch. 40 PVC sump 23.30-24.8' below grade.
25									End of boring at 24.8' below grade. Terminated boring to fit well screen and packing materials beneath clay/silt interface.	
-20										
30										
-25										
35										

Remarks:
SAA=same as above. NA=not applicable. ppm=parts per million. WOH=weight of hammer.

Water Levels

Date / Time	Elevation	Depth
09/16/96 14:11	4.85	4.55 ▼
10/12/96 09:43	8.10	3.33 ▼

Date Start/Finish: 08/12/96 - 08/12/96 **Drilling Company:** Parratt Wolff **Driller's Name:** Doug Richmond **Drilling Method:** Hollow Stem Auger **Bit Size:** NA **Auger Size :** 3.25-in. **Rig Type:** IER 300 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 9648.993 **Easting:** 50497.437 **Borehole Depth:** 14.0 ft. **Ground Surface Elev.:** 7.86 ft. **Geologist:** Jeff D. Conrad	**Boring No.** MW-08A **Client:** Niagara Mohawk Power Corporation **Site:** Hudson, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID (ppm) Headspace	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
gs elevation 7.86 ft.										**GROUND SURFACE**	
		1		4 10 14 20	24	1.0	0.0			Black fine to medium SAND (GM), some Coal ash, trace to little Brick and Slag, trace Glass, and opaque Plastic, dry (FILL).	
5		2		8 10 14 8	24	1.3	2.5			Green-blue medium Gravel (2.7-2.9' below grade, FILL). Brown fine to medium SAND, some white angular fine Gravel, little slag, dry to moist (FILL).	
5		3		7 9 10 12	19	1.6	0.0			Brown fine to medium SAND, rounded coarse sand-sized quartz, black and red medium to coarse gravel-sized slag, glass and brick fragments (FILL).	Cement/bentonite grout from ground surface to 14.0 feet below grade.
0		4		3 3 3 3	6	1.5	0.0			Olive CLAY (OH), moist. (At 7.3' to 7.35' below grade) rounded medium SAND, wet. (At 7.8-7.8' below grade) trace to little fine Sand-sized Coal, dry (FILL).	
		5		3 4 4 14	8	1.9	0.0			Black-gray SILT and fine to medium SAND, wet. (At 9.6' below grade) soft gray CLAY, wet. (At 9.9-10.0' below grade) solid yellow wood (FILL).	
10		6		52 15 16 17	31	1.7	224.6			Black-gray SILT (FILL). Gray CLAY and SILT. (At 11.4-11.8' below grade) silver sheens, slight hydrocarbon odor. (At 11.8-12.0' below grade) solid yellow wood (FILL).	
-5		7		4 3 4 4	7	2.0	126.0			Moist brown Clayey SILT (MH), trace wood fibers. No sheens, no hydrocarbon odor. Slight organic odor.	
15										Bottom of borehole 14.0 feet below grade.	

Remarks:

ppm=parts per million. Boring terminated due to significant penetration of silt layer, and absense of adequate clay layer. Moved location approximately 10 ft to north, see MW-08B well log. Moved north to location MW-08B.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 08/14/96 / 08/19/96
Drilling Company: Parratt Wolff
Driller's Name: Doug Richmond
Drilling Method: Hollow Stem Auger
Bit Size: N/A Auger Size: 3.75, 6.25-in
Rig Type: IER 300
Spoon Size: 2-in.

Northing: 9642.024
Easting: 50401.799
Well Casing Elev.: 9.21 ft.
Corehole Depth: 24.1 ft.
Borehole Depth: 24.1 ft.
Ground Surface Elev.: 8.3 ft.

Geologist: Jeff D. Conrad

Well No. MW-09A

Client:
Niagara Mohawk Power Corporation

Site:
Hudson, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID (ppm) Headspace	Analytical Sample	Geologic Column	Stratigraphic Description	Well Construction
gs elevation 8.3 ft.									GROUND SURFACE	8-in diameter steel protective casing installed from 1.84' above grade to 9.5' below grade, locking cap installed.
5	(0-6')		NA	NA	NA	NA			Augered continuously to 6' below grade.	Type I Portland cement/bentonite grout grade to 8.5' below grade.
0	(6-8')		3 4 4 6	8	0.6	1.5			Porous and angular fine to coarse GRAVEL and brown fine to medium Sand, trace very coarse sand-sized, blue-green chips, silvery sheens, hydrocarbon odor (FILL).	Type I Portland cement/bentonite grout grade to 9.1' below grade.
-5	(8-10')		2 2 2 3	4	1.1	0.0			Olive-gray CLAY (OH), little fine rounded Gravel.	2-in diameter Sch. 40 PVC well casing 1.80' above grade to 12.95' below grade.
-10	(10-12')		4 5 7 5	12	1.6	1.6			Little staining in a 0.1' thick seam of gray medium to coarse Sand from 9.4-9.5' below grade, some fine Gravel. (Sampled slough, consisted of angular fine to medium Gravel, sheens, little fine to medium Sand, wet, sheens, slight odor.) Olive-gray CLAY (OH), little staining.	Bentonite seal 7.1' to 11.7' below grade.
-15	(12-14')		4 4 4 5	8	2.0	2.0			Moist dark brown SILT (MH), little rounded fine Gravel, trace organics, little wood pieces, no odor.	
	(14-16')		2 2	5	1.4	1.4			SAA, no gravel. SAA, trace wood.	

Remarks:
Augered to 8.5' below grade using 6.25-in. ID augers, set 8-in. casing to 8.5' and pushed casing to 9.5'. Tremie-grouted casing in place. PVC well fittings were hand tightened.

Water Levels

Date / Time	Elevation	Depth
09/16/96 14:00	4.04	4.26 ▼
10/12/96 10:17	3.93	4.37 ▼

Site:
Hudson, NY

Well No. MW-09A
Total Depth = 24.1 ft.

Client:
Niagara Mohawk Power Corporation

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID (ppm) Headspace	Analytical Sample	Geologic Column	Stratigraphic Description	Well Construction
	(14-16")		3 3	5	1.4	1.4			SAA, trace Clay, wet.	Grade #0 silica sand pack 11.7' to 24.1' below grade.
	(16-18")		3 3 3 3	6	2.0	2.0			SAA, no Clay, little wood, wet.	
-10	(18-20")		2 3 3 4	6	2.0	2.0				
-20	(20-22")		3 3 3 3	6	2.0	2.0				2-in diameter Sch. 40 PVC 0.10 slot screen 13.1 to 22.65' below grade.
	(22-24")		2 2 3 3	5	2.0	2.0				2-in diameter Sch. 40 PVC sump 22.65-24.1' below grade.
-15									End of boring at 24.1' below grade. Boring terminated to fit well screen below packing materials.	
-25										
-20										
-30										
-25										
35										

Remarks:
SAA=same as above. NA=not applicable. ppm=parts per million.

Water Levels

Date / Time	Elevation	Depth
09/16/96 14:00	4.04	4.26 ▼
10/12/96 10:17	3.93	4.37 ▼

Project: 364.68

Script: BBL-NWSW
Date: 12/17/96

Date Start/Finish: 08/12/96 / 08/16/96 **Drilling Company:** Parratt Wolff **Driller's Name:** Doug Richmond **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A **Auger Size:** 3.75, 6.25-in **Rig Type:** IER 300 **Spoon Size:** 2-in.	**Northing:** 9702.819 **Easting:** 50322.259 **Well Casing Elev.:** 8.60 ft. **Corehole Depth:** 29.4 ft. **Borehole Depth:** 29.4 ft. **Ground Surface Elev.:** 8.9 ft. **Geologist:** Jeff D. Conrad	**Well No.** MW-10 **Client:** Niagara Mohawk Power Corporation **Site:** Hudson, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft)	PID (ppm) Headspace	Analytical Sample	Geologic Column	Stratigraphic Description	Well Construction
gs elevation 8.9 ft.										**GROUND SURFACE**	
		(0-2')		7 9 10 11	19	1.3	0.0			Black fine to medium SAND (GM), trace brick and wood chips, coarse Sand-sized chips of Slag, black angular gravel, dry (FILL). Red Brick fragments, sharp angular coarse Gravel, little fine to medium Sand.	11-in diameter steel flush mount bolted cover installed 0.37' above grade to 1.0' below grade.
		(2-4')		3 4 7 7	11	0.9	0.0			Fine to medium angular Gravel, wet.	
5	5	(4-6')		4 5 5 6	10	2.0	0.0			Stiff tan-brown-gray, varved CLAY (OH), trace wood fibers, trace shells, moist.	8-in diameter steel protective casing installed from grade to 7.3' below grade.
		(6-7')		NA	NA	NA	NA			Cement Grout from outer casing installation. Augered through 6-7' below grade).	Type I Portland cement/bentonite grout 0.0' to 6.3' below grade.
		(7-9')		2 2 3 4	5	0.8	0.0			Brown gray dry CLAY (OH), stiff, trace amber glass.	
0		(9-11')		2 2 2 2	4	2.0	0.0			Brown CLAY (OH), moist, little Silt, some dry zones.	Type I Portland cement/bentonite grout 1.0' to 12.0' below grade.
10		(11-13')		3 3 3 4	6	1.0	0.0			SAA, increasing Silt content, tending toward olive.	2-in diameter Sch. 40 PVC well casing 0.3' to 18.45' below grade.
	-5	(13-15')		2 2 2 2	4	1.6	0.0			Olive-gray CLAY (OH).	
15										Dark brown SILT (MH), trace organic fibers, moist.	

Remarks:

Augered to 6.3' below grade, using 6-in. ID/8-in. OD auger, set 8-in. casing to 6.3' and pushed casing to 7.3'. Grouted casing in place. PVC well fittings were hand tightened.

Water Levels

Date / Time	Elevation	Depth
09/16/96 13:48	4.48	4.42 ▼
10/12/96 10:17	6.17	2.73 ▼

Site:
Hudson, NY

Well No. MW-10

Total Depth = 29.4 ft.

Client:
Niagara Mohawk Power Corporation

DEPTH / ELEVATION	Sample / Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Analytical Sample	Geologic Column	Stratigraphic Description	Well Construction
	(15-17')		3 4 4 4	8	2.0	0.0			Light brown 0.02' thick seam of fine Sand, Silt and fine Gravel (14.80-14.82' below grade). SAA, moist.	Bentonite seal 12.0' to 18.0' below grade.
	(17-19')		2 3 4 5	7	2.0	0.0			SAA, trace rounded very coarse Sand.	
-10										Grade #0 silica sand pack 18.0' to 29.4' below grade.
-20	(19-21')		4 4 4 4	8	1.2	0.0			SAA, trace wood slivers, trace plant seeds.	
	(21-23')		3 3 3 4	6	1.6	0.0			SAA, trace plant stems.	2-in diameter Sch. 40 PVC 0.10 slot screen 18.45 to 27.95' below grade.
-5	(23-25')		2 3 2 3	5	2.0	0.0				
-25	(25-27')		2 3 3 3	6	2.0	0.0			Little degraded solid wood. SAA, trace wood fibers and flakes. (Submitted sample from MW-10 interval 25-27' for grain size analysis). A 0.01' thick seam of brown fine Sand, wet.	
	(27-29')		3 3 4 5	7	2.0	0.0			SAA, trace plant stems, degraded wood flakes.	
-20										2-in diameter Sch. 40 PVC sump 27.95-29.40' below grade.
-30									End of boring at 29.4' below grade. Terminated boring to fit well screen and packing materials beneath clay/silt interface.	
-25										
35										

Remarks:

SAA=same as above. NA=not applicable. ppm=parts per million. Analytical analysis for soil sample MW-10 (13-15') not available due to lab error.

Water Levels

Date / Time	Elevation	Depth
09/16/96 13:48	4.48	4.42 ▼
10/12/96 10:17	6.17	2.73 ▼

Date Start/Finish: 6/21/99 / 6/21/99
Drilling Company: Parratt-Wolff
Driller's Name: Rick Navatka, Mark Eaves
Drilling Method: Hollow Stem Auger

Auger Size: I.D.= 4.25 in.
Rig Type: Ingersoll Rand A-300
Spoon Size: 2 in.

Northing: 977171854
Easting: 603515050T
Well Casing: 10.35

Borehole Depth: 8.0 ft.
Ground Surface: 10.6

Geologist: Ron D. Kuhn

Well No: MW-11

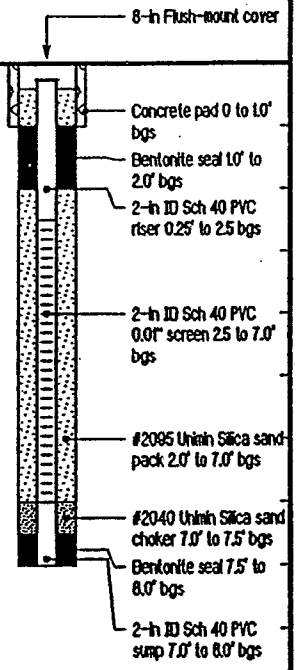
Client:
Niagara Mohawk Power Corporation

Location:
Water Street Site
Hudson, NY.

gs elevation 10.6 ft.

DEPTH / ELEVATION	Sample / Run Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
									GROUND SURFACE
10 / 5	(0-2')		NA NA NA NA	NA	1.8	22.1			Gray brown fine to coarse SAND and fine to medium GRAVEL, little Silt, damp.
									Dark brown/black stained FILL (SLAG, CINDERS, BRICK) and SILT, trace fine to coarse Sand and fine to medium Gravel, odor, tar, moist.
	(2-4')		NA NA NA NA	NA	0.4	4.4			Gray brown CLAY and FILL materials as above.
5 / 5	(4-6')		NA NA NA NA	NA	0.6	8.9			Gray brown fine to coarse SAND, some fine to medium Gravel, little Clay, saturated, sheens, NAPL, odor.
	(6-8')		NA NA NA NA	NA	1.2	4.5			Gray brown CLAY, mottled, moist, confining.
10 / 0									End of boring at 8' BGS.
15									

Well Construction



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engineers & scientists

Remarks:
NA = BlowCounts and N values not collected due to direct push sampling technology. BGS = Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 364.68
Script: nbblwell
Date: 09/29/99

Date Start/Finish: 6/22/99 / 6/22/99
Drilling Company: Parratt-Wolff
Driller's Name: Rick Navatka, Mark Eaves
Drilling Method: Hollow Stem Auger

Auger Size: I.D. = 4.25 in.
Rig Type: Ingersoll Rand A-300
Spoon Size: 2 in.

Northing: 9829.38286
Easting: 50457.45344
Well Casing: 13.69

Borehole Depth: 26.0 ft.
Ground Surface: 11.4

Geologist: Ron D. Kuhn

Well No: OW-2

Client:
Niagara Mohawk Power Corporation

Location:
Jater Street Site
Hudson, NY.

DEPTH / ELEVATION	Sample / Run Number	Sample Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
gs elevation 11.4 ft.										6-in steel protective casing, locking
									GROUND SURFACE	
10	(0-2')		NA NA NA NA	NA	1.8	0.0			Gray brown fine to coarse SAND, some Silt, little fine to medium Gravel, damp.	Concrete pad 0 to 2.0' bgs
	(2-4')		NA NA NA NA	NA	0.9	0.0			Dark brown/black fine SAND and SILT, little medium to coarse SAND, trace fine to medium Gravel, trace Slag, Cinders, and Brick, damp.	
5	(4-6')		NA NA NA NA	NA	0.8	0.0			Dark gray/brown Slag, Ash, and Brick [FILL], slight odor, saturated.	Type I/II Portland/5% bentonite grout 2.0' to 11.2' bgs
5	(6-8')		NA NA NA NA	NA	0.4	0.0			Blue-gray CLAY, medium stiff, moist. Gradational change to light brown.	
	(8-10)		NA NA NA NA	NA	1.2	0.0			Light brown fine SAND, little Silt, saturated.	2-in ID Sch 40 PVC riser from 2.29' ags to 15.7' bgs
10	(10-12)		NA NA NA NA	NA	0.5	0.0				Bentonite seal 11.2 to 13.2' bgs
0	(12-14)		NA NA NA NA	NA	2.0	0.0			Brown Clayey SILT, trace fine Sand, moist.	#2095 Unimin Silica Sand choker 13.2' to 13.7' bgs
	(14-15)		NA NA	NA	2.0	0.0			Brown Clayey SILT, trace fine Sand and natural organics, moist.	
15										

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Remarks:
NA = Blowcounts and N values not collected due to direct push sampling technology. BGS = Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 364.68
Script: nbblwell
Date: 09/29/99

Client:
Niagara Mohawk Power Corporation

Location:
Jater Street Site
Hudson, NY

Well No: GW-2

Total Depth = 26.0 ft.

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
	(15-16)		NA NA	NA	2.0	0.0			Brown Clayey SILT, trace fine Sand and natural organics, moist.	2-in ID Sch 40 PVC riser from 2.29' ags to 15.7' bgs
-5	(16-18)		NA NA NA NA	NA	2.0	0.0				
	(18-20)		NA NA NA NA	NA	2.0	0.0				2-in ID Sch 40 0.01" slot PVC screen 15.7' to 25.2' bgs
-20	(20-22)		NA NA NA NA	NA	2.0	0.0				#2040 Unimin Silica sandpack 13.7' to 25.4' bgs
-10	(22-24)		NA NA NA NA	NA	2.0	0.0				
-25	(24-26)		NA NA NA NA	NA	2.0	0.0				2-in ID Sch 40 PVC sump 25.2' to 25.4' bgs
-15									End of boring at 26.0' bgs.	
-30										
-20										
-35										

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engineers & scientists

Remarks:
NA = Blowcounts and N values not collected due to direct push sampling technology. BGS = Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 364.68

Script: nbblwell
Date: 09/29/99

Date Start/Finish: 6/23/99 / 6/23/99
Drilling Company: Parratt-Wolff
Driller's Name: Rick Navatka, Mark Eaves
Drilling Method: Hollow Stem Auger

Auger Size: I.D. = 4.25 in.
Rig Type: Ingersoll Rand A-300
Spoon Size: 2 in.

Northing: 9848.80296
Easting: 50460.87329
Well Casing: 13.63

Borehole Depth: 26.0 ft.
Ground Surface: 11.5

Geologist: Ron O. Kuhn

Well No: GW-4

Client:
Niagara Mohawk Power Corporation

Location:
Water Street Site
Hudson, NY.

DEPTH / ELEVATION	Sample Run Number	Sample Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
gs elevation 11.5 ft.									**GROUND SURFACE**	6-in steel protective casing, locking
10	(0-2')		NA NA NA NA	NA	1.0	NA			Brown fine SAND and SILT, little medium to coarse Sand, little fine to medium Gravel, damp.	Concrete pad 0 to 2.0' bgs
	(2-4')		NA NA NA NA	NA	0.8	NA			Dark brown/black FILL (Slag and Cinders), damp. Gray/brown/orange FILL (fine Brick and Ash) and SILT, wet.	
-5	(4-6')		NA NA NA NA	NA	1.0	NA			Black COAL with tar.	Type I/II Portland/5% bentonite grout 2.0' to 12.0' bgs
5	(6-8')		NA NA NA NA	NA	1.0	NA			Dark gray/black stained SILT, trace fine Sand and Fill (Brick, Slag, and Cinders), sheens, saturated.	
	(8-10)		NA NA NA NA	NA	1.0	NA			Gray brown CLAY, medium stiff, moist, NAPL present.	2-in ID Sch 40 PVC riser 2.13'ags to 16.1' bgs
-10	(10-12)		NA NA NA NA	NA	0.4	NA			Brown fine SAND and SILT, wet.	
0	(12-14)		NA NA NA NA	NA	1.8	NA			Gray brown mottled CLAY, medium stiffness, slight odor, moist. Gray brown CLAY, soft, plastic, moist.	Bentonite seal 12.0' to 14.0' bgs
-15	(14-15)		NA NA	NA	0.2	NA				#2095 Unimin Silica sand choker 14.0' to 14.5' bgs

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Remarks:
NA = Blowcounts and N values not collected due to direct push sampling technology. BGS = Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Client:
Niagara Mohawk Power Corporation

Location:
Water Street Site
Hudson, NY.

Well No: GW-4

Total Depth = 26.0 ft.

DEPTH ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
	(15-16)		NA NA	NA	0.2	NA			Gray brown CLAY, soft, plastic, moist.	#2040 Unimin sand pack 14.5' to 25.6' bgs
-5	(16-18)		NA NA NA NA	NA	2.0	NA			Gray brown Clayey SILT, trace fine Sand, trace natural organics, moist.	
	(18-20)		NA NA NA NA	NA	2.0	NA				
-20	(20-22)		NA NA NA NA	NA	2.0	NA				2-in ID Sch 40 PVC 0.01" screen 15.1 to 25.6' bgs
-10	(22-24)		NA NA NA NA	NA	2.0	NA				
-25	(24-26)		NA NA NA NA	NA	2.0	NA				2-in ID Sch 40 PVC sump 25.6' to 25.8' bgs
-15									End of boring 26.0' bgs.	
-30										
-20										
-35										

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Remarks:
NA = Blowcounts and N values not collected due to direct push sampling technology. BGS = Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

parratt wolff inc

TEST BORING LOG

5879 FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT MGP site

LOCATION Hudson, New York

DATE STARTED 8-15-05

DATE COMPLETED 8-17-05

HOLE NO. CW01-R

SURF. EL.

JOB NO. 05192A

GROUND WATER DEPTH WHILE DRILLING 24' & 30'

BEFORE CASING REMOVED 30'

AFTER CASING REMOVED Installed 4" ss well

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ 140 # HAMMER FALLING "/OR — % CORE RECOVERY

Lee Lemon

CASING TYPE 6¼ H.S.A. 4"x3' B.I.P. Sump
2" spoons 4" B.I.P. Riser
4" ss Screen

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
5'						6¼ H.S.A. no sampling	
10'							10'
15'							
20'	18'-20'	1		3-1 3-6	4	Backfill & gravel mix	
	20'-22'	2		2-4 2-3	6		21'
25'	22'-24'	3		3-4 4-5	8	Grey moist, medium stiff, SILT / DNAPL present	24'
	24'-26'	4		3-2 1-1	3	Grey, moist to wet soft SILT & some clay DNAPL still present	
30'	26'-28'	5		3-3 2-2	5		28'
	28'-30'	6		4-3 4-4	7	Grey moist, medium stiff SILT, TRACE DNAPL still present	30'
35'	30'-32'	7		[illegible]		[illegible], stiff SILT, TRACE clay	
	33'-35'	8		5-5 7-10	12	Thicker thinly soils from 31'-35' were drawn from DNAPL	
	34'-35'	9		6-8	14	Grouted in comp 8-16-05 completed well 8-17-05	35' B.O.B.
40'						17.5' 4" stainless steel screen = 1 10' piece, 1 2.5' piece 3' 4" B.I.P. T&C Sandpack 32'-17.5' = 14 bags #0 3' 4" B.I.P. sump Seal 17.5'-15.5' = 1 bag Hole Sump 35'-32' Grout 15.5'-1.0 Below Grade Concrete 32'-19.5' Backfill 1.0'-grade 8" fine	

WOITTInc **TEST BORING LOG** EAST SYRACUSE, N.Y. 13057

PROJECT mgp site

LOCATION Hudson, New York

DATE STARTED 8-15-05 DATE COMPLETED 8-17-05

HOLE NO. CW01-R

SURF. EL.

JOB NO. 05192A

GROUND WATER DEPTH WHILE DRILLING 24' & 30'

BEFORE CASING REMOVED 30'

AFTER CASING REMOVED Installed 4" SS well

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ 140 # HAMMER FALLING "/OR — % CORE RECOVERY

Lee Lemon

CASING TYPE 6¼ H.S.A. 2" spoons 4" SS Screen 4" x 3' B.I.P. sump 4" B.I.P. Riser

SHEET 1 OF 1

DFL

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
5'						6¼ H.S.A. no sampling	
10'							
15'							
20'	18'-20'	1		3-1 3-6	4	Backfill & gravel mix	18'
	20'-22'	2		2-4 2-3	6	Grey moist, medium stiff, SILT / DNPL present	21'
25'	22'-24'	3		3-4 4-5	8		24'
	24'-26'	4		3-2 1-1	3	Grey, moist to wet soft SILT & some clay DNPL still present	
	26'-28'	5		3-3 2-2	5		28'
30'	28'-30'	6		4-3 4-4	7	Grey, moist, medium stiff SILT, trace stone present	30'
35'	30'-32'	7				wet, stiff SILT, TRACE clay	
	32'-34'	8		5-5 7-10	12	Cohesive thicks coils from 31'-35' nice clean Heavy DNPL	
	34'-35'	9		6-8	14	Grouted in Sump 8-16-05 Completed well 8-17-05	35' B.O.B.
40'						35' 4" stainless steel screen = 10' piece, 1 25' piece 17' 4" B.I.P. T&C 3' 4" B.I.P. Sump Sump 35'-32' Screen 32'-19.5' Riser 19.5'-0' Below grade 8" Flush 24" Steel Tube Pad Sandpack 32'-17.5' = 14 bags #0 Seal 17.5'-15.5' = 1 bag Hole Plug Grout 15.5'-1.0 Below Grade Backfill 1.0' - grade	

Date Start/Finish: 8/18/05 - 8/19/05 **Drilling Company:** Parratt-Wolff **Driller's Name:** Layne Pech **Drilling Method:** Hollow Stem Augers **Bit Size:** 10" **Auger Size:** 6.25" **Rig Type:** Mobile B-57 **Sampling Method:** 2' x 2" Split Spoon	**Northing:** 821805.64 **Easting:** 644324.77 **Casing Elevation:** 5.59 **Borehole Depth:** 27' below grade **Surface Elevation:** NA **Geologist:** Jennifer Sandorf	**Boring ID:** RW-1 **Client:** Niagara Mohawk, A National Grid Company **Location:** Hudson (Water Street) Site Hudson, NY

DEPTH ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 Inches	N - Value	Geologic Column	Stratigraphic Description	Boring Construction
0 0								Well will be converted to flushmount after final grading activities.
	1	0-4	1.0	NA	NA		Note: The following soil data and descriptions were obtained while drilling test boring TB-112, located 5 feet E of NMW-1. Brown fine to medium SAND, trace medium Gravel, trace Roots, moderately loose, dry to moist.	4-in ID Sch. 40 PVC riser -2.0' ags - 10.0' bgs.
5 -5	2	4-8	0.8	NA	NA		Trace coarse Gravel, moist to wet below 4.0' bgs.	Portland Type I cement grout 0.0' - 6.0' bgs.
								Hydrated bentonite chip seal 6.0' - 8.0' bgs.
10 -10	3	8-12	1.4	NA	NA		Grading to some fine to coarse Gravel with depth, moderately loose to medium dense, wet below 8.0' bgs.	Morie #1 Silica sandpack 8.0' - 25.0' bgs.
							Trace Silt below 12' bgs.	
	4	12-16	1.1	NA	NA		Brown to dark brown SILT, little dark gray coloration, little fine Sand, slight petroleum odor, non-plastic, soft, wet.	4-in ID Sch. 40 PVC 0.020" slotted screen 10.0' - 25.0' bgs.
15 -15								

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Remarks: bgs = below ground surface; NA = Not Available/Not Applicable.
Well located in AOC #5.
Note that the drilling cuttings exhibited no evidence of the presence of NAPL during drilling at this location.
Soil data and descriptions from nearby soil boring TB-112, located 5 feet to the east.
Well installed before final surface grade was established. Well construction and depth measurements will not match final grade.

Client:
Niagara Mohawk,
A National Grid Company

Site Location:
Hudson (Water Street) Site
Hudson, NY

Boring ID: RW-1

Borehole Depth: 27' below grade

DEPTH ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 Inches	N - Value	Geologic Column	Stratigraphic Description	Boring Construction
							Brown fine SAND, little Silt, little medium to coarse Sand, trace iridescent sheen, moderately loose to medium dense, wet.	
							Dark gray ROCK fragments, little Silt, slight petroleum-like odor, no sheen observed.	
	5	16-20	0.5	NA	NA			4-in ID Sch. 40 PVC 0.020" slotted screen 10.0' - 25.0' bgs.
20-20							Brown fine to coarse SAND, some fine to coarse Gravel, little Silt, trace red Brick fragments, little rainbow sheen, trace (pinhead-size) blebs of dark brown/black, thin, oily NAPL. [Note: Due to low recovery, it is unclear if NAPL is present throughout entire interval]	Morie #1 Silica sandpack 8.0' - 25.0' bgs.
	6	20-24	2.5	NA	NA			
							Trace rainbow sheen, no NAPL present below 24' bgs.	
25-25							Brown SILT, trace Clay, trace black Coal fragments, Shell fragments, Ceramic fragments, faint petroleum-like odor, slightly plastic, soft.	4-in ID Sch. 40 PVC sump 25.0' - 27.0' bgs.
	7	24-28	2.5	NA	NA			Cement/bentonite grout 25.0' - 27.0' bgs.
30-30								
35-35								

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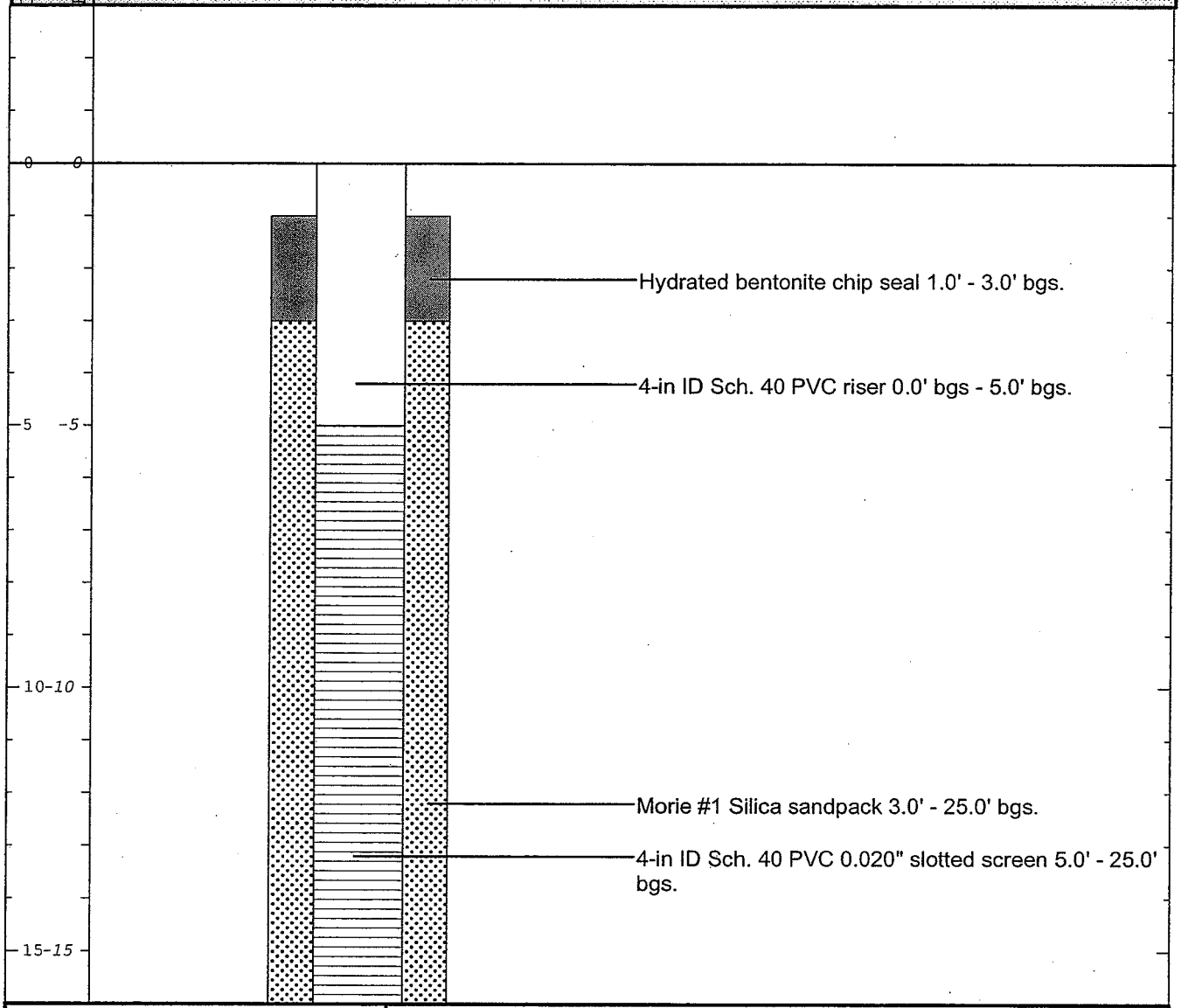
Remarks: bgs = below ground surface; NA = Not Available/Not Applicable.
Well located in AOC #5.
Note that the drilling cuttings exhibited no evidence of the presence of NAPL during drilling at this location.
Soil data and descriptions from nearby soil boring TB-112, located 5 feet to the east.
Well installed before final surface grade was established. Well construction and depth measurements will not match final grade.

Date Start/Finish: 8/19/05 - 8/22/05 **Drilling Company:** Parratt-Wolff **Driller's Name:** Layne Pech/Lee Penrod **Drilling Method:** Hollow Stem Augers **Bit Size:** 10" **Auger Size:** 6.25" **Rig Type:** Mobile B-57 **Sampling Method:** NA	**Northing:** 821728.67 **Easting:** 644260.50 **Casing Elevation:** 5.41 **Borehole Depth:** 27' below grade **Surface Elevation:** NA **Geologist:** Jennifer Sandorf	**Well ID:** RW-2 **Client:** Niagara Mohawk, A National Grid Company **Location:** Hudson (Water Street) Site Hudson, NY

Well Construction Details



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Remarks: bgs = below ground surface; NA = Not Available/Not Applicable:

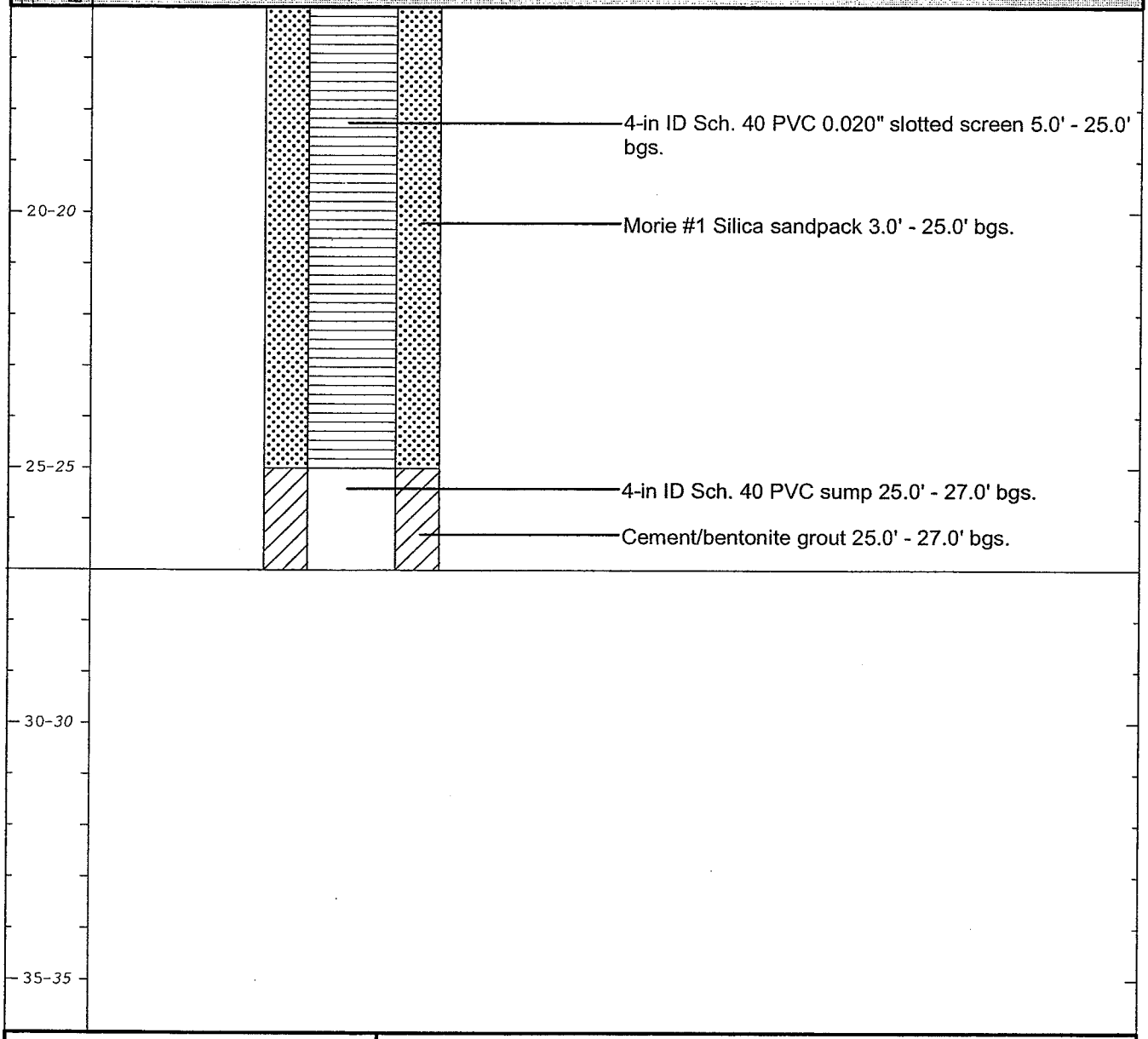
Client: Niagara Mohawk, A National Grid Company

Site Location: Hudson (Water Street) Site Hudson, NY

Well ID: RW-2

Borehole Depth: 27' below grade

Well Construction Details



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Remarks: bgs = below ground surface; NA = Not Available/Not Applicable.

parratt wolff inc

TEST BORING LOG

5879 FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT MGP site

LOCATION Hudson, New York

DATE STARTED 8-15-05

DATE COMPLETED 8-17-05

HOLE NO. CW01-R

SURF. EL.

JOB NO. 05192A

GROUND WATER DEPTH WHILE DRILLING 24' & 30'

BEFORE CASING REMOVED 30'

AFTER CASING REMOVED Installed 4" SS well

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ 140 # HAMMER FALLING "/OR — % CORE RECOVERY

Lee Lennon

CASING TYPE 6¼ H.S.A. 4"x3' B.I.P. sump
2" spoons 4" B.I.P. Risers
4" SS Screen

SHEET 1 OF 1

DFL

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
5'						6¼ H.S.A. no sampling	
10'							
15'							
20'	18'-20'	1		3-1 3-6	4	Backfill & gravel mix	18'
	20'-22'	2		2-4 2-3	6		21'
25'	22'-24'	3		3-4 4-5	8	Grey moist, medium stiff, SILT / DNPL present	24'
	24'-26'	4		3-2 1-1	3	Grey, moist to wet soft SILT & some clay DNPL still present	
	26'-28'	5		3-3 2-2	5		28'
30'	28'-30'	6		4-3 [illegible]	7	Grey, moist, medium stiff SILT, TRACE [illegible] still present	30'
8-17-05 →	30'-32'	7		[illegible]		[illegible], stiff SILT, TRACE clay	
	33'-35'	8		5-5 7-10	12	Effort thinly soils from 31'-35' Rec. clean from DNPL	
35'	34'-35'	9		[illegible]	14	Grouted in Sump 8-16-05 Completed well 8-17-05	35' B.O.B.
→ 40'						17.5' 4" Stainless Steel Screen = 1 10' piece, 1 2.5' piece 18' 4" B.I.P. T&C Sandpack 32'-17.5' = 14 bags #0 3' 4" B.I.P. sump Seal 17.5'-15.5' = 1 bag Aquagel Sump 35'-32' Grout 15.5'-1.0 Below Grade Screen 32'-19.5' Backfill 1.0'-grade 8" FMC	

WOITTinc **TEST BORING LOG** EAST SYRACUSE, N.Y. 13057

PROJECT mgp site — HOLE NO. CW01-R

LOCATION Hudson, New York — SURF. EL.

DATE STARTED 8-15-05 — DATE COMPLETED 8-17-05 — JOB NO. 05192A

GROUND WATER DEPTH WHILE DRILLING 24' & 30'

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

BEFORE CASING REMOVED 30'

C — NO. OF BLOWS TO DRIVE CASING 12" W/ 140 # HAMMER FALLING "/OR — % CORE RECOVERY

AFTER CASING REMOVED Installed 4" ss well

Lee Lemon

CASING TYPE 6¼ H.S.A. — 2" spoons — 4" ss Screen — 4" x 3' B.I.P. Sump — 4" B.I.P. Risers

SHEET 1 OF 1

DFL

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
5'						6¼ H.S.A. no sampling	
10'							
15'							
20'	18'-20'	1		3-1	4	Backfill & gravel mix	18'
				3-6			
	20'-22'	2		2-4	6		21'
				2-3		Grey moist, medium stiff, SILT / DNPL present	
	22'-24'	3		3-4	8		24'
25'				4-5			
	24'-26'	4		3-2	3	Grey, moist to wet soft SILT & some clay DNPL still present	
				1-1			
	26'-28'	5		3-3	5		28'
				2-2			
30'	28'-30'	6		4-3	7	Grey moist, medium stiff SILT, trace [illegible] still present	30'
5-05 →							
	30'-32'	7		[illegible]		wet, stiff SILT, trace clay	
	32'-34'	8		5-5	12	Grout thicks coils from 31'-35' Nice clean	
				7-10			
35'	34'-35'	9		6-8	14	Grouted in sump 8-16-05 Completed well 8-17-05	35'
-16-05 →							B.O.B.
						15.5' 4" Stainless steel screen = 10' piece, 1 5.5' piece 10' 4" B.I.P. T&C 3' 4" B.I.P. sump Sump 35'-32' Screen 32'-19.5' Riser 19.5'-15.5' Below grade: 8" Flush	Sand pack 32'-17.5' = 14 bags #0 Seal 17.5'-15.5' = 1 bag Hole-Plug Grout 15.5'-1.0 Below Grade Backside 1.0' - grade 24" Steel Flush Mount Pad
40'							

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Appendix E

Monitoring Well Development

Appendix E

Monitoring Well Development

I. Scope and Application

Monitoring wells (or piezometers, well points, or micro-wells) will be developed to clear them of fine-grained sediment and any drilling fluids that may have been used during well installation, and enhance the hydraulic connection between the well and the surrounding geologic formation. Development will be accomplished by evacuating well water by either pumping or bailing. Prior to pumping or bailing, the screened interval will be gently surged using a surge block, bailer, or inertial pump with surge-block fitting. In addition, sediment accumulated in the bottom of the well will be removed by bailing with a bottom-loading bailer or inertial pump.

Pumping methods will be selected based on site-specific geologic conditions, anticipated well yield, water table depth, and groundwater monitoring objectives, and may include one or more of the following:

a. submersible pump
b. inertial pump (e.g. Waterra™ pump)
c. bladder pump
d. peristaltic pump

When developing a well using the pumping method, the pump (or with inertial pumps, the tubing) is lowered to the screened portion of the well. During purging, the pump or tubing will be moved up and down the screened interval until the well yields relatively clear water.

Submersible pumps have a motor-driven impeller that pushes the water discharge tubing to the ground surface. Inertial pumps have a check valve at the bottom of stiff tubing which, when operated up and down, lifts water to the ground surface. Bladder pumps have a bottom check valve and a flexible internal bladder that fills from below and is then compressed using pressurized air to force water out the top of the bladder through the discharge tubing to the ground surface. These three types of pumps have a wide range of applicability in terms of well depth and water depth. Centrifugal and peristaltic pumps use atmospheric pressure to lift water from the well, and therefore can only be practically used where the depth to water is less than 25 feet.

II. Personnel Qualifications

Monitoring well development activities will be performed by BBL field personnel who have been trained in proper well development procedures under the guidance of an experienced field geologist, engineer, or technician.

III. Equipment List

Materials for monitoring well development include:

- health and safety equipment, as required by the site Health and Safety Plan (HASP);
- cleaning equipment;

- photoionization detector (PID) to measure headspace vapors;
- pump;
- polyethylene pump discharge tubing;
- plastic sheeting;
- power source (generator or battery);
- stopwatch;
- field notebook;
- graduated pails;
- appropriate containers; and
- keys to wells.

Materials for monitoring well development include:

- personal protective equipment (PPE) as required by the HASP;
- cleaning equipment;
- PID to measure headspace vapors;
- bottom-loading bailer, sand bailer;
- polypropylene or nylon rope;
- plastic sheeting;
- field notebook;
- graduated pails;
- appropriate containers; and
- keys to wells.

IV. Cautions

Where surging is performed to assist in removing fine-grained material from the sand pack, surging must be performed in a gentle manner. Excessive suction could promote the entry of fine-grained sediment into the outside of the sand pack from the formation.

V. Health and Safety Considerations

Field activities associated with monitoring well development will be performed in accordance with a site-specific HASP, a copy of which will be present on site during such activities.

VI. Procedures

1. The procedures for monitoring well development are described below. (Note: Steps 6, 7, and 9 can be performed concurrently using an inertial pump with a surge-block fitting.)

2. Don appropriate PPE, as required by the HASP.

3. Place plastic sheeting around the well.

4. Clean all equipment entering each monitoring well, except for new, disposable materials that have not been previously used.

5. Unlock and open the well cover while standing upwind of the well. Remove well cap. Check breathing zone air with the PID. If the PID reading in the breathing zone meets the limits specified in the HASP, proceed. If the PID reading is above the specified limits, move upwind from the well

for 5 minutes to allow the volatiles to dissipate. Repeat the breathing zone test. If the reading is still above 5 PID units, don appropriate respiratory protection in accordance with the requirements of the HASP. Record all PID readings.

6. Obtain an initial measurement of the depth to water and the total well depth from the reference point at the top of the well casing.

7. Lower a surge block or bailer into the screened portion of the well. Gently raise and lower the surge block or bailer within the screened interval of the well to force water in and out of the screen. Continue surging for 15 to 30 minutes. Note that this step is optional but recommended for all new wells/piezometers, particularly in formations with a relatively high content of fine-grained material.

8. Lower a bottom-loading bailer to the bottom of the well and gently bounce the bailer on the bottom of the well to collect accumulated sediment, if any. Remove and empty the bailer. Repeat until the bailed water is free of excessive sediment and the bottom of the well feels solid. Alternatively, an inertial pump can be used to remove sediment.

9. After surging the well and removing excess accumulated sediment from the bottom of the well, re-measure the depth to water and the total well depth from the reference point at the top of the well casing.

10. Remove formation water by pumping or bailing. Where pumping is used, measure and record the pre-pumping water level. Operate the pump at a relatively constant rate. Measure the pumping rate using a calibrated container and stopwatch. Measure and record the water level in the well at least once every 5 minutes during pumping. Note any relevant observations in terms of water color, visual level of turbidity, sheen, odors, etc. Pump or bail for 30 to 60 minutes or until termination criteria specified in the Work Plan or Field Sampling Plan (FSP) are reached. Record the total volume of water purged from the well.

11. If the well goes dry, stop pumping or bailing and allow well to recover. Resume pumping or bailing when sufficient water has recharged the well.

12. Contain all water in appropriate containers.

13. When complete, secure the lid back on the well.

14. Place disposable materials in plastic bags for appropriate disposal and decontaminate reusable, down-hole pump components and/or bailer.

VII. Waste Management

Materials generated during monitoring well installation and development will be placed in appropriate containers that are properly labeled, and staged as directed by National Grid. Wastes will be disposed of by National Grid.

VIII. Data Recording and Management

Well development activities will be documented in a field notebook. Pertinent information will include personnel present on site; times of arrival and departure; significant weather conditions; timing of well

development activities; development method(s); observations of purge water color, turbidity, odor, sheen, etc.; purge rate; and water levels before and during pumping.

IX. Quality Assurance

All reused, non-disposable, down-hole well development equipment will be cleaned in accordance with the procedures outlined below.

All submersible pumps will be decontaminated and flushed between wells. The decontamination process will consist of:

- Removing any visible sheens or NAPL with an appropriate solvent (e.g., Citra-Solve);
- Washing the pump exterior using a solution of non-phosphate detergent and potable water;
- Washing the interior of the pump by submerging it in detergent solution and running the pump for at least one minute (care should be taken to avoid spraying solution out of the vessel in which the pump is submerged);
- Rinsing detergent solution from the pump by submerging the pump in potable water and running it for at least one minute;
- Place the pump on clean polyethylene sheeting, or wrap it in aluminum foil to avoid recontaminating the pump.

Caution should be exerted to avoid contact with the pump casing and water in the container while the pump is running (do not use metal drums or garbage cans) to avoid electric shock. Contain fluids generated during decontamination as described in Section VII above.

X. References

Not Applicable.

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Appendix F

Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells

Appendix F

Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells

I. Scope and Application

Groundwater samples will be collected from monitoring wells to evaluate groundwater quality. The protocol presented in this appendix describes the procedures used to purge monitoring wells and collect groundwater samples. This protocol has been developed in accordance with the United States Environmental Protection Agency (USEPA) Region I Low Stress (Low Flow) Purging and Sampling Procedures for the Collection of Groundwater Samples from Monitoring Wells (USEPA SOP No. GW0001; July 30, 1996). Both filtered and unfiltered groundwater samples may be collected using this low-flow sampling method. Filtered samples will be obtained using a 0.45-micron disposable filter. No wells will be sampled until the well has been inspected for integrity and usability, and redeveloped if necessary, in accordance with the procedures presented in Appendix E - Monitoring Well Development.

II. Personnel Qualifications

BBL personnel directing, supervising, or leading groundwater sampling activities should have a minimum of 2 years previous groundwater sampling experience. BBL personnel providing assistance to groundwater sample collection and associated activities should have a minimum of 6 months of related experience or an advanced degree in environmental sciences, engineering, hydrogeology, or geology. The supervisor of the groundwater sampling team will have at least 1 year previous supervised groundwater sampling experience.

III. Equipment List

Specific to this activity, the following materials (or equivalent) will be available:

- Site Plan, well construction records, prior groundwater sampling records (if available).
- Sampling pump, which may consist of one or more of the following:
  - submersible pump (e.g., Grundfos® Redi-Flo 2);
  - peristaltic pump (e.g., ISCO Model 150); and/or
  - bladder pump (e.g., Marschalk System 1).
- Polyethylene tubing of an appropriate size for the pump being used. For peristaltic pumps, dedicated Tygon® tubing (or other type as specified by the manufacturer) will also be used through the pump apparatus.
- Water-level probe (e.g., Solinst Model 101).
- Water-quality (temperature/pH/specific conductivity/ORP/turbidity/dissolved oxygen) meter and flow-through measurement cell such as:
  - YSI 6-Series Multi-Parameter Instrument;
  - Hydrolab Series 3 or Series 4a Multiprobe and Display; and/or

- Horiba U-10 or U-22 Water Quality Monitoring System.

- Supplemental turbidity meter (e.g., Horiba U-10 or Hach 2100P), if needed. Turbidity measurements collected with multi-parameter meters have been shown to sometimes be unreliable due to fouling of the optic lens of the turbidity meter within the flow-through cell. A supplemental turbidity meter may be used to verify turbidity data during purging if such fouling is suspected. Note that industry improvements may eliminate the need for these supplemental measurements in the future.
- Disposable bailer.
- Appropriate water sample containers (supplied by the laboratory).
- Appropriate blanks (trip blank supplied by the laboratory).
- 0.45-micron disposable filters.
- Pressure filter apparatus (for collecting dissolved samples from a bailer).
- Health and safety equipment, as required in the site Health and Safety Plan (HASP).
- Plastic sheeting.
- Rope or string.
- Large glass mixing container.
- Teflon® stirring rod.
- Cleaning equipment.
- Sample labels.
- Clear packing tape.
- Groundwater sampling log (attached).
- Field notebook.

The maintenance requirements for the above equipment generally involve decontamination or periodic cleaning, battery charging, and proper storage, as specified by the manufacturer. For operational difficulties, the equipment will be serviced by a qualified technician.

IV. Cautions

If heavy precipitation occurs and no cover over the sampling area and monitoring well can be erected, sampling must be discontinued until adequate cover is provided. Rain water could contaminate groundwater samples.

It may be necessary to field filter some parameters (e.g., metals) prior to collection, depending on preservation, analytical method, and project quality objectives.

Store and/or stage empty and full sample containers and coolers out of direct sunlight.

To mitigate potential cross-contamination, groundwater samples are to be collected in a pre-determined order from least impacted to most impacted based on previous analytical data. If no analytical data are available, samples are collected in order of upgradient, to furthest downgradient, and finally to source area locations.

Be careful not to over-tighten lids with Teflon® liners or septa (e.g., 40-milliliter (mL) vials). Over-tightening can impair the integrity of the seal or break the vial, potentially causing injury.

V. Health and Safety Considerations

If thunder or lightning is present, discontinue sampling until 30 minutes have passed after the last occurrence of thunder or lightning.

VI. Procedures

Groundwater will be purged from the wells using an appropriate pump. Peristaltic pumps will initially be used to purge and sample all wells, if appropriate. If the depth to water is below the sampling range of a peristaltic pump (approximately 25 feet), submersible pumps or bladder pumps will be used provided the well is constructed with a casing diameter greater than or equal to 2 inches (the minimum well diameter capable of accommodating such pumps). For smaller diameter wells where the depth to water is below the sampling range of a peristaltic pump, alternative sampling methods (i.e., bailing) will be used to purge and sample the groundwater. Purge water will be collected and containerized.

1. Calibrate field instruments according to procedures for calibration.

2. Measure initial depth to groundwater prior to placement of pumps. If a submersible or bladder pump is being used, slowly lower pump, safety cable, tubing, and electrical lines into the well to a depth corresponding to the approximate center of the saturated screen section of the well. If a peristaltic pump is being used, slowly lower the sampling tube into the well to a depth corresponding to the approximate center of the saturated screen section of the well. The pump intake or sampling tube must be kept at least 2 feet above the bottom of the well to prevent mobilization of any sediment present in the bottom of the well.

3. Measure the water level again with the pump in the well before starting the pump. Start pumping the well at 200 to 500 mL per minute. The pump rate should be adjusted to cause little or no water level drawdown in the well (less than 0.3 foot below the initial static depth to water measurement) and the water level should stabilize. The water level should be monitored every 3 to 5 minutes (or as appropriate) during pumping if the well diameter is of sufficient size to allow such monitoring. Care should be taken not to break pump suction or cause entrainment of air in the sample. Record pumping rate adjustments and depths to water. If necessary, pumping rates should be reduced to the minimum capabilities of the pump to avoid pumping the well dry and/or to stabilize indicator parameters. A steady flow rate should be maintained to the extent practicable. Groundwater sampling records from previous sampling events (if available) should be examined to estimate the optimum pumping rate and anticipated drawdown for the well in order to more efficiently reach a stabilized pumping condition.

If the recharge rate of the well is very low, alternative purging techniques should be used, which will vary based on the well construction and screen position. For wells screened across the water table, the well should be pumped dry and sampling should commence as soon as the volume in the well has recovered sufficiently to permit collection of samples. For wells screened entirely below the water table, the well should be pumped until a stabilized level (which may be below the maximum displacement goal of 0.3 foot) can be maintained and monitoring for stabilization of field indicator parameters can commence.

4. During purging, monitor the field indicator parameters (e.g., turbidity, temperature, specific conductance, pH) every 3 to 5 minutes (or as appropriate). Field indicator parameters will be measured using a flow-through analytical cell or a clean container such as a glass beaker. Record field indicator parameters on the groundwater sampling log (attached). The well is considered stabilized and ready for sample collection when turbidity values remain within 10% (or within 1 NTU if the turbidity reading is less than 10 NTU), the specific conductance and temperature values remain within 3%, and pH remains within 0.1 units for three consecutive readings collected at 3- to 5-minute intervals. If the field indicator parameters do not stabilize within 1 hour of the start of purging, but the groundwater turbidity is below the goal of 50 NTU and the values for all other parameters are within 10%, the well can be sampled. If the parameters have stabilized but the turbidity is not in the range of the 50 NTU goal, the pump flow rate should be decreased to a minimum rate of 100 mL/min to reduce turbidity levels as low as possible. During extreme weather conditions, stabilization of field indicator parameters may be difficult to obtain. Modifications to the sampling procedures to alleviate these conditions (e.g., measuring the water temperature in the well adjacent to the pump intake) will be documented in the field notes. If other field conditions exist that preclude stabilization of certain parameters, an explanation of why the parameters did not stabilize will also be documented in the field notebook.

5. Complete the sample label and cover the label with clear packing tape to secure the label onto the container.

6. After the indicator parameters have stabilized, collect groundwater samples by diverting flow out of the unfiltered discharge tubing into the appropriate labeled sample container. If a flow-through analytical cell is being used to measure field parameters, the flow-through cell should be disconnected after stabilization of the field indicator parameters and prior to groundwater sample collection. Under no circumstances should analytical samples be collected from the discharge of the flow-through cell. Samples should be collected in the following order: VOCs, TOC, SVOCs, metals and cyanide, and others, unless a peristaltic pump is being used.

   If a peristaltic pump is being used to collect groundwater samples, samples will be collected from the pump beginning with SVOCs. After the SVOCs and remaining inorganics have been collected, the pump will be stopped, disconnected, and tubing removed from the well. A clean disposable bailer will then be slowly lowered to the pump intake depth. Upon retrieval, samples will be collected from the bailer for VOCs and TOC.

7. If sampling for total and filtered metals and/or PCBs, a filtered and unfiltered sample will be collected. Install an in-line, disposable 0.45-micron particle filter on the discharge tubing after the appropriate unfiltered groundwater sample has been collected. Continue to run the pump until an initial volume of "flush" water has been run through the filter in accordance with the manufacturer's directions (generally 100 to 300 mL). Collect filtered groundwater sample by diverting flow out of the filter into the appropriately labeled sample container. When the container is full, tightly screw on the cap.

8. Secure with packing material and store at 4°C in an insulated transport container provided by the laboratory.

9. Record on the groundwater sampling log or bound field notebook the time sampling procedures were completed, any pertinent observations of the sample (e.g., physical appearance and the presence or lack of odors or sheens), and the values of the stabilized field indicator parameters as measured during the final reading during purging.

10. Remove pump and tubing from well, secure well, and properly dispose of personal protective equipment (PPE) and disposable equipment.

11. If tubing is to be dedicated to a well, it should be folded to a length that will allow the well to be capped and also facilitate retrieval of the tubing during later sampling events. A length of rope or string should be used to tie the tubing to the well cap.

12. Complete the procedures for packaging, shipping, and handling with associated chain-of-custody.

13. Complete cleaning procedures for flow-through analytical cell and submersible pump, as appropriate.

14. At the end of the day, perform calibration check of field instruments.

If it is not technically feasible to use the low-flow sampling method, purging and sampling of monitoring wells may be conducted using the bailer method as outlined below:

1. Don appropriate PPE (as required by the HASP).

2. Place plastic sheeting around the well.

3. Clean sampling equipment.

4. Open the well cover while standing upwind of the well. Remove well cap and place on plastic sheeting. Insert PID probe approximately 4 to 6 inches into the casing or the well headspace and cover with gloved hand. Record the PID reading in the field notebook. If the well headspace reading is less than 5 PID units, proceed; if the headspace reading is greater than 5 PID units, screen the air within the breathing zone. If the breathing zone reading is less than 5 PID units, proceed. If the PID reading in the breathing zone is above 5 PID units, move upwind from well for 5 minutes to allow the volatiles to dissipate. Repeat the breathing zone test. If the reading is still above 5 PID units, don appropriate respiratory protection in accordance with the requirements of the HASP. Record all PID readings. For wells that are part of the regular weekly monitoring program and prior PID measurements have not resulted in a breathing zone reading above 5 PID units, PID measurements will be taken monthly.

5. Measure the depth to water and determine depth of well by examining drilling log data or by direct measurement. Calculate the volume of water in the well (in gallons) using the length of the water column (in feet), multiplying by 0.163 for a 2-inch well or by 0.653 for a 4-inch well. For other well diameters, use the formula:

   Volume (in gallons) = π TIMES **well radius** (in feet) **squared** TIMES **length of water column** (in feet) TIMES **7.481** (gallons per cubic foot)

6. Measure a length of rope at least 10 feet greater than the total depth of the well. Secure one end of the rope to the well casing and secure the other end to the bailer. Test the knots and make sure the rope will not loosen. Check bailers so that all parts are intact and will not be lost in the well.

7. Lower bailer into well and remove one well volume of water. Contain all water in appropriate containers.

8. Monitor the field indicator parameters (e.g., turbidity, temperature, specific conductance, pH). Measure field indicator parameters using a clean container, such as a glass beaker or sampling cups provided with the instrument. Record field indicator parameters on the groundwater sampling log.

9. Repeat Steps 7 and 8 until three or four well volumes have been removed. Examine the field indicator parameter data to determine if the parameters have stabilized. The well is considered stabilized and ready for sample collection when turbidity values remain within 10% (or within 1 NTU if the turbidity reading is less than 10 NTU), the specific conductance and temperature values remain within 3%, and pH remains within 0.1 units for three consecutive readings collected once per well volume removed.

10. If the field indicator parameters have not stabilized, remove a maximum of five well volumes prior to sample collection.

11. If the recharge rate of the well is very low, wells screened across the water table may be bailed dry and sampling should commence as soon as the volume in the well has recovered sufficiently to permit collection of samples. For wells screened entirely below the water table, the well should only be bailed down to a level slightly higher than the bentonite seal above the well screen. To maintain the integrity of the seal, the well should not be bailed completely dry.. Sampling should commence as soon as the well volume has recovered sufficiently to permit sample collection.

12. Following purging, allow water level in well to recharge to a sufficient level to permit sample collection.

13. Complete the sample label and cover the label with clear packing tape to secure the label onto the container.

14. Slowly lower the bailer into the screened portion of the well and carefully retrieve a filled bailer from the well, causing minimal disturbance to the water or any sediment in the well.

15. The sample collection order (as appropriate) will be as follows:

    a. VOCs
    b TOC;
    c. SVOCs;
    d. metals and cyanide; and
    e. others.

16. When sampling for volatiles, collect water samples directly from the bailer into 40-mL vials with Teflon®-lined septa. For other parameters, transfer the appropriate amount into the laboratory jar(s).

17. If sampling for total and filtered metals and/or PCBs, a filtered and unfiltered sample will be collected. The sample should either be placed directly from the bailer into a pressure filter apparatus or pumped directly from the bailer with a peristaltic pump, through an in-line filter, into the pre-preserved sample bottle. Sample filtration for the filtered sample will be performed in the field using a pressure filter

apparatus or a peristaltic pump prior to preservation. For the peristaltic pump method, install new medical-grade silicone tubing in the pump head. Place new Teflon® tubing into the sample mixing container and attach to the intake side of pump tubing. Attach (clamp) a new 0.45-micron filter (note the filter flow direction). Turn the pump on and dispense the filtered liquid directly into the laboratory sample bottles.

18. Secure with packing material and store at 4°C in an insulated transport container provided by the laboratory.

19. After sample containers have been filled, remove one additional volume of groundwater. Measure the pH, temperature, turbidity, and conductivity. Record on the groundwater sampling log or bound field notebook the time sampling procedures were completed, any pertinent observations of the sample (e.g., physical appearance and the presence or lack of odors or sheens), and the values of the field indicator parameters.

20. Remove bailer from well, secure well, and properly dispose of PPE and disposable equipment.

21. If a bailer is to be dedicated to a well, it should be secured inside the well above the water table, if possible. Dedicated bailers should be tied to the well cap so that inadvertent loss of the bailer will not occur when the well is opened.

22. Complete the procedures for packaging, shipping, and handling with associated chain-of-custody.

VII. Waste Management

Purge water, PPE and decontamination fluids will be contained separately in appropriate containers and staged at an appropriate location specified by National Grid. Containers must be labeled at the time of collection. Labels will include date, location(s), site name, city, state, and description of matrix contained (e.g., soil, groundwater, PPE). Wastes will be disposed of by National Grid.

VIII. Data Recording and Management

Initialed field logs and chain-of-custody records will be transmitted to the BBL PM at the end of each day unless otherwise directed by the PM. The groundwater team leader retains copies of the groundwater sampling logs.

IX. Quality Assurance

In addition to the quality control samples to be collected in accordance with this appendix, the following quality control procedures should be observed in the field:

- Collect samples from monitoring wells in order of increasing concentration, to the extent known.
- Equipment blanks should include the pump and tubing (if using disposable tubing) or the pump only (if using tubing dedicated to each well).
- Collect equipment blanks after wells with higher concentrations (if known) have been sampled.
- Operate all monitoring instrumentation in accordance with manufacturer's instructions and calibration procedures. Calibrate instruments at the beginning of each day and verify the calibration at the end of each day.

- Clean all groundwater sampling equipment prior to use in the first well and after each subsequent well using equipment decontamination procedures as described below.

All submersible pumps will be decontaminated and flushed between wells. The decontamination process will consist of:

- removing any visible sheens or NAPL with an appropriate solvent (e.g. Citra-Solve);
- Washing the pump exterior using a solution of non-phosphate detergent and potable water;
- Washing the interior of the pump by submerging it in detergent solution and running the pump for at least one minute (care should be taken to avoid spraying solution out of the vessel in which the pump is submerged);
- Rinsing detergent solution from the pump by submerging the pump in potable water and running it for at least one minute;
- Place the pump on clean polyethylene sheeting, or wrap it in aluminum foil to avoid recontaminating the pump.

Caution should be exerted to avoid contact with the pump casing and water in the container while the pump is running (do not use metal drums or garbage cans) to avoid electric shock. Contain fluids generated during decontamination as described in Section VII above.

X. References

USEPA. 1986. RCRA Groundwater Monitoring Technical Enforcement Guidance Document (September 1986).

USEPA. 1991. Handbook on Groundwater, Volume II Methodology, Office of Research and Development, Washington, DC. USEPN62S, /6-90/016b (July, 1991).

U.S. Geological Survey (USGS). 1977. National Handbook of Recommended Methods for Water-Data Acquisition: USGS Office of Water Data Coordination. Reston, Virginia.

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Appendix G

Agreement and Declaration of Covenants and Restrictions

AGREEMENT AND DECLARATION of COVENANTS and RESTRICTIONS

THIS AGREEMENT and COVENANT, made the 14th day of April, 2004, by The City of Hudson and Niagara Mohawk Power Corporation, a National Grid Company, involves property located on Water Street in the City of Hudson, Columbia County, New York, as more fully described below. The City of Hudson is a City under the Laws of the State of New York and holds all powers provided by said laws. The Department of Environmental Conservation is an Agency of the State of New York. Niagara Mohawk Power Corporation, A National Grid Company, is a corporation organized and existing under the laws of the State of New York and having an office for the transaction of business at 300 Erie Blvd., West, Syracuse, New York.

WHEREAS, the City of Hudson is the present owner of an inactive hazardous waste disposal site which is listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site Number 4-11-005 located on Water Street in the City of Hudson, Columbia County, State of New York, which is part of lands more particularly described in Appendix "A," attached to this declaration and made a part hereof, and hereinafter referred to as "the Property"; and

WHEREAS, the Property is the subject of an Order on Consent ("Order") entered by the New York State Department of Environmental Conservation with Niagara Mohawk Power Corporation, dated November 7, 2003, because of the historic release of hazardous waste and/or hazardous substances at the Property; and

WHEREAS, the New York State Department of Environmental Conservation set forth a remedy to eliminate or mitigate all significant threats to the environment presented by hazardous waste disposal at the Site in a Record of Decision ("ROD") dated March 2001, and such ROD or the Work Plan for the implementation of the ROD required that the Property be subject to restrictive covenants; and

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WHEREAS, this Agreement and Declaration of Covenants and Restrictions (hereafter "Declaration of Covenant Restrictions") is intended by the parties to prevent any activity that is likely to disrupt or expose hazardous waste or substances, or to increase human exposure to such wastes or substances, or any other conduct that will or may tend to interfere with an ongoing or completed remedial action program implemented at the site; and

WHEREAS, this Agreement and Declaration of Covenants and Restrictions is intended by the parties to apply to, and be binding upon, all owners and subsequent purchasers of the Property so that any such owners and subsequent purchasers shall not interfere with the completed remedial action and shall not substantially change the commercial and/or industrial use of the Property without first notifying the Department of Environmental Conservation, the City of Hudson, and Niagara Mohawk Power Corporation (hereinafter "Respondent") so that such parties may review, comment and, as provided in this document and as otherwise provided by law, enjoin or authorize any proposed change of use on the Property;

NOW, THEREFORE, in mutual consideration of the promises, conditions, covenants and payments recited herein and otherwise made in the Order on Consent dated November 7, 2003, and the Agreement between the City and Niagara Mohawk Power Corporation dated November 26, 2003, the sufficiency of which is acknowledged by the parties hereto, the City of Hudson and any of its agencies, authorities or corporations, for itself and its successors and/or assigns, The New York State Department of Environmental Conservation, and Niagara Mohawk Power Corporation, A National Grid Company, hereby agree and covenant that:

First, the Property subject to this Agreement and Declaration of Covenants and Restrictions (hereinafter "Declaration of Covenants and Restrictions") is as shown on a map attached to this declaration as Appendix "B" and made a part hereof, and as described in Appendix "A".

Second, unless prior written approval by the New York State Department of Environmental Conservation (NYS DEC), New York State Department of Health or, if such Departments shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," and Niagara Mohawk Power Corporation is first obtained, no person shall engage in any activity that will, or that reasonably is anticipated to, prevent or interfere significantly with any proposed, ongoing or completed environmental remediation program at the Property or that will, or is reasonably foreseeable to, expose the public health or the environment to a significantly increased threat of harm or damage associated with environmental contaminant conditions at the Property. No person shall conduct an activity or use of the Property which creates a greater risk of harm to health, safety, the environment, or public welfare, than

the limited activities which are authorized for this Property, to wit: commercial and/or industrial activities and uses, (other than the operation of a commercial child care center, long term care facility or any other housing facility, which is strictly prohibited), which:

1. do not disturb the implementation and maintenance of the approved remedial action plan approved by the NYS DEC; and

2. do not involve or increase the risk of exposure, either by inhalation, ingestion, dermal contact, or any other human exposure pathway, to hazardous wastes or substances remaining in the subsurface of the Property;

Third, the City and any subsequent owner of the Property shall permit Niagara Mohawk Power Corporation to maintain any cap that may be applied to cover the Property. In the event that the City or subsequent owner ("owner") wishes to change the use of the Property, it may, after notifying Respondent Niagara Mohawk Power Corporation and the Relevant governmental agencies, seek to obtain the written approval of the Relevant Agency and Niagara Mohawk Power Corporation. Niagara Mohawk will review the proposal and shall either approve the proposal or provide written reasons why the proposal is not adequately protective of human health and/or the environment and is not consistent with the goals of the remedial actions at the Property. Niagara Mohawk will not unreasonably withhold its approval of a proposal. The owner may also seek authorization to cap the Property with another material, but only after notification and permission is obtained as set forth above. The Property has an existing warehouse which the City, Niagara Mohawk, and the Department expect to remain on the Property for future commercial use. No other structures or development outside of the footprint of the warehouse within the Property boundary shall be permitted without the express written authorization of the Relevant agencies and Niagara Mohawk Power Corporation as described above. Where Niagara Mohawk disapproves of a proposal or request for authorization as discussed above, the parties shall meet to attempt to informally resolve the disagreement. If such initial informal attempts to resolve the dispute are not successful, the parties shall notify the New York State Department of Environmental Conservation and request a meeting with the Division Director of Environmental Remediation, or a representative assigned by the Director, to present the dispute and hear the position of the DEC. The parties may also seek the input of the New York State Department of Health. In the event that the parties, after hearing the position of the DEC, still cannot agree to a resolution of the dispute, the parties may submit and present the matter to arbitration.. In the event that future construction inside or outside the footprint of the warehouse is authorized by the Relevant agencies and Niagara Mohawk Power Corporation and implemented, the owner at the time of said construction shall be fully and solely responsible for the proper excavation, handling, transport and disposal of any soils in the construction area. Nothing in these restrictive covenants is meant to interfere with routine maintenance and minor park enhancement activities conducted on the Property, including minor plantings, pole placements, bench placements, installation of lighting fixtures, and other minor intrusion activities having a minimal impact on the soil at the site, provided the City fully complies with the soil management plan approved by DEC. Within a reasonable time prior to such activities that require excavation into the subsurface of the Property, the City will provide notification to Niagara Mohawk.

Fourth, the City and any subsequent owner of the Property shall prohibit, and take the necessary measures to so prohibit, the Property from ever being used for purposes other than for commercial and/or industrial uses, (other than a commercial child care center, long term care facility or any other housing facility, which are strictly prohibited), without the express written waiver of such use limitation by the Relevant Agency and Niagara Mohawk Power Corporation. Any written waiver from a Relevant Agency shall be sent to Respondent Niagara Mohawk Power Corporation by the owner of the Property obtaining the waiver.

Fifth, the owner of the Property shall not use, and shall prohibit the use of the groundwater underlying the Property for drinking water or other uses without treatment rendering it safe for drinking water or industrial purposes, as appropriate, unless the user first obtains written permission to do so from the Relevant Agency, including but not limited to, the New York State Department of Health.

Sixth, there shall be no agricultural or residential housing use of the Property.

Seventh, any emergency utility maintenance activities on the Property shall be limited to such activity needed to address the emergency. The owner must notify Niagara Mohawk and the Relevant Agencies no later than 3 business days after the emergency utility maintenance activities begin. Prior to any planned utility work being performed on the Property, the site owner must first notify, in writing, Niagara Mohawk Power Corporation and the Relevant Agencies. In the event that utility work is performed on the Property, the site owner shall fully restore any cap or cover, that is a part of the remedial action, to the condition that existed before the utility work. In the event that utility work is performed on the Property, the site owner shall make certain that an appropriate Health and

Safety Plan is implemented by the contractors performing the utility work.

Eighth, in the event that the City sells the Property, it shall give a minimum of thirty days written notice to enter into a contractual agreement with the purchaser that provides for and obligates the owner of the Property to permit Niagara Mohawk Power Corporation to continue in full force and effect any institutional and engineering controls the Department required to be placed and maintained unless the owner first obtains written permission to discontinue such controls from the Relevant Agency and obtains the written consent of Niagara Mohawk Power Corporation to such discontinuance. Nothing herein shall be deemed to preclude the owner from taking over the obligation to implement and maintain the institutional and engineering controls required of Respondent so long as both Niagara Mohawk Power Corporation and the Relevant agencies consent in writing to the transfer of such obligations.

Ninth, this Declaration is and shall be deemed a covenant that shall run with the land and shall be binding upon all future owners of the Property and shall provide that the owner, and its successors and assigns, consents to the enforcement by the Relevant Agency and Niagara Mohawk Power Corporation of the prohibitions and restrictions that Paragraph X of the Order requires to be recorded, and hereby covenants not to contest the authority of the Department or Niagara Mohawk Power Corporation to seek enforcement. Further, it is the intention of the City, the Department and Niagara Mohawk Power Corporation ("party" or "parties") that each of them be permitted to enforce the covenants and restrictions described herein, and that no party will oppose any attempt by the other party to enforce such covenants and restrictions. In the event that a future owner fails to comply with this Declaration, the parties reserve any rights available to enforce the terms of this Covenant. In any such circumstance, the parties shall support the enforcement of the land use limitations established by this Declaration.

Tenth, any deed of conveyance of the Property, or any portion thereof, shall recite, unless the Relevant Agency and Niagara Mohawk Power Corporation have consented to the termination of such covenants and restrictions, that said conveyance is subject to this Declaration of Covenants and Restrictions. The City of Hudson agrees that this Declaration shall be incorporated either in full or by reference into all future deeds, easements, leases, licenses, occupying agreements or any other instrument of transfer.

Eleventh, the parties to this Declaration agree and consent to the right of the Department of Environmental Conservation, and their own rights, to enforce the provisions of this Declaration. It is the intention of the parties that each of them be able to enforce the terms of this Agreement and Declaration at law and at equity, and each owner of the Property shall advise and obtain the acknowledgment of any subsequent purchasers of the Property that the parties to this Agreement and Declaration have the power to enforce the provisions herein, including the right to seek specific performance of the restrictions set forth herein.

IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

CITY OF HUDSON

By: _____

NIAGARA MOHAWK POWER CORPORATION

By: _____

STATE OF NEW YORK)
)SS.:
COUNTY OF Columbia)

On the 25th day of August in the year two thousand four before me, the undersigned, a notary public in and for said state, personally appeared Richard Scalera, Mayor of the CITY OF HUDSON, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

Kevin M. Colwell
Notary Public

KEVIN M. COLWELL
NOTARY PUBLIC, State of New York
No. 02CO6003271
Qualified in Albany County Columbia County
Commission Expires: 3/2/06

STATE OF NEW YORK)
)SS.:
COUNTY OF Onondaga)

On the 1st day of Sept. in the year two thousand four before me, the undersigned, a notary public in and for said state, personally appeared Joseph M. Kwasnik, VP-Environmental of NIAGARA MOHAWK POWER CORPORATION, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

Notary Public

VICKI L. PIAZZA
Notary Public in the State of New York
Qualified in Onondaga County, No. 4846074
My Commission Expires March 30, 2007

APPENDIX "A"

Legal Description of Property Subject to Agreement and Declaration of Covenants and Restrictions

Legal Description of Lot 10

Beginning at a point formed by the intersection of the westerly line of Water Street with the northerly line of River Street (not constructed). Being the southeasterly corner of the lands now owned by the City of Hudson. Proceed along the northerly line of River Street (not constructed).

THENCE North 58 degrees 54 minutes 00 seconds West for a distance of 168.50 feet to a corner of land now or formerly of Lockwood Properties, Inc., as described in deed book 531 page 791. Continue along the lands of Lockwood on the south and this parcel on the north.

THENCE North 58 degrees 54 minutes 00 seconds West for a distance of 36.13 feet. Here continue along the westerly line of the parcel of the City of Hudson.

THENCE North 33 degrees 48 minutes 00 seconds East for a distance of 14.85 feet.

THENCE North 54 degrees 41 minutes 00 seconds West for a distance of 107.00 feet to the southwesterly corner of the lands of the City of Hudson. Being at or under the waters of the Hudson River. Continue along the westerly line of the lands of the City of Hudson.

THENCE North 31 degrees 10 minutes 00 seconds East for a distance of 4.24 feet to a point. Here continue through the lands of the City of Hudson.

THENCE South 54 degrees 55 minutes 25 seconds East for a distance of 59.05 feet to a point on a concrete wall with a chain link fence. Continue along the concrete wall and chain link fence.

THENCE South 54 degrees 55 minutes 25 seconds East for a distance of 31.14 feet.

THENCE South 56 degrees 36 minutes 00 Seconds East for a distance of 36.17 feet.

THENCE South 55 degrees 30 minutes 20 seconds East for a distance of 42.33 feet.

THENCE South 55 degrees 33 minutes 45 seconds East for a distance of 43.66 feet.

THENCE South 55 degrees 54 minutes 20 seconds East for a distance of 46.40 feet.

THENCE South 55 degrees 49 minutes 50 seconds East for a distance of 50.72 feet to the westerly line of Water Street. Continue along the westerly line of Water Street.

THENCE South 20 degrees 30 minutes 25 seconds West for a distance of 9.21 feet to the point or place of beginning. All as shown on a map entitled "EASEMENT GRANT MAP FOR: THE CITY OF HUDSON" prepared by Robert J. Ihlenburg and last revised March 24, 2004.

Together with and subject to covenants, easements, and restrictions of record.

Said property contains 0.079 acres more or less.

Being the same premises conveyed by Robert C. Hunter, as referee, and Hudson Petroleum Incorporated, by referee, to the City of Hudson by deed dated November 26,1997 and recorded December 11, 1997 in the Columbia County Clerk's Office in Liber 303 of Deeds at Page 1782.

Legal Description of Lot 15

ALL that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the City of Hudson, County of Columbia, State of New York, being bounded and described as follows:

Beginning at the southeasterly corner of Broad Street and Water Street, and running thence northeasterly along the southerly side of Water Street 239.7 feet, more or less, to the division line between the lands of the New York Power and Light Corporation and lands formerly of Charles McArthur; thence southeasterly along said division line 127.9 feet, more or less, to a point in the northerly line of Franklin Street; thence southwesterly along the northerly line of Franklin Street 184.4 feet, more or less, to the division line between said lands of the said New York Power and Light Corporation and lands now supposed to be owned by the Boston and Albany Railroad; thence northwesterly along said division line to an angle point in said division line; thence southwesterly along said division line 90 feet, more or less, to the easterly line of Broad Street 43 feet, more or less, to the point or place of beginning. Containing 0.56 of an acre, be the same more or less.

Being the same premises conveyed by South Bay Capital Limited to the City of Hudson by deed dated December 8, 2003 and recorded December 15, 2003 in the Columbia County Clerk's Office in Liber 481 of Deeds at Page 1288.

Also including the premises conveyed by Francis P. Shader to the City of Hudson by deed dated December 1, 2003 and recorded December 15, 2003 in the Columbia County Clerk's Office in Liber 481 of Deeds at Page 1292.

Legal Description of Former Lockwood Property (Lot 16.2)

ALL THAT PARCEL of land situate in the First Ward, City of Hudson and State of New York, bounded and described as follows:

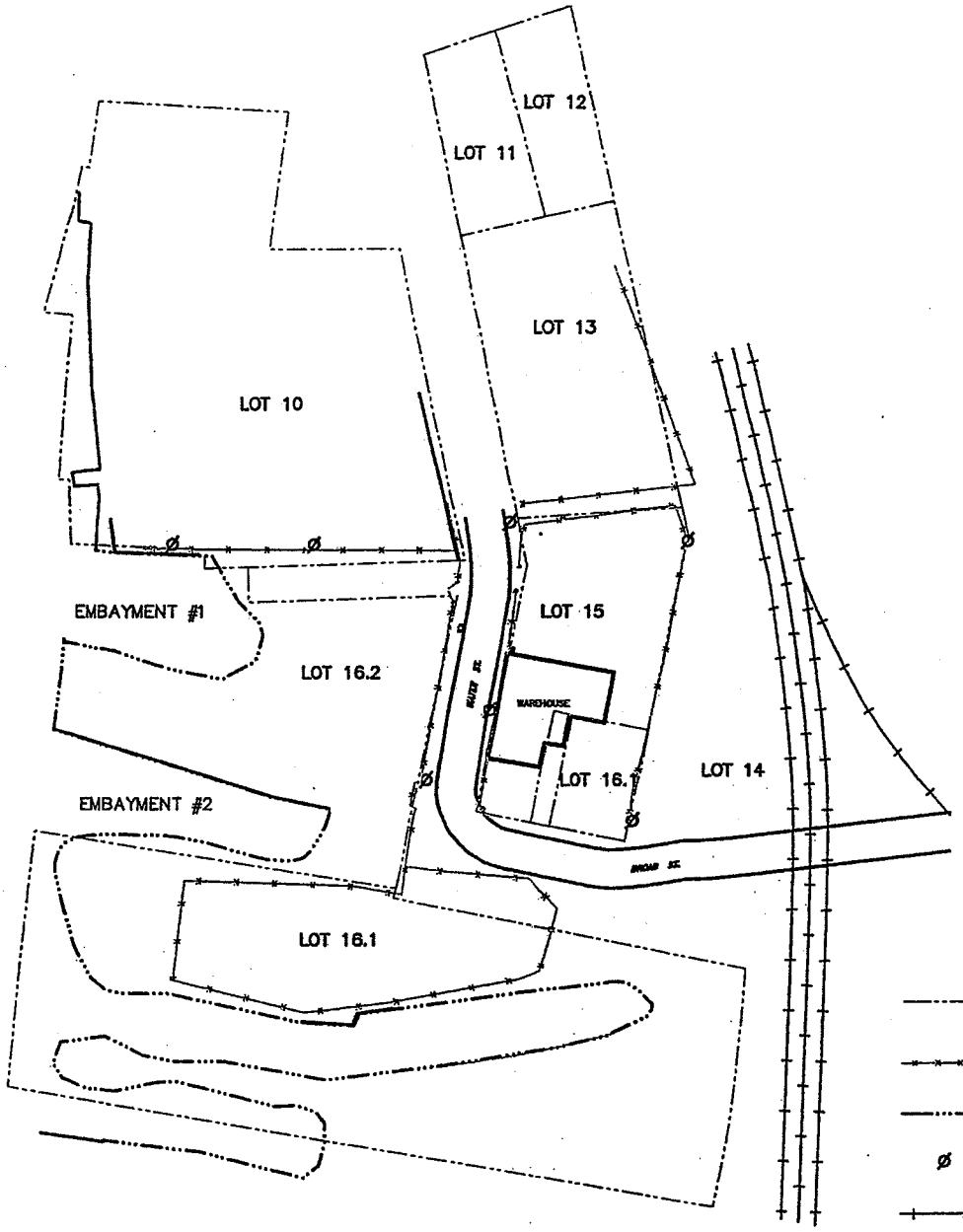
BEGINNING at an iron rod set at the point of intersection of the southerly line of River Street with the westerly line of Water Street; thence along said westerly line of Water Street South 44 degrees 11 minutes 50 seconds West, 245.00 feet to an iron rod; thence North 48 degrees 00 minutes 12 seconds West, 250.19 feet to an iron rod; thence North 48 degrees 00 minutes 12 seconds West, 39.81 feet; thence generally along the easterly shore of the Hudson River North 36 degrees 10 minutes 10 seconds East, 204.61 feet; thence South 58 degrees 54 minutes East, 122.23 feet to an iron rod; thence along lands of Canada Oil Company South 58 degrees 54 minutes East, 36.13 feet to an iron rod; thence South 31 degrees 06 minutes West, 26.0 feet to an iron rod in the southerly line of River Street; thence along the southerly line of River Street South 58 degrees 54 minutes East, 163.85 feet to the point of beginning.

CONTAINING 68,459 square feet or 1.572 acres of land, more or less.

Being the same premises conveyed by Lockwood Brothers Inc. to the City of Hudson by deed dated January 14, 2003 and recorded March 28, 2003 in the Columbia County Clerk's Office in Liber 443 of Deeds at Page 0675.

APPENDIX "B'

MAP



LEGEND:

- APPROXIMATE PROPERTY LINE
- CHAIN–LINK FENCE
- EDGE OF WATER
- UTILITY POLE
- RAILROAD TRACKS

NOTES:

1. BASE MAP FROM TOPOGRAPHIC SURVEY BY BOSK ASSOCIATES, DRAWING FILE HUDSONDL.DWG, DATED 3/24/95.

2. THE SOUTHERN PORTION OF THE RIVER SHORELINE IS BASED ON BBL SURVEYS CONDUCTED IN DECEMBER 1995, AUGUST 1996 AND MARCH 1998.

3. ALL LOCATIONS ARE APPROXIMATE.

0 150' 300'

GRAPHIC SCALE

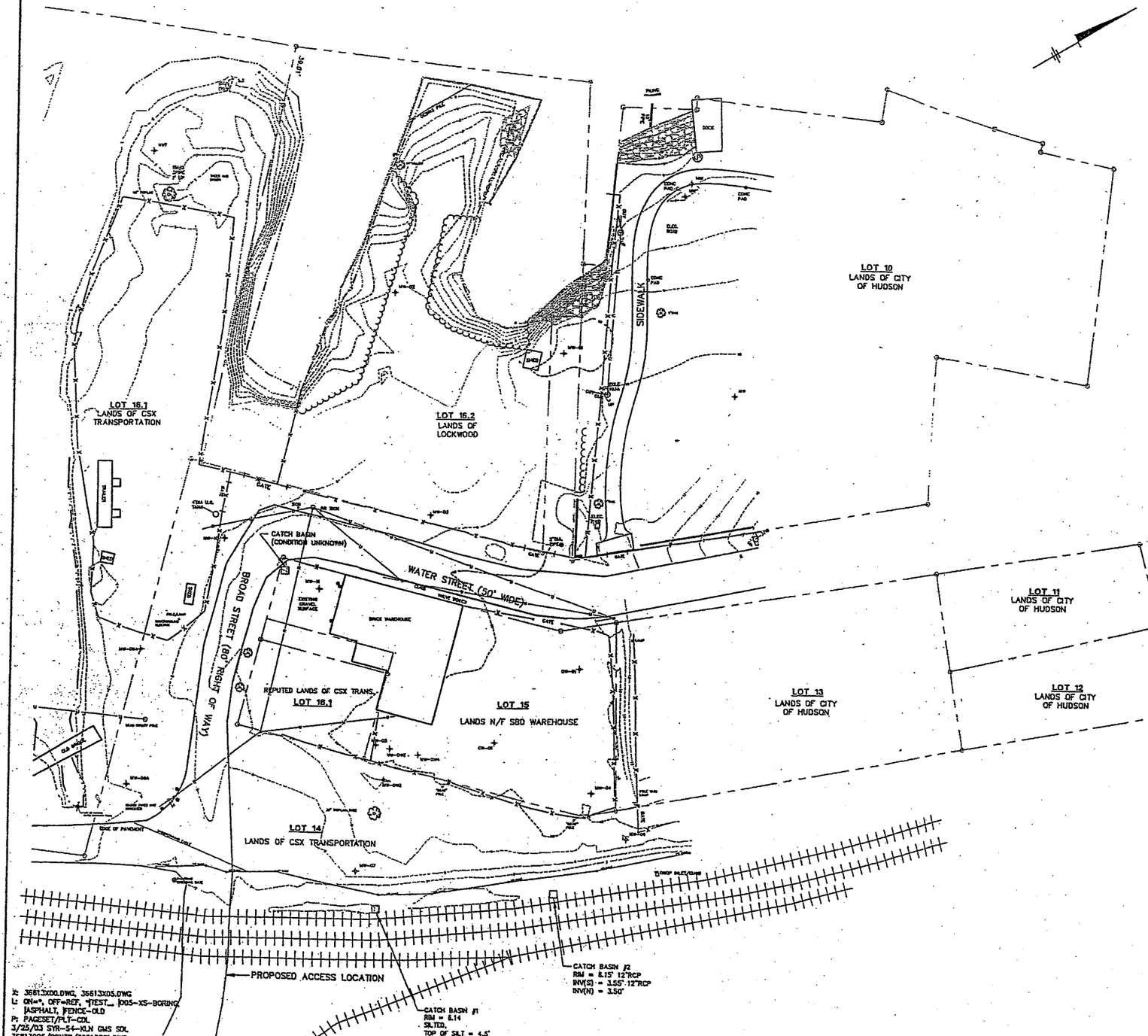
NIAGARA MOHAWK, A NATIONAL GRID COMPANY
HUDSON (WATER STREET) SITE
HUDSON, NEW YORK

SITE PLAN

BBL®
BLASLAND, BOUCK & LEE, INC.

FIGURE
--

L: ON=*, OFF=REF
P: PAGESET/PLT-AP
11/07/03 SYR-54-RCB JER SDL



X: 36813X00.DWG, 36813X05.DWG
L: ON=*; OFF=REF, *TEST_005-XS-BORING, *ASPHALT, *FENCE-OLD
P: PAGESET/PLT-CDL
3/25/03 SYR-54-KLN CMS SDL
36813005/CONT2/36813C01.DWG

LEGEND:

- PROPERTY LINE
- CONTOUR LINE
- APPROXIMATE EDGE OF WATER (VARIES WITH TIDE)
- EXISTING UTILITY LINE
- UNDERGROUND AT&T FIBER-OPTIC CABLE
- EXISTING CHAIN-LINK FENCE
- EXISTING IRON FENCE
- RAILROAD LINE
- RAILROAD TIE RETAINING WALL
- CONCRETE RETAINING WALL
- SEWER MANHOLE
- BOLLARD
- VEGETATION/TREES
- MW-11 + MONITORING/OBSERVATION WELL
- RIPRAP

GENERAL NOTES:

1. BASE MAP INFORMATION WAS COMPILED FROM A COMBINATION OF A PLAN PREPARED BY ROBERT J. IHLENBERG, LAND SURVEYOR ENTITLED "AREA SITE MAP WATER STREET AND BROAD STREET" PERFORMED AUGUST 2001 AND A LIMITED SURVEY PERFORMED BY BLASLAND, BOUCK & LEE IN OCTOBER AND NOVEMBER 2001.
2. PROPERTY LINES SHOWN WERE ESTABLISHED FROM DEEDS OF RECORD AND EXISTING MONUMENTATION.
3. ELEVATIONS SHOWN ARE REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM (NGVD 1988).
4. DIFFERENCES NOTED BY THE CONTRACTOR BETWEEN BASE MAP INFORMATION AND ACTUAL SITE CONDITIONS WHICH MAY AFFECT THE DESIGN CONFIGURATION SHALL BE SUBMITTED TO THE ENGINEER IN WRITING. MODIFICATIONS MAY BE MADE TO THE DESIGN CONFIGURATION DURING PERFORMANCE OF THE SITE WORK AT THE DISCRETION OF NIAGARA MOHAWK.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE PRESENCE AND LOCATION OF ALL ABOVEGROUND AND UNDERGROUND SITE FEATURES (INCLUDING UTILITIES) IN THE VICINITY OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO THE COMMENCEMENT OF WORK. THE LOCATION OF ALL STRUCTURES/UTILITIES SHOWN ARE APPROXIMATE BASED ON SURVEYS AND INFORMATION PROVIDED BY THE CITY OF HUDSON. ADDITIONAL SITE FEATURES MAY BE PRESENT WHICH ARE NOT SHOWN ON THE DRAWINGS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE PRESENCE AND LOCATION OF ALL SUCH FEATURES.
6. THE EXISTING EDGE OF WATER IS THE APPROXIMATE LOW TIDE WATER LINE.
7. THE CONTRACTOR SHALL PLACE AND MAINTAIN EQUIPMENT AND MATERIALS IN A NEAT AND WORKMANLIKE MANNER.
8. THE CONTRACTOR SHALL FURNISH AND PLACE PROPER GUARDS FOR PREVENTION OF ACCIDENTS, PROVIDE ALL TRENCH SHORING, SCAFFOLDING, SHIELDING, DUST/FUME PROTECTION, MECHANICAL/ELECTRICAL PROTECTION, SPECIAL GROUNDING, SAFETY RAILINGS, BARRIERS, OR OTHER SAFETY FEATURES REQUIRED. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SUFFICIENT LIGHT DURING NIGHT HOURS TO SECURE SUCH PROTECTION.
9. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE ANY NECESSARY TRAFFIC CONTROLS AND OBTAIN ANY NECESSARY PERMITS THAT MAY BE REQUIRED TO PERFORM THE WORK.
10. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THIS CONTRACT. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE SAFETY OF, AND SHALL PROVIDE THE NECESSARY PRECAUTION TO PREVENT DAMAGE, INJURY, OR LOSS TO, ALL EMPLOYEES ON THE WORK AND ANY OTHER PERSONS WHO MAY BE AFFECTED THEREBY.
11. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS, AND ORDERS OF PUBLIC BODIES HAVING JURISDICTION FOR THE SAFETY OF PERSONS OR PROPERTY OR TO PROTECT THEM FROM DAMAGE, INJURY, OR LOSS, INCLUDING, WITHOUT LIMITATION, THE DEPARTMENT OF LABOR SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION PROMULGATED UNDER THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 (PL 91-596) AND UNDER SECTION 107 OF THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT (PL 91-54) AND AMENDMENTS THERETO. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS SET FORTH UNDER 29 CFR 1910, 29 CFR 1926, AND THE MINIMUM REQUIREMENTS OF NIAGARA MOHAWK'S HEALTH AND SAFETY PLAN. THE CONTRACTOR SHALL ERECT AND MAINTAIN, AS REQUIRED BY THE CONDITIONS AND THE PROGRESS OF THE WORK, ALL NECESSARY SAFEGUARDS FOR THE SAFETY AND PROTECTION OF PERSONS AND PROPERTY AND SHALL COMPLY WITH ALL APPLICABLE RECOMMENDATIONS OF THE MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION OF THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA INC. THE CONTRACTOR SHALL ALSO COMPLY WITH ALL APPLICABLE U.S. COAST GUARD LAWS, ORDINANCES, RULES, AND REGULATIONS ASSOCIATED WITH WORKING WITHIN/ADJACENT TO A NAVIGABLE WATERWAY.
12. ALL SURFACES DAMAGED OR DESTROYED AS A RESULT OF WORK PERFORMED SHALL BE RESTORED TO THEIR PRECONSTRUCTION CONDITION IN A TIMELY MANNER AND PRIOR TO CONTRACTOR DEMOBILIZATION.
13. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ESTABLISH AND MAINTAIN CONSTRUCTION SURVEY CONTROL DURING THE PERFORMANCE OF WORK.
14. THE ENTIRE SITE IS LOCATED WITHIN THE 100-YEAR FLOODPLAIN.

NOT FOR CONSTRUCTION

Graphic Scale
40' 0 40' 80'

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED BY ANY MEANS. USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.

No.	Date	Revisions	Init

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

Project Mgr. WILLIAM A. RANKIN
Designed by WAR
Drawn by KLN
Checked by FJK
Prof. Eng. F. J. JORSCHENHOFER
PE License N.Y. 058859

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

NIAGARA MOHAWK, A NATIONAL GRID COMPANY
FINAL (100%) REMEDIAL DESIGN FOR OPERABLE UNIT 1
HUDSON (WATER STREET) SITE, HUDSON, NEW YORK

EXISTING SITE CONDITIONS/UTILITIES

GENERAL

File Number 366.13
Date MARCH 2003

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

G-1