First Half 2018
Semi-Annual Groundwater Monitoring Report
Patchogue Former MGP Site
NYSDEC Site No. 1-52-182
Village of Patchogue, Suffolk County, New York

Prepared for
National Grid USA
Hicksville, New York
September 2018

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Project Number: 149322.780.004

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Section 1

Introduction

This Semi-Annual Groundwater Monitoring Report documents the implementation and summarizes the results of the groundwater monitoring activities conducted during the first half of 2018 at the Patchogue Former Manufactured Gas Plant (MGP) Site (hereinafter referred to as the "Site"). The groundwater monitoring activities included the performance of the water level measurements, non-aqueous phase liquid (NAPL) gauging and groundwater sampling activities.

The groundwater monitoring event and the preparation of this report are part of the semi-annual routine groundwater monitoring program being conducted at the Site. This report has been prepared for submittal to the New York State Department of Environmental Conservation (NYSDEC) and includes the following:

- Description of the scope of the field activities, methods and procedures;
- Table summarizing the results of the water level measurements and the gauging for the presence of NAPL in the monitoring wells and piezometers (see Table 1);
- Table summarizing the analytical results for the groundwater samples obtained during the June 2018 monitoring event including a comparison to the applicable groundwater quality criteria (see Table 2);
- Comparison of data from this monitoring period to data from historical monitoring events (Tables 3 and 4);
- Discussion of the results and findings from the groundwater monitoring data;
- A water table elevation contour map depicting the generalized direction of groundwater flow based on groundwater elevation data obtained from monitoring wells and piezometers, as well as surface water elevation data obtained from a staff gauge installed in the Patchogue River (Figure 1);
- Field Sampling Data Sheets (Appendix A);
- Laboratory Data Report (Appendix B);
- Data Usability Summary Report (Appendix C); and
- Electronic Data Deliverable (Appendix D).

1.1 Background

Groundwater monitoring events have been conducted at the Site since March 2008 including two monitoring events conducted as part of the remedial investigation (RI) in March 2008 and July 2008. The groundwater monitoring event conducted in June 2018 is the subject of this report. The results of previous monitoring events have had, in general, consistent concentrations and areal distribution of constituents in groundwater. Prior to the March 2010 groundwater monitoring event, site-related dissolved phase constituents [e.g., benzene, toluene, ethylbenzene, isomers of xylene (BTEX) and polycyclic aromatic hydrocarbons (PAHs)] were detected at concentrations above the Class GA groundwater quality criteria [i.e., standards from the 6 NYCRR Part 703 Standards and guidance values from the Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1] in a limited area near the center of the Site. These elevated concentrations did not extend downgradient to the wells closer to the Patchogue River. However, during the March 2010 and September 2010 monitoring events, detections of BTEX and PAH compounds were more widely distributed than during previous

events. It was surmised that this change was the result of a temporary dewatering operation at a construction project conducted by the Village of Patchogue at their wastewater treatment facility (WWTF) located directly across the river (east-southeast) from the Site. Based on the understanding of Site conditions, it was anticipated that when the dewatering operations had ceased, contaminant concentrations in groundwater would re-equilibrate with steady-state (i.e., pre-dewatering) groundwater flow conditions, and eventually return to levels similar to those prior to dewatering. To confirm this, National Grid increased the frequency of the groundwater monitoring from semi-annually to quarterly. The subsequent six quarterly monitoring events documented the return of groundwater flow and groundwater quality to conditions consistent with those prior to the dewatering operations.

Based on this finding, in a May 24, 2012 email, National Grid proposed to the NYSDEC that the frequency of groundwater sampling and analysis return to a semi-annual basis with the schedule for water level monitoring and NAPL gauging remaining on a quarterly basis. NYSDEC agreed with this proposal. Collection of NAPL gauging and water level data remained on a quarterly schedule to provide additional water level data from the piezometers that had been installed in the first half of 2012 in support of the Pre-Remedial Design Investigation. Subsequently, in an October 8, 2013 letter to the NYSDEC, National Grid proposed that that the frequency of all components of the groundwater monitoring program (i.e., water level measurements, NAPL gauging and groundwater sampling) be returned to the semi-annual schedule. This proposal was made because the data from the water level measurements and NAPL gauging, including data from the newer piezometers, continued to indicate very consistent findings from quarter to quarter and confirmed the understanding of groundwater flow conditions and NAPL occurrence at the Site. The NYSDEC concurred with this proposal in a December 9, 2013 email.

Section 2

Scope of Work

Field activities for the first half 2018 groundwater monitoring were conducted by Brown and Caldwell Associates (BC) on June 26th and 27th, 2018. The activities conducted during this monitoring event are described below. Locations of the monitoring wells, piezometers and staff gauges referenced below are depicted on Figure 1.

Prior to groundwater sampling, water level measurements and NAPL gauging was performed in the piezometers and monitoring wells associated with the Site. The level of the Patchogue River was measured at one of the two staff gauges (no measurement was made at staff gauge SG-1 due to vegetative overgrowth inhibiting access to the staff gauge location for this monitoring event). Water level measurements and NAPL gauging were conducted using an electronic oil/water interface probe; measurements were made to the nearest 0.01 foot. At the locations where NAPL was detected using the oil/water interface probe, a 3-foot long threaded rod attached to a nylon mason line was lowered into the monitoring well or piezometer to confirm the presence of the NAPL. The threaded rod was lowered to the bottom of the monitoring well to measure the approximate thickness of the NAPL accumulation.

Groundwater sampling was conducted at 11 monitoring wells following the water level and NAPL gauging activities. Monitoring well MW-5 was not sampled during this monitoring period due to the presence of NAPL in this well. The presence of NAPL in this well is consistent with observations during previous gauging activities. The standard protocol is that if NAPL is observed in a well during gauging or sampling, groundwater samples are not submitted for laboratory analyses. Indications of NAPL have been observed on several occasions in MW-6, with sporadic blebs of NAPL observed as recently as the June 2017 monitoring event; however, no NAPL was observed in MW-6 during the December 2017 and the June 2018 gauging activities and thus, a field decision was made to purge and sample MW-6 in June. Groundwater sampling was conducted using low flow purging and sampling techniques in accordance with the United States Environmental Protection Agency (USEPA) protocol (USEPA, July 1996, Revised January 2010). Samples were submitted to Eurofins Lancaster Laboratories Environmental (Lancaster) located in Lancaster, Pennsylvania. Lancaster is certified (Certification No. 10670) through the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP).

The groundwater samples were analyzed for: BTEX compounds and methyl tertiary-butyl ether (MTBE) using USEPA SW-846 Method 8260B; and PAHs using USEPA SW-846 Method 8270D. The selective ion monitoring (SIM) component of the 8270 analysis was also performed on the samples to obtain lower detection limits for certain PAH compounds. The groundwater samples were also analyzed in the field for pH, specific conductivity, temperature, turbidity, oxidation-reduction potential, and dissolved oxygen (see Appendix A for field data sheets).

The laboratory report from Lancaster is provided in Appendix B. Laboratory analytical data were provided to BC in electronic form by Lancaster and have been incorporated into the environmental database maintained by BC for the Site.

In addition to the samples described above, quality assurance/quality control (QA/QC) samples were also collected. The QA/QC samples included: trip blanks (one per cooler containing samples for BTEX and MTBE analysis), a field duplicate, and an equipment blank. Also, extra sample volume was collected

from one location to provide for matrix spike/matrix spike duplicate (MS/MSD) analysis. The trip blank sample was analyzed for BTEX and MTBE only. The other QA/QC samples were analyzed for BTEX, MTBE, and PAHs.

Laboratory results for the groundwater sample analyses were forwarded to a data validator, Meridian Consultant Group, Inc. of Annapolis, Maryland, for review and preparation of a Data Usability Summary Report (DUSR). The DUSR presents a summary of data usability including a discussion of qualified data. The DUSR is provided as Appendix C. As described in the DUSR, the data were considered by the validator to be valid and usable. An Electronic Data Deliverable (EDD) of the validated analytical data, prepared in accordance with NYSDEC requirements, is provided in Appendix D.

Section 3

Results and Findings

3.1 Water Level Data

Table 1 provides the water level data and calculated water elevations from the June 26, 2018 measurements. Figure 1 illustrates the elevation contours of the water table based on these data. The contours were developed using water level elevation data from the shallow monitoring wells and shallow piezometers at the Site (i.e., those with screens that straddle, or are just below, the water table) and one of the two surface water staff gauges (SG-2) in the Patchogue River. The surface water level was not measured at SG-1 due to vegetative overgrowth inhibiting access to staff gauge location. The accessibility of SG-1 will be reevaluated during the next groundwater monitoring event (planned for December 2018) and if this location continues to be considered inaccessible, then the staff gauge will no longer be maintained as a surface water elevation control point for subsequent monitoring events. The water level elevations used for contouring are representative of water table elevations at the Site. The groundwater elevation (hydraulic head) values for the wells and piezometers screened in deeper intervals are also posted for reference on Figure 1. The water table is relatively shallow and is typically positioned in the fill that overlies the native alluvial deposits and outwash deposits. The water table contours indicate that lateral groundwater flow is from northwest to southeast across the Site toward the Patchogue River. Comparisons of the groundwater elevations in the monitoring wells to the river elevation, as measured at the staff gauges, demonstrate that groundwater elevations are higher than the river level indicating that groundwater is discharging to the Patchogue River. The upward vertical hydraulic gradient measured at well pairs adjacent to the river (well pairs MW-4S and MW-4D, and MW-9S and MW-9D) is indicative of a discharge area and provides further support to the conclusion that groundwater is discharging to the Patchogue River. The general configuration of the water table contours, developed using the June 26, 2018 data, and the interpreted groundwater flow patterns are consistent with those from previous rounds of water level measurements with one exception. The exception occurred during the March 2010 sampling event when the large-scale dewatering activities were being conducted on the WWTF site located east of the Site on the opposite side of the river (see discussion in Section 1.1). Operation of this dewatering system temporarily altered groundwater flow patterns and levels at the Site (see "Groundwater Monitoring Report, Second Semiannual 2010 Sampling Event" [GEI, November 2010]).

3.2 NAPL Gauging

Table 1 presents the results of the NAPL gauging conducted in the monitoring wells and piezometers associated with the Site during the June 2018 groundwater monitoring event. NAPL was identified in MW-5 during the June 2018 gauging activities. Specifically, NAPL with a strong mothball-like odor was observed on the lower 0.3 feet of the threaded rod used to gauge the bottom of the well. NAPL has been observed in MW-5 during previous gauging events. No other visible indications of impact were observed during the June 2018 gauging activities.

3.3 Groundwater Quality Data

Table 2 provides the results of the laboratory analyses of the groundwater samples collected during the June 2018 monitoring event and a comparison of the data to the New York State Class GA groundwater quality criteria. Comparisons of total BTEX and total PAH concentrations from this sampling event to previous sampling events are provided as Tables 3 and 4, respectively.

As previously stated, NAPL was identified in one of the 12 monitoring wells (MW-5) associated with the Site. This well is located in the central part of the Site in the area of former MGP operations (refer to Figure 1). As discussed in Section 2, because MW-5 contained NAPL, groundwater samples were not collected from this location. Groundwater samples were collected from the remaining 11 monitoring wells and submitted to the laboratory for analysis.

The constituent concentrations in groundwater samples collected during the June 2018 monitoring event are consistent with those measured during previous monitoring events. No MTBE or BTEX compounds were detected at any of the 11 monitoring wells sampled during the June 2018 monitoring event.

Several PAH compounds were detected in samples collected from MW-6 at concentrations above the Class GA groundwater quality criteria during the June 2018 monitoring event. This well is located within the source area where NAPL is frequently encountered in the soil and which is the target of the planned remedial action as described in the "Remedial Design Report (90-95% Submission), Patchogue Former MGP Site" (BC, February 2018). PAH compounds were also detected in samples collected from monitoring wells MW-3, MW-4S, MW-7S, MW-8S, MW-8D, MW-9S, and MW-9D at low concentrations (i.e., at or slightly above the laboratory method detection limit) above the Class GA groundwater quality criteria during the June 2018 monitoring event. The PAH compounds that were identified in the groundwater samples from these sampling locations at concentrations above the Class GA groundwater quality criteria include one or more of the following six compounds: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene. These PAH compounds have very low aqueous solubilities, are not readily mobile in groundwater, and are unlikely to have migrated from the on-site source area. The criteria that were exceeded for five of these six PAHs are unpromulgated guidance values rather than 6 NYCRR Part 703 standards. The criteria for the sixth PAH, benzo(a)pyrene, is a Part 703 standard. The standard for benzo(a)pyrene is "non-detect" and the guidance value for the other four PAHs, 0.002 µg/L, is approximately an order of magnitude below the method detection limit. Therefore, any detection of these compounds in groundwater will result in an exceedance. Aside from the concentrations observed in samples collected from MW-6, which are likely associated with dissolved-phase MGP-related impacts, the detection of these constituents in the other monitoring locations is likely related to the disturbance of fine or colloid sized particles during purging or sampling activities. These particles are derived from within the well or the soil adjacent to the well that become suspended into the water column of the well as a result of disturbance during purging and sampling activities. The concentrations of these constituents will be further evaluated through continued semi-annual groundwater monitoring.

Section 4

Summary and Conclusions

As noted in previous monitoring events, NAPL was identified in one of the monitoring wells (MW-5) during the June 2018 event. MW-5 is located in the center of the Site in the area of former MGP operations where NAPL has been identified in the soil; this area will be addressed by planned future remedial action as described in the "Remedial Design Report (90-95% Submission), Patchogue Former MGP Site" (BC, February 2018).

No MTBE or BTEX compounds were detected in groundwater samples from the 11 monitoring wells sampled during the June 2018 monitoring event.

Several PAH compounds were detected in samples collected from MW-6 at concentrations above the Class GA groundwater quality criteria during the June 2018 monitoring event. The PAH concentrations observed at MW-6 are likely associated with dissolved-phase MGP-related impacts, as NAPL has been observed in this well during previous NAPL gauging activities. At MW-3, MW-4S, MW-7S, MW-8S, MW-8D, MW-9S, and MW-9D, one or more PAH compounds were detected at low concentrations (i.e., at or slightly above the laboratory method detection limit) above the Class GA groundwater quality criteria during the June 2018 monitoring event. The detected PAH compounds have very low aqueous solubilities, are not readily mobile in groundwater and are unlikely to have migrated from the on-site source area. In addition, the criteria that were exceeded for five of the six detected PAHs are unpromulgated guidance values rather than Part 703 standards. The criteria for these compounds are extremely low, approximately an order of magnitude below the laboratory method detection limit. Therefore, any detection of these compounds in groundwater will result in an exceedance. This will continue to be evaluated through subsequent semi-annual groundwater monitoring.

Section 5

References

Brown and Caldwell Associates, February 2018, Remedial Design Report (90-95% Submission), Patchogue Former MGP Site, Village of Patchogue, Suffolk County, New York, Site ID No. 1-52-182.

Brown and Caldwell Associates, December 2012, Construction Completion Report Utility Corridor Work Plan Implementation, Patchogue Former MGP Site, Village of Patchogue, Suffolk County, New York, Site ID No. 1-52-182.

GEI, November 2010. Groundwater Monitoring Report, Second Semiannual 2010 Sampling Event, Patchogue Former MGP Site, Town of Brookhaven, Suffolk County, Long Island, New York, Site ID No. 1-52-182.

USEPA, July 1996; Revised January 2010. Low-Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells.

Tables

TABLE 1
WATER ELEVATIONS AND NAPL MONITORING DATA
FIRST HALF 2018 SEMI-ANNUAL GROUNDWATER MONITORING EVENT
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

		6/26/2018				
Location ID	Top of Casing Elevation [(a)] (ft., NAVD)	Depth to Water (ft., BTOC)	Water Elevation (ft., NAVD)	Depth to NAPL (ft., BTOC)	Total Depth of Well (ft., BTOC)	Remarks
MW-1	11.47	5.80	5.67	NI	15.20	Slight mothball-like odor observed on oil/water interface probe.
MW-3	5.56	2.28	3.28	NI	10.40	
MW-4S	7.97	5.00	2.97	NI	12.28	
MW-4D	7.79	4.78	3.01	NI	26.65	
MW-5	8.66	4.60	4.06	16.40	16.70	NAPL with a strong mothball-like odor observed on the lower 0.3 feet of the threaded rod.
MW-6	5.03	0.38	4.65	NI	18.45	Mothball-like odor observed on oil/water interface probe.
MW-7S	8.45	4.43	4.02	NI	12.41	
MW-7D	8.31	4.28	4.03	NI	28.05	
MW-8S	5.08	0.79	4.29	NI	9.90	Soft bottom.
MW-8D	4.98	0.70	4.28	NI	25.10	
MW-9S	4.47	1.50	2.97	NI	10.22	
MW-9D	4.66	1.40	3.26	NI	22.98	
PZ-1A	8.05	3.56	4.49	NI	9.92	
PZ-1B	8.91	4.49	4.42	NI	22.45	
PZ-2A	8.77	4.43	4.34	NI	8.04	
PZ-2B	8.29	3.86	4.43	NI	18.01	Slight mothball-like odor observed on oil/water interface probe.
PZ-3A	8.78	4.98	3.80	NI	8.95	Soft bottom, moderate mothball-like odor observed on oil/water interface probe.
PZ-3B	8.90	5.11	3.79	NI	21.21	
PZ-4A	4.79	1.75	3.04	NI	4.89	
SG-1	5.23	NM	--	NI	NA	Not measured due to vegetative overgrowth inhibiting access to staff gauge location.
SG-2	5.17	3.77	1.40	NI	NA	

Notes:
NAVD - North American Vertical Datum 1988
ft. - Feet
ppm - parts per million
BGS - Below Ground Surface
BTOC - Below Top of Casing
NAPL - Non-Aqueous Phase Liquid
PID - Photoionization Detector
PVC - Polyvinyl chloride
NA - Not Applicable
NI - NAPL not Indicated by Oil/Water Interface Probe
NM - Not measured
MW - monitoring well
PZ - piezometer
SG - staff gauge
(a) - Monitoring wells resurveyed on 7/3/12 following utility corridor construction activities. See "Construction Completion Report, Utility Corridor Work Plan Implementation" (Brown and Caldwell, December 2012). Above ground casing at MW-5 was lowered during utility corridor construction activities and was resurveyed in September 2015.

TABLE 2
GROUNDWATER ANALYSIS RESULTS
FIRST HALF 2018 SEMI-ANNUAL GROUNDWATER MONITORING EVENT
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Constituent	Class GA Groundwater Criteria TOGS 1.1.1 Guidance	NYS Part 703 Standard	Units	Loc ID Date	MW-1 6/26/2018	MW-3 6/27/2018	MW-4S 6/27/2018	MW-4D 6/27/2018	MW-6 6/27/2018	MW-7S 6/26/2018	MW-7D 6/26/2018	MW-8S 6/26/2018	MW-8S DUP 6/26/2018	MW-8D 6/26/2018	MW-9S 6/27/2018	MW-9D 6/27/2018
Volatile Organic Compounds (VOCs)																
BTEX Compounds																
Benzene	NE	1	µg/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	NE	5	µg/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	NE	5	µg/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylenes, Total	NE	NE	µg/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Total BTEX[(a)]	NE	NE	µg/L		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Other VOCs																
Methyl Tertiary Butyl Ether	10	NE	µg/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Semi-Volatile Organic Compounds (SVOCs)																
Polycyclic Aromatic Hydrocarbons (PAHs)																
Acenaphthene	20	NE	µg/L		0.01 U	0.01 J	0.01 J	0.01 U	0.60	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.07	0.01 J
Acenaphthylene	NE	NE	µg/L		0.01 U	2.0	0.80	0.01 J	5.0	0.01 U	0.01 J	0.01 U	0.01 U	0.02 J	2.0	0.10
Anthracene	50	NE	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	7.0	0.01 U	0.01 U	0.01 U	0.01 U	0.01 J	0.40	0.04 J
Benzo(a)anthracene	0.002	NE	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	**6.0**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.30**	**0.04 J**
Benzo(a)pyrene	NE	0	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	**7.0**	0.01 U	0.01 U	0.01 U	0.01 U	**0.02 J**	**0.60**	**0.06**
Benzo(b)fluoranthene	0.002	NE	µg/L		0.01 U	**1.00**	**0.03 J**	0.01 U	**2.0**	0.01 U	0.01 U	0.01 U	0.01 U	**0.02 J**	**1.0**	**0.07**
Benzo(g,h,i)perylene	NE	NE	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	3.0	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.20	0.02 J
Benzo(k)fluoranthene	0.002	NE	µg/L		0.01 U	0.01 U	**0.05**	0.01 U	**3.0**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.10**	0.01 U
Chrysene	0.002	NE	µg/L		0.01 U	**0.03 J**	0.01 U	0.01 U	**4.0**	0.01 U	0.01 U	0.01 U	0.01 U	**0.01 J**	**0.50**	**0.05 J**
Dibenzo(a,h)anthracene	NE	NE	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	10	0.01 U	0.01 U	0.01 U	0.01 U	0.01 J	0.60	0.05 J
Fluoranthene	50	NE	µg/L		0.02 U	0.02 U	0.02 U	0.02 U	1.0	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.07 J	0.02 U
Fluorene	50	NE	µg/L		0.01 U	0.04 J	0.01 U	0.01 U	3.0	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.60	0.04 J
Indeno(1,2,3-cd)pyrene	0.002	NE	µg/L		0.01 U	0.01 U	**0.10**	0.01 U	**0.30**	**0.02 J**	0.01 U	**0.08**	**0.08**	0.01 U	**0.50**	0.01 U
Naphthalene	10	NE	µg/L		0.03 U	0.03 U	0.03 U	0.03 U	0.40	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.20	0.05 J
Phenanthrene	50	NE	µg/L		0.01 U	0.01 U	0.02 J	0.01 U	0.60	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.20	0.02 J
Pyrene	50	NE	µg/L		0.03 U	0.03 U	0.05 J	0.03 U	0.08	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.10	0.03 U
Total PAHs[(b)]	NE	NE	µg/L		ND	3.1 J	1.1 J	0.01 J	53	0.02 J	0.01 J	0.08	0.08	0.09 J	7.4 J	0.55 J

Notes:
BTEX - benzene, toluene, ethylbenzene and isomers of xylene.
U - The analyte was analyzed for, but was not detected above the sample reporting limit. Value shown is representative of method detection limit for the analyzed constituent.
J - Estimated concentration. The result is below the reporting limit but above the method detection limit.
µg/L - micrograms per liter
ND - Not detected.
NE - Not established.
(a) - To calculate total BTEX concentration, a value of zero is used for non-detect values.
(b) - To calculate total PAH concentration, a value of zero is used for non-detect values.

Boxed concentrations are above New York State Class GA Groundwater Quality Criteria (Standards or Guidance values).

TABLE 3
SUMMARY OF HISTORICAL BTEX CONCENTRATIONS
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Sampling Date	Total BTEX Concentrations (µg/L) [a]														
	Monitoring Well/Piezometer														
	MW-1	MW-2S	MW-2D	MW-3	MW-4S	MW-4D	MW-5	MW-6	MW-7S	MW-7D	MW-8S	MW-8D	MW-9S	MW-9D	PZ-4A
Mar-08	0	0	0	0	3.4	0	1016	57	NS	NS	NS	NS	NS	NS	NI
Jul-08	NS	0	0	0	0	0	678	0	0	0	0	0	0	0	NI
Mar-09	0	0	0	0	0	0	975	0	0	1	0	0	0	0	NI
Sep-09	0	0	0	0	0	0	1257	1	0	0	0	0	0	0	NI
Mar-10	0	0	0	0	0	0	637	2	0	9	0	0	0	0	NI
Sep-10	0	0	0	0	0	0	NS	0	0	0	0	0	27	0	NI
Jan-11	1.7	0	0	0	0	0	NS	NS	0	0	0	0	1	0	NI
Apr-11	0	0	0	0	0	0	NS	NS	0	0	0	0	0	0	NI
Aug-11	0	0	0	0	0	0	NS	NS	0	0	0	0	0	0	NI
Nov-11	0	0	0	0	0	0	NS	NS	0	0	0	0	0	0	NI
Feb-12	0	0	0	0	0	0	NS	NS	0	0	0	0	0	0	NI
May-12	0	0	0	0	0	0	NS	NS	0	0	0	0	0	0	NI
Nov-12	0	-- [b]	-- [a]	0	12	0	NS	NS	1	0	0	0	NS	NS	NI
Jun-13	0	-- [b]	-- [b]	0	0.8	0	NS	NS	0.7	0	0	0	0	NS	NI
Dec-13	0	-- [b]	-- [b]	NS	0	0	NS	NS	0.8	0	0	0	NS	NS	NI
Jun-14	0	-- [b]	-- [b]	0	0	0	NS	NS	0.8	0	0	0	NS	NS	0
Dec-14	0	-- [b]	-- [b]	0	0	0	NS	NS	1.3	0	0	0	0	0	NS
Jun-15	0	-- [b]	-- [b]	0	0	0	NS	NS	0	0	0	0	0	0	NS
Dec-15	0	-- [b]	-- [b]	0	0	0	NS	NS	0.5	0	0	0	0	0	NS
Jun-16	0	-- [b]	-- [b]	0	0	0	NS	NS	0	0	0	0	0	0	NS
Dec-16	0	-- [b]	-- [b]	0	0	0	NS	NS	0	0	0	0	0	0	NS
Jun-17	0	-- [b]	-- [b]	0	0	0	NS	NS	0	0	0	0	0	0	NS
Dec-17	0	-- [b]	-- [b]	0	0	0	NS	NS	0	0	0	0	0	0	NS
Jun-18	0	-- [b]	-- [b]	0	0	0	NS	0	0	0	0	0	0	0	NS
Minimum	0	0	0	0	0	0	637	0	0	0	0	0	0	0	0
Maximum	1.7	0	0	0	12	0	1257	57	1.3	9	0	0	27	0	0
Mean	0.1	0	0	0	0.7	0	913	9	0.2	0.4	0	0	1	0	0

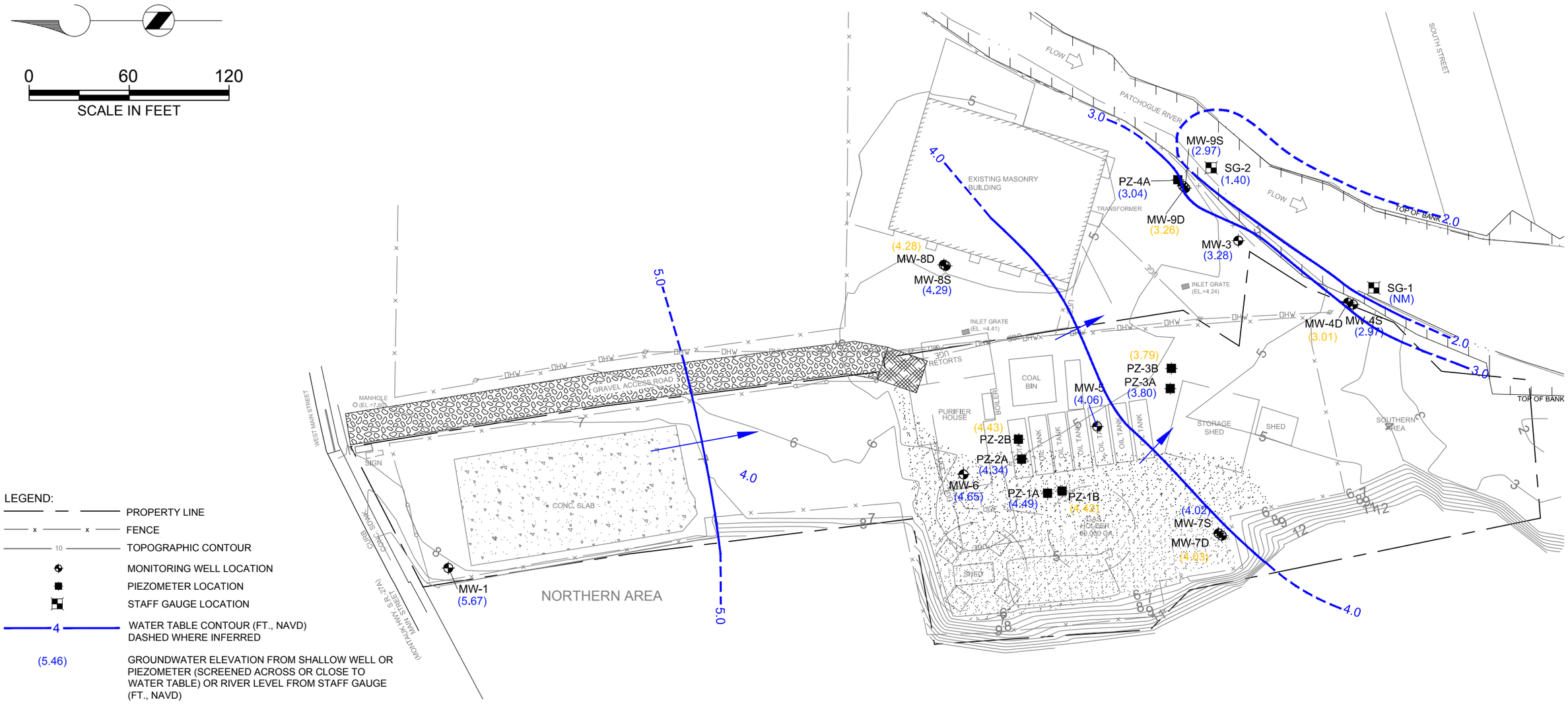
Notes:
BTEX - Benzene, toluene, ethylbenzene and isomers of xylene
µg/L - micrograms per liter
NS - Not sampled.
NI - Piezometer not installed at time of sampling.
(a) - To calculate total BTEX concentration, a value of zero is used for non-detect values.
(b) - Monitoring well was decommissioned on 6/4/12 as part of the Utility Corridor Construction activities. See "Construction Completion Report, Utility Corridor Work Plan Implementation" (Brown and Caldwell, December 2012).

TABLE 4
SUMMARY OF HISTORICAL PAH CONCENTRATIONS
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Sampling Date	Total PAH Concentrations (µg/L) [a]														
	Monitoring Well/Piezometer														
	MW-1	MW-2S	MW-2D	MW-3	MW-4S	MW-4D	MW-5	MW-6	MW-7S	MW-7D	MW-8S	MW-8D	MW-9S	MW-9D	PZ-4A
Mar-08	0	0	0	0.76	0.6	4.3	1774	214	NS	NS	NS	NS	NS	NS	NI
Jul-08	NS	0.7	0	0	8	0	1799	154	0	0.47	0	0	12	0	NI
Mar-09	0	0	0	0	0	0	2730	0	0	0	0	0	0	0	NI
Sep-09	0	0	0	0	0	0	3373	1	0	0	0	0	0	0	NI
Mar-10	0	0	0	0	0	39	2390	17	0	0	22	0	2	0	NI
Sep-10	0	0	0	128	0	6	NS	14	0	0	11	0	396	0	NI
Jan-11	22	0	0	17	0	12	NS	NS	0	0	6	0	42	5	NI
Apr-11	0	0	0	6	0	20	NS	NS	0	0	0	0	9	0	NI
Aug-11	0	0	0.1	14	0.1	0	NS	NS	0	0	0.4	0	16	1.2	NI
Nov-11	0	0	0.2	10	0.4	0	NS	NS	0	0	0.8	0.2	8	3.4	NI
Feb-12	0.2	0	0	6	0.6	4	NS	NS	0.1	0	0.6	0	5	2.9	NI
May-12	0.4	0.1	0.6	5	0	5.8	NS	NS	0.1	0.3	1	0	6	2.8	NI
Nov-12	0.1	-- [b]	-- [b]	5.6	0.4	11.7	NS	NS	2.5	2.6	0.8	1.2	NS	NS	NI
Jun-13	0.8	-- [b]	-- [b]	NS	0.3	3.7	NS	NS	1.3	0.4	0.4	0.6	2	NS	NI
Dec-13	0	-- [b]	-- [b]	NS	0	2.5	NS	NS	0.8	0.4	0.3	0	NS	NS	NI
Jun-14	0	-- [b]	-- [b]	2.2	0.9	0	NS	NS	0.8	0.3	0.2	0	NS	NS	0.3
Dec-14	0.1	-- [b]	-- [b]	1.2	0.4	0	NS	NS	3	0	0.1	0	21	0.3	NS
Jun-15	0	-- [b]	-- [b]	1.1	0.9	0	NS	NS	0.9	0	0.3	0	10	0.3	NS
Dec-15	0	-- [b]	-- [b]	0	0	0	NS	NS	0.9	0	0	0	3.9	0	NS
Jun-16	0	-- [b]	-- [b]	1.9	0.8	0	NS	NS	2.5	0	0	0	5.9	0	NS
Dec-16	0	-- [b]	-- [b]	0.02	0	0.1	NS	NS	0	0	0	0	5.5	0.07	NS
Jun-17	0	-- [b]	-- [b]	2.0	0.5	0	NS	NS	1	0	0	0	3.2	0	NS
Dec-17	0	-- [b]	-- [b]	0.53	0	0.031	NS	NS	0	0.11	0	0.017	6.0	0.14	NS
Jun-18	0	-- [b]	-- [b]	3.1	1.1	0.010	NS	53	0.02	0.01	0.08	0.09	7.4	0.55	NS
Min	0	0	0	0	0	0	1774	0	0	0	0	0	0	0	0.3
Max	22	0.7	0.6	128	8	39	3373	214	3	2.6	22	1.2	396	5	0.3
Mean	1.0	0.1	0.1	9	0.6	5	2413	65	0.6	0.2	1.9	0.1	28	0.9	0.3

Notes:
PAH - Polycyclic aromatic hydrocarbons
µg/L - micrograms per liter
NS - Not sampled.
NI - Piezometer not installed at time of sampling.
(a) - To calculate total PAH concentration, a value of zero is used for non-detect values.
(b) - Monitoring well was decommissioned on 6/4/12 as part of the Utility Corridor Construction activities. See "Construction Completion Report, Utility Corridor Work Plan Implementation" (Brown and Caldwell, December 2012).

Figures



Brown AND Caldwell	SCALE: 1" = 60' 149322 DATE: September 4, 2018	NATIONAL GRID PATCHOGUE FORMER MGP SITE VILLAGE OF PATCHOGUE, NEW YORK	WATER TABLE ELEVATION CONTOUR MAP JUNE 26, 2018	FIGURE 1

Path: P:\DRAFTING\NATIONAL_GRID\Patchogue\Quarterly-GW-Contour-Map File Name: FIG-1-(Aug2018) Plot Date: September 13, 2018 9:57 AM Cadd User: Robert Near

Appendix A: Field Sampling Data Sheets

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-1
Sample I.D.: MW-1-20180626 (if different from well no.)

Project: Patchogue Former MGP Site
Personnel: REH/TMB

Date: 6/26/18 Time: 1403
Weather: Sun Air Temp.: 75°

WELL DATA:

Casing Diameter: 6" ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other: ____
Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☑ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 5.80 ft Bottom of Well: ____ ft
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☑ Yes ☐ No Is well clean to bottom? ☑ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Does Weep Hole adequately drain well head? ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☑ Yes ☐ No ☐ NA Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No
VOLUME OF WATER: Standing in well: NA To be purged: NA

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: ____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other: ____
Tubing/Rope: ☐ Teflon® ☑ Polyethylene ☐ Polypropylene ☐ Other: ____

Pumping Rate: 250 ml/min Elapsed Time: 30 min Volume Pumped: 2.5 gal
Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: NA
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: ____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel
Tubing/Rope: ☐ Teflon® ☑ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned
Metals samples field filtered? ☐ Yes ☑ No Method: ____
APPEARANCE: ☑ Clear ☐ Turbid ☐ Color: ____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☑ No ☐ Yes Name: ____
MS/MSD : ☑ No ☐ Yes Name: ____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: [signature] Date: 6/26/18

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue Former MGP Site
Client: National Grid
Personnel: REH/TMB
Purge/Sample Depth: ~13'

Project Number: 149322
Date: 6/26/18
Well ID: MW-1
Sample ID: MW-1-20180626

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (ms/cm)	DO (mg/L)	Turbidity (NTU)				
1403	6.60	19.63	4.30	2.31	4.1	-70	5.96	250	
1406	6.67	17.15	4.602	0.36	2.5	-87			
1409	6.70	16.85	4.65	0.23	2.2	-87			
1412	6.70	16.50	4.64	0.00	0.0	-90			
1415	6.67	16.42	4.67	0.00	0.0	-91	↓		
1418	6.68	16.42	4.68	0.00	0.0	-92	5.96		
1421	6.67	16.26	4.73	0.00	0.0	-90			
1424	6.67	16.16	4.75	0.00	0.0	-91			
1427	6.63	16.09	4.77	0.00	0.0	-92			
1430	6.66	16.09	4.77	0.00	0.0	-92	↓		
1433	6.63	16.01	4.78	0.00	0.0	-92	5.96	↓	
1436	Sample MW-1-20180626								

TMB

Certified Sample Information:
Time of Sample: 1436
Analyst Signature: _____

Instrument Data:
Manufacturer/Model: _____
Serial No. Unit: _____ Serial No. Handheld: _____
Calibration Date/Time: _____

Are low-flow parameters subject to field lab certification? ☐ Yes ☒ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-75

Sample I.D.: MW-75-20180626 (if different from well no.)

Project: Patchogue Former MGP Site

Personnel: REH/TMB

Date: 6/26/18 Time: 1457

Weather: SUN Air Temp.: 80°

WELL DATA:

Casing Diameter: 10" ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other: _____

Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☑ PVC ☐ Teflon® ☐ Open rock

DEPTH TO : Static Water Level: 14.45 ft Bottom of Well: _____ ft

DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other:

CONDITION:
- Is Well clearly labeled? ☑ Yes ☐ No Is well clean to bottom? ☑ Yes ☐ No
- Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
- Does Weep Hole adequately drain well head? ☐ Yes ☐ No
- Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
- Is Padlock Functional? ☑ Yes ☐ No ☐ NA Is Inner Casing Intact? ☑ Yes ☐ No
- Is Inner Casing Properly Capped and Vented? ☐ Yes ☑ No

VOLUME OF WATER: Standing in well: NA To be purged: NA

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: (Pump/Bailer): ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other: _____

(Tubing/Rope): ☐ Teflon® ☑ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: 300 ml/min Elapsed Time: 30 min Volume Pumped: 3 gal

Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: NA

PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump ☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: (Pump/Bailer): ☐ Teflon® ☑ Stainless Steel

(Tubing/Rope): ☐ Teflon® ☑ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned

Metals samples field filtered? ☐ Yes ☑ No Method: _____

APPEARANCE: ☑ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid

FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☑ No ☐ Yes Name: _____

MS/MSD : ☐ No ☑ Yes Name: MW-75-20180626-MS/MSD

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: _____ Date: 6/26/18

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name:	Patchogue Former MGP Site	Project Number:	149322
Client:	National Grid	Date:	6/26/18
Personnel:	REH/TMB	Well ID:	MW-75
Purge/Sample Depth:	~10	Sample ID:	MW-75-20180626

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (ms/cm)	DO (mg/L)	Turbidity (NTU)				
1457	7.05	16.63	0.446	2.68	74.0	~~-30~~ -161	4.105	300	
1500	7.10	16.00	0.446	1.71	54.0	~~-24~~ -163			
1503	7.17	15.42	0.445	0.99	31.5	~~-84~~			
1506	7.17	14.84	0.441	0.36	19.5	-85			
1509	7.16	14.75	0.442	0.25	21.4	~~-25~~			
1512	7.15	14.70	0.443	0.19	26.6	-25	4.105		
1515	7.20	14.68	0.437	0.13	23.0	-160			
1518	7.19	14.65	0.434	0.07	18.5	-163			
1521	7.20	14.59	0.436	0.03	7.8	-161			
1524	7.18	14.50	0.432	0.00	8.0	-161	4.105		
1527	7.21	14.44	0.432	0.00	10.7	-160	4.105		
1530	Sample MW-75-20180626 + MS/MSD								

TMB

Certified Sample Information:
Time of Sample: _____ Analyst Signature: _____

Instrument Data:
Manufacturer/Model: _____
Serial No. Unit: _____ Serial No. Handheld: _____
Calibration Date/Time: _____

Are low-flow parameters subject to field lab certification? ☐ Yes ☒ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-7D
Sample I.D.: MW-7D-20180626 (if different from well no.)

Project: Patchogue Former MGP Site
Personnel: REH/TMB

Date: 6/26/18 Time: 1720
Weather: Sunny Air Temp.: 80

WELL DATA:

Casing Diameter: 4 ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other: _____
Intake Diameter: 2 ☐ Stainless Steel ☐ Galv. Steel ☑ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 4.28 ft Bottom of Well: _____ ft
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☑ Yes ☐ No Is well clean to bottom? ☐ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Does Weep Hole adequately drain well head? ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☑ Yes ☐ No ☐ NA Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☑ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: 325 mL/min Elapsed Time: 30 min Volume Pumped: 3.25G
Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: _____
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel
Tubing/Rope: ☑ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned
Metals samples field filtered? ☐ Yes ☑ No Method: _____
APPEARANCE: ☑ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☑ No ☐ Yes Name: _____
MS/MSD : ☑ No ☐ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: Rachel Heuedi Date: 6/26/18

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue Former MGP Site
Client: National Grid
Personnel: REH/TMB
Purge/Sample Depth: ~25.5

Project Number: 149322
Date: 6/26/18
Well ID: MW-7D
Sample ID: MW-7D-20180626

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (ms/cm)	DO (mg/L)	Turbidity (NTU)				
1520	6.68	16.48	0.676	1.69	17.3	37	4.27	375	
1523	6.32	15.19	0.624	0.64	7.5	57	4.28		
1526	6.21	14.73	0.598	0.34	6.1	71	4.30		
1529	6.17	14.67	0.581	0.28	5.6	76	4.30		
1532	6.12	14.60	0.569	0.26	4.2	85	4.32		
1535	6.13	14.56	0.559	0.24	3.6	83	4.32		
1538	6.12	14.48	0.556	0.22	2.8	92	4.32		
1541	6.10	14.49	0.553	0.16	2.1	93	4.31		
1544	6.06	1440	0.555	0.17	2.4	103	4.31		
1547	6.10	14.40	0.554	0.11	2.1	100	4.30		
1550	6.16	14.40	0.554	0.13	2.6	101	4.30		
1553	Collect Sample MW-7D-20180626								

Certified Sample Information:
Time of Sample: 1553
Analyst Signature: Rachel Hamby

Instrument Data:
Manufacturer/Model:
Serial No. Unit: Serial No. Handheld:
Calibration Date/Time:

Are low-flow parameters subject to field lab certification? ☐ Yes ☒ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-85
Sample I.D.: MW-85-20180626 (if different from well no.)

Project: Patchogue Former MGP Site
Personnel: REH/TMB

Date: 6/26/18 Time: 1634
Weather: Sunny Air Temp.: 80

WELL DATA:

Casing Diameter: 8 ☐ Stainless Steel ☒ Steel ☐ PVC ☐ Teflon® ☐ Other: _____
Intake Diameter: 2 ☐ Stainless Steel ☐ Galv. Steel ☒ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 0.80 ft Bottom of Well: _____ ft
DATUM: ☐ Top of Protective Casing ☒ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☐ Yes ☒ No Is well clean to bottom? ☐ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☒ Yes ☐ No
Does Weep Hole adequately drain well head? ☒ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☒ Yes ☐ No
Is Padlock Functional? ☐ Yes ☐ No ☒ NA Is Inner Casing Intact? ☐ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☒ Yes ☐ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☒ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☒ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☒ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: _____ Elapsed Time: 30 min Volume Pumped: _____
Was well Evacuated? ☐ Yes ☒ No Number of Well Volumes Removed: _____
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☒ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☐ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☒ Stainless Steel
Tubing/Rope: ☒ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☒ Field Cleaned
Metals samples field filtered? ☐ Yes ☒ No Method: _____
APPEARANCE: ☒ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☐ No ☒ Yes Name: DUP-20180626
MS/MSD : ☒ No ☐ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: Rachel Hojnacki Date: _____

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue Former MGP Site
Client: National Grid
Personnel: REH/TMB
Purge/Sample Depth: ~8

Project Number: 149322
Date: 6/26/18
Well ID: MW-8S
Sample ID: MW-8S-20180626

Actual Time	Certified Parameters: pH	Temp (°C)	Cond (ms/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
1634	6.66	18.26	0.677	3.08	151	-50	0.83	200	
1637	6.63	17.03	0.710	0.87	69.0	-50	0.83		
1640	6.67	17.67	0.709	0.42	29.7	-52	0.85		
1643	6.64	16.47	0.708	0.17	6.6	-52	0.85		
1646	6.65	16.39	0.711	0.07	6.4	-54	0.85		
1649	6.66	14.35	0.712	0.03	7.8	-54	0.86		
1652	6.67	16.30	0.712	0.00	9.1	-55	0.86		
1655	6.63	16.20	0.711	0.00	3.8	-54	0.84		
1658	6.66	16.17	0.712	0.00	2.7	-52	0.86		
1701	6.62	16.11	0.712	0.00	3.0	-53	0.80		
1704	6.66	16.13	0.713	0.00	2.6	-55	0.86		
1707	Collect sample								

Certified Sample Information:
Time of Sample: 1707
Analyst Signature:

Instrument Data:
Manufacturer/Model: Horiba U-52
Serial No. Unit:
Serial No. Handheld:
Calibration Date/Time:

Are low-flow parameters subject to field lab certification? ☐ Yes ☒ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-8D
Sample I.D.: MW-8D-20180626 (if different from well no.)

Project: Patchogue Former MGP Site
Personnel: REH/TMB

Date: 6/26/18 Time: 1105
Weather: Sm Air Temp.: 80'

WELL DATA:

Casing Diameter: 8" ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other:
Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☑ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 0.70 ft Bottom of Well: ft
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☐ Yes ☑ No Is well clean to bottom? ☑ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Does Weep Hole adequately drain well head? ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☐ Yes ☐ No ☑ NA Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No
VOLUME OF WATER: Standing in well: NA To be purged: NA

PURGE DATA:

METHOD: ☐ Bailer, Size: ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other:

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other:
Tubing/Rope: ☐ Teflon® ☑ Polyethylene ☐ Polypropylene ☐ Other:

Pumping Rate: 250 ml/min Elapsed Time: 30 min Volume Pumped: 2.5 gal
Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: NA
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other:

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel
Tubing/Rope: ☐ Teflon® ☑ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned
Metals samples field filtered? ☐ Yes ☑ No Method:
APPEARANCE: ☑ Clear ☐ Turbid ☐ Color: ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☐ No ☐ Yes Name:
MS/MSD : ☐ No ☐ Yes Name:

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: Date: 6/26/18

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue Former MGP Site
Client: National Grid
Personnel: REH/TMB
Purge/Sample Depth: ~22'

Project Number: 149322
Date: 6/26/18
Well ID: MW-8D
Sample ID: MW-8D-20180626

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (ms/cm)	DO (mg/L)	Turbidity (NTU)				
1653	6.44	18.81	0.653	3.80	21.4	101	0.71	250	
1656	6.52	18.05	0.657	3.08	14.5	103	0.72		
1659	6.55	17.49	0.659	1.91	8.4	105	0.72		
1702	6.49	17.33	0.658	1.48	7.1	108	0.74		
1705	6.48	17.26	0.662	0.93	6.3	109	0.74		
1708	6.45	17.10	0.665	0.59	5.3	109	0.74		
1711	6.45	17.07	0.666	0.32	5.1	109	0.75		
1714	6.49	17.04	0.664	0.15	4.8	110	"		
1717	6.48	17.09	0.661	0.06	3.9	111	"		
1720	6.44	17.07	0.662	0.02	4.0	112	"		
1723	6.40	17.15	0.661	0.00	3.9	112	0.75		
1725	Sample MW-8D-20180626								

Certified Sample Information:
Time of Sample: _____ Analyst Signature: _____

Instrument Data:
Manufacturer/Model: _____
Serial No. Unit: _____ Serial No. Handheld: _____
Calibration Date/Time: _____

Are low-flow parameters subject to field lab certification? ☐ Yes ☒ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-45
Sample I.D.: MW-45-20180627 (If different from well no.)

Project: Patchogue Former MGP Site
Personnel: REH/TMB

Date: 6/27/18 Time: 0830
Weather: Sun Air Temp.: 72°

WELL DATA:

Casing Diameter: 4" ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other: _____
Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☑ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 5.07 ft Bottom of Well: _____ ft
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☑ Yes ☐ No Is well clean to bottom? ☑ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Does Weep Hole adequately drain well head? ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☐ Yes ☒ No ☐ NA Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No
VOLUME OF WATER: Standing in well: NA To be purged: NA

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☐ Teflon® ☑ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: 250 ml/min Elapsed Time: 30 min Volume Pumped: 2.5 gal
Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: NA
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel
Tubing/Rope: ☐ Teflon® ☑ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned
Metals samples field filtered? ☐ Yes ☑ No Method: _____
APPEARANCE: ☑ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☑ No ☐ Yes Name: _____
MS/MSD : ☑ No ☐ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: _____ Date: 6/27/18

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue Former MGP Site
Client: National Grid
Personnel: REH/TMB
Purge/Sample Depth: ~10'

Project Number: 149322
Date: 6/27/18
Well ID: MW-45
Sample ID: MW-45-20180627

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (ms/cm)	DO (mg/L)	Turbidity (NTU)				
0830	6.89	15.90	0.540	14.58	53.7	-104	5.15	250	
0833	6.94	15.05	0.540	2.41	40.7	-122	5.16		
0836	7.04	14.38	0.533	0.19	20.9	-134	5.18		
0839	7.06	14.00	0.529	0.00	16.2	-141	5.20		
0842	7.10	13.96	0.526	0.00	14.0	-137			
0845	7.12	13.94	0.525	0.00	12.60	-139			
0848	7.10	13.90	0.524	0.00	8.9	-142			
0851	7.08	13.86	0.521	0.00	5.5	-145			
0854	7.11	13.87	0.518	0.00	3.9	-145			
0857	7.10	13.82	0.518	0.00	3.2	-145	5.20		
0900	7.13	13.80	0.517	0.00	2.6	-147			
0903	Sample MW-45-20180627								

Certified Sample Information:
Time of Sample: _____ Analyst Signature: _____

Instrument Data:
Manufacturer/Model: _____
Serial No. Unit: _____ Serial No. Handheld: _____
Calibration Date/Time: _____

Are low-flow parameters subject to field lab certification? ☐ Yes ☒ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-40
Sample I.D.: MW-40-20180627 (If different from well no.)

Project: Patchogue Former MGP Site
Personnel: REH/TMB

Date: 6/27 Time: 0843
Weather: cloudy Air Temp.: 75

WELL DATA:

Casing Diameter: 4 ☐ Stainless Steel ☒ Steel ☐ PVC ☐ Teflon® ☐ Other: _____
Intake Diameter: 2 ☐ Stainless Steel ☐ Galv. Steel ☒ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 4.76 ft Bottom of Well: _____ ft
DATUM: ☐ Top of Protective Casing ☒ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☒ Yes ☐ No Is well clean to bottom? ☐ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☒ Yes ☐ No
Does Weep Hole adequately drain well head? ☒ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☒ Yes ☐ No
Is Padlock Functional? ☒ Yes ☐ No ~~☐ N/A~~ Is Inner Casing Intact? ☐ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☒ Yes ☐ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☒ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☒ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☒ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: 250 ml/min Elapsed Time: 30 min Volume Pumped: 2.5 G
Was well Evacuated? ☐ Yes ☒ No Number of Well Volumes Removed: _____
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☒ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☒ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☒ Stainless Steel
Tubing/Rope: ☒ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☒ Field Cleaned
Metals samples field filtered? ☐ Yes ☒ No Method: _____
APPEARANCE: ☒ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☒ No ☐ Yes Name: _____
MS/MSD : ☒ No ☐ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: Rachel Hazewski Date: 6/27/18

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue Former MGP Site
Client: National Grid
Personnel: REH/TMB
Purge/Sample Depth: ~23

Project Number: 149322
Date: 6/27/18
Well ID: MW-4D
Sample ID: MW-4D-20180627

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (ms/cm)	DO (mg/L)	Turbidity (NTU)				
0843	6.44	16.60	0.663	2.56	1.2	177	4.83	250	
0846	6.10	15.76	0.665	1.08	2.5	192	4.83		
0849	6.07	15.46	0.665	0.59	0.7	199	4.83		
0852	6.02	15.48	0.664	0.41	0.0	207	4.83		
0855	6.00	15.49	0.666	0.28	0.0	213	4.83		
0858	6.00	15.39	0.670	0.17	0.0	219	4.83		
0901	6.00	15.49	0.673	0.14	0.0	222	4.83		
0904	5.98	15.56	0.673	0.11	0.0	223	4.83		
0907	5.99	15.45	0.677	0.08	0.0	228	4.83		
0910	5.99	15.60	0.680	0.04	0.0	230	4.83		
0913	6.00	15.55	0.680	0.14	0.0	233	4.83		
0916	Collect sample		MW-4D-20180627						

Certified Sample Information:
Time of Sample: 0916
Analyst Signature:

Instrument Data:
Manufacturer/Model: Horiba U-52
Serial No. Unit:
Serial No. Handheld:
Calibration Date/Time:

Are low-flow parameters subject to field lab certification? ☐ Yes ☒ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-3
Sample I.D.: MW-3-20180627 (If different from well no.)

Project: Patchogue Former MGP Site
Personnel: REH/TMB

Date: 6/27/18 Time: 1040
Weather: overcast Air Temp.: 72°

WELL DATA:

Casing Diameter: 8" ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other: ____
Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☑ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 2.28 ft Bottom of Well: ____ ft
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☐ Yes ☑ No Is well clean to bottom? ☑ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Does Weep Hole adequately drain well head? ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost-heaved) ☑ Yes ☐ No
Is Padlock Functional? ☐ Yes ☐ No ☑ NA Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No
VOLUME OF WATER: Standing in well: NA To be purged: NA

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: ____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other: ____
Tubing/Rope: ☐ Teflon® ☑ Polyethylene ☐ Polypropylene ☐ Other: ____

Pumping Rate: 300 ml/min Elapsed Time: 30 min Volume Pumped: 3 gal
Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: NA
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: ____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel
Tubing/Rope: ☐ Teflon® ☑ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned
Metals samples field filtered? ☐ Yes ☑ No Method: ____
APPEARANCE: ☑ Clear ☐ Turbid ☐ Color: ____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☑ No ☐ Yes Name: ____
MS/MSD : ☑ No ☐ Yes Name: ____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: [signature] Date: 6/27/18

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue Former MGP Site
Client: National Grid
Personnel: REH/TMB
Purge/Sample Depth: 24'

Project Number: 149322
Date: 6/27/18
Well ID: MW-3
Sample ID: MW-3-20180627

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (ms/cm)	DO (mg/L)	Turbidity (NTU)				
0940	6.09	17.28	0.635	3.92	1.9	167	2.28	300	
0943	6.87	16.38	0.641	0.92	0.0	151	2.28		
0946	6.86	16.13	0.640	0.52	0.0	142	2.29		
0949	6.91	16.00	0.638	0.31	0.0	137	2.29		
0952	6.91	15.90	0.637	0.14	0.0	128	2.30		
0955	6.90	15.88	0.637	0.11	0.0	126			
0958	6.92	15.85	0.637	0.07	0.0	128			
1001	6.90	15.83	0.635	0.04	0.0	127			
1004	6.91	15.82	0.635	0.04	0.0	126			
1007	6.93	15.81	0.634	0.04	0.0	125	↓	↓	
1010	6.93	15.82	0.634	0.04	0.0	125	2.30		
1013	Sample MW-3-20180627								

Certified Sample Information:
Time of Sample: _____ Analyst Signature: _____

Instrument Data:
Manufacturer/Model: _____
Serial No. Unit: _____ Serial No. Handheld: _____
Calibration Date/Time: _____

Are low-flow parameters subject to field lab certification? ☐ Yes ☒ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-9D
Sample I.D.: MW-9D-20180627 (If different from above)

Project: Patchogue
Personnel: TMB REH

Date: 6/27/18 Time: 1029
Weather: overcast Air Temp.: 75°

WELL DATA:

Casing Diameter: 8" ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other:
Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☑ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 1.40 ft Bottom of Well: ft
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☐ Yes ☑ No Is well clean to bottom? ☑ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Does Weep Hole adequately drain well head? ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost-heaved) ☑ Yes ☐ No
Is Padlock Functional? ☐ Yes ☐ No ☐ NA Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No
VOLUME OF WATER: Standing in well: NA To be purged: NA

PURGE DATA:

METHOD: ☐ Bailer, Size: ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other:

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other:
Tubing/Rope: ☐ Teflon® ☑ Polyethylene ☐ Polypropylene ☐ Other:

Pumping Rate: 750 ml/min Elapsed Time: 30 min Volume Pumped: 2.5 gal
Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: NA
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other:

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel
Tubing/Rope: ☐ Teflon® ☑ Polyethylene
SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned
Metals samples field filtered? ☐ Yes ☑ No Method:
APPEARANCE: ☑ Clear ☐ Turbid ☐ Color: ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☑ No ☐ Yes Name:
MS/MSD : ☑ No ☐ Yes Name:

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols

Signature: Date: 6/27/18

Brown AND Caldwell
2 Park Way, Upper Saddle River, NJ 07458
Phone (201) 574-4700 Fax (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue
Client: National Grid
Personnel: THB KEH
Purge/Sample Depth: ~20
Project Number: 149322
Date: 6/27/18
Well ID: MW-9D
Sample ID: MW-9D-20180627

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (mS/cm)	DO (mg/L)	Turbidity (NTU)				
1029	6.32	17.47	0.429	1.43	25.9	168	1.35	250	
1032	6.00	17.03	0.455	0.59	19.5	229	1.35		
1035	5.26	16.79	0.477	0.22	11.4	277	1.35		
1038	5.19	16.60	0.478	0.13	12.2	299	1.36		
1041	5.19	16.58	0.479	0.09	14.7	306	1.36		
1044	5.19	16.55	0.477	0.05	20.6	316			
1047	5.18	16.49	0.477	0.02	14.3	321			
1050	5.18	16.47	0.477	0.00	16.1	324			
1053	5.18	16.47	0.475	0.00	15.0	327			
1056	5.19	16.45	0.476	0.00	14.2	327	1.36		
1059	5.18	16.46	0.477	0.00	11.8	329			
1102	Sample MW-9D-20180627								

Certified Sample Information:
Time of Sample: _____ Analyst Signature: _____

Instrument Data:
Manufacturer/Model _____
Serial No Unit _____ Serial No Handheld _____
Calibration Date/Time _____

Are low-flow parameters subject to field lab certification? ☐ Yes ☐ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-9S
Sample I.D.: MW-9S-20180627 (if different from well no.)

Project: Patchogue
Personnel: REH / TMB

Date: 6/27/18 Time: 1048
Weather: Cloudy Air Temp.: 75

WELL DATA:

Casing Diameter: 8 ☐ Stainless Steel ☒ Steel ☐ PVC ☐ Teflon® ☐ Other: _____
Intake Diameter: 2 ☐ Stainless Steel ☐ Galv. Steel ☒ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 1.30 ft Bottom of Well: _____ ft
DATUM: ☐ Top of Protective Casing ☒ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☐ Yes ☒ No Is well clean to bottom? ☐ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☒ Yes ☐ No
Does Weep Hole adequately drain well head? ☒ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☒ Yes ☐ No
Is Padlock Functional? ☐ Yes ☐ No ☒ NA Is Inner Casing Intact? ☐ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☒ Yes ☐ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☒ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☒ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☒ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: 300 mL/min Elapsed Time: 30 min Volume Pumped: 3 G
Was well Evacuated? ☐ Yes ☒ No Number of Well Volumes Removed: _____
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☒ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☒ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☒ Stainless Steel
Tubing/Rope: ☒ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☒ Field Cleaned
Metals samples field filtered? ☐ Yes ☒ No Method: _____
APPEARANCE: ☒ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☒ No ☐ Yes Name: _____
MS/MSD : ☒ No ☐ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: Rachel Hojnacki Date: 6/27/18

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue
Client: National Grid
Personnel: REH / TMB
Purge/Sample Depth: ~ 8

Project Number: 149322
Date: 6/27/18
Well ID: MW-9S
Sample ID: MW-9S-20180627

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (mS/cm)	DO (mg/L)	Turbidity (NTU)				
1048	6.84	17.78	0.554	0.00	964	-118	1.57	300	
1051	6.77	17.12	0.462	0.00	86.6	-119	1.52		
1054	6.91	16.97	0.462	0.00	45.1	-131	1.54		
1057	6.98	16.91	0.460	0.00	29.0	-130	1.54		
1100	6.99	16.83	0.458	0.00	17.1	-140	1.56		
1103	6.97	16.82	0.458	0.00	15.9	-141	1.58		
1106	6.99	16.74	0.457	0.00	46.1	-143	1.59		
1109	7.00	16.73	0.458	0.00	22.8	-141	1.59		
1112	7.01	16.73	0.454	0.00	19.0	-134	1.59		
1115	7.01	16.71	0.462	0.00	12.5	-142	1.58		
1118	7.01	16.73	0.463	0.00	11.8	-140	1.58		
1121	Collect sample MW-9S-20180627								

Certified Sample Information:
Time of Sample: 1121
Analyst Signature:

Instrument Data:
Manufacturer/Model: Horiba U-52
Serial No. Unit: _____ Serial No. Handheld: _____
Calibration Date/Time: _____

Are low-flow parameters subject to field lab certification? ☐ Yes ☒ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-6
Sample I.D.: MW-6-20180627 (If different from well no.)

Project: Patchogue
Personnel: KEH / TMB

Date: 6/27/18 Time: 1145
Weather: Cloudy Air Temp.: 75

WELL DATA:

Casing Diameter: 8 ☐ Stainless Steel ☒ Steel ☐ PVC ☐ Teflon® ☐ Other: ____
Intake Diameter: 2 ☐ Stainless Steel ☐ Galv. Steel ☒ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: ____ ft Bottom of Well: ____ ft
DATUM: ☐ Top of Protective Casing ☒ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☐ Yes ☒ No Is well clean to bottom? ☐ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☒ Yes ☐ No
Does Weep Hole adequately drain well head? ☒ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☒ Yes ☐ No
Is Padlock Functional? ☐ Yes ☐ No ☒ NA Is Inner Casing Intact? ☐ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☐ Yes ☐ No
VOLUME OF WATER: Standing in well: ____ To be purged: ____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☒ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: ____

MATERIALS: Pump/Bailer: ☐ Teflon® ☒ Stainless Steel ☐ PVC ☐ Other: ____
Tubing/Rope: ☒ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: ____

Pumping Rate: 150 mL/min Elapsed Time: 30 min Volume Pumped: 1.5 G
Was well Evacuated? ☐ Yes ☒ No Number of Well Volumes Removed: ____
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☒ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☒ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: ____

MATERIALS: Pump/Bailer: ☐ Teflon® ☒ Stainless Steel
Tubing/Rope: ☒ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☒ Field Cleaned
Metals samples field filtered? ☐ Yes ☒ No Method: ____
APPEARANCE: ☒ Clear ☐ Turbid ☐ Color: ____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☒ No ☐ Yes Name: ____
MS/MSD : ☒ No ☐ Yes Name: ____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: Rachel Hojnacki Date: 6/27/18

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name:	Patchogue	Project Number:	149322
Client:	National Grid	Date:	6/27/18
Personnel:	REH / TMB	Well ID:	MW-6
Purge/Sample Depth:	~16	Sample ID:	MW-6-20180627

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (mS/cm)	DO (mg/L)	Turbidity (NTU)				
1145	6.41	18.16	0.567	7.80	36.4	-66	0.40	150	
1148	6.71	16.45	0.615	0.28	32.4	-98	0.40		
1151	6.79	16.16	0.617	0.00	37.2	-104	0.42		
1154	6.77	16.18	0.613	0.00	39.8	-104	0.42		
1157	6.81	16.40	0.592	0.00	46.3	-106	0.44		
1200	6.80	16.42	0.589	0.00	46.7	-107	0.45		
1203	6.62	16.43	0.582	0.00	39.9	-98	0.45		
1206	6.82	16.59	0.569	0.00	33.3	-106	0.45		
1209	6.78	16.49	0.563	0.00	27.4	-106	0.45		
1212	6.80	16.66	0.554	0.00	24.6	-107	0.45		
1215	6.81	16.84	0.547	0.00	21.9	-107	0.45		
1218	Sample MW-6-20180627								

Certified Sample Information:
Time of Sample: 1218

Analyst Signature: Rachel Hescott

Instrument Data:
Manufacturer/Model: Horiba
Serial No. Unit: _____ Serial No. Handheld: _____
Calibration Date/Time: _____

Are low-flow parameters subject to field lab certification? ☐ Yes ☒ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Appendix B: Laboratory Reports (CD-ROM)

Appendix C: Data Usability Summary Report

MCGI

USEPA Data Validation
Organic
Data Validation Report

Patchogue, NY

Lab SDG No. BCH21
MCGI Project No. BC051801-BCH21

Prepared for:

Brown & Caldwell
2 Park Way, Suite 2A
Upper Saddle River, NJ 07458

Prepared by:

"MCGI"
Meridian Consultant Group, Inc.
Environmental Services & Data Validation

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September, 2018

CONTENTS

GLOSSARY OF ACRONYMS & TERMS

GLOSSARY OF ACRONYMS & TERMS

One or more of the following acronyms and terms may have been used in the descriptive process of the **Organic** Data Validation.

Acronyms:

BFB	Bromofluorobenzene (volatile instrument performance check)
BNA	Base/Neutral/Acid
CCCs	Calibration Check Compounds
CF	Calibration Factor
CLP	Contract Laboratory Program
COC	Chain of Custody
CRDL	Contract Required Detection Limit
CRQL	Contract Required Quantitation Limit
CSF	Complete SDG File
%D	Percent Difference
DCB	Decachlorobiphenyl (Pesticide/PCB/ surrogate compound)
DFTPP	Decafluorotriphenylphosphine (semivolatile instrument performance check)
DSF	Data Summary Form
ECD	Electron-Capture Detector
EICP	Extended Ion Current Profile
EPA	United States Environmental Protection Agency
GC	Gas Chromatography
GC/EC	Gas Chromatography/Electron Capture
GC/MS	Gas Chromatography/Mass Spectra
GPC	Gel Permeation Chromatography (Clean Up)
ICAL	Initial Calibration
IS	Internal Standard
LCS	Laboratory Control Sample
LCL	Lower Control Limit
MCL	Maximum Contamination Level
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix Spike Duplicate
m/z	The ratio of mass (m) to charge (z) of ions measured by GC/MS
OADS	Organic Analysis Data Sheet (Form 1)
ORDA	Organic Regional Data Assessment
PCB	Poly Chlorinated Biphenyl
PEM	Performance Evaluation Mixture

QA/QC	Quality Assurance/Quality Control
QAPjP	Quality Assurance Project Plan
QC	Quality Control
%R	Percent Recovery of spiked amount
RF	Response Factor
RIC	Reconstructed Ion Chromatogram
RPD	Relative Percent Difference
RRF	Relative Response Factor
RSD	Relative Standard Deviation
RT	Retention Time
RTW	Retention Time Window
SDG	Sample Delivery Group
SMC	System Monitoring Compound
SOP	Standard Operation Procedures
SOW	Statement of Work
SPCCs	System Performance Check Compounds
SSL	Samples Shipping Log
SVOA	Semivolatile Organic Analyte
TCL	Target Compound List
TCX	Tetrachloro-m-Xylene (Pesticide/PCB surrogate compound)
TIC	Tentatively Identified Compound
TPH	Total Petroleum Hydrocarbons
UCL	Upper Control Limit
VOA	Volatile Organic Analyte
VTSR	Validated Time of Sample Receipt

Terms:

Associated Samples

Any sample related to a particular QC analysis.

Case A finite, usually predetermined number of samples collected over a given time period for a particular site. A Case consists of one or more Sample Delivery Group(s).

Contractual Holding Time

The time from VTSR (validated time of sample receipt) to laboratory extraction and /or analysis.

Data Validation Qualifier (DVQ)

This refers to the column on the data summary form in which EPA Region III and other qualifiers have been placed by the data validator.

Data Validation Result (DVR)

This refers to the column on the data summary form used to report results that have been modified by the data validator. A result in the DVR column that is qualified "U" indicates a modification of the reporting limit.

Field Blank Field blanks are intended to identify contaminants that may have been introduced in the field. Examples are rinsate blank (RB), field blanks (FB) and trip blank (TB).

Field Duplicate

A duplicate sample generated in the field; not in the laboratory.

Initial Calibration (ICAL)

The establishment of a calibration curve with the appropriate number of standards and concentration ranges. The calibration curve plots absorbances and/or emissions versus concentration of the standards. .

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Introduction of a known concentration of a compound into a sample to provide information about the effect of sample matrix on the extraction and/or measurement methodology.

Performance Evaluation Mixture

A standard used to verify that the ICAL sequence is stable throughout the GC or GC/MS analyses.

Sample Delivery Group (SDG)

Defined by one of the following, whichever occurs first:
- case of sample
- each twenty field samples in a case or
- each 14-day calendar period during which field samples in a case are received, beginning with the receipt of the first sample in the SDG.

Technical Holding Time

The time from sample collection to laboratory extraction and /or analysis

COMMUNICATION RECORDS

N/A

GLOSSARY OF DATA VALIDATION QUALIFIERS

GLOSSARY OF DATA QUALIFIER CODES

CODES RELATED TO IDENTIFICATION:

(Confidence concerning presence or absence of compounds)

U	=	Not detected above the level of the associated value. The associated value is either the approximate sample quantitation or detection limit.
NO CODE	=	Confirmed identification
U1	=	Not detected substantially above the level reported in laboratory or field blanks.
R	=	Unusable results. Analyte may or may not be present in the sample.
N	=	Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.

CODES RELATED TO QUANTITATION:

(Can be used for both positive results and sample quantitation limits)

J	=	Analyte present. Reported value may not be accurate or precise (estimated value).
J+	=	Analyte present. Reported value may be biased high. Result is estimated high.
J-	=	Analyte present. Reported value may be biased low. Result is estimated low.
UJ	=	Not detected. Quantitation limit may be inaccurate or imprecise (Estimated).
UJ-	=	Not detected. Quantitation limit is probably higher.

OTHER CODES:

NJ	=	Qualitative identification questionable. Presumptively present at approximate quantity.
Q	=	No analytical result.
X	=	Data not Validated.

DATA VALIDATION REPORT NARRATIVE

MCGI

Meridian Consultant Group, Inc.
Environmental Services & Data Validation
1997 Annapolis Exchange Pkwy., Suite 300
Annapolis, MD 21401

(301)803-9207 Phone
(410)972-4701 Fax
www.meridiancgi.com

DATE: September 4, 2018

SUBJECT: USEPA Organic Data Validation Report
BTEX/MTBE & PAH
Site: Patchogue, NY
MCGI Project No. BC051801-BCH21

FROM: Sherif N. Mina
Meridian Consultant Group, Inc.

TO: Mr. James L. Marolda
Brown and Caldwell

OVERVIEW

This report consists of one (1) Sample Delivery Group (SDG) for a total of fourteen (14) aqueous samples submitted to eurofins Laboratories, Lancaster, PA, for BTEX/MTBE & Poly Aromatic Hydrocarbons (PAH) analyses according to SW-846 Methods 8260C & 8270D-SIM, respectively. Details about this SDG are listed in separate section below. The samples were analyzed in accordance with the Chain-of-Custody (COC).

The analytical results were validated according to the pertinent parts of U.S. Environmental Protection Agency (USEPA) National Functional Guidelines for Organic Data Review, dated January 2017; Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use, dated January 2009; along with the Quality Assurance/Quality Control (QA/QC) requirements for the analytical methods used for the analyses.

Deviation from USEPA NFG: The "U" qualifier recommended by USEPA NFG for blank contamination was replaced by the "U1" qualifier to clearly indicate blank contamination on the EDDs.

GENERAL NOTES

- ***Electronic Data Deliverable (EDD):*** Several rows in the electronic data deliverable (EDD) are marked with an "X" and hidden from the EDDs by the validator. These rows may include quality control samples such as Method Blanks, Laboratory Control Samples, Matrix Spikes, or Matrix Spike Duplicates which are not validated. Additionally, some field sample results may not be used since only one (1) result for each compound is reported after validation. The following list indicates some instances in which an "X" may be placed in the DVQ column:
  1. The compounds in an analysis that have exceeded the instrument calibration range.
  2. All compounds in a diluted analysis that were within the calibration range in the initial analysis.
  3. All compounds in either the initial analysis or re-analysis of a sample, depending on which analysis is not reported on the EDD.

  Although QC samples and some field samples results may not be used, all data were reviewed and considered in the overall assessment.

- ***Data Validation Qualifier (DVQ)*:**This refers to the column on the data summary form in which EPA and other qualifiers have been placed by the data validator.

- ***Data Validation Result (DVR):***This refers to the column on the data summary form used to report results that have been modified by the data validator. A result in the DVR column that is qualified "U" indicates a modification of the reporting limit. Results in the DVR column supersede those reported by the laboratory.

- ***Tentatively Identified Compounds (TICs):*** The TICs, if applicable, were reviewed during data validation.

- ***Compound Quantitation:*** Positive results for compounds which are below the CRQL were qualified as estimated "J" on the EDD.

1-SDG: BCH21

This SDG consisted of fourteen (14) aqueous samples submitted to eurofins Laboratories, Lancaster, PA, for for BTEX/MTBE & PAH analyses according to SW-846 Methods 8260C & 8270D-SIM, respectively. One (1) trip & one (1) field blanks; and one (1) aqueous field duplicate pair were identified in this SDG. The samples were analyzed in accordance with the Chain-of-Custody (COC), see Sample Identification Summary.

Sample Identification Summary

SAMPLE INFORMATION				Analysis	
Field ID	**Lab ID**	**SDG**	**Matrix**	**B**	**P**
MW-1-20180626	9682855	BCH21	Aqueous	x	x
MW-7S-20180626	9682856		Aqueous	x	x
MW-7D-20180626	9682859		Aqueous	x	x
MW-8S-20180626	9682860		Aqueous	x	x
DUP-20180626	9682861		Aqueous	x	x
MW-8D-20180626	9682862		Aqueous	x	x
MW-4S-20180627	9682863		Aqueous	x	x
MW-4D-20180627	9682864		Aqueous	x	x
MW-3-20180627	9682865		Aqueous	x	x
MW-9D-20180627	9682866		Aqueous	x	x
MW-9S-20180627	9682867		Aqueous	x	x
MW-6-20180627	9682868		Aqueous	x	x
FB-20180627	9682869		Aqueous	x	x
TRIP BLANK-20180627	9682870		Aqueous	x	x

B=BTEX/MTBE, P=PAH

Duplicates: DUP-20180626/MW-8S-20180626

- ***Field Duplicates:*** For the associated aqueous samples, an RPD of 20% was used as the QC limit for results >5x the CRQL; and for results <5x the CRQL, the difference between the two values must be less than the CRQL. Results <5x the CRQL have "NA", not applicable, placed in the RPD field.

Compound	**DUP-20180626**	**MW-8S-20180626**	**RPD**	**Qualifier**
BTEX/MTBE				
	ND	ND		
PAH				
Acenaphthene	0.08	0.08	0	

ND=None Detected

ORGANIC VALIDATION

SUMMARY

All samples were successfully analyzed for all target compounds according to U.S. Environmental Protection Agency (USEPA) National Functional Guidelines for Organic Data Review, dated August 2014; Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use, dated January 2009; along with the Quality Assurance/Quality Control (QA/QC) requirements for the analytical methods used for the analyses. All instruments and method sensitivities were according to the specified analytical methods, except as noted in the Major Problem section. Refer to Minor Problems for information regarding biases identified during data validation.

Data Validation Summary

	Parameters	B			P		
		q	t	a	q	t	a
*	Data Completeness		14	0		13	0
*	Holding Time		14	0		13	0
*	Instrument Performance (BFB/DFTPP)		14	0		13	0
*	Calibrations		14	0		13	0
*	Laboratory and Field Blanks analyses		14	0		13	0
*	Surrogate Recoveries		14	0		13	0
*	Matrix Spike/Matrix Spike Duplicate		14	0		13	0
*	Laboratory Control Sample(LCS)		14	0		13	0
*	Laboratory and/or Field Duplicates		14	0		13	0
*	Internal Standards		14	0		13	0
*	Compound Identification		14	0		13	0
*	Compound Quantitation		14	0		13	0
*	Sample Preservation		14	0		13	0
* All Criteria were met for that Parameter, B=BTEX/MTBE, P=PAH							

q=qualified; t=total number of samples analyzed; a=number of samples affected

MAJOR PROBLEMS

- None noted.

MINOR PROBLEMS

- None noted.

NOTES

- ***Blank Contaminants:*** The maximum concentration of all compounds found in the analyses of the trip, field or laboratory method blanks are listed in the following table. Associated samples with positive results of these contaminants maybe qualified "U1" or "J+", based on the concentration level found in the samples, according to USEPA National Functional Guideline for Organic Data Review, dated January 2017.

Analytical Fraction	**Compound**	Maximum Concentration	Units	Blank Type	Associated Samples
BTEX/MTBE	None				
PAH	None				

*Common lab contaminant

BTEX/MTBE:

- ***Surrogate Recovery:*** Surrogates 1,2-Dichloroethane-d4 in sample DUP-20180626; Dibromofluoromethane & 1,2-Dichloroethane-d4 in sample MW-9D--20180627; and Dibromofluoromethane in sample TRIP BLANK-20180627 displayed slightly high recoveries. No positive results were detected in these samples. No data were qualified.

PAH:

- None noted.

REPORT CONTENT STATEMENT

All data for this project were reviewed in accordance with the pertinent parts of the U.S. Environmental Protection Agency (USEPA) National Functional Guidelines for Organic Data Review, dated January 2017; Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use, dated January 2009; along with the Quality Assurance/Quality Control (QA/QC) requirements for the analytical methods used for the analyses. The text of the report addresses only those problems affecting data usability.

ATTACHMENTS

l) Glossary of Data Qualifiers
2) Electronic Data Deliverable (EDD). These include:
   (a) All results for target compounds with qualifier codes where applicable.
   (b) All unusable detection limits (qualified "R"), where applicable.
3) Electronic Data Package (.pdf file) as Support Documentation

DCN: BC051801-BCH21

Respectfully Submitted,

Sherif N. Mina Date: September 4, 2018
Sherif N. Mina

QA/Review: SM

Appendix D: Electronic Data Deliverable (CD-ROM)