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Subject:
2016 Groundwater Sampling & Soil Cover Inspection Report
Waterville Former MGP Site
Waterville, New York

ENVIRONMENT

Dear Mr. Verrigni:

Date:
November 22, 2016

On behalf of NYSEG, Arcadis is pleased to present this annual report summarizing the results of groundwater sampling and soil cover inspection activities conducted in 2016 at the Waterville manufactured gas plant (MGP) site. Relevant background information is provided below, followed by a discussion of the 2016 results and recommendations for the site.

Contact:
David Cornell

Phone:
315 671 9379

BACKGROUND

Email:
David.Cornell@arcadis.com

As required by the New York State Department of Environmental Conservation's (NYSDEC's) Record of Decision (ROD) issued in March 2002, NYSEG administered a 5-year post-IRM groundwater monitoring program at the Waterville, New York MGP site. An evaluation of the results of this monitoring program was submitted to the NYSDEC on May 8, 2007. Based on the NYSDEC's comments on this evaluation, NYSEG agreed (in a letter dated January 4, 2008) to revise the scope of the monitoring to sampling one well (MW98-7D) annually for an additional 5 years (until 2012). Based on the results of the supplemental 5-year groundwater monitoring program completed in 2012 and discussions with the NYSDEC, NYSEG agreed to continue sampling groundwater from MW98-7D on an annual basis.

Our ref:
B0013053

2016 GROUNDWATER SAMPLING EVENT

Arcadis sampled groundwater from monitoring well MW98-7D on July 20, 2016. The location of the well and other pertinent site features can be found on Figure 1. Consistent with the sampling events completed since 2004, the sampling from MW98-7D was conducted using low-flow purging techniques. The low-flow

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method consists of slowly purging water from the well at a rate of approximately 100 to 200 milliliters per minute until readings of the following field parameters stabilized: pH, dissolved oxygen, oxidation-reduction potential (ORP), turbidity and conductivity. The table below presents the values for these field parameters at the time of sampling:

Well ID	pH (S.U.) ¹	Temperature (°C) ²	Conductivity (mS/cm) ³	Dissolved Oxygen (mg/L) ⁴	ORP (mV) ⁵	Turbidity (NTU) ⁶
MW98-7D	7.12	12.02	0.396	0.16	-103.6	3.42

Notes:

¹ S.U. = Standard Units.

² °C = degrees Celsius.

³ mS/cm = milliSiemens per centimeter.

⁴ mg/L = milligrams per liter.

⁵ mV = milliVolts.

⁶ NTU = Nephelometric Turbidity Units.

The collected sample was analyzed for BTEX (benzene, toluene, ethylbenzene, and xylenes) and PAHs (polycyclic aromatic hydrocarbons) by TestAmerica of Amherst, New York. No problems arose during the sampling event. The groundwater sampling log is included as Attachment 1 and the historical analytical results for MW98-7D are summarized in Table 1 in comparison to NYSDEC Class GA Standards and Guidance Values¹.

Consistent with previous sampling events, groundwater sampled from MW98-7D exceeded the NYSDEC Class GA Standards for all of the BTEX compounds. Also consistent with previous events, several PAHs continue to be detected in the sample collected from well MW98-7D. While trace amounts of individual PAHs continue to be detected, only acenaphthene and naphthalene were detected at a concentration above the NYSDEC Class GA Guidance Value for these compounds. The levels for both BTEX and PAHs were generally within the range of concentrations detected during the previous sampling rounds.

2015 RECONNAISSANCE OF SOIL COVER AREA

On July 20, 2016, Arcadis also performed the annual reconnaissance of the soil cover portion of the site, as required by the site's ROD. Unlike previous years, the area of soft wet soil typically observed in the southwest corner of the property, near the fence corner and just north of the MW98-7S/7D, was not present (Photo #1). This was likely due to the unusually dry summer in 2016. As reported in previous inspection reports, the above-ground pool installed at the 139 Babbott Avenue property, and raised-bed vegetable garden at 145 Babbott Avenue were still present during the 2016 inspection event (Photo #2). The pool appears to be located within the soil cover area and approximately 0.5 feet to 1.5 feet of material appears to have been excavated to facilitate the installation. No additional disturbances to the soil cover area were observed during the 2016 inspection.

¹ The NYSDEC Class GA Guidance Values are published in the NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations; reissued June 1998 and revised in April 2000 and June 2004.

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Jamie Verrigni, P.E.
November 22, 2016

SUMMARY

The 2016 PAH analytical results for the groundwater sample collected from MW98-7D are higher than those from the previous two rounds but generally within the range of concentrations historically detected at this well. Only acenaphthene and naphthalene were found to exceed Class GA Guidance Values. BTEX concentrations decreased in 2016 compared to analytical results collected in 2015, but remained similar to the range of historical BTEX concentrations observed prior to 2015. Analytical data from the 2017 BTEX and PAH results will be evaluated to determine if any concentration trends become apparent.

Aside from the disturbances caused by the installation of the above-ground pool and raised garden, the soil cover appeared to be in good condition with no obvious damage.

The next groundwater sampling and soil cover inspection event is scheduled for the summer of 2017. If you have any questions, please feel free to contact John Ruspantini of NYSEG at 607.762.8787 or me at 315.671.9379.

Sincerely,

Arcadis of New York, Inc.



David A. Cornell
Geologist

Copies:

John J. Ruspantini, CHMM, NYSEG
Keith A. White, C.P.G., Arcadis

Enclosures:

Table

- 1 Comparison to NYSDEC Class GA Standards and Guidance Values

Figure

- 1 Site Map

Attachments

- 1 Groundwater Sampling Log
- 2 Chain of Custody Record
- 3 Soil Cover Inspection Photograph Log

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TABLE



Table 1
Historical and Current Groundwater Analytical Results

New York State Electric & Gas Company
Waterville MGP Site, Waterville, New York

	Class GA Groundwater Standards	MW98-7D													
		7/1/04	7/1/04 DUP	11/11/04	11/11/04 DUP	5/10/05	5/10/05 DUP	11/10/05	11/10/05 DUP	5/10/06	5/10/06 DUP	11/7/06	11/7/06 DUP	5/1/08	5/1/08 DUP
BTEX (ug/L)															
Benzene	1	170	160	98	100	160	150	90	NA	140	140	110	94	140 D	120 D
Ethylbenzene	5	96	82	74	73	110	110	84	NA	97	93	85	66 J	86	81
Toluene	5	31	27	19 J	19 J	26	28	20 J	NA	27	26	18	16 J	26	24
total Xylenes	5	100	92	88	86	110	110	81	NA	95	91	90	64 J	90	86
TOTAL BTEX		397	361	279	278	406	398	275	0	359	350	303	240	342	311
PAHs (ug/L)															
2-Methylnaphthalene		NA	NA	130	140	110	120	140	140	130	52	100 J	82 J	110	97
Acenaphthene	20 G	190	190	120	130	110	110	140	140	96 J	92	140	110	120	120
Acenaphthylene		40 J	42 J	25 J	27 J	23 J	22 J	24 J	23 J	19 J	14 J	19 J	15 J	22	22
Anthracene	50 G	16 J	17 J	11 J	13 J	7 J	7.2 J	11 J	11 J	44 J	5.2 J	8.7 J	7.6 J	8	9
Benzo(a)anthracene	0.002 G	10 U	10 U	10 U	10 U	5.3 U	5.3 U	10 U	10 U	10 U	2.1 U	11 U	10 U	5 U	5 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U	5.3 U	5.3 U	10 U	10 U	10 U	2.1 U	11 U	10 U	5 U	5 U
Benzo(b)fluoranthene	0.002 G	10 U	10 U	10 U	10 U	5.3 U	5.3 U	10 U	10 U	10 U	2.1 U	11 U	10 U	5 U	5 U
Benzo(g,h,i)perylene		100 U	100 U	100 U	100 U	53 U	53 U	100 U	100 U	100 U	21 U	110 U	100 U	5 U	5 U
Benzo(k)fluoranthene	0.002 G	10 U	10 U	10 U	10 U	5.3 U	5.3 U	10 U	10 U	10 U	2.1 U	11 U	10 U	5 U	5 U
Chrysene	0.002 G	100 U	100 U	100 U	100 U	53 U	53 U	100 U	100 U	100 U	21 U	110 U	100 U	5 U	5 U
Dibenzo(a,h)anthracene		10 U	10 U	10 U	10 U	5.3 U	5.3 U	10 U	10 U	10 U	2.1 U	11 U	10 U	5 U	5 U
Dibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 J	2 J
Fluoranthene	50 G	6.7 J	6.1 J	100 U	3.6 J	2.6 J	2.3 J	100 U	100 U	100 U	21 U	3.5 J	3 J	3 J	3 J
Fluorene	50 G	28 J	29 J	18 J	22 J	13 J	13 J	100 U	17 J	57 J	28	14 J	12 J	16	15
Indeno(1,2,3-cd)pyrene	0.002 G	10 U	10 U	10 U	10 U	5.3 U	5.3 U	10 U	10 U	10 U	2.1 U	11 U	10 U	5 U	5 U
Naphthalene	10 G	1600	1600	1400	1500	970	1000	1200	1100	910	360	1300	930	1100 D	980 D
Phenanthrene	50 G	88 J	90 J	58 J	66 J	44 J	42 J	54 J	51 J	75 J	39	51 J	44 J	46	45
Pyrene	50 G	8.8 J	9 J	100 U	4.5 J	2.9 J	3.4 J	100 U	100 U	100 U	21 U	4.1 J	3.1 J	4 J	4 J
TOTAL PAHs		1978	1983	1762	1906	1283	1320	1569	1482	1331	590	1640	1207	1431	1297

See Notes on Page 2.

Table 1
Historical and Current Groundwater Analytical Results

New York State Electric & Gas Company
Waterville MGP Site, Waterville, New York

	Class GA Groundwater Standards	MW98-7D										
		5/28/09	5/28/09 DUP	5/12/10	5/12/10 DUP	6/3/11	6/3/11 DUP	6/21/12	6/28/13	6/20/2014	7/9/2015	7/20/2016
BTEX (ug/L)												
Benzene	1	110 D	120 D	110 D	110 D	57 J	170 J	90 J	8.9	17	68	39 J
Ethylbenzene	5	90	91	95	96	36 J	150 J	97 J	6.3	11	66	48 J
Toluene	5	22	23	22	22	9 J	34 J	18	2.2	3.3	15	9.7 J
total Xylenes	5	91	93	96	99	46 J	139 J	93 J	7.5	17	74	52 J
TOTAL BTEX		313	327	323	327	148	493	298	24.9	48	223	149
PAHs (ug/L)												
2-Methylnaphthalene		110	140	110	120 D	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	20 G	120	140	150 D	150 D	130	160	86 J	120 J	61	35	100 J
Acenaphthylene		19	25	27	23 D	21 J	24 J	12 J	20 J	5.6	0.66 J	18
Anthracene	50 G	7.8	9.6	12	9.3 D	8.5 J	9.6 J	6.3 J	7.7 J	4.2	4.9 J	7.8
Benzo(a)anthracene	0.002 G	0.48U	0.48U	0.5 U	4.8U,D	48U	48U	ND	ND	1.9 U	5.2U	4.8U
Benzo(a)pyrene	ND	0.48U	0.48U	0.5 U	4.8U,D	48U	48U	ND	ND	1.9 U	5.2U	4.8U
Benzo(b)fluoranthene	0.002 G	0.48U	0.48U	0.5 U	4.8U,D	48U	48U	ND	ND	1.9 U	5.2U	4.8U
Benzo(g,h,i)perylene		0.48U	0.48U	0.5 U	4.8U,D	48U	48U	ND	ND	1.9 U	5.2U J	4.8U
Benzo(k)fluoranthene	0.002 G	0.48U	0.48U	0.5 U	4.8U,D	48U	48U	ND	ND	1.9 U	5.2U	4.8U
Chrysene	0.002 G	0.48U	0.48U	0.5 U	4.8U,D	48U	48U	ND	ND	1.9 U	5.2U	4.8U
Dibenzo(a,h)anthracene		0.48U	0.48U	0.5 U	4.8U,D	48U	48U	ND	ND	1.9 U	5.2U J	4.8U
Dibenzofuran		2.3	2.9	3	2.6 D,J	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	50 G	2.6	3.2	3.8	4.8U,D	48U	48U	ND	2.7 J	1.7 J	1.7 J	2.6 J
Fluorene	50 G	19	24	24	23 D	20 J	22 J	15 J	18	8.5	9.7	14
Indeno(1,2,3-cd)pyrene	0.002 G	0.48U	0.48U	0.5 U	4.8U,D	48U	48U	ND	ND	1.9 U	5.2U J	4.8U
Naphthalene	10 G	850 D	1100 D	980 D	1100 D	780	1000	600	990 D	1.9 U	0.86 J	640 D
Phenanthrene	50 G	44	56	62	61 D	59	69	37 J	49	23	24	45
Pyrene	50 G	3	3.7	4.4	3.8 D,J	3.3 J	3.7 J	ND	3.4 J	2.2	2 J	2.8 J
TOTAL PAHs		1178	1504	1376	1493	1022	1288	756	1211	110	94.4	830.2

Notes:

D = Concentration is based on a diluted sample analysis.

J = The concentration given is an approximate value.

NA = Not available/Not applicable.

U = The compound was not detected at the indicated concentration.

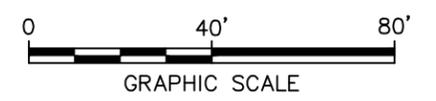
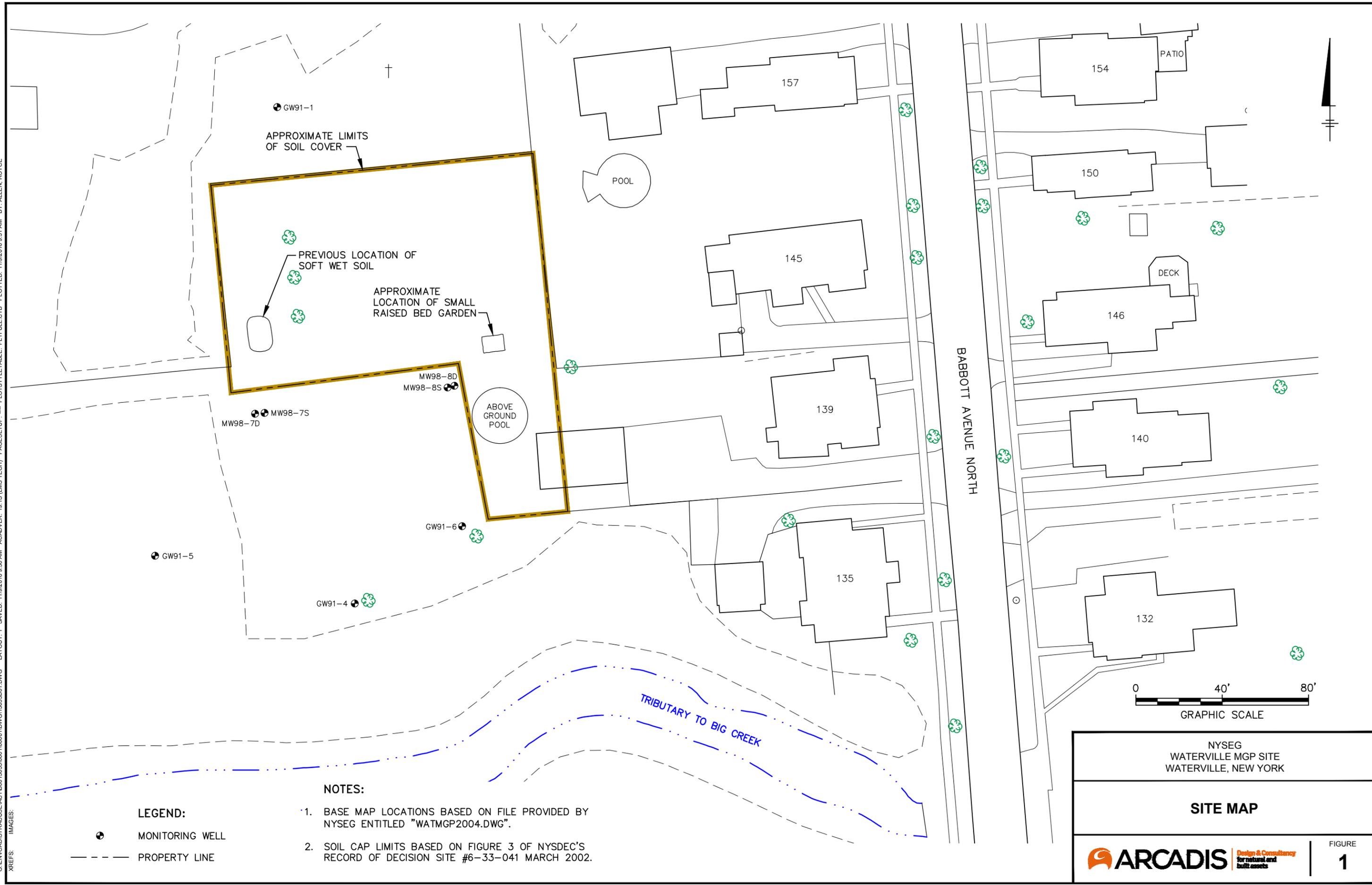
ND = Not detected.

The NYSDEC Class GA Guidance Values are published in the NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations; reissued June 1998 and revised in April 2000 and June 2004.

FIGURE



CITY: SYRACUSE, NY DIV: GROUP: ENV/IM/DV DB: P. LISTER, R. ALLEN PM/TM/TR: D. CORNELL LVR: ON=OFF=REF (FRZ)
 G:\ENVCAD\SYRACUSE\ACT\B0013053\000100001\DWG\13053B01.DWG LAYOUT: 1 SAVER: 11/9/2016 9:30 AM ACADVER: 19.1S (LMS TECH) PAGES: 1 PAGES SETUP: --- PLOT STYLE TABLE: PLTFULL.CTB PLOTTED: 11/9/2016 9:31 AM BY: ALLEN ROYCE
 XREFS: IMAGES:



NOTES:

1. BASE MAP LOCATIONS BASED ON FILE PROVIDED BY NYSEG ENTITLED "WATMGP2004.DWG".
2. SOIL CAP LIMITS BASED ON FIGURE 3 OF NYSDEC'S RECORD OF DECISION SITE #6-33-041 MARCH 2002.

LEGEND:

- MONITORING WELL
- PROPERTY LINE

NYSEG WATERVILLE MGP SITE WATERVILLE, NEW YORK	
SITE MAP	
	Design & Consultancy for natural and built assets
FIGURE 1	

ATTACHMENT 1

Groundwater Sampling Log



GROUNDWATER SAMPLING LOG

Sampling Personnel: Levia G Terrell/Nicholle R Griffith
Client / Job Number: NYSEG Waterville / B0013053
Weather: Sunny 75
Well ID: MW98-7D
Date: 7/20/16
Time In: 10:10 **Time Out:** 12:00

Well Information

Depth to Water: 6.53 (feet) (from MP)
Total Depth: 18.47 (feet) (from MP)
Length of Water Column: (feet) 11.94
Volume of Water in Well: (gal) 1.9

Well Type: Flushmount
Well Material: Stainless Steel
Well Locked: Yes (No)
Measuring Point Marked: Yes (No)
Well Diameter: 1" 2" Other:

Purging Information

Purging Method: Bailer Peristaltic Grundfos Other:
Tubing/Bailer Material: St. Steel Polyethylene Teflon Other:
Sampling Method: Bailer Peristaltic Grundfos Other:
Duration of Pumping: 70 (min)
Average Pumping Rate: 130 ml/min **Water-Quality Meter Type:** HACH 7000 YSI/Lamotte 2020
Total Volume Removed: 2.0 (gal) **Did well go dry:** Yes (No)

Conversion Factors				
gal / ft. of water	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469
1 gal = 3.785 L = 3785 ml = 0.1337 cubic feet				

Unit Stability			
pH	DO	Cond.	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

Parameter:	1	2	3	4	5	6	7	8	9	10	11	12	13
Volume Purged (gal)	0.1	0.3	0.5	0.7	0.8	1.1	1.2	1.4	1.5	1.6	1.7	1.8	1.9
Rate (mL/min)	200	130	130	130	130	130	130	130	130	130	130	130	130
Depth to Water (ft.)	8.08	8.17	8.29	8.39	8.48	8.58	8.65	8.72	8.82	8.82	8.86	8.91	8.93
pH	6.76	6.85	6.89	6.94	6.97	7.00	7.03	7.06	7.07	7.08	7.10	7.09	7.09
Temp. (C)	12.14	12.46	12.77	12.71	12.79	12.47	12.25	12.25	12.38	12.27	11.85	11.96	11.93
Conductivity (mS/cm)	0.381	0.382	0.384	0.386	0.387	0.390	0.390	0.389	0.391	0.393	0.391	0.391	0.392
Dissolved Oxygen (mg/L)	0.76	0.38	0.43	0.40	0.41	0.40	0.34	0.32	0.34	0.26	0.23	0.19	0.17
ORP (mV)	-102.6	-107.9	-109.0	-108.1	-110.9	-111.8	-111.5	-110.8	-108.6	-107.0	-107.3	-108.2	-105.8
Turbidity (NTU)	15.7	7.04	5.13	4.54	4.31	3.01	2.91	3.11	3.26	3.79	3.74	3.68	3.71
Notes:	Yak					Water							

Sampling Information

Analyses	#	Laboratory
BTEX	3	TestAmerica Buffalo
PAHs	2	TestAmerica Buffalo
Sample ID: MW98-7D Sample Time: 11:35		
MS/MSD:	Yes	No
Duplicate:	Yes	No
Duplicate ID	N/A	Dup. Time: N/A
Chain of Custody Signed By:	N. Griffith	

Problems / Observations

Initial: Clear, colorless, odorless
 Final: SAA

GROUNDWATER SAMPLING LOG

Sampling Personnel: Levia G Terrell/Nicholle R Griffith
Client / Job Number: NYSEG Waterville / B0013053
Weather: SUNNY 75
Well ID: MW-98-7D
Date: 7-20-16
Time In: 1010 **Time Out:** 1200

Well Information

Depth to Water: (feet) 6.53 (from MP)
Total Depth: (feet) 18.47 (from MP)
Length of Water Column: (feet) 11.94
Volume of Water in Well: (gal) 1.9

Well Type: Flushmount **Stick-Up**
Well Material: Stainless Steel **PVC**
Well Locked: Yes **(No)**
Measuring Point Marked: Yes **(No)**
Well Diameter: 1" **(2")** Other:

Purging Information

Purging Method: Bailer **(Peristaltic)** Grundfos Other:
Tubing/Bailer Material: St. Steel **(Polyethylene)** Teflon Other:
Sampling Method: **(Bailer)** **(Peristaltic)** Grundfos Other:
Duration of Pumping: (min) 70
Average Pumping Rate: (ml/min) 130 **Water-Quality Meter Type:** YSI/Lamotte 2020
Total Volume Removed: (gal) 22.0 **Did well go dry:** Yes **(No)**

Conversion Factors				
gal / ft. of water	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469
1 gal = 3.785 L = 3785 ml = 0.1337 cubic feet				

Unit Stability			
pH	DO	Cond.	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

Parameter:	1	2	3	4	5	6	7	8	9	10	11	12	13
Volume Purged (gal)	2.0	2.1											
Rate (mL/min)	130	130											
Depth to Water (ft.)	8.99	9.01											
pH	7.11	7.12											
Temp. (C)	11.99	12.02											
Conductivity (mS/cm)	0.391	0.396											
Dissolved Oxygen (mg/L)	0.16	0.16											
ORP (mV)	-104.0	-103.6											
Turbidity (NTU)	3.75	3.42											
Notes:													

Sampling Information

Analyses	#	Laboratory
BTEX	3	TestAmerica Buffalo
PAHs	2	TestAmerica Buffalo
Sample ID:		Sample Time: 11:35
MS/MSD:	Yes	No
Duplicate:	Yes	No
Duplicate ID	NA	Dup. Time: NA
Chain of Custody Signed By:	NRC	

Problems / Observations

See pg #1

ATTACHMENT 2

Chain of Custody Record



ATTACHMENT 3

Soil Cover Inspection Photograph Log



SOIL COVER INSPECTION PHOTOGRAPH LOG

CLIENT: NYSEG	SITE NAME: Waterville Former MGP Site
PROJECT#: B0013053.0001	SITE LOCATION: Waterville, New York
PHOTOGRAPH #: 1	
PHOTOGRAPHER: LT	
DATE: 07/20/16	
DIRECTION: E	
COMMENT: Raised bed garden and above ground swimming pool behind 139 and 145 Babbott Avenue.	

CLIENT: NYSEG	SITE NAME: Waterville Former MGP Site
PROJECT#: B0013053.0001	SITE LOCATION: Waterville, New York
PHOTOGRAPH #: 2	
PHOTOGRAPHER: LT	
DATE: 07/20/16	
DIRECTION: NW	
COMMENT: Location where soft wet area and tire ruts were previously observed.	