Sarah Aldridge
Project Manager
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nationalgrid

April 26, 2018

VIA EMAIL: scott.deyette@dec.ny.gov

Mr. R. Scott Deyette
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau C, 11th Floor
625 Broadway
Albany, New York 12233-7014

RE: Site Characterization Addendum Work Plan
Kings County Former MGP Site
Brooklyn, New York
Site No. 224056
Index No. A2-0552-0606

Dear Mr. Deyette:

Pursuant to your letter on May 10, 2016, National Grid implemented the Site Characterization (SC) Addendum Work Plan to conduct additional field activities at the Kings County Former Manufactured Gas Plant (MGP) site (the Site). Visual impacts were observed at the proposed soil boring and step out locations. This work plan has been prepared by GEI Consultants, Inc., P.C. (GEI) on behalf of National Grid, to further delineate impacts at the Site. The Site and proposed sample locations are shown in Figure 1.

1.0 SCOPE OF WORK

Soil borings advanced as part of the SC and SC Addendum activities encountered tar-like non-aqueous phase liquid (NAPL) along the southern boundary of the former MGP footprint and south of the MGP property. In this SC Addendum Work Plan, the installation of soil borings and monitoring wells are proposed to further delineate impacts in subsurface soil as requested by NYSDEC.

Additional areas of delineation include:

1. Parcel 2 south of KC-SB-36, KC-SB-37, and KC-SB-38
2. West Side of Building B
3. East Side of Building A

The SC Addendum activities will be conducted in accordance with the *Site Characterization Work Plan, Kings County Former MGP Site* dated March 2011, including the Quality Assurance Project Plan (QAPP), Field Sampling Plan (FSP), Health and Safety Plan (HASP, updated 2017), and Community Air Monitoring Plan (CAMP) which will be implemented at the

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Site during intrusive field activities. The remainder of this letter describes the proposed soil borings and monitoring wells, as well as their analyses.

1.1 Soil Boring Installation

Nine soil borings (KC-SB-42 through KC-SB-50) are proposed as shown in Plate 1. If tar-like NAPL coating or saturation is observed within the borings west of Building B (KC-SB-48 through 50), a step out boring will be installed along the bulkhead. Table 1 contains sample descriptions, rationale, and analysis. Actual drilling locations will be determined based upon the subsurface utility clearance activities, permanent above ground structures, and property owner requirements. The borings will be installed with a sonic drill rig in accordance with drilling methods and procedures in the FSP and SC Work Plan. Each boring location will be hand cleared using hand tools or a vacuum truck to a depth of 5 feet, or 1 foot below the estimated depth of any nearby known utility, whichever is deeper.

Following the collection of subsurface soil samples, each soil boring will be abandoned by tremmie grouting the boring from the bottom of the boring to the top. Each sampling implement will be decontaminated in accordance with decontamination procedures described in the FSP. Soil cuttings and decontamination fluids will be contained within United States Department of Transportation (USDOT) 55-gallon drums and temporarily stored on-site for characterization and ultimate disposal at a National Grid-approved facility.

1.2 Soil Sampling

Soil samples will be collected and logged continuously from each boring. Soil borings will terminate at approximately 40 feet bgs. If tar-like NAPL is observed within the last 10 feet in a particular boring, then that boring(s) will be advanced to approximately 10 feet beyond observed tar-like NAPL.

Up to three soil samples per boring will be selected for chemical analysis. One sample will be collected from the top 5-feet of soil from the depth interval indicating the greatest degree of apparent contamination based upon photoionization detector (PID) measurements, and visual and olfactory observations. A second sample will be collected at the depth interval, deeper than 5 feet, indicating the greatest degree of contamination from the full vertical extent of the borehole. If no impacts are encountered the second and final sample will be collected at the water table interface. If tar-like NAPL is observed, a third sample will be collected beneath the observed impacts, or at the completion of the boring.

Each sample will be analyzed for:

- volatile organic compounds (VOCs) by the United States Environmental Protection Agency (EPA) Method 8260B
- semi-volatile organic compounds (SVOCs) by EPA Method 8270C

- target analyte list (TAL) metals by EPA Method 6000/7000 series
- free cyanide by EPA Method 9016
- alkylated PAHs by EPA method 8270D SIM and
- total petroleum hydrocarbon (TPH) by EPA method 8015C

One sample within the fill at each location will also be analyzed for:

- herbicides by EPA Method 8151A
- pesticides by EPA Method 8081A and
- polychlorinated biphenyls (PCBs) by EPA Method 8082
- tributyl tin (TBT) by ALS butyltin[1]

The sample collected from the interval indicating the greatest degree of apparent contamination, or the water table, will also be analyzed for:

- PCBs by EPA Method 8082 and
- TBT by ALS butyltin

Quality Assurance/Quality Control (QA/QC) samples will include blind duplicate soil samples, Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples, and equipment rinse blank samples. The quality control samples will be collected at on a frequency of 1 per 20 soil samples for all proposed analyses. Alpha Analytical, an approved New York State Environmental Laboratory Approval Program (ELAP) registered laboratory will perform the analyses. One trip blank will be included per shipment of samples to the laboratory.

1.3 Monitoring Well Installation

Two of the proposed soil borings (KC-SB-43 and KC-SB-48) will be completed as permanent monitoring wells to characterize groundwater quality and characteristics. If tar-like NAPL coating or saturation is observed within KC-SB-48, the well will be installed in the step out boring location. The proposed well locations are shown in Plate 1. Table 1 provides sample description, rationale, and analysis. The wells will be installed using rotosonic methods in accordance with drilling methods and procedures in the FSP.

Each proposed monitoring well will be screened in the shallow aquifer and will span the unsaturated/water table interface, extending approximately 2 feet above the water table. Each monitoring well will be constructed with a 10-foot length of 2-inch inner diameter (ID) 0.010 inch slotted monitoring well screen and finished with 2-inch ID poly vinyl chloride (PVC) riser pipe to the surface. If NAPL coating or saturation is observed within the soil boring, the well will include a 2-foot sump. The annular space between the borehole and well screen, plus 1 to 2 feet above the top of the screen, will be backfilled with chemically inert silica sand. A bentonite clay seal will be placed above the sand pack. The remaining annular space will be

[1] Tributyl Tin (TBT) analysis will be subcontracted by Battelle to ALS Environmental laboratory. TBT will be analyzed by an internally developed method.

filled to grade with cement/bentonite grout. Where possible, the bentonite seal will be a minimum of 24 inches thick, except in those instances where the top of the well screen is in close proximity to the ground surface. When the well screen is in close proximity to the ground surface the bentonite seal will be a minimum of 6-inches thick. The remainder of the annular space will be filled with a bentonite cement grout up to the ground surface. The grout will be tremmied from the bottom up to the top. The grout will be allowed to set for a minimum of 48 hours prior to developing the monitoring wells. The top of the casing will be finished using flush-mount casings with keyed-alike locks. A concrete surface pad will be sloped to channel water away from the well casing.

1.4 Monitoring Well Development

Development of the newly installed monitoring wells will be performed by alternately surging and pumping for a maximum of 1 hour or until the turbidity of the development water is less than 50 nephelometric turbidity units (NTUs) or until a maximum of 10 well volumes has been removed in accordance with the FSP. A field turbidity meter will be used to monitor NTU levels. Groundwater sampling will not be completed for at least two weeks following the development of the permanent monitoring wells.

1.5 Groundwater Sampling

Prior to sampling, two synoptic rounds of groundwater level measurements will be recorded for the existing and newly installed monitoring wells; the groundwater will be gauged at both the low and high tidal levels.

Groundwater samples will be collected from the newly installed monitoring wells using low flow groundwater sampling procedures and in accordance with the FSP. Each groundwater sample will be analyzed for VOCs by EPA Method 8260B, SVOCs by EPA Method 8270C, TAL metals by EPA Method 6000/7000 series, herbicides by EPA Method 8151A, pesticides by EPA Method 8081A, PCBs by EPA Method 8082 and, total cyanide by EPA Method 9012B. QA/QC samples will include blind duplicate water samples, MS/MSD samples, and equipment rinse blank samples. The quality control samples will be collected at on a frequency of 1 per 20 soil samples for all proposed analyses.

If a measurable thickness of NAPL accumulation is present in any well, then no groundwater sample will be collected. A sample of the NAPL, if present, will be collected and submitted for high resolution hydrocarbon fingerprint forensic analysis.

If measurable DNAPL tar is found in a well, then the tar will be bailed or pumped from the well and the volume of tar will be recorded. All DNAPL tar removed from a well will be containerized for disposal. The recovery rate of the DNAPL tar will be assessed through periodic measurements of DNAPL tar levels with an oil/water interface probe. DNAPL tar

levels in each monitoring well will be measured and recorded with the time of the measurement after the DNAPL tar has been removed. DNAPL tar measurements will be collected immediately following the removal of the DNAPL tar from a well, within 1 hour, and on the day following the removal of DNAPL tar from a well.

QA/QC procedures are detailed within the QAPP and will include one blind duplicate groundwater sample, a MS/MSD sample, and an equipment rinsate blank sample. An approved New York State ELAP laboratory will perform the analyses. One trip blank will be included per shipment of samples to the laboratory.

1.6 Survey

The sample locations will be surveyed by a New York State Licensed Land Surveyor. The coordinates and elevation of each sample location will be determined to ±0.01 foot. All locations and elevations will be tied to the New York State Plane Coordinate System and Mean Sea Level.

1.7 Data Validation and Management

Alpha Analytical and Battelle, approved New York State ELAP laboratories will provide New York State Category B data deliverables. The data will be validated in accordance with New York State Analytical Service Protocols (NYSASP) protocols.

The data validator will prepare a data usability report summarizing the adequacy of the analytical data obtained from the laboratory and discussing any pertinent data excursions or limitations on the use of the data.

2.0 REPORT PREPARATION

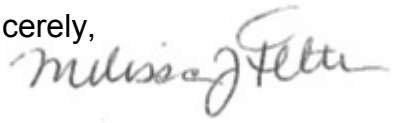
The information collected as part of this SC Addendum will be incorporated with that collected during the initial SC and presented in a SC Addendum Report. The SC Addendum Report will include SC Addendum findings, comparisons, and conclusions of SC Addendum findings relative to the initial SC, and recommendations for future steps.

3.0 SCHEDULE

Field activities can commence following NYSDEC and NYSDOH approval of this work plan, contractor availability, and access to private properties. Fieldwork is projected to last approximately two weeks. NYSDEC will be notified a minimum of 5 business days prior to the mobilization start date. Reporting will begin following the completion of field activities and is expected to be submitted to NYSDEC and NYSDOH six months after completion of fieldwork.

If you have any questions or require additional information, please feel free to contact me at (516) 545-2568 or by e-mail at sarah.aldridge@nationalgrid.com.

Sincerely,



for
Sarah Aldridge
Project Manager

Attachments

ec: A. Perretta, NYSDOH
F. Murphy, National Grid
M. Felter, GEI

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Table 1
Sample Descriptions, Rationale and Analysis
National Grid
Kings County Former MGP Site

Sample I.D.	Sample Location	Sample Rationale	Number of Samples			VOCs (EPA 8260)	SVOCs (EPA 8270)	TAL Metals (6000/7000)	Cyanide[1]	PCBs (EPA 8082)	TBT (ALS butlytin)	Herbicides (EPA 8151A)	Pesticides (EPA 8081A)	High Resolution Hydrocarbon Fingerprint
			Soil	Groundwater	NAPL									
KC-SB-42	1st Avenue	Soil boring to evaluate potential NAPL impacts to soils east of Building A.	Up to 3			X	X	X	X	X[2]	X[3]	X[4]	X[4]	
KC-SB-43/ KC-MW-11	1st Avenue	Soil boring and monitoring well to evaluate potential NAPL impacts to soils and groundwater east of Building A.	Up to 3	1		X	X	X	X	X[2]	X[3]	X[4]	X[4]	
KC-SB-44	5600 1st Avenue	Soil boring to evaluate potential NAPL impacts to soils along the southern property border.	Up to 3			X	X	X	X	X[2]	X[3]	X[4]	X[4]	
KC-SB-45	5600 1st Avenue	Soil boring and monitoring well to evaluate potential NAPL impacts to soils along the southern property border.	Up to 3			X	X	X	X	X[2]	X[3]	X[4]	X[4]	
KC-SB-46	5600 1st Avenue	Soil boring to evaluate potential NAPL impacts to soils along the southern property border.	Up to 3			X	X	X	X	X[2]	X[3]	X[4]	X[4]	
KC-SB-47	5600 1st Avenue	Soil boring to evaluate potential NAPL impacts to soils along the southern property border.	Up to 3			X	X	X	X	X[2]	X[3]	X[4]	X[4]	
KC-SB-48/ KC-MW-12[5]	5600 1st Avenue	Soil boring and monitoring well to evaluate potential NAPL impacts to soils and groundwater west of Building B.	Up to 3	1		X	X	X	X	X[2]	X[3]	X[4]	X[4]	
KC-SB-49	5600 1st Avenue	Soil boring and monitoring well to evaluate potential NAPL impacts to soils and groundwater west of Building B.	Up to 3			X	X	X	X	X[2]	X[3]	X[4]	X[4]	
KC-SB-50	5600 1st Avenue	Soil boring and monitoring well to evaluate potential NAPL impacts to soils and groundwater west of Building B.	Up to 3			X	X	X	X	X[2]	X[3]	X[4]	X[4]	

Notes:

Chemical analysis test methods specified are from U.S. EPA SW-846 test methods
NAPL - Non-Aqueous Phase Liquid
EPA - Environmental Protection Agency
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
TAL - Target Analyte List
PCB - Polychlorinated Biphenyls

[1]-Soils will be analyzed by Free Cyanide (EPA Method 9016) and water will be analyzed for Total Cyanide (EPA Method 9012)
[2]-One soil sample from within the fill, one soil sample from the greatest degree of apparent contamination or from the water table interface, and all groundwater samples
[3]-One soil sample from within the fill and one soil sample from the greatest degree of apparent contamination or from the water table interface
[4]-One sample from within the fill in each soil boring and all groundwater samples
[5]-If tar-like NAPL coating or saturation is observed within KC-SB-32, the well will be installed in the furthest step out boring location.

LEGEND

- APPROXIMATE CURRENT PROPERTY BOUNDARY
- APPROXIMATE BOUNDARY OF FORMER MANUFACTURED GAS PLANT (MGP) SITE
- APPROXIMATE SHORELINE (1880)
- HISTORIC MGP STRUCTURE
- HISTORIC STRUCTURE
- DISTRIBUTION OF LNAPL BASED ON DECEMBER 2013 ARCADIS SUPPLEMENTAL INVESTIGATION REPORT (DASHED WHERE INFERRED)

PROPOSED SITE CHARACTERIZATION ADDENDUM (SCA) SAMPLES

- KC-SB-43/ KC-MW-11 — PROPOSED SOIL BORING WITH MONITORING WELL
- KC-SB-39 — PROPOSED SOIL BORING

SITE CHARACTERIZATION ADDENDUM (SCA) SAMPLES

- KC-SB-27/ KC-MW-8 — SOIL BORING WITH MONITORING WELL
- KC-SB-24 — SOIL BORING

SITE CHARACTERIZATION (SC) SAMPLES

- KC-SB-01/ KC-MW-01 — SOIL BORING WITH MONITORING WELL
- KC-SB-03 — SOIL BORING
- KC-SB-06/ KC-GW-01 — SOIL BORING WITH TEMPORARY GROUNDWATER SAMPLE

NARROWS GENERATING STATION PREVIOUS INVESTIGATION SAMPLES

- MW-1 — MONITORING WELL LOCATION
- SB-2/MW-16 — SOIL BORING / MONITORING WELL
- SB-1 — SOIL BORING
- P2 — PIEZOMETER
- MT-1 — MOUNTED TANK MANWAY

NOTES:

1. UNDERGROUND STORAGE TANK (UST) LOCATIONS ADJACENT TO BUILDINGS A AND B ARE APPROXIMATE.
2. IF TAR-LIKE NAPL COATING OR SATURATION IS OBSERVED WITHIN KC-SB-32, THE WELL WILL BE INSTALLED IN THE FURTHEST STEP OUT BORING LOCATION.

SOURCES:

1. PHOTOGRAPH OBTAINED FROM BLUE SKY INTERNATIONAL LTD. ALL RIGHTS RESERVED. COPYRIGHT 2007.
2. SANBORN FIRE INSURANCE MAPS (1887 THROUGH 2007).
3. NEW YORK CITY OPEN ACCESSIBLE SPACE INFORMATION SYSTEM http://www.oasisnyc.net, ACCESSED OCTOBER 7, 2010.
4. PREVIOUS INVESTIGATION SAMPLE LOCATIONS FROM: *DRAFT SUPPLEMENTAL INVESTIGATION DATA SUMMARY, NARROWS GENERATING STATION, ASTORIA GENERATING COMPANY, L.P.,* PREPARED BY ARCADIS OF NEW YORK, INC., DECEMBER 2013.
5. HISTORIC SHORELINE FROM: LIONEL PINCUS AND PRINCESS FIRYAL MAP DIVISION, THE NEW YORK PUBLIC LIBRARY. (1880). VOL. 4. PLATE, P. [MAP BOUND BY FIFTY-SECOND, FOURTH AVE., CITY LINE, GOWANUS BAY, INCLUDING FIFTY-THIRD ST., FIFTY-FOURTH ST., FIFTY-FIFTH ST., FIFTY-SIXTH ST., FIFTY-SEVENTH ST., FIFTY-EIGHTH ST., FIFTY-NINTH ST., FIRST AVE., SECOND AVE., THIRD AVE.] ACCESSED FROM: *http://digitalcollections.nypl.org/items/510d47e4-4192-a3d9-e040-e00a18064a99*
6. NAPL DISTRIBUTION FROM FIGURE 10: *LNAPL DISTRIBUTION,* SUPPLEMENTAL INVESTIGATION, ASTORIA GENERATING COMPANY, L.P., NARROWS GENERATING STATION, BROOKLYN, NY, PREPARED BY ARCADIS, SCALE: 1" = 150', DATE: 11/2013.
7. UST LOCATIONS ADJACENT TO BUILDINGS A AND B FROM FIG 2: *GEOPROBE LOCATIONS,* PREPARED BY LAW ENVIRONMENTAL, NO SCALE LISTED, DATE: 6/27/94.

0 60' 120'
SCALE: 1" = 60'

Site Characterization Addendum Work Plan
Kings County Former MGP Site
Brooklyn, New York

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PROPOSED SAMPLE LOCATIONS

Project 103910 | April 2018 | Plate 1

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