Department of Environmental Conservation

COLD SPRING MGP

PERIODIC REVIEW REPORT

WORK ASSIGNMENT D007622-29.1

COLD SPRING MGP — SITE NO. 340026
COLD SPRING — PUTNAM COUNTY, NY

Prepared for:
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PERIODIC REVIEW REPORT

COLD SPRING FORMER MANUFACTURED GAS PLANT

NYSDEC SITE NO. SITE 340026

WORK ASSIGNMENT NO. D007622-29.1

Prepared for:

New York State Department of Environmental Conservation

Albany, New York

Prepared by:

URS Corporation – NY

Buffalo, NY

FEBRUARY 2019

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

BTEX	benzene, toluene, ethylbenzene, and xylenes
DWQC	Drinking Water Quality Council
EC	engineering control
FS	Feasibility Study
FER	Final Engineering Report
GES	Groundwater Environmental Services, Inc.
IC	institutional control
MGP	Manufactured Gas Plant
ng/L	nanograms per liter
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
PAHs	polycyclic aromatic hydrocarbons
PFAS	per and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PRR	Periodic Review Report
RA	Remedial Action
ROD	Record of Decision
SCO	Soil Cleanup Objective
SIM	selected ion monitoring
SM	site management
SMP	Site Management Plan
µg/L	micrograms per liter
VOC	volatile organic compound

EXECUTIVE SUMMARY

The Cold Spring Former Manufactured Gas Plant (MGP) (Site No. 340026; hereinafter referred to as the Site) is a commercially zoned parcel approximately 1.09 acres in size located at the intersection of New Street and West Street in the Village of Cold Spring, New York. A MGP operated on the Site in the mid-to-late 1800's and apparently ceased operations before 1887.

The remedy for the Cold Spring Site was selected and a Record of Decision (ROD) issued in February 2010. In October 2013, the New York State Department of Environmental Conservation (NYSDEC) agreed to the request by the Village of Cold Spring that the selected remedy presented in the ROD be expanded to include demolition of the boat house and removal of contamination beneath the boat house. Remedial Action (RA) work began in October 2015 and was completed in June 2017. The following major RA activities were completed at the Site:

- Demolition of the boat house
- Excavation of the source area, which included the subsurface remnants of the former MGP structure. The excavation included all visible coal tar and extended vertically to bedrock or the confining clay layer. The Site was backfilled with clean soil. To the north, excavation was limited by New Street.
- Approximately 8,990 tons of contaminated soil and debris were excavated.
- The excavation was backfilled with 6,858 tons of clean soil meeting 6 New York Codes, Rules and Regulations Subpart 375-6 Restricted Residential Use Soil Cleanup Objectives (SCOs)
- Approximately 540 cubic yards of flowable fill was placed along the southern extent of the excavation.
- The Site was restored with 6,120 square feet of seeded area and 10,910 square feet of a gravel parking area.

A draft Site Management Plan (SMP) was created in 2009 to identify the controls established to meet the ROD. A final SMP is currently being prepared to address the revised remediation (i.e., removal of the boat house and underlying soils). Since contaminants of concern, specifically benzene, toluene, ethylbenzene, xylene, and polycyclic aromatic hydrocarbons, remain at levels above the SCOs, institutional controls are required to protect human health and the environment.

This Periodic Review Report (PRR) is the first PRR for the Site. The PRR summarizes the Site Management (SM) activities completed during the period of March 31, 2017 to July 31, 2018, and evaluates the effectiveness of the RA. During the reporting period, SM requirements were met. Based on this review, the remedy continues to be protective of the public health and the environment and is compliant with the ROD.

Sampling for emerging contaminants was conducted in July 2018. Per and polyfluoroalkyl substances (PFAS) exceeded Drinking Water Quality Council recommended screening levels. Continued groundwater monitoring and site inspection in accordance with the SMP are recommended for the next reporting period and should also include monitoring for PFAS'.

1.0 SITE OVERVIEW

The Cold Spring Former Manufactured Gas Plant (MGP) is located in Village of Cold Spring, Putnam County, New York and is identified as Section 48.12 Block 1 Lot 51 on the Putnam County Tax Map. The Site is a 0.98 portion of the 1.09 acre parcel and is bounded by New Street to the north, a rock outcrop and private residences to the south, Market Street to the east, and the Hudson River to the west (Figure 1). The Site consists of an undeveloped grassy area with gravel and asphalt parking areas. The Site is zoned for general business and is currently vacant.

A MGP operated on the Site in the mid-to-late 1800's and apparently ceased operations before 1887. The primary contaminants produced by the MGP operations include benzene, toluene. ethylbenzene, and xylene (BTEX); and polycyclic aromatic hydrocarbons (PAHs). These contaminants were present in soil and groundwater.

The Record of Decision (ROD) for the Site was signed in February 2010 (NYSDEC 2010). The ROD specified the removal of the source area located east of the boat house, including subsurface MGP structures. In October 2013, the New York State Department of Environmental Conservation (NYSDEC) agreed to the request by the Village of Cold Spring that the selected remedy presented in the ROD be expanded to also include demolition of the boat house and removal of contaminated soil beneath the boat house. In 2010, the NYSDEC established an Environmental Easement for the Site.

The major components of the completed Remedial Action (RA) consisted of the following:

- Demolition of the boat house.
- Excavation of the source area, which included the subsurface remnants of the former MGP structure. The excavation extended to a depth of 13 feet in some areas and included all visible coal tar, and extended vertically to bedrock or the confining clay layer. To the north, excavation was limited by the road. Approximately 8,990 tons of contaminated soil and debris were excavated.
- Backfill with approximately 6,858 tons of clean soil meeting 6 New York Codes, Rules and Regulations (NYCRR) Subpart 375-6 Restricted Residential Use Soil Cleanup Objectives (SCOs).
- Placement of 540 cubic yards of flowable fill.
- Restore the Site with 6,120 square feet of seeded area and 10,910 square feet of a gravel parking area.

This Periodic Review Report (PRR) represents the first PRR for the Site. Subsequent PRRs will be conducted as directed by NYSDEC. This PRR covers the period of performance from March 31, 2017 to July 31, 2018 and includes required institutional control (IC) certification and summary, and documentation of site-related data to support IC certification.

2.0 EVALUATION OF REMEDY PERFORMANCE, EFFECTIVENESS AND PROTECTIVENESS

BTEX and PAHs were the major contaminants detected in site soil. Thirteen soil samples (DOC-1 through DOC-13) were collected during the remediation to document contaminant levels remaining on site. Samples DOC-1 through DOC-11 were collected from the bottom of the excavation and DOC-12 and DOC-13 were collected from the sidewalls of the excavation. The results showed that documentation samples DOC-2 and DOC-7 through DOC-12 contained contaminants at concentrations above the 6 NYCRR Subpart 375-6 Restricted Residential Use SCOs (see Figure 2 and Table 1).

A demarcation layer consisting of non-woven geotextile fabric was placed at the bottom of the entire excavation, except the flowable fill wall located on south side of the Site. Clean fill, soil and/or gravel were placed on top of the demarcation layer.

2.1 Site Management Status

A draft Site Management Plan (SMP) was prepared in 2010 in accordance with the ROD. During this PPR reporting period, URS prepared a revised SMP to address changes in the RA subsequent to issuance of the ROD (i.e., removal of the boat house and underlying impacted soils).

This PRR was completed using site-specific documentation including the Site's ROD, Final Engineering Report (FER), and draft SMP. The Site monitoring for this PPR was performed by Groundwater Environmental Services, Inc. (GES) on July 10, 2018. The site was inspected on July 10, 2018 by GES and no changes to the site cover were noted. The monitoring wells were also inspected. Minor maintenance was performed on GW-04 by replacing a missing curb box bolt.

The PPR was conducted to confirm that controls established according to the ROD and draft SMP are operational and effective, that the draft SMP is being implemented and conducted accordingly, and that the remedy remains protective of the environment and/or public health.

In accordance with the draft SMP, groundwater samples were collected by GES from five monitoring wells in July 2018. The groundwater results were compared to NYSDEC's Class GA Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1). Exceedances for benzene, toluene, and acenaphthene (a PAH) were observed in one downgradient monitoring well (GW-07) at the western excavation limit (see Figure 2 and Table 2). A groundwater elevation contour map is provided in Figure 3.

Additionally, the monitoring wells were sampled for emerging contaminants. Samples were collected for the analysis of 1,4-dioxane by SW846 Method 8270D selected ion monitoring (SIM) and per-and polyfluorylalkyl substances (PFAS) by USEPA Method 537-modified. The emerging contaminant results are provided in Table 3 and Figure 5. Results for 1,4-dioxane in all samples were below the Drinking Water Quality Council (DWQC) recommended screening level (January 2019) of 1 microgram per liter (µg/L). Results for perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were greater than the DWQC recommended screening level of 10 nanograms per liter (ng/L) in GW-01, GW-04 and GW-06, but below the USEPA Drinking Water Health Advisory (May 2016) of 70 ng/L.

2.2 Institutional Controls

Because contaminants are present in the subsurface soils at levels above the SCOs, ICs have been implemented to protect public health and the environment for the applicable future use. The purpose of the IC is to:

- prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and
- limit the use and development of the Site to commercial or industrial uses only.

The ICs in place consist of the following:

- groundwater use restriction
- SMP
- land use restriction
- building use restriction
- Monitoring Plan
- Environmental Easement

Based on inspections conducted during the reporting period, there has not been a change in property use and groundwater beneath the site is not being used. The on-site building, the boat house, was removed during remediation, so a building use restriction is no longer applicable. Based on the site inspection, the Site is in compliance with the ICs.

There are no engineering controls at the Site.

3.0 CONCLUSIONS AND RECOMMENDATIONS

Based on this review, the remedy continues to be protective of the public health and the environment and is compliant with the decision document.

3.1 Institutional Controls

The current ICs are adequate to achieve the objectives for protection of human health and the environment.

3.2 Other Site-Related Activities

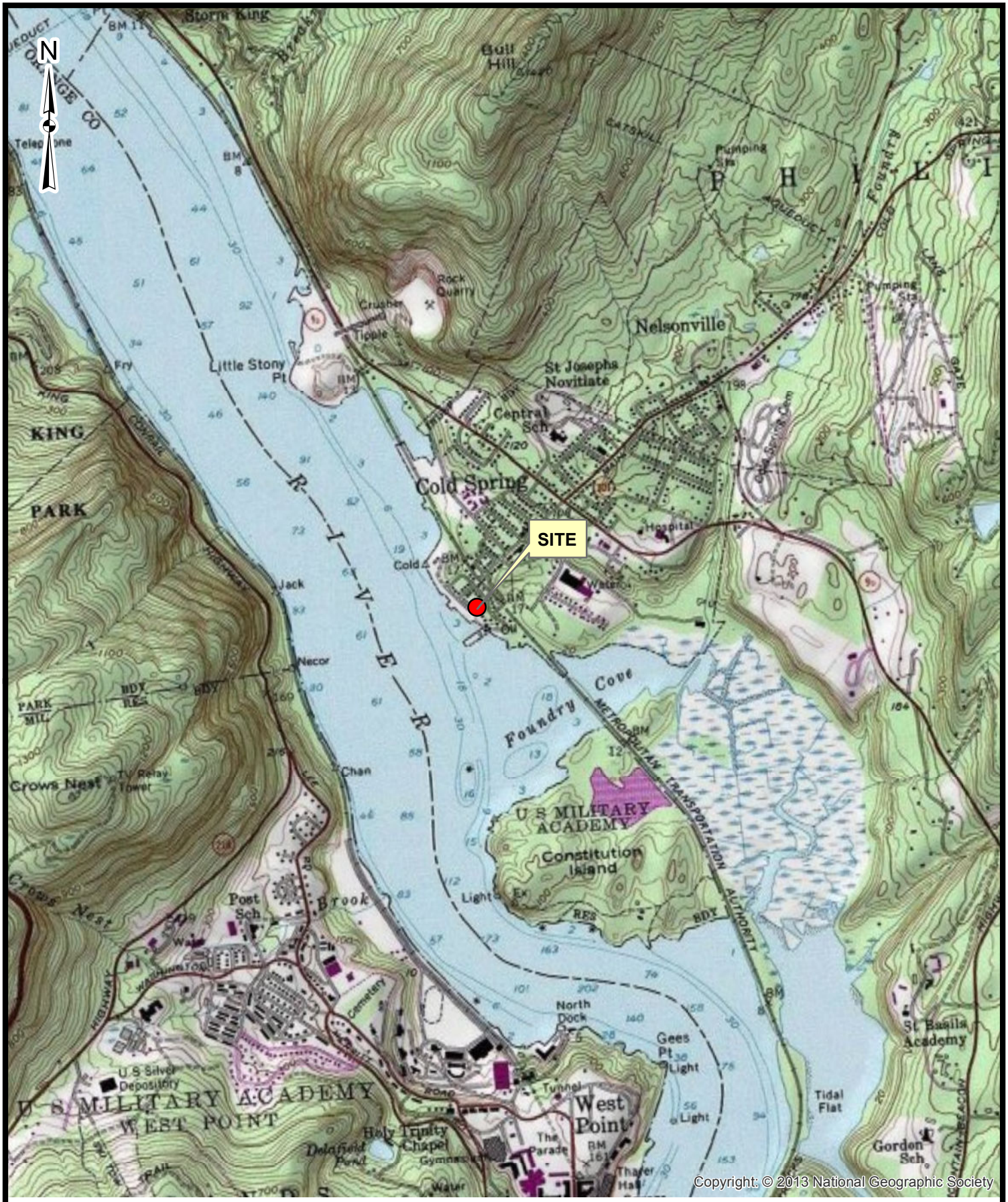
Groundwater monitoring and site inspections as specified in the SMP should be continued, including sampling and analysis for PFAS in groundwater. No other additional activities are recommended within the next reporting period. A revised SMP will be finalized after the updated Environmental Easement is executed and filed with the Putnam County Clerk.

4.0 REFERENCES

URS Corporation (URS). 2017. *Final Engineering Report – Work Assignment D007622-29.1 Cold Spring Former MGP-Site No. 340026*. 2017.

New York State Department of Environmental Conservation (NYSDEC), 2010. *Record of Decision, Cold Spring Former MGP Site. Village of Cold Spring, Putnam County, New York*. Site Number E340026. February.

NYSDEC, 2009. *Site Management Plan – Cold Spring MGP Site- Site #340026*. April.



Source:
1:24,000-scale USGS Topographic Map, West Point, NY

2,000 0 2,000 Feet

URS

NYSDEC COLD SPRING FORMER MGP SITE
5 NEW STREET
COLD SPRING, NEW YORK

FIGURE 1

I:\19998446.00004\GIS\MAPS\TOPO.mxd 2/25/2010 MDL

POINT ID	NORTHING	EASTING	ELEVATION
DOC-1	941107.11	640273.09	-1.56
DOC-2	941046.66	640197.86	-4.74
DOC-3	941110.87	640250.65	-6.64
DOC-4	941074.85	640187.54	-6.38
DOC-5	941065.12	640168.51	-6.49
DOC-6	941148.74	640251.35	-4.76
DOC-7	941098.01	640188.98	-5.36
DOC-8	941059.39	640145.31	-6.70
DOC-9	941057.60	640250.02	-3.90
DOC-10	941021.22	640201.01	-3.40
DOC-11	941003.65	640174.67	-3.80
DOC-12	940995.91	640165.53	-1.00
DOC-13	941014.78	640167.85	-1.00

WEST STREET

NEW STREET

DOC-8	CRIT	5/16
PAHs:		
Benzo[a]anthracene	1	1.2
Benzo[a]pyrene	1	1.1

DOC-7	CRIT	5/16
PAHs:		
Benzo[a]anthracene	1	2.6
Benzo[a]pyrene	1	2.1
Benzo[a]fluoranthene	1	1.8
Dibenzo[a,h]anthracene	0.33	0.34
Indeno[1,2,3-cd]pyrene	0.5	0.79

DOC-06

DOC-05

DOC-04

DOC-03

DOC-01

LIMITS OF EXCAVATION

DOC-13

DOC-12	CRIT	6/16
PAHs:		
Benzo[a]anthracene	1	1.1
Benzo[a]fluoranthene	1	1.2
Indeno[1,2,3-cd]pyrene	0.5	0.53

DOC-2	CRIT	3/16
PAHs:		
Benzo[a]anthracene	1	1.9
Benzo[a]pyrene	1	1.3
Benzo[a]fluoranthene	1	1.2
Indeno[1,2,3-cd]pyrene	0.5	0.56

DOC-11	CRIT	6/16
PAHs:		
Benzo[a]anthracene	1	1.4
Benzo[a]pyrene	1	1.2
Benzo[a]fluoranthene	1	1.4
Indeno[1,2,3-cd]pyrene	0.5	0.56

DOC-10	CRIT	6/16
PAHs:		
Total	500	1616.3

DOC-9	CRIT	6/16
VOCs:		
Benzene	4.8	66
Ethylbenzene	41	150
Toluene	100	110
Xylenes (total)	100	200
PAHs:		
Total	500	969.3

PROPERTY LINE (TYP.)

Legend

- Soil Sample - No Exceedances of RAOs or Recommended Criteria
- Soil Sample Exceeding Recommended Criteria: 6NYCRR Subpart 375-6 Restricted Residential Use SCOs
- Soil Sample Exceeding RAO: 500 mg/Kg Total PAHs
- Soil Sample Exceeding Both Criteria

NOTES:
(1) Results in mg/Kg.
(2) CRIT - Criteria: 6 NYCRR Subpart 375-6 Restricted Residential Use SCOs and 500 mg/Kg or more Total PAHs.
(3) Horizontal datum is based upon the New York State Plane Coordinate System, East Zone, North American Datum of 1983 (NAD83).
(4) Vertical datum is based upon the elevations of the monitoring wells established by William D. Youngblood Land Surveying, P.C. as shown on a drawing titled "Survey For Village Of Cold Spring", file #P-1001, dated 9/11/08, which was based upon the North American Vertical Datum of 1988 (NAVD88).
(5) All samples met RAO of being free of visible tar.

20 0 20 Feet

COLD SPRING FORMER MGP SITE
EXCEEDANCES OF RAOs AFTER REMEDY

URS

FIGURE 2

J:\Projects\60429529\MISC\GIS\Maps\DOC SAMPLING ANALYTICAL.mxd 8/29/2018

WEST STREET

NEW STREET

GW-04, 2.18

GW-05, 2.28

GW-06, 2.32

GW-01, 4.08

GW-07, 2.28

LIMITS OF EXCAVATION

PROPERTY LINE (TYP.)

2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4

Legend

- Monitoring Well
- Groundwater Flow Direction
- 3.9 Groundwater Elevation Contour

20 0 20 Feet

COLD SPRING FORMER MGP SITE GROUNDWATER ELEVATION MAP

URS

FIGURE 3

J:\Projects\60429529\MISC\GIS\Maps\GW_Elevation.mxd 8/29/2018

N

WEST STREET

NEW STREET

GW-04 | No Compounds Exceed Criteria

GW-05 | No Compounds Exceed Criteria

GW-06 | No Compounds Exceed Criteria

GW-01 | No Compounds Exceed Criteria

LIMITS OF EXCAVATION

GW-07	CRIT	07/18
VOCs:		
Benzene	1	2.5
Xylene (total)	5	8.7
SVOCs:		
Acenaphthene	20	32

PROPERTY LINE (TYP.)

Legend

Monitoring Well

Location ID	Criteria	Date
GW-07	CRIT	07/18
VOCs:		
Benzene (Parameter)	1	2.5 (Concentration)

Note: Units are in µg/L
Criteria: NYSDEC TOGS 1.1.1 Ambient Water Quality Standards, Class GA

20 0 20 Feet

COLD SPRING FORMER MGP SITE
GROUNDWATER ANALYTICAL EXCEEDANCES

URS

FIGURE 4

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GW-04	CRIT 1	CRIT 2	07/18
SVOCs:			
1,4-Dioxane	1	--	0.24
Per- and Polyfluoroalkyl Substances:			
Perfluorobutanesulfonic acid (PFBS)	100	--	6.9
Perfluorobutanoic acid (PFBA)	100	--	13
Perfluorodecanoic acid (PFDA)	100	--	0.61
Perfluoroheptanoic acid (PFHpA)	100	--	5.1
Perfluorohexanesulfonic acid (PFHxS)	100	--	6.5
Perfluorohexanoic acid (PFHxA)	100	--	7.3
Perfluorononanoic acid (PFNA)	100	--	2.4
Perfluorooctanesulfonic acid (PFOS)	10	70	13
Perfluorooctanoic acid (PFOA)	10	70	16
Perfluoropentanoic acid (PFPA)	100	--	11
6:2 Fluorotelomer sulfonate (62FTS)	100	--	ND
8:2 Fluorotelomer sulfonate (82FTS)	100	--	0.55
Total PFOA and PFOS	--	70	25.5
Total Per- and Polyfluoroalkyl Substances	500	--	66.47

GW-05	CRIT 1	CRIT 2	07/18
SVOCs:			
1,4-Dioxane	1	--	ND
Per- and Polyfluoroalkyl Substances:			
Perfluorobutanesulfonic acid (PFBS)	100	--	7.9
Perfluorobutanoic acid (PFBA)	100	--	17
Perfluorodecanoic acid (PFDA)	100	--	ND
Perfluoroheptanoic acid (PFHpA)	100	--	3.6
Perfluorohexanesulfonic acid (PFHxS)	100	--	4.3
Perfluorohexanoic acid (PFHxA)	100	--	4.5
Perfluorononanoic acid (PFNA)	100	--	1.1
Perfluorooctanesulfonic acid (PFOS)	10	70	8.4
Perfluorooctanoic acid (PFOA)	10	70	8.1
Perfluoropentanoic acid (PFPA)	100	--	5.9
6:2 Fluorotelomer sulfonate (62FTS)	100	--	ND
8:2 Fluorotelomer sulfonate (82FTS)	100	--	ND
Total PFOA and PFOS	--	70	16.5
Total Per- and Polyfluoroalkyl Substances	500	--	60.8

GW-06	CRIT 1	CRIT 2	07/18
SVOCs:			
1,4-Dioxane	1	--	0.17
Per- and Polyfluoroalkyl Substances:			
Perfluorobutanesulfonic acid (PFBS)	100	--	7.5
Perfluorobutanoic acid (PFBA)	100	--	23
Perfluorodecanoic acid (PFDA)	100	--	ND
Perfluoroheptanoic acid (PFHpA)	100	--	4.8
Perfluorohexanesulfonic acid (PFHxS)	100	--	4.3
Perfluorohexanoic acid (PFHxA)	100	--	5.8
Perfluorononanoic acid (PFNA)	100	--	1.6
Perfluorooctanesulfonic acid (PFOS)	10	70	11
Perfluorooctanoic acid (PFOA)	10	70	16
Perfluoropentanoic acid (PFPA)	100	--	11
6:2 Fluorotelomer sulfonate (62FTS)	100	--	ND
8:2 Fluorotelomer sulfonate (82FTS)	100	--	ND
Total PFOA and PFOS	--	70	27
Total Per- and Polyfluoroalkyl Substances	500	--	85

NEW STREET

AREA OF EXCAVATION

FLOWABLE FILL

GW-07	CRIT 1	CRIT 2	07/18
SVOCs:			
1,4-Dioxane	1	--	ND
Per- and Polyfluoroalkyl Substances:			
Perfluorobutanesulfonic acid (PFBS)	100	--	1.2
Perfluorobutanoic acid (PFBA)	100	--	5.7
Perfluorodecanoic acid (PFDA)	100	--	ND
Perfluoroheptanoic acid (PFHpA)	100	--	1.1
Perfluorohexanesulfonic acid (PFHxS)	100	--	1.1
Perfluorohexanoic acid (PFHxA)	100	--	2.2
Perfluorononanoic acid (PFNA)	100	--	0.33
Perfluorooctanesulfonic acid (PFOS)	10	70	1.8
Perfluorooctanoic acid (PFOA)	10	70	2.7
Perfluoropentanoic acid (PFPA)	100	--	6.3
6:2 Fluorotelomer sulfonate (62FTS)	100	--	12
8:2 Fluorotelomer sulfonate (82FTS)	100	--	ND
Total PFOA and PFOS	--	70	4.5
Total Per- and Polyfluoroalkyl Substances	500	--	34.43

GW-01	CRIT 1	CRIT 2	07/18
SVOCs:			
1,4-Dioxane	1	--	0.14
Per- and Polyfluoroalkyl Substances:			
Perfluorobutanesulfonic acid (PFBS)	100	--	7
Perfluorobutanoic acid (PFBA)	100	--	6.7
Perfluorodecanoic acid (PFDA)	100	--	ND
Perfluoroheptanoic acid (PFHpA)	100	--	6.6
Perfluorohexanesulfonic acid (PFHxS)	100	--	8.7
Perfluorohexanoic acid (PFHxA)	100	--	11
Perfluorononanoic acid (PFNA)	100	--	0.37
Perfluorooctanesulfonic acid (PFOS)	10	70	11
Perfluorooctanoic acid (PFOA)	10	70	20
Perfluoropentanoic acid (PFPA)	100	--	13
6:2 Fluorotelomer sulfonate (62FTS)	100	--	ND
8:2 Fluorotelomer sulfonate (82FTS)	100	--	ND
Total PFOA and PFOS	--	70	31
Total Per- and Polyfluoroalkyl Substances	500	--	84.37

Legend

- Monitoring Well
- Limits of Excavation
- Northern Boundary of Flowable Fill
- Flowable Fill

Location ID | Criteria 1 | Criteria 2 | Date

GW-07	CRIT 1	CRIT 2	07/18
SVOCs:			
1,4-Dioxane	1	--	ND

Parameter | Concentration

NOTES:
(1) 1,4-Dioxane shown in micrograms per liter, whereas Per- and Polyfluoroalkyl Substances are shown in nanograms per liter.
(2) Criteria (CRIT 1): Recommended Drinking Water Quality Council (DWQC) Screening Level (January 2019).
(3) Criteria (CRIT 2): USEPA Drinking Water Health Advisory (USEPA, May 2016).
(4) Data obtained from analysis of samples collected by GES on July 10, 2018.

20 0 20 Feet

COLD SPRING FORMER MGP SITE
EMERGING CONTAMINANTS
ANALYTICAL RESULTS

URS

FIGURE 5

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TABLE 1
REMAINING CONTAMINANTS ON SITE
COLD SPRING FORMER MGP SITE

Sample ID			DOC-1	DOC-2	DOC-3	DOC-4	DOC-5	DOC-6	DOC-7	DOC-8	DOC-9	DOC-10	DOC-11	DOC-12	DOC-13
Date sampled			3/8/2016	3/29/2016	4/4/2016	4/5/2016	4/8/2016	5/17/2016	5/18/2016	5/19/2016	6/2/2016	6/6/2016	6/8/2016	6/9/2016	6/9/2016
Matrix			Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Analyte	Units	Criteria*													
Benzene	mg/kg	4.8	ND	ND	ND	0.16	0.16	ND	0.12	ND	66	0.73	ND	ND	ND
Ethylbenzene	mg/kg	41	ND	0.0016	0.0062	1.1	1.3	ND	1.3	ND	150	26	0.016	0.0021	ND
Toluene	mg/kg	100	0.00099	0.00098	0.0045	ND	ND	ND	ND	ND	110	2.4	0.0024	0.0017	ND
Xylenes(Total)	mg/kg	100	ND	0.0039	0.015	1.7	1.8	ND	1.5	ND	200	40	0.021	0.0033	ND
2-Methylnaphthalene	mg/kg	--	ND	1.3	ND	0.57	0.55	ND	0.78	0.084	140	150	0.38	0.29	0.054
Acenaphthene	mg/kg	100	ND	2.2	ND	0.44	0.56	ND	2.3	0.82	55	64	0.47	0.34	0.072
Acenaphthylene	mg/kg	100	ND	0.34	ND	ND	0.090	ND	0.41	0.23	19	36	0.24	0.16	ND
Anthracene	mg/kg	100	ND	1.4	0.067	0.24	0.26	ND	2.2	0.86	46	100	0.78	0.54	0.13
Benzo[a]anthracene	mg/kg	1	ND	1.9	0.065	0.23	0.55	ND	2.6	1.2	43	84	1.4	1.1	0.46
Benzo[a]pyrene	mg/kg	1	ND	1.3	0.042	0.16	0.43	ND	2.1	1.1	37	57	1.2	0.98	0.56
Benzo[b]fluoranthene	mg/kg	1	ND	1.2	ND	0.16	0.41	ND	1.8	0.92	32	66	1.4	1.2	0.51
Benzo[g,h,i]perylene	mg/kg	100	ND	0.84	ND	ND	0.24	ND	1.2	0.81	20	24	0.66	0.68	0.59
Benzo[k]fluoranthene	mg/kg	3.9	ND	0.34	ND	ND	0.14	ND	0.58	0.24	10	26	0.43	0.31	0.13
Chrysene	mg/kg	3.9	ND	1.7	0.056	0.21	0.52	ND	2.5	1.2	44	67	1.4	1.0	0.46
Dibenzo[a,h]anthracene	mg/kg	0.33	ND	0.25	ND	ND	0.077	ND	0.34	0.21	6.3	9.3	0.30	0.24	0.15
Fluoranthene	mg/kg	100	ND	2.4	0.098	0.32	0.83	ND	3.5	1.5	57	180	1.8	1.3	0.40
Fluorene	mg/kg	100	ND	1.4	0.045	0.24	0.20	ND	1.6	0.63	47	110	0.58	0.38	0.062
Indeno[1,2,3-cd]pyrene	mg/kg	0.5	ND	0.56	ND	ND	0.17	ND	0.79	0.47	13	23	0.56	0.53	0.33
Naphthalene	mg/kg	100	0.021	1.9	0.039	4.5	2.3	ND	0.86	0.13	270	320	0.33	0.41	0.085
Phenanthrene	mg/kg	100	ND	4.2	0.25	0.85	0.79	ND	5.7	2.1	170	300	1.7	1.4	0.46
Pyrene	mg/kg	100	ND	4.0	0.15	0.51	1.2	ND	6.0	3.1	100	150	2.5	1.6	0.80
Total PAHs	mg/kg	500	0.021	25.9	0.812	7.86	8.767	0	34.5	15.52	969.3	1616.3	15.75	12.17	5.20

* Criteria - 6NYCRR Subpart 375-6 Restricted Residential Use Soil Cleanup Objectives (SCO)

Concentration exceeds SCO

mg/kg - milligrams per kilogram

ND - not detected

TABLE 2
GROUNDWATER MONITORING RESULTS
COLD SPRING FORMER MGP SITE

Location ID			GW-01	GW-04	GW-04	GW-05	GW-06	GW-07
Field Sample ID			GW-01	FIELD DUPLICATE	GW-04	GW-05	GW-06	GW-07
Matrix			Groundwate	Groundwater	Groundwate	Groundwate	Groundwate	Groundwate
Date Sampled			07/10/18	07/10/18	07/10/18	07/10/18	07/10/18	07/10/18
Parameter	**Units**	**Criteria**						
Volatile Organic Compounds								
Benzene	UG/L	1	ND	ND	ND	ND	ND	2.5
Ethylbenzene	UG/L	5	ND	ND	ND	ND	ND	4.0
Toluene	UG/L	5	ND	ND	ND	ND	ND	0.62 J
Xylene (total)	UG/L	5	ND	ND	ND	ND	ND	8.7
Semivolatile Organic			ND	ND	ND	ND	ND	ND
Acenaphthene	UG/L	20	ND	ND	6.6 J	12	3.0 J	32
Acenaphthylene	UG/L	-	ND	ND	ND	0.48 J	ND	4.0 J
Anthracene	UG/L	50	ND	ND	ND	ND	0.46 J	ND
Fluoranthene	UG/L	50	ND	ND	ND	0.47 J	1.1 J	3.5 J
Fluorene	UG/L	50	ND	ND	0.88 J	ND	ND	4.5 J
Phenanthrene	UG/L	50	ND	ND	0.82 J	ND	ND	ND
Pyrene	UG/L	50	ND	ND	ND	1.1 J	1.8 J	2.1 J

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998 (includes 4/2000 and 6/2004 Addenda) Class GA.

Exceeds Criteria
ND - Not Detected
UG/L - Micrograms per Liter
J - Estimated value

TABLE 3
EMERGING CONTAMINANT ANALYTICAL RESULTS
COLD SPRING FORMER MGP SITE

			Location ID	GW-01	GW-04		GW-05	GW-06	GW-07
			Field Sample ID	GW-01	GW-04	FIELD DUPLICATE	GW-05	GW-06	GW-07
			Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Date Sampled	07/10/18	07/10/18	07/10/18	07/10/18	07/10/18	07/10/18
Parameter	**Units**	**Screening Level**	**Health Advisory**			Field Duplicate			
Semivolatile Organic Compounds									
1,4-Dioxane	UG/L	1	-	0.14 J	0.16 J	0.24	0.10 U	0.17 J	0.10 U
Per- and Polyfluoroalkyl Substances									
Perfluorobutanesulfonic acid (PFBS)	NG/L	100	-	7.0	6.9	5.1	7.9	7.5	1.2 J
Perfluorobutanoic acid (PFBA)	NG/L	100	-	6.7	13 J	5.4 J	17	23	5.7
Perfluorodecanoic acid (PFDA)	NG/L	100	-	0.31 U	0.61 J	0.32 U	0.32 U	0.31 U	0.33 U
Perfluoroheptanoic acid (PFHpA)	NG/L	100	-	6.6	2.9 J	5.1 J	3.6	4.8	1.1 J
Perfluorohexanesulfonic acid (PFHxS)	NG/L	100	-	8.7	2.3 J	6.5 J	4.3	4.3	1.1 J
Perfluorohexanoic acid (PFHxA)	NG/L	100	-	11	4.5	7.3	4.5	5.8	2.2
Perfluorononanoic acid (PFNA)	NG/L	100	-	0.37 J	2.4	0.57 J	1.1 J	1.6	0.33 J
Perfluorooctanesulfonic acid (PFOS)	NG/L	10	70	**11**	**13**	9.5	8.4	**11**	1.8
Perfluorooctanoic acid (PFOA)	NG/L	10	70	**20**	9.1 J	**16 J**	8.1	**16**	2.7
Perfluoropentanoic acid (PFPA)	NG/L	100	-	13	8.1	11	5.9	11	6.3
6:2 Fluorotelomer sulfonate (62FTS)	NG/L	100	-	0.80 U	0.90 U	0.85 U	0.85 U	0.81 U	12 J
8:2 Fluorotelomer sulfonate (82FTS)	NG/L	100	-	0.45 U	0.55 J	0.48 U	0.48 U	0.45 U	0.48 U
Total PFOA and PFOS	NG/L		70	31	22.1	25.5	16.5	27	4.5
Total Per- and Polyfluoroalkyl Substances (PFAS)	NG/L	500	-	84.37	63.36	66.47	60.8	85	34.43

Screening Level - Drinking Water Quality Council (DWQC) screening level (January 2019)

Health Advisory - USEPA Drinking Water Health Advisory (USEPA, May 2016)

- = No health advisory value.

UG/L = micrograms per liter. NG/L = nanograms per liter.

Flags assigned during chemistry validation are shown.

J - The reported concentration is an estimated value. U - Not detected above the reported quantitation limit.

Detection limits shown are method detection limits (MDL).

Concentration Exceeds Screening Level

Concentration Exceeds Health Advisory