ARCADIS
Infrastructure, environment, buildings

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ENVIRONMENT

Mr. Joshua Cook, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau C, 625 Broadway, 11th Floor
Albany, New York 12233-7014

Subject:
Proposed Supplemental PDI Activities
Port Jervis Former MGP Site
City of Port Jervis, Orange County, New York
Site No. 3-36-049

Date:
November 19, 2010

Contact:
Andrew Corbin, P.E.

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Our ref:
B0043021

Dear Mr. Cook:

This letter has been prepared on behalf of Orange and Rockland Utilities, Inc. (O&R) to propose supplemental pre-design investigation (PDI) activities to be performed at the Port Jervis former manufactured gas plant (MGP) site. These supplemental PDI activities were developed following the November 16, 2010 meeting between O&R, New York State Department of Environmental Conservation (NYSDEC), and ARCADIS.

The objective of the supplemental PDI activities described herein is to 1) gain additional information to further understand the condition, dimensions, and contents of Gas Holder A and 2) evaluate the applicability of in-situ stabilization (ISS) activities generally at depths below the water table.

The proposed scope of supplemental PDI activities consists of the following:

Field Activities:

The following activities will be conducted at the O&R Port Jervis Operations Center on November 23, 2010. If necessary, work will be completed on Nov. 24, 2010.

- Installation of up to three soil borings (PDI-Supp-1 through PDI-Supp-3; Figure 1) within Gas Holder A in an attempt to achieve objective No. 1 above. These soil borings will be advanced to the holder floor (anticipated to be approximately 10 feet below ground surface [bgs]) or refusal. If consistent soil and holder bottom conditions are observed in the first 2 borings installed, the third boring will not be installed.

- Installation of up to five soil borings (PDI-Supp-4 through PDI-Supp-8; Figure 1) adjacent to/outside of Gas Holder A to collect representative soil samples for the treatability study (objective No. 2 above). These borings are anticipated to be advanced to a depth of 30 feet bgs. Prior to the advancement of these borings, the upper five feet at each location will be hand cleared to confirm the absence of potential utilities. Following hand clearing, the remaining upper 10 feet will be augured to a depth of 15 feet bgs. Split spoon samples will be continuously collected starting at 15 feet bgs and continuing to 30 feet bgs. Representative samples will then be collected into 5-gallon pails for shipment to ARCADIS's laboratory facility located in Durham, North Carolina. Waste materials generated during hand clearing will be drummed by the driller along with excess soil cuttings.

- Installation of a piezometer in one of the soil borings located outside of Holder A.

- Collection of a potable water sample to assist in the treatability study.

The above drilling activities will be completed by NYEG Drilling, LLC (NYEG) using hollow-stem auger (HSA) methods and soil sampling will be performed using 3-inch diameter split spoon sampling devices. ARCADIS will be conducting the treatability study at our laboratory facilities located in Durham, North Carolina. All drilling activities will be conducted in conformance with the RD Work Plan previously prepared for this site.

Soil cuttings will be staged within the Operations Center in 55-gallon drums. Soil cuttings will be field screened for the presence of volatile organic vapors. Soil cuttings and other IDW (e.g. decontamination water) will be managed and treated/disposed in accordance with applicable rules and regulations.

Treatability Study

The composite soil samples to be collected as described above, and the representative sample of the municipal water source will be submitted to ARCADIS's laboratory for use in bench-scale testing. The objective of the bench-scale testing is to identify an appropriate mix design to reduce hydraulic conductivity and to demonstrate chemical compatibility with constituents of concern (COC) at the site. Specially, the ISS mix designs will be evaluated based on the following criteria:

- Reduction in the hydraulic conductivity of the soil matrix resulting from treatment. The reduction in hydraulic conductivity of the treated soil matrix will result in a corresponding reduction in the potential leachability of COCs within the stabilized soil matrix. The target hydraulic conductivity for the treated soil matrix following addition of mixing reagents will be approximately 1 x 10-6 cm/sec or less.

- Physical properties of the treated soil. The treated soil matrix will need to have suitable physical properties to withstand anticipated future site activities and surface/subsurface loads without settling or deterioration. The targeted 28-day unconfined compressive strength of the treated soil matrix will be greater than 50 pounds per square inch (psi) and less than 500 psi.

Upon receipt at the laboratory, the soil samples will initially be visually characterized within the containers. The samples will be homogenized by the laboratory to prepare representative samples for the treatability study. The untreated soil will be evaluated for the following chemical and physical parameters:

- pH (Hach Test Kit)
- Grain Size (ASTM D422)
- Plasticity (ASTM D4318)
- Classification (ASTM D2487)
- Fines (ASTM D1140)
- Loss On Ignition (ASTM D2974)
- Moisture Content (ASTM D2216)

In order to confirm the suitability of the onsite municipal water source for treatment purposes, ARCADIS will also test the water sample from the site for pH, hardness, and total dissolved solids (using a Hach Test Kit)

Following physical characterization of the soil, ARCADIS will prepare a grout mixture that will be analyzed for the following:

- Viscosity, Density, pH, Temperature (API RP 13B)
- Grout Bleed (ASTM C940)
- Set Time (ASTM D403/C953)

The grout mixture may include a combination of municipal water, Portland cement, bentonite and/or blast furnace slag. After testing the soil and grout, ARCADIS will perform bench-scale testing activities which will consist of mixing soil with various soil-to-grout ratios and other additives (if required) to develop a mixture that achieves a reduced hydraulic conductivity and suitable physical properties. Following mixing, each soil/cement mixture will be tested for the following physical properties:

- Slump and Density (ASTM D143 Modified)
- pH and Temperature (API RP 13B)
- Moisture Content (ASTM D 2216/2937)
- Penetration Resistance – tested at 1, 3, & 5 days (ASTM D1558)
- Hydraulic Conductivity – tested at 7 and 28 days (ASTM D5084)
- Unconfined Compressive Strength – tested at 7 and 28 days (ASTM D1633/D4832)

Mix designs will be optimized and ARCADIS anticipates that at least two final mix designs will be developed, including one final mix that is suitable for ISS treatment.

Following completion of the bench-scale testing activities, a letter report will be prepared that will include the following information:

- Discussion of soil boring and sample collection activities, including soil boring logs.
- Discussion of sample preparation and material testing activities leading to the development of the final mix design (including methods, procedures, and photographs of the work).
- Proposed mix designs identified by the bench-scale testing activities.

Please feel free to contact Ms. Maribeth McCormick of O&R at 845.783.5534 with any questions or comments regarding the information provided herein.

Sincerely,

ARCADIS of New York, Inc.

Andrew Corbin, P.E.
Principal Engineer

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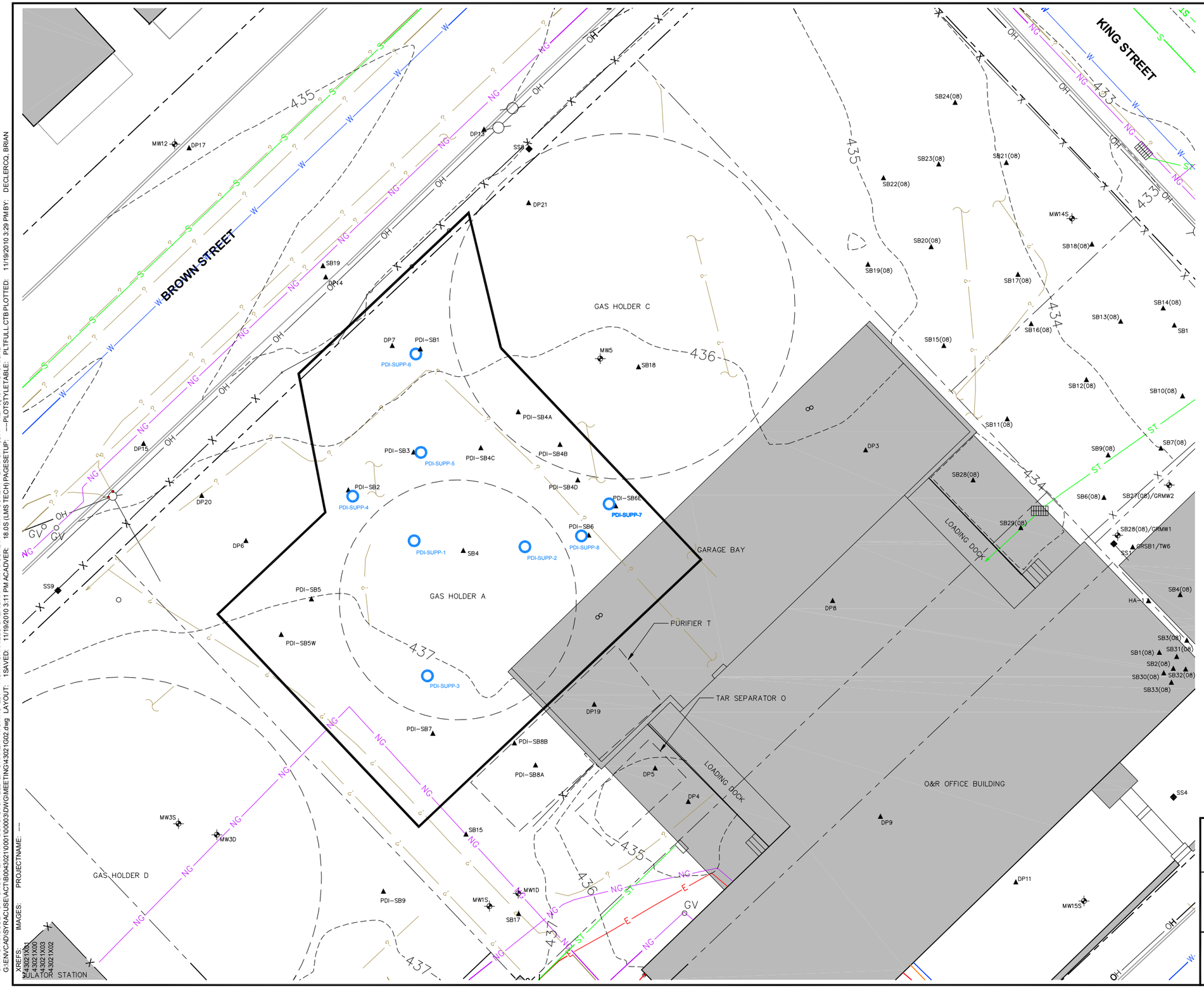

LEGEND:

- PROPERTY LINE
- 433 GROUND SURFACE CONTOUR (1–FOOT INTERVAL)
- EXISTING STRUCTURE/BUILDING
- APPROXIMATE LOCATION OF HISTORICAL SITE FEATURE
- X EXISTING CHAIN–LINK FENCE
- EXISTING WOOD FENCE
- OH OVERHEAD WIRES
- ? UNKNOWN/SUSPECTED UTILITY LINE
- E ELECTRICAL UTILITY LINE
- NG NATURAL GAS UTILITY LINE
- T TELEPHONE UTILITY LINE
- W WATER UTILITY LINE
- S SANITARY SEWER UTILITY LINE
- ST STORM SEWER UTILITY LINE
- SS4 EXISTING SURFACE SOIL SAMPLE LOCATION
- SB1 EXISTING SOIL BORING LOCATION
- PDI-SUPP-1 PROPOSED SOIL BORING LOCATION (SEE NOTE 3)
- MW5 EXISTING MONITORING WELL LOCATION
- HORIZONTAL LIMITS OF EXCAVATION FOR GAS HOLDER A

NOTES:

1. BASE MAP MODIFIED FROM DRAWINGS PORT_JERVIS_08.DWG AND FIG2–1_GW3–08.DWG PROVIDED BY AECOM AND BASED ON ELECTRONIC COPY OF SURVEY DRAWING NO. 100204, TITLED "SURVEY OF PROPERTY", DATED 03–25–10, PROVIDED BY BORBAS SURVEYING AND MAPPING, LLC.
2. HORIZONTAL DATUM IS THE NORTH AMERICAN DATUM OF 1983 (NAD 83); NEW YORK STATE PLANE EAST COORDINATE SYSTEM, IN U.S. SURVEY FEET. VERTICAL DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
3. A PIEZOMETER IS ANTICIPATED TO BE INSTALLED DURING SOIL BORING INSTALLATION ACTIVITIES OUTSIDE OF GAS HOLDER A.
4. ALL LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

0 10' 20'
GRAPHIC SCALE

PORT JERVIS FORMER MGP SITE
ORANGE AND ROCKLAND UTILITIES, INC.
PORT JERVIS, NEW YORK

PROPOSED SUPPLEMENTAL PDI ACTIVITIES

ARCADIS

FIGURE
1