REMEDIAL INVESTIGATION WORK PLAN
RENSSELAER NON-OWNED
FORMER MANUFACTURED
GAS PLANT SITE (V00488)
89 WASHINGTON STREET
RENSSELAER, NEW YORK

Prepared for

National Grid, Syracuse, New York

November 2008

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Prepared for
National Grid
300 Erie Boulevard West
Syracuse, New York 13202

November 2008

Project Number: 128531.007

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1. INTRODUCTION

This Remedial Investigation Work Plan (RIWP) describes the scope of work and procedures that will be used to conduct a Remedial Investigation (RI) of the Rensselaer Non-Owned Former Manufactured Gas Plant (MGP) site (hereafter referred to as the "site"). In a letter dated May 5, 2006, the New York State Department of Environmental Conservation (DEC) indicated that, based on its review of the "Site Characterization Data Summary Report, Rensselaer Non-Owned Former MGP Site" (Brown and Caldwell Associates, February 2006), completion of an RI is warranted. In July, 2007 National Grid submitted the original version of this RIWP to the DEC for review ["Remedial Investigation Work Plan, Rensselaer Non-Owned Former Manufactured Gas Plant Site, 89 Washington Street, Rensselaer, New York; July 2007; Brown and Caldwell Associates]. In a letter dated October 1, 2007, the DEC provided comments on the July 2007 RIWP. By letter dated October 22, 2007, Brown and Caldwell Associates (BC) responded on behalf of National Grid to the DEC's comments. On November 20, 2007 National Grid participated in an on-site meeting with representatives of the DEC and DOH. By letter dated November 28, 2007, the DEC responded to BC's October 22, 2007 letter and provided additional requirements for the RIWP. This RIWP was prepared in response to the aforementioned correspondence and meeting.

Investigation activities at this site are being conducted pursuant to the Voluntary Consent Order (VCO) between the DEC and National Grid (Order Index Number D0-0001-0011) dated January 25, 2002. This VCO primarily covers former MGPs that are situated on properties not currently owned by National Grid but where National Grid has assumed responsibility for necessary investigation and remedial activities.

The objectives of the RI are to:

- Confirm the existence and layout of a suspected tar well associated with the former MGP.
- Evaluate the nature and extent of waste constituents associated with the former MGP site.
- Evaluate the surface and subsurface environmental characteristics of the site.
- Identify sources of site-related waste constituents and migration paths for the constituents via site media (e.g., soil, groundwater, etc.).
- Provide data necessary to evaluate remedial action alternatives, if required, that are protective of human health and the environment, taking into account current and anticipated future use of the site.

Section 2.0 provides a description of the site, its history, and a summary of the findings from previous investigations. Section 3.0 describes the scope of work and the methods and materials to be used in performing the RI. Section 4.0 provides the anticipated schedule for completion of the RI. Section 5.0 describes project organization, and Section 6.0 contains the Citizen Participation Plan.

2. BACKGROUND

2.1 Site Location and Description

The site is located on Washington Street in the City of Rensselaer, Rensselaer County, New York (see Figure 2-1). The former MGP was located on land that is currently associated with a single parcel of property. The parcel is identified by the City of Rensselaer Assessors Office as Lot 5-1 on Assessors Office's Map 143.67. According to the City of Rensselaer Assessors Office's records, Lot 143.67-5-1 is owned by the City of Rensselaer, New York and is zoned for commercial use.

The site is abutted to the northwest by Academy Street and residences on the opposite side of this street; to the southwest by remaining portions of Lot 143.67-5-1; to the southeast by Washington Street and the Capital View Office Park; and to the northeast by Huyck Square and undeveloped land surrounding Huyck Stream on the opposite side of Huyck Square. The area surrounding the site to the northeast, southeast and southwest is primarily used for commercial purposes. Residences are located to the northwest of the site.

The majority of the site is paved, as the property is used as a parking lot for employees of nearby State offices. The topography of the site is generally flat with a slight decline from the west to the east, and from the south to the north.

The United States Geological Survey (USGS) 7.5 Minute Series Troy South Quadrangle Topographic Map indicates the area is a part of a relatively flat-lying area, at an elevation of approximately 15 to 20 ft NGVD, along the eastern bank of the Hudson River. The Hudson River is located approximately 800 feet west of the site.

2.2 Site History

The site history below was previously provided in the *"Site Characterization Work Plan for Site Investigations at Rensselaer Non-Owned Former MGP Site"* (EECS, May 2004) and is presented again herein. Brown and Caldwell Associates (BC) researched the holdings of the Rensselaer County Historical Society to identify any additional information pertinent to the history of MGP operations on the site. This additional information is provided in the footnote below.

The site history presented in this section was collected from several sources including Sanborn Maps provided by EDR, "Brown's Directory of American Gas Companies 1887-1907, 1908-1911, and 1917-1918", "Survey of Town Gas and By-Product Production and Locations in the U.S. (1880-1950)" prepared by Radian Corporation in 1985, and the City of Rensselaer Assessors Office. Additional resources that were researched included the City Directory and aerial photograph archives maintained by EDR. No information pertaining to the former MGP was discovered during the research of these additional resources. This historical third party documentation is provided for informational purposes only. National Grid cannot warrant the accuracy of such third party information.

The original MGP was apparently built by the East Albany Gas Light Company (EAGLC) according to the available historical information. Based on the available information, the MGP was built between 1860 and 1887.

The first "Brown's Directory of American Gas Companies", which was published in 1887, indicated the EAGLC manufactured coal gas. According to Brown's Directory, the EAGLC plant was sold to the Kinderhook Light and Power Company of Rensselaer in 1900. The operators of the plant changed from Kinderhook Light and Power Company to the Albany and Hudson Railway & Power Company in 1902 and then to the Albany & Southern Railroad Company in 1909.

The first schematic of the plant found during the research performed by EECS was shown on a 1909 Sanborn Map. This Sanborn Map indicates the plant was situated within the confines of the property boundary shown on Figure 2-2. Figure 2-2 shows the structures associated with the MGP that were indicated on the 1909 Sanborn Map[1].

According to the available records, sometime between 1918 and 1925, gas manufacturing at the site ceased. A 1925 Sanborn map shows the MGP structures being used for storage and as a chemical laboratory by F.C. Huyck & Sons, which operated a cloth, carpet, and felt manufacturing facility on the current Capital View Office Park property. Based on the available Sanborn Maps, the former MGP structures were removed sometime between 1949 and 1967. No buildings are known to have been erected on the site since that time.

During the operation of the MGP, the uses of the surrounding area were not significantly different from the present uses of these areas. The areas to the southwest and northwest were primarily residential with some light commercial properties. The area to the north was undeveloped land surrounding Huyck Stream. The above-mentioned F.C. Huyck & Sons manufacturing facility was situated on the current Capital Office Park property located to the east of the site.

2.3 Summary of Previous Investigations

No known subsurface investigations of the site have been conducted prior to the Site Characterization (SC) performed by BC on behalf of National Grid. The SC field investigation was conducted in June and July of 2005. These activities were performed in accordance with the approved "Site Characterization Work Plan for Site Investigations at Rensselaer Non-Owned Former MGP Site" (EECS, May 2004), hereinafter referred to as the "SC Work Plan". Tables and figures presenting the results and findings of the SC were provided to the DEC in the 'Site Characterization Data Summary Report, Rensselaer Non-Owned Former MGP Site" (Brown and Caldwell Associates, February 2006), hereinafter referred to as the "SC Data Summary Report". The following is a summary of the findings from the SC:

- **Subsurface Deposits & Stratigraphy** - The overburden deposits at the site generally consist of fill material overlying silts and clays of alluvial or lacustrine origin. Poorly sorted sands, silt and fine gravel, which may be glacial outwash or river bed deposits, were observed in most borings under the silts and clays. Dense glacial till was encountered at depths ranging from 10 to 20 feet below ground surface (bgs). Due to the limited amount of data collected for the SC, the lateral continuity of these materials has not yet been evaluated. Based on a limited amount of data, the fill varies in thickness, but is typically 4 to 7 feet thick. However, the northern gas holder contains fill that extends to the depth of spoon refusal (possibly the bottom of the holder) at 10 feet below grade.

[1] A figure in *County Atlas of Rensselaer New York* (1876, F.W. Beers & Co.), shows the former MGP as consisting of only two structures: the former retort house and a single gas holder located in the northeast corner of the site.

- **Subsurface Former MGP Structures** - Subsurface structures related to the former MGP were identified during the SC. These included subsurface portions of both gas holders (TP-101-05[2], TP-102-05) and possibly a portion of the purifier room and meter room. The tar well indicated on the 1909 Sanborn map was not identified during the SC.
- **Groundwater Occurrence and Flow** - The water table was generally encountered within lower portion of the fill. Based on water level data collected in July 2005 from the three (3) on-site monitoring wells, the general direction of shallow groundwater flow is from southwest to northeast across the site. It appears that shallow groundwater may potentially discharge to Huyck Stream.
- **NAPL Occurrence** - Non-aqueous phase liquid (NAPL) was identified in the subsurface in three general areas.
  - **Area of Former Tar Well** - NAPL blebs were observed in the silt and clay in test pit TP-103-05-NW side. In the boring for MW-103-05, NAPL was present in a silty clay and sand layer from 14-19 feet bgs, and immediately beneath this layer in the uppermost foot of a glacial till. NAPL was not observed in the last 1.4 feet of till penetrated by the boring.
  - **Northeast Gas Holder** - NAPL was observed in the fill within the holder foundation (soil boring B-104-05). NAPL was observed in the soil boring for MW-102-05 (north of the former holder) in a silt and clay layer from 8-12 feet bgs, and in a sand and gravel layer from 18-20 feet bgs. A thin "string" of NAPL was observed within the glacial till found in last 2 feet of the boring (20-22 feet).
  - **Southwest Gas Holder and Purifier/Condenser Room** - NAPL blebs were present in the clay and sand at approximately 7 feet bgs in the vicinity of the southwest gas holder and purifier/condenser rooms (TP-102-05). A NAPL seep was also observed in the footprint of the former purifier/condenser rooms in test pit TP-104-05 at approximately 8 feet bgs. Small pockets of NAPL were observed at 10 feet bgs in soil boring B-106-05, located approximately 15 feet west of the southwest holder.
- **Black Fill Layers - Possible Purifier Waste** - A black, fine- to coarse-grained material was observed in test pit TP-103-05-NW Side. The material had a slight sulfurous odor and was present in layers 0.1 to 0.3 feet thick in the interval from approximately 3 feet to 5 feet bgs. The material was not observed in any other locations.
- **Soil Quality** - Concentrations of total polycyclic aromatic hydrocarbons (PAHs) measured in soil samples, where detected, were below 500 mg/kg. Concentrations of benzene, toluene, ethylbenzene and xylene (BTEX) compounds measured in soil samples ranged from non-detect to 13.6 mg/kg (TP-104-Native). Total cyanide concentrations measured in the soil ranged from non-detect to 18.5 mg/kg (SB/MW-103 12-14'). In accordance with the approved SC Work Plan, no on-site surface soil samples were collected because the ground surface of the site is generally covered with pavement. According to the available records, the MGP ceased operations on the site approximately 80 years ago and the MGP was razed prior to development of the site as a parking lot. Surficial soils are likely to have been reworked after the demolishing of the MGP.
- **Groundwater Quality** - Target analyte concentrations in groundwater were measured at levels above the New York State Class GA Groundwater Quality criteria in samples from monitoring wells MW-101-05 and MW-103-05. In accordance with the Site Characterization Work Plan, groundwater was not sampled from monitoring well MW-102-05 because NAPL was found inside the well during the round of water level measurements performed prior to the groundwater monitoring event. In the sample from

[2] A suffix indicating the year of installation has been added to all sample location IDs (borings, wells, test pits, etc.). All location IDs from the SC-IRM investigation now include the suffix -05 to indicate the year 2005.

MW-101-05, 1,1-dichloroethene, hexachlorocyclopentadiene, and 2,4-dinitrophenol were detected at levels above applicable criteria. The compounds 1,1-dichloroethene and 2,4-dinitrophenol were also detected at levels above applicable criteria in MW-103-05. MW-101-05 is considered an upgradient well and the constituents observed may be attributable to operations other than those associated with MGP sites. The BTEX and PAH compounds detected in the sample collected from MW-103-05 are likely associated with the NAPL present in this area. Analysis for metals in groundwater revealed concentrations of cobalt, iron, manganese and sodium above New York State Class GA Groundwater Quality criteria in both wells sampled (MW-101-05 and MW-103-05). However, levels observed in MW-103-05 were generally an order of magnitude higher than those observed in MW-101-05. Additional inorganic constituents were reported in MW-103-05 above applicable criteria including chromium, lead, nickel, vanadium, and total cyanide. Samples were not collected from MW-102-05, as NAPL was identified within the well.

3. SCOPE OF WORK

The RI activities are described below. Specific methods and procedures associated with the RI will be conducted in accordance with the following plans:

- Generic Field Sampling Plan for Site Investigations at Non-Owned Former MGP Sites, (Foster Wheeler, November, 2002) (referred to as "FSP").
- Generic Quality Assurance Project Plan for Site Investigations at Non-Owned Former MGP Sites, (Foster Wheeler, November, 2002) (referred to as "QAPP").
- Generic Health & Safety Plan for Site Investigations at Non-Owned Former MGP Sites (Foster Wheeler, November 2002) as modified by Attachment with Site-Specific Health & Safety Information (Brown and Caldwell, June 2005) (referred to as "Health and Safety Plan" or "HASP").

The RI activities will also be conducted in accordance with the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan in Appendix B of this work plan (draft DER-10 Technical Guidance for Site Investigation and Remediation Appendix 1A, December 2002). Continuous air monitoring for VOCs and particulates at the perimeter of the exclusion zone will be required.

The scope of work for the RI is divided into three components: property access activities; field activities; and data evaluation and reporting.

3.1 Property Access Activities

Prior to the SC field activities, the owner of the property that occupies the former MGP site (City of Rensselaer) was contacted and an access permission agreement was established allowing National Grid to conduct the investigation activities.

Prior to initiating field activities for the RI, the City of Rensselaer will be contacted to brief them on the planned activities. The access agreement previously obtained with the City of Rensselaer is currently in effect. As described below, planned RI activities include the excavation of test pits, installation of monitoring wells, the advancement of soil borings, and the collection of soil and stream sediment samples on one or more properties located north of Huyck Square, on the public rights-of-way along Academy Street, Huyck Square and Washington Street, and on private properties located on Academy and Washington Streets. Upon approval of this RI Work Plan, National Grid will attempt to establish access agreements with the owners of these properties. Also, the City of Rensselaer will be contacted to obtain permission to install borings and monitoring wells in the streets and public rights of way bordering the site (Sections 3.2.4, 3.2.5), and to make observations in adjacent sewers (Section 3.2.1).

3.2 Field Activities

3.2.1 Underground Utility Observations

Observations of dry-weather flow conditions in nearby sewer manholes on Washington Street, Huyck Square and Academy Street will be recorded to assess the potential for interaction of shallow groundwater and the underground storm water and sanitary sewer lines (e.g., infiltration or exfiltration). Other pertinent

information related to the sewers that is observed will also be recorded (e.g., structural integrity of utility line, visual or olfactory observations). Select features such as sewer inverts and manhole rims may be identified for subsequent measurement of elevation and location during the survey that will follow well installation activities. A figure showing the locations of subsurface utilities (including manholes) and other pertinent data such as invert elevations will be included in the RI report.

3.2.2 Utility Mark-Outs and Clearance

Prior to conducting the intrusive activities described below, the locations for these activities will be marked in the field. New York Dig Safely will be contacted to obtain utility clearance for the subscribed underground utilities, while the City of Rensselaer will be contacted to obtain clearance for utilities that they maintain (e.g., sewer and water). The owners of the properties will be requested to identify and locate known on-site private utilities.

Some of the proposed drilling and sampling locations may be adjusted to provide for adequate clearance from underground utilities. The final locations of all soil borings and monitoring wells, particularly those in road-side locations, will also be subject to drilling rig clearance requirements for overhead power and telephone lines.

3.2.3 Test Pit Excavation

Two test pits will be excavated in order to locate and characterize the tar well shown on historical maps in the northwest corner of the site. The test pits will be located in the general area of test pit TP-103-05, including the unpaved area at this corner of the site. The test pits will extend longitudinally through potential locations of the tar well not previously investigated with TP-103-05.

The test pits will be excavated as practicable to a minimum depth of approximately 10 feet below grade. If the tar well is found, the test pits will be excavated adjacent to the tar well to a depth sufficient to identify the base of the tar well and the vertical extent of NAPL (if any) associated with the tar well. The excavation will not extend through the base of the tar well.

If the vertical extent of visible impacts cannot be determined in the test pits due to equipment capabilities or subsurface conditions within the test pits, a soil boring may be advanced in the vicinity of the test pits. Upon completion of the test pits, the excavated material will be backfilled into the excavations in the order the material was excavated (last-out, first-in), placing the backfill in approximately 1.5- to 2-foot lifts and tamping with the excavator bucket.

Two (2) soil samples will be collected from within each test pit to characterize visually impacted soil and evaluate soil quality beneath the visually impacted zone. The soil samples will be submitted for analysis of Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), Total Cyanide, and free cyanide (HCN and CN). A summary of the planned soil analyses is provided in Table 3-2. Analysis of soil samples will be conducted by a laboratory certified under the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) to provide ASP/CLP deliverables.

3.2.4 Soil Borings

Soil borings will be drilled and sampled at 10 locations (locations B-107-08 through B-112-08, and MW-104-08 through MW-107-08) at the approximate positions illustrated in Figure 3-1. Four (4) of these borings will be completed as monitoring wells, as described in Section 3.2.5. The boring locations were

selected to further evaluate the horizontal and vertical extent of localized NAPL occurrences identified during the SC and to evaluate concentrations of TCL VOCs, TCL SVOCs, Total Cyanide, and free cyanide in soils. Information from the borings will also be used to improve the understanding of the stratigraphy and hydrogeologic properties of the overburden. A summary of the technical rationale for the positioning and depths of the proposed soil borings is presented on Table 3-1.

Soil borings will be advanced using hollow-stem augers and continuously sampled, with a two-foot long, two-inch inside diameter (I.D.) split-spoon sampler to the target depths indicated in Table 3-1. The samples will be described in the field to characterize soil type, including grain-size, texture, and moisture content. Soil samples will be logged in accordance with the Burmister Soil Classification System and classified using the Unified Soil Classification System (USCS) as per the FSP. The samples will also be field screened for indications of MGP-related, or other, impacts via visual/olfactory observations and organic vapor concentration measurements using a PID. Upon completion, the soil borings not intended for monitoring wells will be filled with cement-bentonite grout.

In the event that NAPL is encountered in a boring and conditions in the boring are such that continued drilling may introduce NAPL into deeper stratigraphic intervals via the borehole (e.g., apparently mobile NAPL perched above a confining layer), measures will be taken to reduce this potential. Advancement of the augers will be suspended and temporary steel casing will be grouted into the borehole before advancing further. Alternatively, the boring will be terminated and consideration given to advancing a boring in an alternate location. Borings with apparently mobile NAPL will not be advanced through a dense till layer. As noted above, soil borings not intended for monitoring wells will, upon completion, be filled with cement-bentonite grout.

Two (2) soil samples from each of the 10 soil boring locations will be submitted for analysis of TCL VOCs, TCL SVOCs, Total Cyanide, and free cyanide. The interval(s) will be selected based on the results of previous borings (e.g., depth of localized NAPL in adjacent boring) and/or results of field screening. A summary of the planned soil analyses is provided in Table 3-2. Analysis of soil samples will be conducted by a laboratory certified under the NYSDOH ELAP to provide ASP/CLP deliverables.

3.2.5 Monitoring Wells

Monitoring wells will be installed at the four (4) locations illustrated on Figure 3-1. The selected locations are intended to improve the current understanding of groundwater flow direction and to further assess the extent of MGP-related constituents in groundwater. The boring for each monitoring well, which will be advanced to refusal on bedrock and then grouted or re-drilled as necessary to install the monitoring well, will be used to evaluate the stratigraphic characteristics of the overburden. The intended purpose of each of the monitoring wells is summarized on Table 3-1.

Two (2) of the proposed monitoring well locations (MW-105-08 and MW-106-08) are planned for positions hydraulically downgradient of the former MGP site, including an area where the SC investigation indicated concentrations were above New York State Class GA groundwater quality criteria (e.g. MW-103-05) and where NAPL was identified in a well (MW-102-05). The remaining proposed monitoring wells (MW-104-08 and MW-107-08) are positioned hydraulically sidegradient of the site and their intended purpose is to evaluate the lateral extent of impacts originating from certain areas of the site. *Note: MW-104-08 will be positioned on the public right-of-way, not on private property.* Consistent with the existing wells, each new well will be installed with a screened interval that straddles the water table.

A deeper monitoring well may also be considered for installation at these locations, with the screened interval positioned at appropriate depths, depending on the field observations from the soil borings described above. A deeper well would be installed if there are indications that potential on-site MGP-related impacts may contribute constituents to groundwater at depths below the screens in the shallower wells.

3.2.5.1 Monitoring Well Construction and Development

Monitoring well installation procedures are provided in the FSP. The wells will be constructed of two-inch diameter, Schedule 40, PVC well casing with 0.020-inch slot PVC screens with an appropriately-sized filter pack. For monitoring well borings advanced deeper than the intended monitoring well, grout and/or a bentonite seal will be placed in the deeper portion of the borehole, below the bottom of the well. Alternatively, the entire borehole may be grouted and a second boring advanced nearby (without sampling) to a depth appropriate for the monitoring well. At well locations where NAPL is encountered, a one- to two-foot long sump will be installed below the screen, if appropriate, as described in the FSP. In instances where sumps are installed, the annular space between the sump and formation will be filled with bentonite, cement/bentonite grout, or other suitable, relatively low permeability material.

After a minimum period of 24 hours has passed following well installation to allow for the cement/bentonite grout to set, each well will be developed. Well development will be conducted in accordance with procedures in the FSP.

3.2.6 Slug Tests

In-situ hydraulic conductivity tests (i.e., slug tests) will be performed on each of the proposed monitoring wells and each monitoring well that was installed during the SC to evaluate the horizontal hydraulic conductivity of the adjacent formation. Rising head slug tests will be conducted in accordance with the procedures described in the FSP and the data generated will be input into AQTESOLV® software for hydraulic conductivity calculations.

The screens of the existing monitoring wells were positioned to straddle the water table. The saturated material adjacent to the screened intervals is primarily the silts and clays of alluvial or lacustrine origin. Thus, the slug tests conducted in existing wells will primarily be evaluating the hydraulic conductivity of these deposits.

3.2.7 Groundwater Monitoring and NAPL Gauging

Two (2) rounds of groundwater sampling will be conducted on the new and existing wells. The first round will be initiated after at least one week has passed since well development and after water levels in the wells have stabilized. The second round will be conducted approximately three months (one quarter) after the first round, preferably in an interval of the seasonal hydrologic cycle that contrasts with the first round. For example, if the first round is conducted during a period when the water table is relatively high, it is preferable to schedule the second round for a period when the water table is relatively low.

Prior to groundwater sampling, depth to water measurements and NAPL gauging will be conducted. NAPL that has accumulated in the monitoring well or its sump will, to the extent practicable, be removed by bailing or other means. In the event that NAPL is detected in a monitoring well, a groundwater sample will not be collected from that well. Groundwater samples will be collected according to the United States Environmental Protection Agency (USEPA) low-flow sampling protocol and in accordance with procedures outlined in the FSP.

The groundwater samples will be submitted for analysis of TCL VOCs, TCL SVOCs, Total Cyanide, and free cyanide. A summary of the planned groundwater sample analyses is provided in Table 3-2. Analysis of groundwater samples will be conducted by a laboratory certified under NYSDOH ELAP to provide ASP/CLP deliverables.

3.2.8 Soil Sampling on Stream Bank and Grass-Covered Areas

Surface soil samples and deeper soil samples will be collected at four (4) locations along the south bank of Huyck Stream. In addition, surface soil samples will be collected at the following locations:

- Two (2) locations in the grass-covered area north of the site, between the stream and Huyck Square;
- One (1) location in the grass-covered area northwest of the site on the west side of Academy Street;
- One (1) location in the grass covered area south-west of the site on the west side of Academy Street;
- One (1) location in the grass covered area near the southeast corner of the site; and
- One (1) location in the grass covered area east of the site on the east side of Washington Street.

The approximate locations are shown on Figure 3-1. One of the soil samples will be collected from an upstream location representative of background conditions. The final locations of the deeper soil samples north of Huyck Square will be selected in the field in consultation with a representative of the DEC by considering the conditions encountered in deeper soil borings to the south (i.e., MW-105-08, MW-106-08). At each of the ten locations a surface soil sample will be collected from the top 2 inches of soil after the overlying vegetation has been removed. The surface soil samples will be collected with a decontaminated stainless steel spoon or dedicated, disposable spoon. At the four locations along the stream (i.e. SOIL-1-08 through SOIL-4-08), the deeper soil samples will be collected using a hand auger. The hand auger will be advanced (as practicable) to a depth of approximately five (5) feet. Upon withdrawal, the hand auger will be inspected for visual and olfactory indications of potential MGP-related impacts (e.g., NAPL, tar, tar odor). The soils retrieved in the hand auger will be screened with a PID and examined for visual/olfactory indications of potential impacts. At each of the four locations along Huyck Stream a soil sample will be collected from the 6-12 inch depth interval. A third, deeper soil sample will be collected at each of the four locations along the stream based on the field screening. In the absence of any indications of impacts (i.e., sheens, staining, odor, elevated PID readings), the third soil sample will be collected from the deepest available interval.

The surface soil (0-2") samples will be submitted for analysis of TCL SVOCs, Total Cyanide and free cyanide. The deeper samples will be submitted for analysis of TCL VOCs, TCL SVOCs, Total Cyanide, and free cyanide. A summary of the planned soil sample analyses is provided in Table 3-2. Analysis of soil samples will be conducted by a laboratory certified under NYSDOH ELAP to provide ASP/CLP deliverables.

3.2.9 Stream Sediment Sampling

Stream sediment samples will be collected from three (3) locations near the south shore of the Huyck Stream. The approximate locations are shown on Figure 3-1. One of the samples will be collected near the east side of the Washington Street bridge (upstream from the former MGP) site to evaluate impacts by urban runoff and other, non-MGP substances. The other two sediment samples will be collected from the portion of the Huyck Stream north of the site. If the previous soil sampling (Section 3.2.8) indicates locations with potential MGP-related impacts, the sediment samples will be positioned adjacent to these locations. The sediment samples will be retrieved from the interval approximately 0-6 inches using a pre-cleaned dredge, clam-shell sampler or similar device. During sampling of stream sediments, the sediment and the surface of the water

will be inspected for evidence of entrained NAPL. The inspection for entrained NAPL will consist of parting the sediment mass with a pre-cleaned knife or similar implement and examining the sediment for NAPL blebs or globules trapped within the pore spaces.

Stream sediment samples will be submitted for analysis of BTEX, PAHs, Total Cyanide and free cyanide. Stream sediment samples will also be submitted for analysis of total organic carbon (TOC).

Stream sediments in this urban setting are likely to be impacted by PAHs from non-MGP sources including storm water run-off containing petroleum-derived substances such as diesel fuel and lubricating oils from vehicles. These petrogenic (non-MGP) substances can contain greater proportions of alkylated PAH compounds relative to the non-alkylated (parent) PAH compounds that predominate in pyrogenic materials such as coal tar and soot. In order to facilitate identification of pyrogenically- and petrogenically-derived mixtures of PAHs, the sediment samples will be analyzed for a total of 34 commonly identified PAH compounds. The 34 PAH compounds will consist of the 18 parent (non-alkylated) PAH compounds typically targeted in SW-846 Method 8270, as well as 16 alkylated PAH compounds that have been generally recognized as most abundant and which are commonly measured as part of environmental monitoring[3]. The analysis for the expanded list of 34 PAHs will be performed using SW-846 Method 8270. In addition to sediment samples, other soil samples suspected of being impacted by petrogenic sources of PAHs may also be analyzed for the expanded list of 34 PAHs. A summary of the sediment sample analyses is provided in Table 3-2. Analyses will be conducted by a laboratory certified under NYSDOH ELAP to provide ASP/CLP deliverables.

3.2.10 Survey

Each of the new soil boring and monitoring well locations will be surveyed. The survey will include location coordinates, ground surface elevation, and in the case of the wells, top of casing elevation data. Pending the findings of the underground utility observations (see Section 3.2.1), sewer inverts may also be surveyed to evaluate whether interaction of storm water and groundwater is occurring at the site. Coordinates will be referenced to the State Plane coordinate system for New York using the North American Datum of 1983 (NAD 1983) in units of feet. Elevations will be referenced to the National Geodetic Vertical Datum (NGVD) of 1929 in units of feet. The survey will be performed by a New York-licensed surveyor.

3.2.11 Investigation-Derived Waste (IDW)

Waste generated during the drilling and installation of monitoring wells will include soil cuttings, drilling water, purge water, equipment decontamination water, disposable sampling equipment, and personal protective equipment (PPE). The waste will be containerized in DOT-approved, 55 gallon drums, which will be properly labeled to identify their contents. Management of IDW will be as specified in the FSP.

3.3 Data Evaluation and Reporting

Laboratory results for the groundwater, soil and sediment samples will be forwarded to a data validation service for preparation of a Data Usability Summary Report (DUSR). The DUSR will present a summary of data usability, including a discussion of qualified and rejected data and provide recommendations for resampling/reanalysis, as applicable.

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[3] Hansen, D.J., et al.; *Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures*; U.S. Environmental Protection Agency; November 2003.

An RI report will be prepared. The report will address the following:

- The identity and characteristics of the source(s) of MGP-related impacts (if any);
- The amount, concentration, environmental fate and transport, phase, location, and other significant characteristics of any MGP-related constituents present;
- Hydrogeologic characteristics, including grain size, soil permeability, depth to saturated zone, hydraulic gradients, proximity to surface water, floodplains, and wetlands;
- Routes of exposure and potential human receptors; and
- Steps 1 and 2b of a Fish and Wildlife Resource Impact Analysis (FWRIA), to be conducted by a qualified individual in accordance with the following DEC guidance documents: 1) Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (FWIA); October 1, 1994 (Steps 1 through 2b); and 2) DRAFT DER-10 Technical Guidance for Site Investigation and Remediation, December 2002.

The Remedial Investigation report will include the following:

- All of the relevant information obtained under this work plan;
- Descriptions of the work done under this work plan and the results of that completed work;
- Deviations from this work plan that result from unexpected conditions encountered during the investigation;
- Summary of the overall nature and extent of contamination referencing any exceedances of applicable local, State and federal standards, criteria, and guidance;
- Summary of any ecological assessments conducted;
- Soil boring logs, well construction diagrams, well development data, and field parameter readings from collection of groundwater samples;
- Hydrogeologic cross-sections of the site;
- Sample location maps with sample depth and contaminant concentrations indicated on the maps;
- Groundwater elevation contour maps with flow directions specified; and
- Conclusions which summarize the areas of concern, identify any potentially completed exposure pathways, and recommendations for any future work (e.g. none, additional investigation, or an evaluation of remedial alternatives [i.e., Feasibility Study]).

4. SCHEDULE

Upon approval of this work plan, property access efforts will commence. Field activities will be initiated after obtaining permission to access the necessary properties. The field activities from drilling/monitoring well installation through the first round of groundwater sampling are anticipated to be completed within approximately four (4) to five (5) weeks.

Note: The on-site drilling and test pitting activities will need to be conducted when the parking lot is not in use by employees of the nearby State office facilities. This will necessitate working after normal business hours and/or on weekends, and will extend the duration of the field activities beyond normal time frames.

As noted in Section 3.2.7, it is anticipated that the second round of groundwater sampling will be conducted approximately three (3) months following the first round, preferably in an interval of the seasonal hydrologic cycle that contrasts with the first round. It is anticipated that the laboratory analyses and the DUSR will be completed within approximately six (6) to eight (8) weeks of completion of the second round of groundwater sampling (see Section 3.2.7). The RI Report will be submitted approximately two (2) months after the DUSR is received from the data validator, or approximately eight (8) to nine (9) months after the start of field work.

5. PROJECT ORGANIZATION

The project organization is outlined the Project Organization Chart (Figure 5-1, attached), which will be updated upon selection of subcontractors. The Project Organization Chart describes the relationship between the National Grid Project Manager, the NYSDEC Project Manager, the NYSDOH Project Manager, the Engineering Consultant, and subcontractors (laboratory, data validator, driller, surveyor, geophysical survey contractor).

For the purpose of quality control, the Project Quality Assurance Manager (PQAM) will be responsible for review of data upon receipt from the analytical laboratory. The PQAM will coordinate data validation activities such that they are performed by a trained and experienced data validator using the applicable criteria specified in the NYSDEC 2001 Analytical Services Protocol (ASP). The PQAM will be responsible for the conformance of the analytical data with requirements of the Generic Quality Assurance Project Plan, November 20, 2002.

6. CITIZEN PARTICIPATION

A Citizen Participation Plan (CPP) will be prepared in accordance with the Consent Order between National Grid and the DEC. The CPP will provide the public with information about how the DEC, the NYSDOH, and National Grid will inform and involve the public during the investigation and remediation of the site. The approved CPP will be in place before initiating field work.

TABLES

TABLE 3-1
RATIONALE FOR SOIL BORING AND MONITORING WELL LOCATIONS
REMEDIAL INVESTIGATION
RENSSELAER NON-OWNED FORMER MGP SITE
RENSSELAER, NEW YORK

Location ID	Purpose	Target Depth
SOIL BORINGS		
B-107-08	Assess southern extent of NAPL identified in soil at TP-102 and TP-104	Approximately 30 feet below grade or below visible indicators of NAPL (if encountered), whichever is deeper.
B-108-08	Assess northern extent of NAPL identified in soil at TP-102 and TP-104	Approximately 30 feet below grade or below visible indicators of NAPL (if encountered), whichever is deeper.
B-109-08	Assess eastern extent of NAPL identified in soil at MW-102.	Approximately 30 feet below grade or below visible indicators of NAPL (if encountered), whichever is deeper.
B-110-08	Assess vertical extent of NAPL identified in soil at MW-102.	Approximately 30 feet below grade or below visible indicators of NAPL (if encountered), whichever is deeper.
B-111-08	Assess the vertical and eastern extent of NAPL identified in soil at MW-103.	Approximately 30 feet below grade or below visible indicators of NAPL (if encountered), whichever is deeper.
B-112-08	Assess eastern extent of NAPL identified as a seep in TP-104	Approximately 30 feet below grade or below visible indicators of NAPL (if encountered), whichever is deeper.
TEST PITS		
TP-105-08	Locate and characterize potential tar well.	Approximately 10 feet below grade, or to exterior of base of tar well if located.
TP-106-08	Locate and characterize potential tar well.	Approximately 10 feet below grade, or to exterior of base of tar well if located.
MONITORING WELLS		
MW-104-08	Evaluate groundwater quality side-gradient of MGP site and improve understanding of groundwater flow. Soil boring will be used to assess western extent of NAPL identified in soil at MW-103, and to further assess stratigraphy and hydrogeologic properties of overburden.	Straddle water table with screen. Total depth of well is anticipated to be approximately 20 feet below grade. Soil boring will be advanced to spoon refusal on bedrock, then grouted to depth of monitoring well.
MW-105-08	Assessment of groundwater quality downgradient of MGP site. Improve understanding of groundwater flow. Soil boring will be used to evaluate northern extent of NAPL identified in soil at MW-103, and to further assess stratigraphy and hydrogeologic properties of overburden.	Straddle water table with screen. Total depth of well is anticipated to be approximately 20 feet below grade. Soil boring will be advanced to spoon refusal on bedrock, then grouted to depth of monitoring well.
MW-106-08	Assessment of groundwater quality downgradient of MGP site. Improve understanding of groundwater flow. Soil boring will be used to evaluate northern extent of NAPL identified in soil at MW-102, and to further assess stratigraphy and hydrogeologic properties of overburden.	Straddle water table with screen. Total depth of well is anticipated to be approximately 20 feet below grade. Soil boring will be advanced to spoon refusal on bedrock, then grouted to depth of monitoring well.
MW-107-08	Evaluate groundwater quality side-gradient of MGP site and improve understanding of groundwater flow. Soil boring will be used to evaluate eastern extent of NAPL identified in soil at MW-102, and to further assess stratigraphy and hydrogeologic properties of overburden.	Straddle water table with screen. Total depth of well is anticipated to be approximately 20 feet below grade. Soil boring will be advanced to spoon refusal on bedrock, then grouted to depth of monitoring well.

TABLE 3-1
RATIONALE FOR SOIL BORING AND MONITORING WELL LOCATIONS
REMEDIAL INVESTIGATION
RENSSELAER NON-OWNED FORMER MGP SITE
RENSSELAER, NEW YORK

Location ID	Purpose	Target Depth
SOIL SAMPLES		
SOIL-1-08	Evaluate background impacts in surface soil and deeper soils along.	Collect surface sample at 0-2" below vegetative cover. Advance hand auger approximately 5 feet below grade as practicable. Collect samples at 6-12" bgs and at a deeper interval based on field screening.
SOIL-2-08	Evaluate potential NAPL/MGP impacts in surface soil and deeper soils along stream bank, north of MW-105 and MW-106.	Collect surface sample at 0-2" below vegetative cover. Advance hand auger approximately 5 feet below grade as practicable. Collect samples at 6-12" bgs and at a deeper interval based on field screening.
SOIL-3-08	Evaluate potential NAPL/MGP impacts in surface soil and deeper soils along stream bank, north of MW-105 and MW-106.	Collect surface sample at 0-2" below vegetative cover. Advance hand auger approximately 5 feet below grade as practicable. Collect samples at 6-12" bgs and at a deeper interval based on field screening.
SOIL-4-08	Evaluate potential NAPL/MGP impacts in surface soil and deeper soils along stream bank, north of MW-105 and MW-106.	Collect surface sample at 0-2" below vegetative cover. Advance hand auger approximately 5 feet below grade as practicable. Collect samples at 6-12" bgs and at a deeper interval based on field screening.
SOIL-5-08	Evaluate potential MGP impacts in surface soil in grass-covered area north of Huyck Square	Collect surface sample at 0-2" below vegetative cover.
SOIL-6-08	Evaluate potential MGP impacts in surface soil in grass-covered area north of Huyck Square	Collect surface sample at 0-2" below vegetative cover.
SOIL-7-08	Evaluate potential MGP impacts in surface soil in grass-covered area northwest of site on the west side of Academy St.	Collect surface sample at 0-2" below vegetative cover.
SOIL-8-08	Evaluate potential MGP impacts in surface soil in grass-covered area southwest of site on the west side of Academy St.	Collect surface sample at 0-2" below vegetative cover.
SOIL-9-08	Evaluate potential MGP impacts in surface soil in grass-covered area near the southeast corner of site on the west side of Washington St.	Collect surface sample at 0-2" below vegetative cover.
SOIL-10-08	Evaluate potential MGP impacts in surface soil in grass-covered area east of site on the east side of Washington St.	Collect surface sample at 0-2" below vegetative cover.
STREAM SEDIMENT SAMPLES		
SED-1-08	Evaluate potential background (upstream) impacts to sediment quality.	Collect sediment sample from 0-6".
SED-2-08	Evaluate potential impacts to sediment quality.	Collect sediment sample from 0-6".
SED-3-08	Evaluate potential impacts to sediment quality.	Collect sediment sample from 0-6".

Note: Suffix "08" after location ID designates year of installation (2008).

TABLE 3-2
SUMMARY OF LABORATORY ANALYSES FOR SOIL AND GROUNDWATER
REMEDIAL INVESTIGATION
RENSSELAER NON-OWNED FORMER MGP SITE
RENSSELAER, NEW YORK

Media and Sample Type	TCL VOCs Method 8260	TCL SVOCs Method 8270	BTEX Method 8260	PAHs Method 8270 (w/ 18 non-alkylated PAHs)	PAHs Method 8270 (w/ 34 non-alkylated and alkylated PAHs)	Total Cyanide	Free Cyanide	Total Organic Carbon
SOIL								
Soil Boring Samples (10 borings, 2 samples each)	20	20	--	--	--	20	20	--
Duplicate[1]	1	1	--	--	--	1	1	--
MS/MSD[1]	1	1	--	--	--	1	1	--
Trip Blank[2]	--	--	--	--	--	--	--	--
Equipment Blank[1]	1	1	--	--	--	1	1	--
Test Pit Samples (2 test pits, 2 samples each)	4	4	--	--	--	4	4	--
Duplicate[1]	1	1	--	--	--	1	1	--
MS/MSD[1]	1	1	--	--	--	1	1	--
Trip Blank[2]	--	--	--	--	--	--	--	--
Equipment Blank[1]	1	1	--	--	--	1	1	--
Stream Bank Soil Samples (4 locations, 2 depths, by hand auger)	8	8	--	--	--	8	8	--
Duplicate[1]	1	1	--	--	--	1	1	--
MS/MSD[1]	1	1	--	--	--	1	1	--
Trip Blank[2]	--	--	--	--	--	--	--	--
Equipment Blank[1]	1	1	--	--	--	1	1	--
Surface Soil Samples (at 10 locations, 0-2")	--	10	--	--	--	10	10	--
Duplicate[1]	--	1	--	--	--	1	1	--
MS/MSD[1]	--	1	--	--	--	1	1	--
Trip Blank[2]	--	--	--	--	--	--	--	--
Equipment Blank[1]	--	1	--	--	--	1	1	--
Stream Sediment Samples (3 locations)	--	--	3	--	3	3	3	3
Duplicate[1]	--	--	1	--	1	1	1	1
MS/MSD[1]	--	--	1	--	1	1	1	--
Trip Blank[2]	--	--	--	--	--	--	--	--

TABLE 3-2
SUMMARY OF LABORATORY ANALYSES FOR SOIL AND GROUNDWATER
REMEDIAL INVESTIGATION
RENSSELAER NON-OWNED FORMER MGP SITE
RENSSELAER, NEW YORK

Media and Sample Type	TCL VOCs Method 8260	TCL SVOCs Method 8270	BTEX Method 8260	PAHs Method 8270 (w/ 18 non-alkylated PAHs)	PAHs Method 8270 (w/ 34 non-alkylated and alkylated PAHs)	Total Cyanide	Free Cyanide	Total Organic Carbon
Equipment Blank[1]	--	--	1	--	1	1	1	--
Groundwater (7 wells, 2 events) [3]								
Samples (1 per well)	14	14	--	--	--	14	14	--
Duplicate [1]	2	2	--	--	--	2	2	--
MS/MSD [1]	2	2	--	--	--	2	2	--
Trip Blank [2]	±4	--	--	--	--	--	--	--
Equipment Blank [1]	2	2	--	--	--	2	2	--

Notes:
(1) - Per the QAPP, one duplicate sample, one MS/MSD pair, and one equipment blank will be submitted and analyzed for every Sample Deliver Group (maximum 20 samples).
(2) - Per the QAPP, one trip blank will be included in every shipment of water samples to be analyzed for VOCs, and subsequently analyzed.
(3) - If NAPL is identified in well, groundwater samples will not be analyzed.

FIGURES

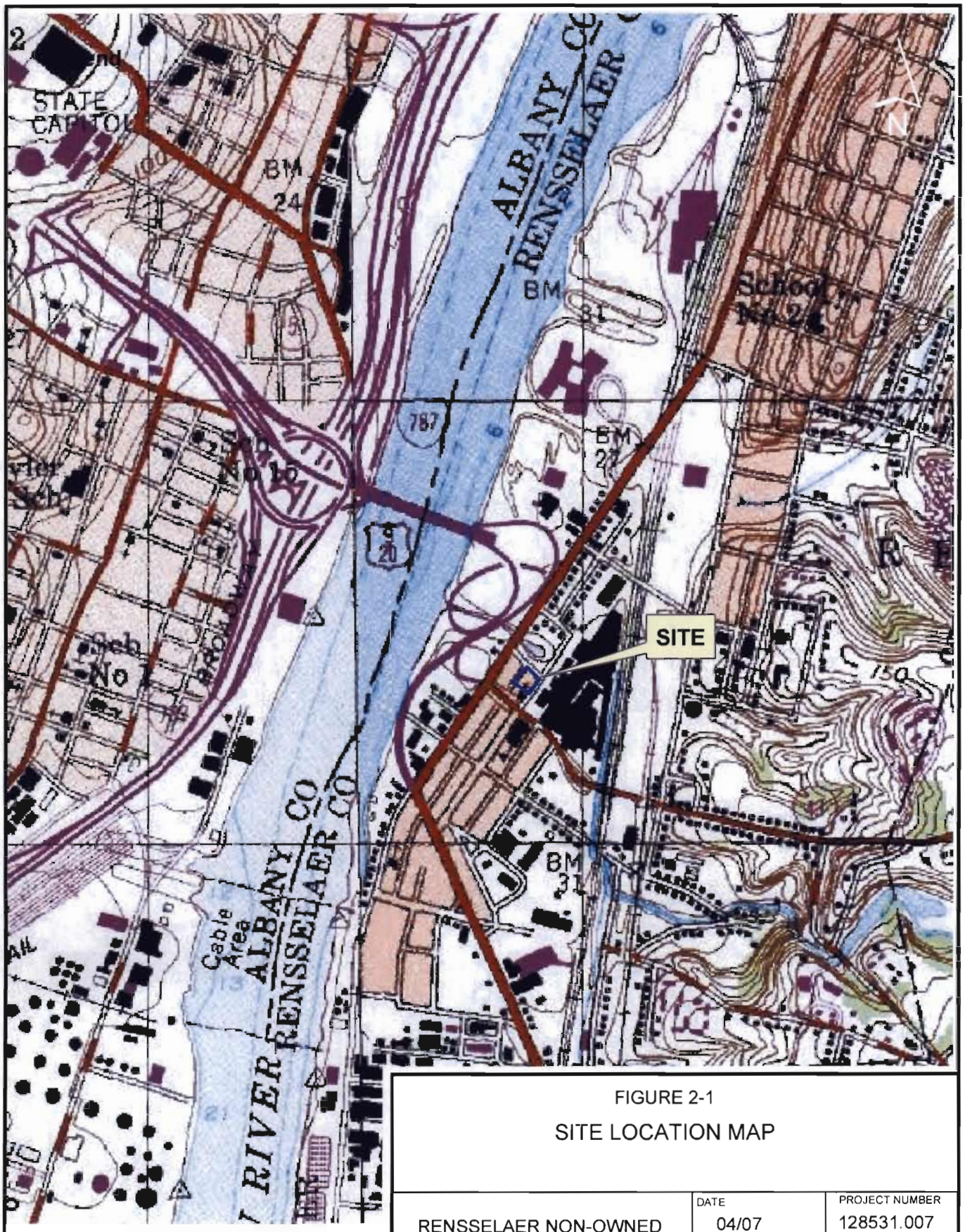

FIGURE 2-1

SITE LOCATION MAP

RENSSELAER NON-OWNED FORMER MGP SITE
RENSSELAER, NEW YORK

DATE	PROJECT NUMBER
04/07	128531.007

BROWN AND CALDWELL
ALLENDALE, NEW JERSEY

P:/GIS/National_Grid/Rensselaer/Rensselaer_Site_Location.mxd

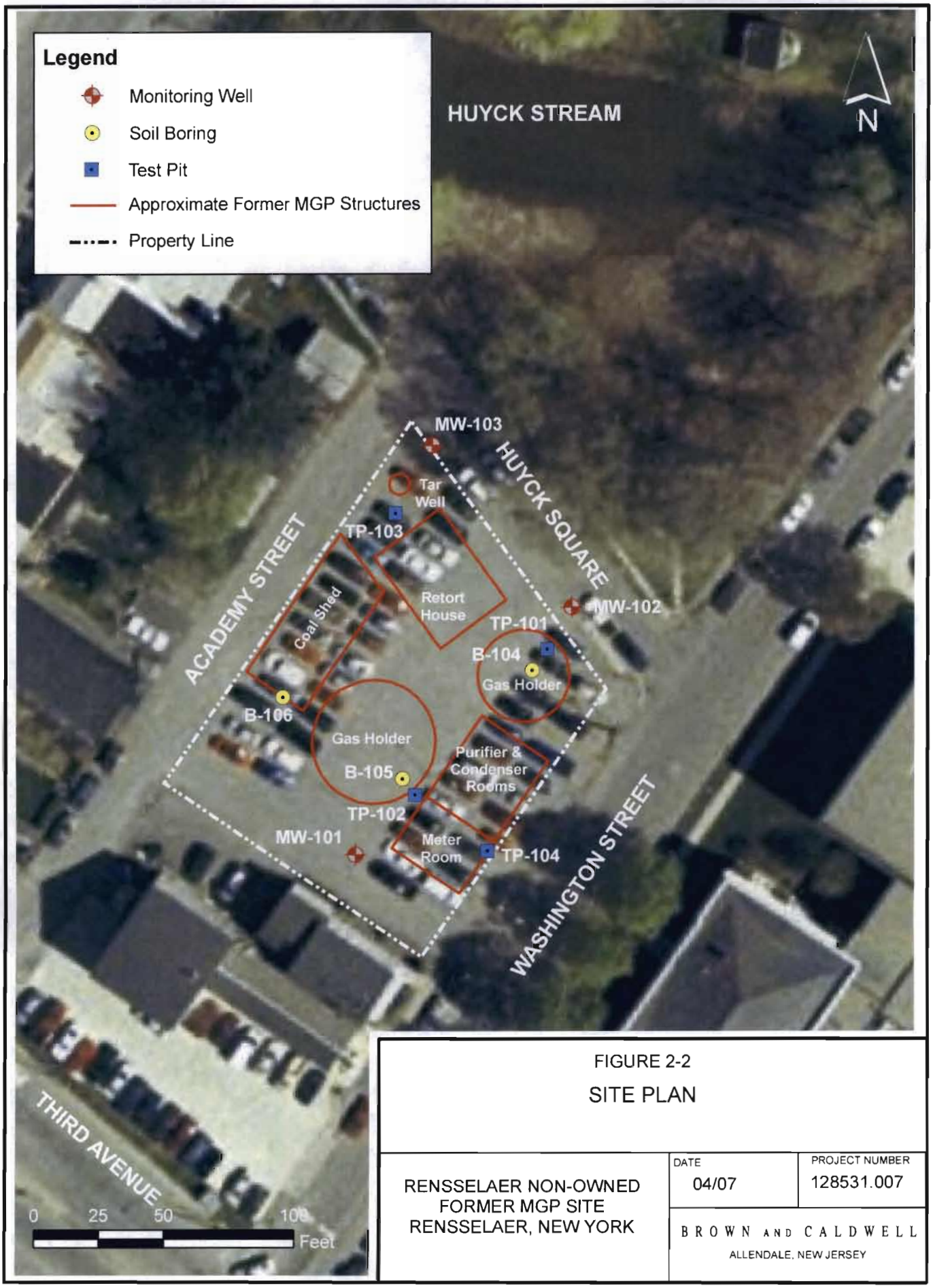

FIGURE 2-2

SITE PLAN

RENSSELAER NON-OWNED FORMER MGP SITE
RENSSELAER, NEW YORK

DATE	PROJECT NUMBER
04/07	128531.007

BROWN AND CALDWELL
ALLENDALE, NEW JERSEY

P:/GIS/National_Grid/Rensselaer/Rensselaer_Site_Plan.mxd

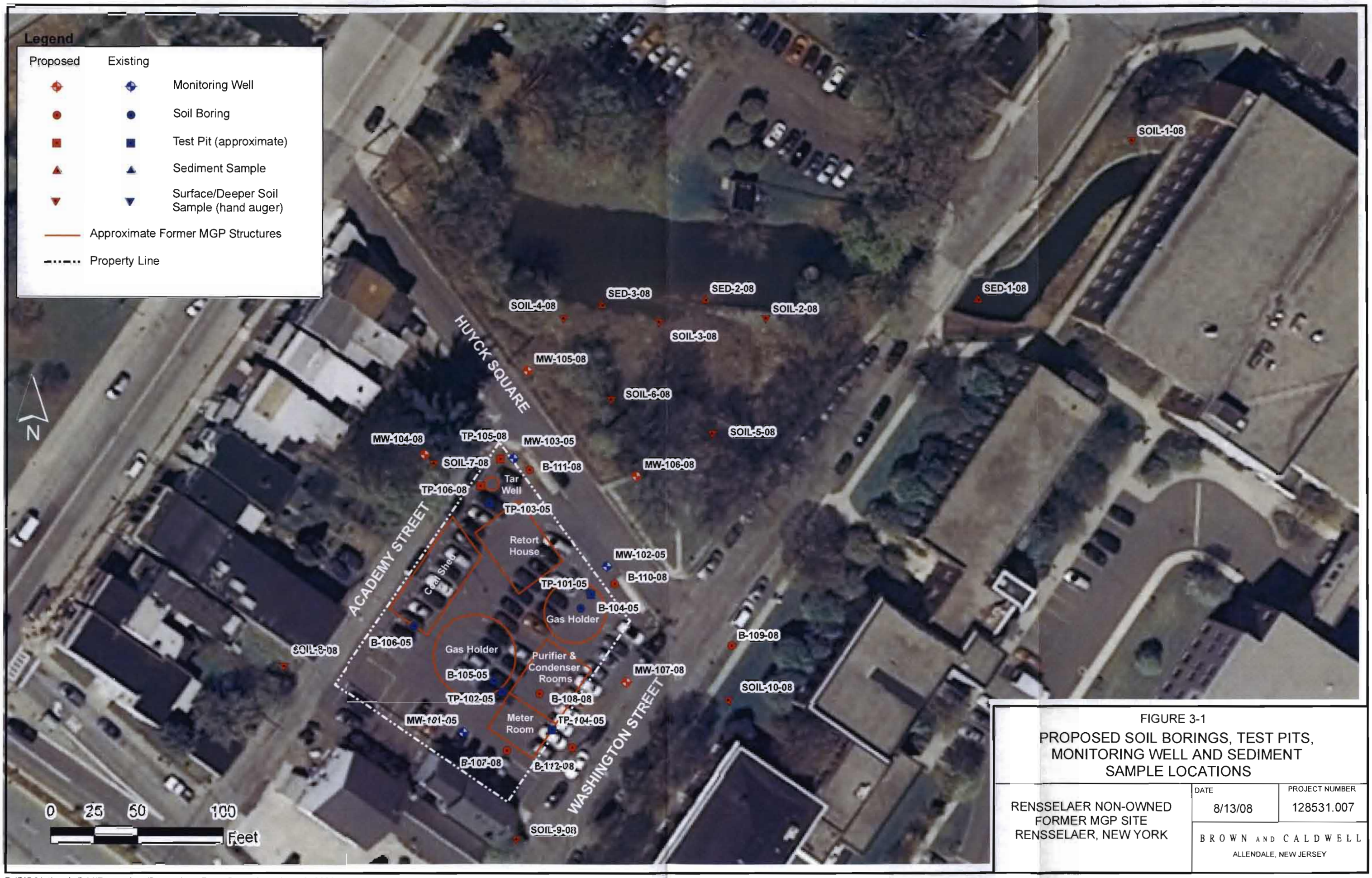

FIGURE 3-1

PROPOSED SOIL BORINGS, TEST PITS, MONITORING WELL AND SEDIMENT SAMPLE LOCATIONS

RENSSELAER NON-OWNED FORMER MGP SITE RENSSELAER, NEW YORK	DATE 8/13/08	PROJECT NUMBER 128531.007
	BROWN AND CALDWELL ALLENDALE, NEW JERSEY	

P:/GIS/National_Grid/Rensselaer/Rensselaer_Prop_Samp_Locations_043008

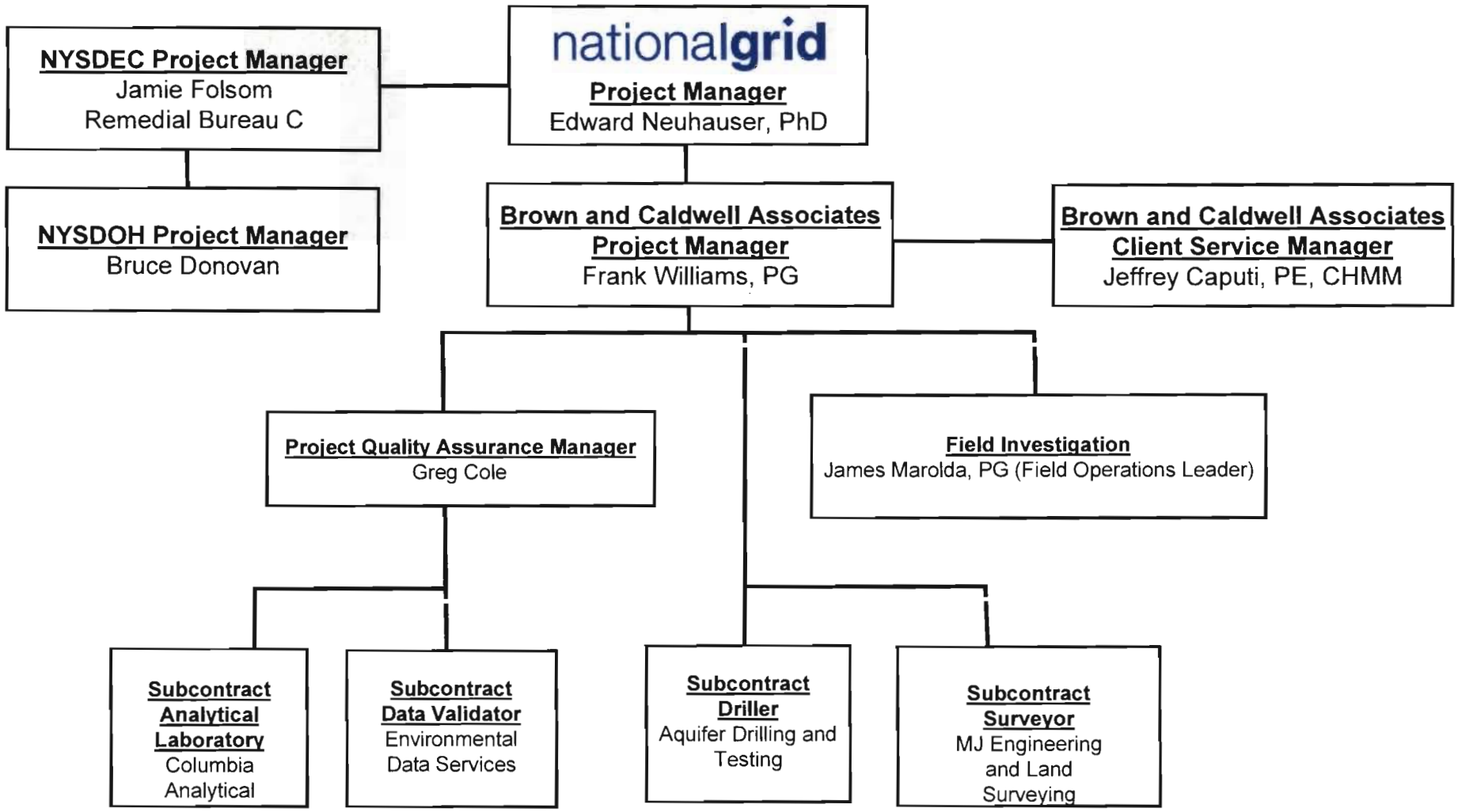

Figure 5-1
PROJECT ORGANIZATION CHART

REMEDIAL INVESTIGATION
RENSSELAER NON-OWNED FORMER MGP
RENSSELAER, NEW YORK

BROWN AND CALDWELL ASSOCIATES

APPENDIX A

Site-Specific Addendum to Generic Health and Safety Plan

Rensselaer Health Center of St Peter's Hospital

62 Washington St
Rensselaer, NY 12144-2735

Phone: 518.434.2526

Turn by Turn Directions

1. Depart Start on Washington St (South-West)	0.1 miles
2. Arrive End	Total Miles: 0.1

Emergency and Site Contacts

Contact	Firm or Agency	Telephone Number
Police Dept.	Rensselaer Police Department	911 or 518-462-7451
Fire Dept.	Rensselaer Fire Department	911 or 518-463-2883
Hospital	Rensselaer Health Center of St Peter's Hospital	518-434-2526
Ambulance	Bruen WF Rescue Squad Emergency Calls	518-479-4303
NG Project Manager: Edward F. Neuhauser, Ph. D.	National Grid	315-428-3355
NG Safety Department: Brian Powell	National Grid	315-428-6194
Engineering Consultant PM: Frank Williams	Brown and Caldwell	518-472-1988
Engineering Consultant Safety Manager: Lydia Crabtree	Brown and Caldwell	615-250-1236
Engineering Consultant Field Operations Lead (FOL): James Marolda	Brown and Caldwell	518-472-1988
Chemtrec		800-424-9300
National Response Center		800-424-8802
NYSDEC Spill Hotline	NYSDEC	800-457-7362/518-457-7362
Poison Control Center		800-336-6997
Dig-Safe New York		800-962-7962
Utility Emergencies (Electric & Gas)	National Grid	800-932-0301

APPENDIX B

Generic Community Air Monitoring Plan

New York State Department of Health
Generic Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background

conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m$_3$) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m$_3$ above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m$_3$ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m$_3$ of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.