April 5, 2019

**Andrew Zwack**
Assistant Engineer
New York State Department of Environmental Conservation
Division of Environmental Remediation – Region 9
270 Michigan Avenue
Buffalo, NY 14203-7226

RE: Vanadium Corporation of America Site No. 9320001
FILE: 1118/50443

Dear Mr. Zwack:

On behalf of National Grid and the New York Power Authority (NYPA), this letter details a Work Plan to install monitoring wells at the Vanadium Corporation of America Site (Vanadium Site); and includes a schedule to submit a revised Site Management Plan (SMP). O'Brien & Gere part of Ramboll (OBG) prepared a Work Plan dated January 16, 2019 which was submitted in response to your letter dated December 19, 2018. The New York State Department of Environmental Conservation (NYSDEC) provided comments on the January 16, 2019 Work Plan in a letter dated February 8, 2019 and during a telephone conversation on February 28, 2019. As requested by the NYSDEC, this version of the Work Plan incorporates the installation of three well clusters in the shallow and deep overburden (intermediate) water-bearing zones as well as the relocation of select shallow wells, where possible, outside the limits of the cap.

## BACKGROUND

As waste would remain on the site, NYSDEC's March 2006 Record of Decision (ROD) required a groundwater and a surface water monitoring program as an element of the selected remedy. Consistent with the ROD requirements, Conestoga Rovers & Associates (CRA) October 2010 100% Design Report, included an Operation, Maintenance and Monitoring Plan (OM&M Plan) as Appendix F. The OM&M Plan included a long-term environmental monitoring plan that consisted of monitoring groundwater quality and water levels at eight shallow well locations and collection and analysis of surface water samples from five locations. The selection of shallow wells rather than shallow, intermediate and bedrock (deep) wells was recommended by CRA based on the groundwater quality data collected during the Remedial Investigation (RI) which concluded that the deep overburden and bedrock groundwater was not impacted by site-related constituents (CRA, 2006). This plan is referenced in the Consent Order signed by the Department on February 2, 2011. The October 2010 CRA Design Report OM&M Plan is the basis for this Work Plan. In addition to wells installed in the shallow overburden aquifer as presented in the OM&M Plan, this Work Plan incorporates wells installed in the deep overburden (intermediate) aquifer at three locations.

## SITE CHARACTERISTICS

NYSDEC separated the approximately 150-acre Vanadium Site in the Town of Niagara, New York, into three Operable Units (OUs) to address environmental concerns. OU-3 consists of approximately 99 acres of the eastern portion of the Vanadium site. The Site is bounded on the north by an automobile depot and vacant property; on the west by Witmer Road (Route 31); on the east by Interstate 190; and on the south by vacant land and industrial facilities. The site also includes numerous high voltage electrical transmission towers owned by National Grid or NYPA, and associated overhead electrical transmission lines cross the Site.

The Remedial Investigation and Alternatives Analysis/Feasibility Study (RI/RAA/FS) Report dated March 2006 prepared by CRA identified four hydrogeologic units at the Site as follows: a shallow perched zone within the slag fill and upper portion of a glaciolacustrine silt and clay deposit; an intermediate zone within the deeper portion of the glaciolacustrine deposit that is characterized as a confining unit; a deep overburden water - bearing zone at the contact of the underlying glacial till and weathered bedrock surface; and the upper bedrock zone. Wells installed during the previous investigation were placed within three of the four units: shallow, deep overburden (intermediate) and upper bedrock. No wells were placed within the deeper glaciolacustrine deposits due to the low permeabilities and lack of water. Groundwater flow in the shallow zone prior to the remedial action was to the west, south and east and likely influenced by the perched conditions noted in the slag material which is more permeable than the underlying glaciolacustrine deposits. Surface water wetland areas and intermittently wet drainage ditches surrounded the mounded slag deposits.

The approved Remedial Design and subsequent construction included consolidation of impacted media (soil and sediment), grading, and covering the slag present at the site to prevent direct contact with the slag. The cover consists of an 18-inch barrier protection layer composed of common fill covered with a 6-inch vegetated topsoil layer. In select areas of the site (*e.g.* drainageways) the soil cover was underlain by a low-permeability geosynthetic clay liner (GCL) and, in some areas, a drainage net. In the areas around transmission towers and access ways, the topsoil was replaced with 6 inches of gravel. In areas where pull/crane pads were constructed, the cover consists of 12 inches of common fill and 12 inches of compacted aggregate underlain by a geotextile stabilization fabric. Monitoring wells used for the RI were abandoned as part of the construction activities. An updated site plan based on the construction as-built drawing is included as Figure 1.

## MONITORING WELL INSTALLATION

As discussed with NYSDEC, a groundwater monitoring network consisting of three 2-well clusters and 5 additional shallow wells will be installed. Some of the wells will be replacements for previous wells that were abandoned and will be designated with the same ID followed by an R. At the clusters, an intermediate well will be will be placed within the deep overburden unit and designated using the shallow well ID and an I. The wells to be installed are as follows:

| | Shallow | Intermediate |
|---|---|---|
| **Individual Wells** | MW-30 | |
| | MW-31 | |
| | MW-18R | |
| | MW-26R | |
| | MW-29R | |
| **Well Clusters** | MW-16R | MW-16RI |
| | MW-24R | MW-24RI |
| | MW-32 | MW-32I |

The approximate locations of these wells are shown on Figure 1. The actual locations of the wells will be established in the field based on accessibility for the drilling equipment.

The RI identified the source of contamination at the Site as the slag material. The primary contaminants in the slag material are chromium and hexavalent chromium and the slag has a high pH. As the purpose of the groundwater monitoring will be to assess the quality of potential impact to groundwater from constituents migrating from the slag, the wells to be installed in the shallow water-bearing zone will be screened in the upper portion of the glaciolacustrine deposit only. Where access does not allow for the placement of wells outside of the limits of the fill material, to the extent possible, the wells will be constructed to isolate the well screen from the overlying slag material.

The boring for the shallow and intermediate wells will be drilled using conventional hollow stem auger drilling methods. Soil samples will be collected continuously using split barrel sampling methods to the base of the boring. For the shallow wells the wells will screen the water table where possible. However, in those areas where the well will be installed through slag, the base of the boring will be approximately 8 to 10 feet below the base of the slag with the screen set within the upper glaciolacustrine deposit. For the intermediate wells the base of the boring will be completed to the top of bedrock and set to screen the glacial till, if present. These wells will be constructed of 2-inch diameter PVC with 5 feet of 10-slot screen and an appropriate length of solid riser casing to extend 2 to 3 feet above grade. A graded sand pack will be placed around the screen and extended approximately 1 foot above the top of the screen. A 2-foot thick bentonite seal will be placed on top of the sand and the remainder of the borehole will be filled with a bentonite/cement grout to just below the ground the surface. If necessary based on location, the well construction of the shallow wells will be adjusted to isolate the well from the overlying slag. A steel protective casing with locking cover will be placed over the PVC and cemented in place within a well pad. The drilling equipment will be steam-cleaned between completion of each well. Following installation, the well will be developed to remove fine grained material that may have entered the well during construction.

The Health and Safety Plan (HASP) used for the remedial construction will provide basic information pertaining to potential hazards associated with the materials and constituents of concern at the site. The HASP will be augmented with a Job Safety Analysis (JSA) that will include information specific to drilling and development of monitoring wells and identify work zone air monitoring requirements for particulates.

Investigation derived waste generated during the well installations and development will consist of drill cuttings and water generated during development and decontamination as well as used supplies and personal protective equipment (PPE). These materials will be segregated and placed into 55-gallon drums and staged on site. The materials will then be characterized and disposed off-site at a facility approved by both NYPA and National Grid.

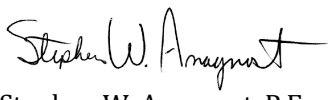
The well locations and elevations will be surveyed by a NY-State Licensed surveyor. The survey will be based on a NAD83 State Plane horizontal datum and NAVD88 vertical datum.

## SMP RESUBMISSION

NYSDEC's December 19, 2018 letter also requested a schedule for the submission of a revised SMP to include the specific parameters of the monitoring plan and to address the Department's previous comments provided in a letter dated June 13, 2018. To allow incorporation of the approved groundwater monitoring well network into the SMP, it is proposed that the revised SMP be submitted 30 days following approval of this Work Plan by the Department.

Should you have any questions or need further information, please do not hesitate to contact Brian Stearns of National Grid and Edward Holman of NYPA.

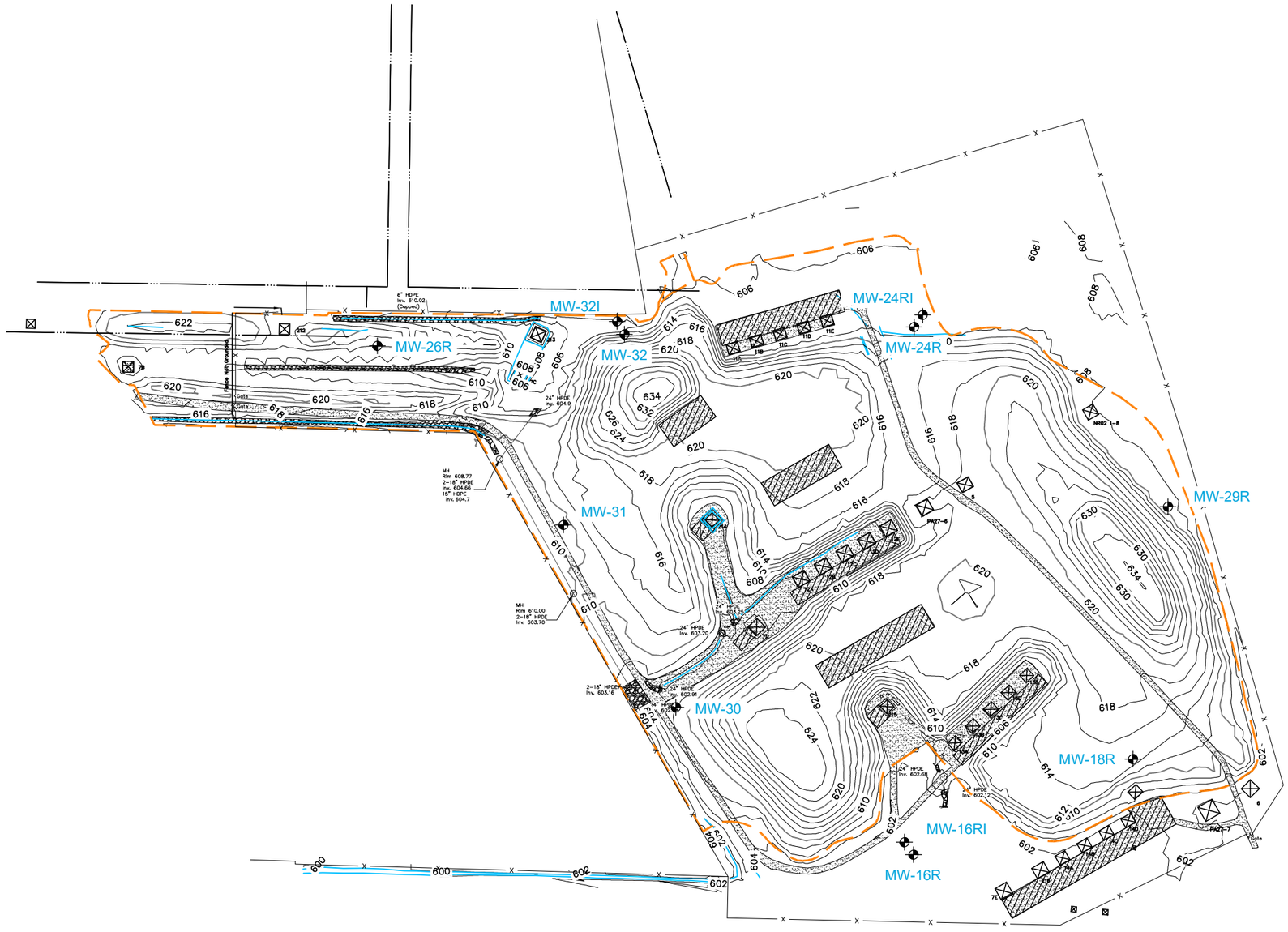
Very truly yours,
O'BRIEN & GERE, INC. OF NORTH AMERICA



Stephen W. Anagnost, P.E.
Senior Managing Engineer

Attachment

cc: Brian Stearns, P.E. – National Grid
Edward Holman – NYPA
Erika Cozza – NYPA
Deborah Wright, CPG – OBG

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## LEGEND

- MW-29R — PROPOSED MONITORING WELL
- UTILITY TOWER
- RIP-RAP
- GRAVEL ROAD/PULL PAD
- LIMITS OF CAP
- x — CHAIN LINK FENCE

VANADIUM CORPORATION
OF AMERICA
NIAGARA FALLS, NY

# MONITORING WELL LOCATION PLAN

300' 0 300'

FILE NO. 1168.50443
APRIL 2019

O'BRIEN & GERE ENGINEERS, INC.