THIRD FIVE-YEAR REVIEW REPORT FOR MOHONK ROAD INDUSTRIAL PLANT SUPERFUND SITE HAMLET OF HIGH FALLS, ULSTER COUNTY, NEW YORK

Prepared by

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LIST OF ABBREVIATIONS AND ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
FLUTe	Flexible Liner Underground Technologies, Inc.
GAC	Granular Activated Carbon
GWET	Groundwater Extraction and Treatment
HFWD	High Falls Water District
ICs	Institutional Controls
µg/L	micrograms per liter
MCL	maximum contaminant level
MRIP	Mohonk Road Industrial Plant
NPL	National Priorities List
DWQC	Drinking Water Quality Council
ng/L	nanograms per liter
NTCRA	Non-Time-Critical Removal Action
NYCDEP	New York City Department of Environmental Protection
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
O&M	Operation and Maintenance
OU	Operable Unit
PCE	Tetrachloroethene
POET	Point-of-Entry Treatment
PWS	Public Water Supply
RAO	Remedial Action Objective
RA	Remedial Action
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
TAGM	Technical and Administrative Guidance Memorandum
TCE	Trichloroethene
UAO	Unilateral Administrative Order
UOC	Unspecified Organic Contaminant
VI	Vapor Intrusion
VOC	Volatile Organic Compound

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of FYRs are documented in FYR reports, such as this one. In addition, FYR reports identify issues found during this review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (40 CFR Section 300.430(f)(4)(ii)) and considering EPA policy.

This is the third FYR for the Mohonk Road Industrial Plant (MRIP) Site (Site). The triggering action of this policy review is the completion date of the previous FYR. The FYR has been prepared since hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE). The Site consists of one Operable Unit (OU) and will be addressed in this FYR.

The Site FYR team was led by EPA: Emily Wong, remedial project manager (RPM) and Damian Duda (supervisor), Liana Agrios (hydrogeologist), Ula Filipowicz (human health risk assessor), Detbra Rosales (ecological risk assessor), and Shereen Kandil (community involvement coordinator). The FYR process began on June 28, 2023.

Site Background

The Site is located in the Hamlet of High Falls, the Towns of Marbletown and Rosendale, Ulster County, New York, approximately seven miles north-northwest of the Village of New Paltz and ten miles south-southwest of the City of Kingston (**Figure 1**). The Site includes a 43,000 square foot commercial building, the MRIP property (**Figure 2**) and surrounding properties impacted by the contaminated groundwater plume. The original MRIP property consisted of approximately 14.5 acres and was used for industrial and commercial activities from the early 1960s until approximately 1992. Previous hazardous waste disposal practices, especially of solvents, from one or more of the former industrial operators in the MRIP building resulted in the groundwater being contaminated with various volatile organic compounds (VOCs). Many of these wastes were disposed of in an on-site septic system. The various operators included manufacturers of plastic and metal store display fixtures, metal finishing, wet spray painting, card punch machines and computer frames operations. Drums, paint sludge and other wastes were also buried in several locations on the MRIP Property. The Site was added to the National Priorities List (NPL) on January 19, 1999.

In August 2005, the High Falls Water District (HFWD) acquired a 6.9-acre unimproved portion of the original MRIP property as part of the water supply remedy discussed below. The HFWD's new public water supply (PWS) treatment plant and water tower were constructed on the northern portion of the MRIP property. Connection of homes and businesses within the water district to the PWS was completed in November 2007.

The Site is located in an area of primarily residential development. The MRIP Property is currently zoned for light industrial use, is currently used for non-industrial commercial purposes, and the most

reasonably anticipated future use for the MRIP Property is commercial and light industrial use. The Town of Marbletown has indicated no zoning changes are planned for the MRIP property.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Mohonk Road Industrial Plant		
EPA ID: NYD986950012		
Region: 2	**State:** NY	**City/County:** High Falls/Ulster
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	**Has the site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name (Federal or State Project Manager): Emily Wong		
Author affiliation: EPA		
Review period: 06/28/23 – 3/1/2024		
Date of site inspection: 10/18/2023		
Type of review: Policy		
Review number: 3		
Triggering action date: 05/29/2019		
Due date *(five years after triggering action date)*: 05/29/2024		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

Site investigations conducted by the New York State Department of Environmental Conservation (NYSDEC) began in 1994 in response to a resident's concerns regarding the quality of drinking water from their private residential well. Contaminants of concern (COCs) identified in Site groundwater are VOCs, including 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethene (1,1-DCE) 1,1-dichloroethane (1,1-DCA), and trichloroethene (TCE). Additional COCs identified in Site soils were cis-1,2-dichloroethene (cis-1,2-DCE), tetrachloroethene (PCE), ethylbenzene and xylenes. Groundwater in the bedrock aquifer beneath the MRIP property exhibited VOC-concentrations above the federal and New

York State (NYS) maximum contaminant levels (MCL) and NYSDEC Class GA groundwater standards.

NYSDEC performed subsequent Site investigations, including a remedial investigation (RI) for the Site between April 1997 and May 1998. A human health risk assessment was conducted to determine potential exposure risks to Site contaminants as part of the RI. The assessment concluded that groundwater posed an unacceptable risk to human health. Ingestion and inhalation of VOCs from contaminated groundwater were determined to be the primary exposure pathways. The assessment concluded that actual or threatened releases of hazardous substances from this Site, if not addressed by remedial actions or other active measures, presented a current or potential threat to human health and the environment. A preliminary fish and wildlife impact assessment was also performed to address the potential impacts from the Site to ecological resources. Since the assessment did not identify any existing pathways for significant exposures to fish or wildlife to Site-related contaminants, EPA determined that an ecological risk assessment was not necessary.

Response Actions

In 1994, NYSDEC installed 70 Point-of-Entry Treatment (POET) systems at residents' homes and businesses as an interim action to address the elevated levels of VOCs detected in the drinking water from private wells. The POET systems consisted of particle filtration, granular activated carbon (GAC) adsorption and ultraviolet treatment processes. From Spring 2000 until June 2005, EPA installed five additional POET systems. In total, 75 residential and commercial wells downgradient of the MRIP property were found to have VOC concentrations above NYS MCLs.

In response to a 1998 NYSDEC request, EPA conducted a non-time-critical removal action (NTCRA), involving the construction of a groundwater extraction and treatment (GWET) system which was designed to minimize further migration of the most highly contaminated portion of the groundwater plume. Part of the NTCRA included the excavation and disposal of 532 tons of contaminated soil, paint waste and debris from a portion of the Site. In May 2000, the NTCRA GWET plant became operational.

Record of Decision – March 2000

The remedial action objectives (RAOs) in the ROD included:

- Eliminate inhalation and ingestion of, and dermal contact with, contaminated groundwater associated with the Site that does not meet federal or state drinking water standards;
- Restore the bedrock aquifer to its most beneficial use, *i.e.*, as a source of potable water, and restore it as a natural resource;
- Prevent or minimize cross-media impacts from COCs in contaminated soil to the underlying groundwater, which will also eliminate potential future soil exposure. Site soil cleanup objectives for COCs would be based on NYSDEC's TAGM 4046 for groundwater protection; and
- Eliminate further off-MRIP property contaminated bedrock groundwater migration.

The selected remedy of the 2000 ROD included the following components:

- Extraction of contaminated groundwater in both the near-field plume and the far-field plume to restore the aquifer to its most beneficial use (as a potable water supply), treatment with an air stripper, and discharge of the treated water to the Rondout Creek and Coxing Kill. The near-field plume refers to that portion of the groundwater plume with total VOC concentrations greater than 1,000 µg/L while the far-field plume refers to the component of the groundwater plume

containing concentrations of 10 to 1,000 µg/L total VOCs. The near-field plume would be addressed through long-term operation of the groundwater GWET system. The far-field groundwater plume would be addressed through the construction and the long-term operation of an additional GWET system;
- Construction of a PWS system to provide potable water to the residences and businesses in the Towns of Marbletown and Rosendale that have impacted or threatened private supply wells. The primary water supply for the system will be the New York City Catskill Aqueduct (NYCCA), as managed by the New York City Department of Environmental Protection (NYCDEP);
- Implementation of a groundwater monitoring program to evaluate the effectiveness of the remedy, and institutional controls, such as groundwater use restrictions, may be employed to prevent use of the bedrock aquifer in the impacted or threatened area;
- Excavation of VOC-contaminated soils from various areas of concern (AOCs) with concentrations above the cleanup criteria to prevent or minimize cross-media impacts from COCs in soil to the underlying groundwater; and
- Off-site disposal of the contaminated soil at appropriately permitted facilities.

ROD Amendment – September 2008

After the issuance of the 2000 ROD, EPA performed extensive monitoring of the far-field plume and conducted an investigation to evaluate potential vapor intrusion (VI). The removal of potential sources, the continued operation and maintenance (O&M) of the existing GWET system, and the reduction of contamination within the near field plume significantly reduced the migration of contaminants from the Site. EPA's evaluation of monitored natural attenuation (MNA) as a remedy for the far-field plume as opposed to groundwater extraction and treatment (the remedy selected in the ROD for the far field plume) resulted in the selection of MNA as a preferred alternative to groundwater extraction and treatment within the far field plume. A ROD Amendment was issued in September 2008 to reflect this change in the groundwater remedy.

The amended groundwater remedy includes:
- MNA within the far-field plume to restore the aquifer to its most beneficial use (as a potable water supply) and continued GWET (air stripper and GAC adsorption) of contaminated groundwater in the near-field plume on the MRIP property. The treated water discharges to the Coxing Kill.
- Implementation of a groundwater monitoring program to evaluate groundwater conditions and the effectiveness of the components of the remedy;
- Institutional controls in the form of existing governmental controls to prevent future use of the aquifer as a drinking water source in the impacted or threatened area. These institutional controls would no longer be necessary following the restoration of the groundwater to beneficial use; and
- Continued operation of vapor mitigation systems and a soil vapor extraction (SVE) system. In 2005, elevated sub-slab and indoor air concentrations were detected in the MRIP building, indicating a need to install a vapor mitigation system. Six sub-slab vapor mitigation systems were installed in the MRIP building and have been operating since early 2007. In 2006, an SVE system and wells were installed to enhance VOC removal. The SVE system was fully operational by early 2008.

The RAOs were updated to reflect activities completed to date and include:
- Restore the aquifer to its most beneficial use, *i.e.*, as a source of potable water, and restore it as a natural resource;

- Eliminate further off-MRIP property contaminated groundwater migration; and
- Eliminate inhalation and ingestion of, and dermal contact with, contaminated groundwater associated with the Site that does not meet state or federal drinking water standards.

For a more complete history of important response actions, other Site activities and documents issued, please consult **Appendix A**, **Table 1** and **Table 2**.

Status of Implementation

Near-Field Groundwater Extraction and Treatment System

EPA operated the GWET plant until September 2011 when the EPA transferred responsibility of the ongoing operation and maintenance (O&M) of the GWET system to NYSDEC. NYSDEC is currently operating a revamped version of the original system which is configured within a smaller housing configuration that was built within the original plant building. Contaminated groundwater is pumped from three extraction wells: MW-5R, MW-7R and ERT-1, located on the MRIP property.

Contaminated Soils Excavation

Under the 2000 ROD, additional removal and disposal of contaminated soil was performed. From October to December 2000, EPA excavated contaminated soils, paint waste and debris from various AOCs at the Site. Post-excavation soil samples collected from the sidewalls and floor indicated that no action levels were exceeded in soils remaining within the excavation. Approximately 2,000 tons of contaminated soils, paint waste and debris were removed and disposed of off-site.

Alternate Water Supply Remedy

Since Fall 2005, the PWS system provides potable water to the residences and businesses in the Towns of Marbletown and Rosendale which had impacted or threatened private supply wells. Potable water from the NYCCA was chosen as the source of the new PWS. EPA and the Army Corps of Engineers constructed the new PWS treatment facility under guidance from NYCDEP. A community water district was established in the Towns of Marbletown and Rosendale, *i.e.*, the HFWD. The HFWD has entered into a use agreement with the NYCDEP.

Soil Vapor Extraction System

In December 2006, EPA installed a SVE system and SVE wells on the MRIP property to enhance the VOC-removal provided by the GWET system. The system was located immediately north of the commercial building and near the former underground septic tank and original septic drain field, targeting the COCs. The system was fully operational by February 2008 and became part of the remedy with the 2008 ROD Amendment. In 2009, an additional five SVE wells were installed at deeper levels in the bedrock aquifer (approximately 55 feet below ground surface) which were able to capture more VOCs from the vadose zone.

From 2006 until early 2011, there was substantial VOC recovery from the vadose zone. This recovery was especially evident in the reduction of VOC-contaminant concentrations in extraction well MW-5R, located directly downgradient of the source area, *i.e.*, the original septic tank area, that was being remediated by the SVE system. In September 2011, EPA evaluated the effectiveness of the SVE system

in continuing to clean up the vadose zone of residual VOC contamination in the source area. EPA noted that the effectiveness of VOC recovery from the vadose zone had diminished dramatically since its operations began in 2006. Subsequently, EPA believed that the SVE had served its purpose in removing a substantial amount of residual VOC contamination from the source area vadose zone. As a result of this evaluation, EPA terminated the operation of the SVE system and removed it from the Site in 2012. The original SVE wells were properly abandoned. The five additional SVE wells, installed in 2009, remain in place, are capped and may be used for future groundwater monitoring should the need arise.

Vapor Mitigation Systems

In February 2005, EPA initiated an investigation to determine if subsurface contamination originating from the MRIP Property may put nearby residents at risk due to VI of VOCs. The investigation determined that the concentrations of VOCs at all residential locations were below the health-based screening levels. However, results showed elevated sub-slab and indoor air concentrations in various locations within the MRIP commercial building. Since the MRIP building is divided into separate office or workspaces for the various tenants, six sub-slab depressurization systems (SSDS) or vapor mitigation systems were added to the MRIP building in February 2007 and became part of the remedy in the 2008 ROD Amendment.

The most recent (October 2009) indoor air sampling at the MRIP building indicated that detectable levels of TCE were found at some locations; however, concentrations of VOCs in indoor air did not exceed risk-based levels for commercial/industrial exposure. Based on these results, it was concluded that the SSDS systems are operating as designed.

Institutional Controls Summary Table

Table 1: Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	Site	Prevent future use of bedrock aquifer. Ensure potable water supply to Site area.	Town Ordinance of Marbletown (Article II-High Falls Water District, Ch. 190) and Town Ordinance of Rosendale (Article II-High Falls Water District, Ch. 73)
Soil vapor and groundwater	Yes	Yes	Site	Prevent installation of groundwater wells at the MRIP Property. Ensure no disturbance or interference with ongoing groundwater remedies. Ensure preventative measures from potential future effects of VI.	Environmental Protection Easement and Declaration of Restrictive Covenants (Amended – October 28, 2011).

An amended environmental protection easement and declaration of restrictive covenants with the owner of the MRIP property is in place and entered with Ulster County. These ICs will remain in place until cleanup goals are met, and groundwater has been restored to beneficial use.

System Operations/Operation and Maintenance

In 2011, EPA transferred the O&M of the revamped GWET plant and SSDS systems to NYSDEC. NYSDEC has contracted with Aztech to perform the ongoing GWET operations, which consist of extraction of contaminated groundwater, treatment through an air stripper and discharge of the treated groundwater to the Coxing Kill. As part of the monitoring program, the influent and effluent concentrations of the GWET system, as well as extraction wells ERT-1, MW-5R and MW-7R, are sampled monthly. Samples are analyzed for all groundwater COCs, *i.e.*, 1,1-DCA 1,1-DCE 1,1,1-TCA and TCE. Aztech technicians also inspect the status of the SSDS fans mounted on the exterior of the industrial building. NYSDEC manages the SSDS systems and does not typically conduct VI sampling when there is an active SSDS in place. As stated above, the most recent sampling event in 2009 indicated the SSDS systems were operating as designed. Based on monthly inspections performed during this FYR period, the SSDSs continue to operate as designed. Maintenance and any part replacement are performed on these systems, as needed.

In 2019, EPA transferred the O&M of the MNA of the far-field plume to the NYSDEC. Since the transfer, long term monitoring (LTM) sampling events have been conducted by NYSDEC and its contractor MACTEC every 15 months instead of annually to incorporate seasonality changes. The most recent sampling event was completed in May 2023.

Potential Site impacts from climate change have been assessed, and the performance of the remedy is currently not at risk from the expected effects of climate change in the region and near the Site. Please see **Appendix C** for the full climate change assessment.

III. PROGRESS SINCE LAST FIVE-YEAR REVIEW

This section includes the protectiveness determinations and statements from the last FYR, as well as any recommendations from the last FYR and the current status of those recommendations.

Table 2: Protectiveness Determinations/Statements from the 2019 FYR

Protectiveness Statement(s)	
Operable Unit: 01	*Protectiveness Determination:* Protective
Protectiveness Statement: The OU1 remedy at the Mohonk Road Industrial Plant site is protective of human health and the environment.	
Sitewide Protectiveness Statement	
Protectiveness Determination: Protective	
Protectiveness Statement: The implemented remedies for the Mohonk Road Industrial Plant site protect human health and the environment.	

While no issues nor recommendations were identified in the last FYR, some considerations noted in the last FYR included:

- Consider installing packers in the extraction wells to determine if targeting shallower, conductive bedrock fracture zones would be suitable for maintaining hydraulic control while improving contaminant recovery.

- Consider installation of an additional groundwater extraction well in the source area, *i.e.*, septic tank area, particularly if groundwater COC concentrations in this area show an increase.
- Consider pilot testing of an SVE system in the source area, in conjunction with the additional extraction well.
- Consider additional investigations if COC-contaminant trends are not decreasing and/or COCs are not completely attenuating in the southeastern portion of the far-field plume to confirm that it is not migrating beyond the current limits.

Efforts to address the first three considerations listed above began in 2019. NYSDEC contracted MACTEC to perform field activities as part of the investigation to evaluate the current site remedy and develop options for overall remedial system optimization. An SVE pilot test was developed to determine the usability of the existing bedrock SVE wells located in the source area that were previously decommissioned in 2012. A packered extraction well pilot test was also completed to determine whether pumping from a shallower fracture zone would reduce the vertical spread of contaminants while still maintaining hydraulic control of the source area groundwater. Further details of this investigation were summarized in the 2020 Soil Vapor Extraction and Packer Testing Pilot Study Report.

Results of the SVE pilot test concluded that reinstating the former bedrock SVE system is not recommended due to insufficient vapor extraction. However, vapor samples collected during the pilot study had concentrations of up to 190,000 µg/m^3 of 1,1,1-TCA, 23,000 µg/m^3 of 1,1-DCE, and 5,300 µg/m^3 of TCE, indicating that contamination is likely still present and potentially contributing to groundwater contamination. The packered extraction well testing determined that targeting and pumping shallower fractures yielded higher concentrations of contaminants, and the influence from deeper fractures may contribute to the dilution of the extracted groundwater. Additionally, based on water level elevations measured in two wells (ERT-1 and ERT-2), pumping from the shallow fractures will also reduce the downward vertical spreading of contaminants by causing upward flow within the aquifer. However, the pilot test was not conducted over a long enough period to determine whether hydraulic control of the plume could be maintained year-round, especially during times of seasonally low water.

MACTEC is currently conducting additional pilot testing to evaluate potential GWET system modifications to extract groundwater from depths coinciding with bedrock fracture depths containing the highest concentrations of 1,1,1-TCA (94 to 170 µg/L) detected at depths of 80 to 100 feet below ground surface. The investigation includes monthly SVE source area mass removal and sampling, installation of water level data loggers and quarterly groundwater sampling of six monitoring wells, and pump and packer installation in the extraction wells. Results of this investigation will be used to determine whether an additional extraction well near the source area will be necessary, as well as any other changes to improve the effectiveness of the current remedial system.

The fourth consideration, which addresses the contamination in the far-field plume, is still ongoing. The trends for the past five years in the southeastern portion of the plume are unknown, since MW-17 and MW-21 have not been sampled since 2017, as described in more detail below. Although concentrations were low in 2017, additional data (planned for August 2024) from MW-17 and MW-21 is necessary prior to assessing whether COCs are attenuating or migrating beyond its known limits. MW-17 and MW-21 are Flexible Liner Underground Technologies, Inc.™ (FLUTe) wells with various sampling ports installed in each well. As discussed below, the other downgradient perimeter wells either had no detections of VOCs or detections were below the MCLs in the last five years.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement and Site Interviews

On August 7, 2023, the EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at 42 Superfund sites in New York, New Jersey, Puerto Rico, and the U.S. Virgin Islands, including the MRIP site. The announcement can be found at the following web address: https://www.epa.gov/superfund/R2-fiveyearreviews.

In addition to this notification, the EPA Community Involvement Coordinator for the Site, Shereen Kandil, posted a public notice on the EPA site webpage https://www.epa.gov/superfund/mohonk-road and provided the notice to Ulster county by email on November 13, 2023, with a request that the notice be posted in municipal offices and on the county webpage. This notice indicated that a FYR would be conducted at the MRIP site to ensure that the cleanup at the site continues to be protective of people's health and the environment. Once the FYR is completed, the results will be made available at the following repositories: EPA, 290 Broadway, 18th Floor, New York, New York and at the Stone Ridge Library, 3700 Main Street, Stone Ridge, New York. In addition, the final report will be posted on the following website: https://www.epa.gov/superfund/mohonk-road. Efforts will be made to reach out to local public officials to inform them of the results.

Data Review

Extraction and Treatment Plant

NYSDEC and Aztech operate the GWET system which consists of extraction wells, pumps, blowers and an air stripper. The current configuration of the GWET system was completed as part of a remedial system optimization in March 2016. Aztech performs monthly maintenance and sample collection at the Site. Groundwater samples are collected from the recovery wells: MW-5R, MW-7R and ERT-1, as well as the combined system influent and effluent. As expected, the three extraction wells show relatively high concentrations of COCs in the groundwater. For this FYR period, the combined influent concentrations were as follows:

- 1,1-DCA ranged from 3.2 to 43 µg/L;
- 1,1-DCE ranged from 7.1 µg/L to 27 µg/L;
- 1,1,1-TCA ranged from 20 µg/L to 190 µg/L and
- TCE ranged from 2.1 µg/L to 8.5 µg/L.

See **Table 3** for groundwater, influent, and effluent concentrations in the extraction wells and GWET system. Low level concentrations of VOCs were detected in the air stripper effluent, but all concentrations were below criteria. NYSDEC provides biennial Site status reports of their operations.

The system has an average flow rate of 16.2 gallons per minute. Permit discharge limits continue to be met. From May 2019 to May 2022, the plant treated approximately 24 million gallons of contaminated groundwater and removed approximately 18.01 pounds of total VOCs. The continued presence of VOC-contaminants in the source area wells is likely attributed to a residual source, *i.e.*, the former septic tank area, being not fully removed by the SVE system.

Groundwater Monitoring

The monitoring wells are categorized based on their location (background, on-site, mid plume or perimeter). The background well, MW-1B, is located upgradient (southwest) of the groundwater plume. On-site wells are located within the MRIP property. Mid-plume wells are located outside of the MRIP property boundary and are generally near the center of the VOC plume. The perimeter wells are generally located at the perimeter of the groundwater plume. The overall monitoring well network is shown on **Figure 3**.

Groundwater samples are collected from a total of 25 monitoring wells, including 20 standard wells and five FLUTe wells (MW-17 through MW-21). FLUTe wells have ports located at various levels along the liner to sample the groundwater at various intervals within an aquifer. Groundwater monitoring is conducted every 15 months and includes sampling of the background, on-site, mid-plume, and perimeter wells. Groundwater is sampled for VOCs (1,1,1-TCA, 1,1-DCA, 1,1-DCE, and TCE) and 1,4-dioxane. The results are compared against the NYS Class GA Groundwater Standard of 5 µg/L for all VOCs and NYS MCL of 1 µg/L for 1,4-dioxane. The following monitoring wells are included in the LTM monitoring plan:

- Seventeen (17) conventional monitoring wells: MW-1B, MW-4, MW-5B, MW-6B, MW-8B, MW-9B, MW-10B, MW-11B, MW-11C, MW-12B, MW-13B, MW-14B, MW-15B, MW-16, ERT-2, ERT-3, and ERT-4.
- Five FLUTe wells: MW-17 (Ports 1-3), MW-18 (Ports 1 - 3), MW-19 (Ports 1 - 3), MW-20 (Ports 1 - 3), and MW-21 (Ports 1-6).
- Three extraction wells: ERT-1, MW-5R and MW-7R.

Groundwater samples are also analyzed for MNA parameters every five years. The wells proposed for analyses of MNA parameters have been selected based on evaluations of the groundwater geochemistry conditions, the presence of degradation products, and the physical locations of the monitoring wells. The most recent sampling event during which MNA parameters were collected was October 2017. The next LTM sampling event, which includes VOCs, 1,4-dioxane, and MNA parameters, is scheduled for August 2024.

Tables 4 and **5** show groundwater monitoring results that exceed NYS Class GA Groundwater Standards during the 2019 and 2022 sampling events, respectively. Isoconcentration maps of total VOCs from 2019 and 2022 are shown on **Figures 4** and **5,** respectively. Isoconcentration map of the values of 1,4-dioxane detected in each well is shown on **Figures 6** and **7**, respectively. Data trends in the extraction wells and select monitoring wells are shown on **Figure 8.**

Near-Field Plume

The near-field plume is defined as the portion of the groundwater plume with total VOC concentrations greater than 1,000 µg/L. During this review period, VOC concentrations continued to exceed 1,000 µg/L in monitoring wells MW-4, ERT-4 and MW-5B, which are located within the source area on the MRIP property and are screened in shallow bedrock. Total VOC concentrations from samples collected in July 2019 and January 2022 ranged from 775.3 µg/L in MW-5B to 3,598 µg/L in ERT-4. Groundwater trend analyses for these wells indicate that VOC concentrations appear to fluctuate seasonally, but have an overall decreasing trend relative to historic concentrations.

The continued presence of elevated VOC concentrations in the source area indicates that the contamination in the overburden and shallow portion of the bedrock near the former SVE wells and the original septic tank continues to be a source of groundwater contamination. Further delineation in the

vicinity of source area wells MW-4, ERT-4 and MW-5B may be required to determine the full extent of residual contamination.

Far-Field Plume

The far-field plume is defined as the portion of the groundwater plume containing concentrations of 5 µg/L to 1,000 µg/L total VOCs. Monitoring and extraction wells MW-5R, MW-6B, MW-7R, ERT-1, ERT-2 and ERT-3 are located on the MRIP property in the source area but are screened in deep bedrock. ERT-1 and MW-7R were not sampled during the 2019 event, and ERT-2 and ERT-3 were not sampled during this FYR period. COC concentrations in wells ERT-1, MW-5R, MW-6B, and MW-7R have decreased considerably since groundwater monitoring began. ERT-1 and MW-7R are groundwater recovery wells that are sampled monthly, along with MW-5R and the combined influent into the GWET system. During this review period, COC concentrations in these wells exhibited fluctuations, with total VOC concentrations ranging from 5.8 µg/L (MW-6B) to 148.3 µg/L (MW-5R).

Mid-plume monitoring wells located immediately downgradient of the source area include the following wells: MW-11B, MW-11C, MW-12B, MW-15B, MW-16 and FLUTe well MW-17. The VOC concentrations in these wells are generally lower for all COCs compared to the wells located on the MRIP property but remain above MCLs. COC concentrations in MW-11B, MW-11C, and MW-12B remained stable with total VOC concentrations ranging from 6.84 µg/L (MW-11C) to 33.8 µg/L (MW-12B). COC concentrations in MW-15B have declined since groundwater sampling began, with 1,1,1-TCA concentrations approaching a historic high of 500 µg/L in the early 2000s but declining to 10.2 µg/L in 2022. In MW-16, concentrations of VOCs have historically fluctuated, but have been steadily declining since 2016. The most recent total VOC concentration in this well was 11.1 µg/L (2022). FLUTe well MW-17 was not sampled during this review period.

Perimeter monitoring wells include MW-8B, MW-9B, MW-10B, MW-13B, MW-14B and FLUTe wells MW-18, MW-19, MW-20, and MW-21. All VOCs in MW-8B, MW-9B, MW-10B, and MW-14B were either not detected or detected below MCLs in the last five years, consistent with previous data results. In MW-18, VOC concentrations ranged from 1.1 µg/L in port 1 to 1.86 µg/L in port 2, which is a slight increase relative to historical records. The maximum total VOC concentrations reported in the perimeter wells was 1.8 µg/L in MW-14B (2022) and 1.86 µg/L in Port 2 of MW-18 (2019).

Monitoring well MW-13B and FLUTe wells MW-17 (Ports 1-3), MW-19 (Ports 1-3), MW-20 (Ports 1-3), and MW-21 (Ports 1-6) were not sampled during this review period as a result of issues surrounding well integrity and frozen conditions. In 2019, all FLUTe wells were examined, purged, and assessed by FLUTe personnel. The results indicated that all ports were functioning in MW-17 and MW-20, but there were issues with the condition of MW-18, MW-19, and MW-21 as they were observed to be seasonally artesian wells with corrosion damage. Based on the presence of flowing water, it was determined that the well liners were likely leaking and in need of repair. MW-13B could not be accessed in 2019 because of extensive rust damage. In 2022, MW-13B and the FLUTe wells were not sampled because the wells were frozen and large snow piles prevented access. Currently, the FLUTe wells are being evaluated for potential conversion to shallow and deep conventional nested monitoring wells. This evaluation will be completed following the conclusion of the pilot study. Although some of the perimeter FLUTe wells could not be sampled during this review period, the data from the perimeter conventional wells indicate that the far-field plume extent of contamination is stable. Additional sampling of perimeter FLUTe wells (or their respective replacement/converted wells), especially in the

southeastern portion of the site, is required to confirm that contamination is not migrating beyond the current limits.

As outlined in the 2008 ROD Amendment, MNA is the groundwater remedy for the far-field portion of the groundwater plume. Historically, there were several lines of evidence that MNA in the far-field plume was occurring. These include decreasing contaminant trends in the mid-plume area, stable or low contaminant concentrations in the far-field plume, the presence of daughter products in the far-field plume and/or near-field plume and the presence of reducing conditions bounding the far-field plume. Since October 2017 was the most recent sampling event during which MNA parameters were collected, additional sampling is needed to determine if these lines of evidence for reductive dechlorination in the far-field portion of the plume still exist.

Emerging Contaminants

In 2019 and 2022, groundwater samples were analyzed for 1,4-dioxane. The NYS MCL for 1,4-dioxane of 1 µg/L in groundwater was exceeded in all but two wells sampled (MW-1B and MW-6B) in 2019. The highest concentration was detected in ERT-4 at 12 µg/L. In 2022, 1,4-dioxane was detected in all monitoring wells sampled (with the exception of MW-1B and MW-10 which were non-detect), at concentrations ranging from 0.48 ug/L (MW-6B) to 4.4 ug/L (MW-9B). Effluent samples collected from the GWET system in 2019 showed no exceedances, with the exception of one sample collected from MW-5R. All effluent samples were non-detect for 1,4-dioxane from 2020 to 2022.

Groundwater samples were also analyzed for per- and poly-fluoroalkyl substances (PFAS) during the 2019 sampling event. The concentrations of perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) in groundwater were below the NYS MCL of 10 nanograms per liter (ηg/L) for each compound in groundwater for all wells that were sampled. The highest concentrations of PFOS and PFOA were detected in ERT-4 at 4.5 ηg/L and 6.8 ηg/L, respectively. Additional PFAS sampling is not anticipated at this time given the low concentrations identified and because all exposure pathways have been interrupted.

Site Inspection

An MRIP Site visit and inspection was conducted on October 18, 2023. The MRIP Site inspection was attended by Damian Duda, Emily Wong, Liana Agrios, and Detbra Rosales from EPA; Charles Gregory from NYSDEC; Josh Bowe and Nicole Bonsteel from MACTEC/WSP; and Terry Bohn, Elliery Carter, and Nate Shaw from Aztech/LaBella.

Prior to the Site walk-through, a meeting was held at the Marbletown First Aid Unit where MACTEC provided an overview of the recent operations of the GWET plant at the Site. Subsequently, the participants performed a walk-through inspection of the Site area. Some of the monitoring wells were located and inspected. No issues were identified during the Site inspection.

V. TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision document?

The remedy is functioning as intended by the 2000 ROD and the Amendment to the ROD signed in 2008.

NYSDEC and Aztech are operating the GWET system which continues to capture and remove VOC-contamination from the groundwater in the near-field plume. Adjustments to the remedial system will continue to be made, as appropriate. To date, the system reduces the VOC contamination found in the three extraction wells (MW-5R, MW-7R and ERT-1) to either non-detect or very low-level concentrations that do not exceed criteria in the effluent. The continued presence of VOC-contaminants in the source area wells is likely attributed to a residual source, *i.e.*, former septic tank, not fully removed by the SVE system and may warrant additional delineation. Pilot testing is currently ongoing to further evaluate potential GWET system modifications to extract groundwater from shallower fracture zones. The pilot test study is projected to finish in 2024.

Although there is evidence of reductive dechlorination in localized anaerobic areas of various parts of the near-field and far-field plumes, low levels of COCs remain in groundwater. The current and historical boundaries of the near-field and far-field plume are defined and stable except for the south-southeast portion of the plume within the vicinity of MW-21. During the last FYR, total VOC concentrations ranged from 9.2 µg/L in port 5 to 22 µg/L in port 1, and VOC concentration trends in ports 1 and 2 appeared to be increasing. The last sampling event for MW-21 was in 2017. Data from this well indicates that complete dechlorination of the COCs has not been occurring in this area. Concentrations remain low, but additional investigation may be needed if VOC concentration trends continue to increase and/or COCs are not completely attenuating in the southeastern portion of the far-field plume to confirm that it is not migrating beyond the current limits. Groundwater samples will be collected and analyzed for MNA parameters in August 2024 to determine whether evidence for reductive dechlorination in the far-field portion of the plume still exists.

NYSDEC will also continue the monitoring and maintenance of the vapor mitigation systems that are installed and operating on the MRIP building to ensure that indoor air levels remain below health-based guidelines. ICs continue to remain in place and are effective. Consequently, as intended by the decision documents, human health and ecological exposure pathways have been interrupted. The remedy will continue to function as intended as long as 1) the GWET system continues to operate, 2) the groundwater monitoring program for both the near-field and far-field plumes continues and 3) the vapor mitigation systems continue to operate.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the Site over the past five years that would change the protectiveness of the remedy. The exposure assumptions, pathways and toxicity values used to estimate potential cancer risks and noncancer hazards to human health followed the Risk Assessment Guidance for Superfund used by the Agency and remain valid. Although specific parameters may have changed since the time of the risk assessment, the process used also remains valid.

The RAOs for the Site remain valid, and the selected remedy continues to be protective of human health. Exposures to contaminated soils and cross-media impacts to the underlying groundwater were addressed through excavation and removal, as well as the SVE system. As stated in the 2008 ROD Amendment, prior to backfilling with clean fill, analytical results from post excavation soil samples indicated that no cleanup levels were exceeded in soils remaining within the excavation. The PWS system provides

potable water to the formerly impacted or threatened residences and businesses in the towns of Marbletown and Rosendale. The extraction and treatment of contaminated groundwater in the near-field plume and MNA of the far-field plume continue to reduce contaminant concentrations to below cleanup goals. ICs imposed also ensure that Site groundwater will not be used for potable purposes in the future.

The VI investigation conducted in 2005 determined that the concentrations of VOCs detected at all residential sub-slab locations were below the risk-based screening levels and that no further evaluation and/or action were deemed necessary. As part of the previous FYR, residential results from the 2005 sampling effort were compared to risk-based vapor intrusion screening levels (VISLs) available at that time. These chemical specific VISLs have not changed since the previous FYR. Consistent with past determinations, the results of the evaluation indicate no further action is necessary.

Samples obtained in the MRIP commercial building indicated the need to install one or more vapor mitigation systems. In early 2007, six vapor mitigation systems were installed to collect soil gas vapors underneath the building's concrete floor at various locations. These mitigation systems were last sampled in October 2009. Although there are no recent VI data to review during this FYR period, the data from 2009 indicated that indoor air concentrations were below risk-based levels for commercial/industrial exposures. In addition, NYSDEC continues to conduct monthly evaluation and maintenance of the vapor mitigation systems. These actions ensure the systems continue to operate as intended, which was confirmed during the October 2023 FYR site inspection.

As discussed in previous FYRs, a fish and wildlife impact assessment was conducted as part of the RI/FS and did not identify any significant exposure pathways to ecological receptors. Based on these findings, the EPA determined that an ecological risk assessment was not necessary. An ecological impact assessment was performed as part of the NTCRA, *i.e.*, the extraction and treatment system, for the Coxing Kill discharge. The NTCRA discharge assessment releveled no adverse impacts on the Coxing Kill ecosystem. As such, there are no completed pathways for significant exposures of Site-related contaminants to ecological receptors.

Changes in Standards

The original remedial goals for soil were based on NYSDEC's Technical and Administrative Guidance Memorandum (TAGM) 4046 for groundwater protection. The TAGMs have since been succeeded by the NYSDEC 6 NYCRR Part 375 (2006). The cleanup goals identified in the ROD, however, are still protective since they are based on impacts to groundwater and are lower than current risk-based screening levels based on a target cancer risk of 1×10^{-6} or a Hazard Index of 1.

The groundwater cleanup levels for each of the Site COCs were based on the NYS Class GA Groundwater standards which have not changed since the decision documents were issued. The ROD selected cleanup goals remain protective. In 2020, NYS set the MCL for 1,4-dioxane, a chemical of interest at the Site, to 1 µg/L. Data collected during the most recent sampling event (in 2022) indicate that 1,4-dioxane was reported as non-detect to 4.4 µg/L in Site monitoring wells and was present in both the near-field and far-field plume wells. However, effluent samples collected from the GWET were all non-detect for 1,4-dioxane. Monitoring for 1,4-dioxane should continue until the MCL is met Site-wide.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

VI. ISSUES, RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU1

OTHER FINDINGS

The following suggestions were identified during the previous FYR and will continue to be considered:

- Consider installation of an additional groundwater extraction well in the source area, *i.e.*, septic tank area, particularly if COC concentrations in this area show an increase.
- Consider additional investigations if COC-contaminant trends are not decreasing, and/or COCs are not completely attenuating in the southeastern portion of the far-field plume.

As previously discussed, NYSDEC has been performing an evaluation of the remedial system at the Site. The ongoing investigation resolved two findings in the previous FYR, which includes the installation of permanent packers in the extraction wells and pilot testing of the SVE system in the source area. The consideration of installing an additional extraction well will be determined once the remedial system evaluation is complete. The second consideration above, which addresses the contamination in the far-field plume, will be determined after additional data collection from MW-17 and MW-21 has been completed.

The following findings were identified during this FYR but do not affect current and/or future protectiveness:

- Consider using Method 8270D SIM instead of Method 624.1 for 1,4-dioxane analysis during the monthly effluent sampling events. The current method analyzes 1,4-dioxane as a VOC and has a reporting limit of 50 µg/L and a method detection limit of 28 µg/L. Therefore, it cannot detect 1,4-dioxane concentrations at the NYS MCL of 1 µg/L. Method 8270D SIM, or another method that can give appropriate reporting and detection limits, should be used in place of Method 624.1.
- Following completion of the pilot study, the FLUTe wells will be evaluated for potential conversion to shallow and deep conventional nested monitoring wells. Groundwater samples will be collected and analyzed for MNA parameters in August 2024 to determine whether evidence for reductive dechlorination in the far-field portion of the plume still exists. Although the data from the perimeter conventional wells indicate that the far-field plume extent of contamination is stable, this work is necessary to ensure that MNA is occuring at the edges of the far-field plume and migration is not occurring.

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)	
Operable Unit: 01	*Protectiveness Determination:* Protective

Protectiveness Statement: The OU1 remedy at the Mohonk Road Industrial Plant site is protective of human health and the environment.
Sitewide Protectiveness Statement
Protectiveness Determination: Protective
Protectiveness Statement: The implemented remedies for the Mohonk Road Industrial Plant site protect human health and the environment.

VIII. NEXT FIVE-YEAR REVIEW

The next FYR report for the Mohonk Road Industrial Plant site is required five years from the completion date of this review.

APPENDIX A – TABLES

Table 1 – Chronology of MRIP Site Events

Volatile organic compounds (VOCs) detected in residential wells.	1994
New York State Department of Environmental Conservation (NYSDEC) installed point-of-entry treatment (POET) systems on residential wells.	1994-1998
NYSDEC performed Remedial Investigation/Feasibility Study.	1996-1999
The EPA began non-time-critical removal action (NTCRA) [built groundwater extraction and treatment plant and excavated and disposed of contaminated soils].	1999-2000
EPA issued Record of Decision (ROD) - Operable Unit One (OU1).	March 2000
Remedial Design for soils excavation/disposal.	September 2000
Remedial Action for soils excavation/disposal.	October 2000 to March 2001
Long Term Response Action (LTRA) begins.	May 2001
Interim Remedial Action Report - extraction and treatment of groundwater (OU1).	July 2001
Remedial Design of the High Falls Water Treatment Plant.	2004
Construction of the High Fall Water Treatment Plant.	September 2005 to May 2007
Installation of the Soil Vapor Extraction (SVE) System.	December 2006
NYSDOH approval of completed water works.	September 2007
All POET systems removed/disposed of – all residences within the High Falls Water District hooked up to new potable water system.	December 2007
ROD Amendment for Monitored Natural Attenuation (MNA).	September 2008
Installation of five additional SVE wells to the SVE System.	July 2009
Transfer of operation and maintenance (O&M) of ongoing extraction and treatment system and vapor mitigation systems to NYSDEC.	September 2011
Close-Out of the SVE System.	June 2012
Reconfigured and upgraded GWET system.	March 2016
Transfer of O&M of MNA sampling of far-field plume to NYSDEC.	2019
MNA sampling of the far-field plume.	Ongoing
Extraction and treatment system operations and vapor mitigation systems operations.	Ongoing

Table 2 – Documents Reference List

Record of Decision – Mohonk Road Industrial Plant (MRIP) Site, EPA	March 31, 2000
Final Remedial Action Report – Excavation and Off-Site Disposal of Contaminated Soils (OU1) – MRIP Site, EPA	June 2001
O&M Discharge Reports, MRIP Site, U.S. Army Corps and EPA	February 2001-September 2011
Remedial Action Report (Excavation and off-site disposal of contaminated soils) (OU1), MRIP Site, EPA and U.S. Army Corps	June 2001
Interim Remedial Action Report – Extraction and Treatment of Groundwater in the Near Field Plume (OU1) – MRIP Site, EPA and U.S. Army Corps	July 2001
Remedial System Evaluation, MRIP Site, Army Corps	November 2005
Subsurface Soil Sampling and Soil Vapor Well Installation, MRIP Site, EPA Environmental Response Team	April 2007
Remedial Action Report – Point-of-Entry Treatment (POET) Systems (Residential and Commercial Properties) (OU1) – MRIP Site, EPA and U.S. Army Corps	March 2008
Final Monitored Natural Attenuation Assessment, MRIP Site – U.S. Army Corps	April 2008
Remedial Action Report – Alternate Water Supply, MRIP Site, EPA and U.S. Army Corps	September 30, 2008
Record of Decision Amendment (OU1) – MRIP Site, EPA	September 30, 2008
Preliminary Close-Out Report, MRIP Site, EPA	September 30, 2008
Long Term Groundwater Monitoring Plan – U.S. Army Corps and AECOM	January 2013
Monitoring Well Sampling – Data Reports (including MNA data) – U.S. Army Corps and AECOM, J.M. Waller and Associates, and Versar, Inc.	May 2014 – May 2018
Field Activities Plan, MRIP, NYSDEC and MACTEC Engineering and Consulting, Inc.	August 2019
Quarterly Progress Reports – MRIP Site, NYSDEC and Aztech Technologies, Inc.	2018-2020
Soil Vapor Extraction and Packing Testing Pilot Study Report, MRIP, NYSDEC, MACTEC Engineering and Consulting, Inc.	May 2020
Long Term Monitoring Event Report, MRIP, NYSDEC and MACTEC Engineering and Consulting, Inc.	June 2020
Periodic Review Report – MRIP Site, NYSDEC and MACTEC Engineering and Consulting, Inc.	May 2022
Field Activities Plan – Remedial System Optimization Pilot Test, MRIP, NYSDEC and MACTEC Engineering and Consulting, Inc.	September 2022

Table 3 – Extraction Wells and GWETS Groundwater Data

Analytical Results (May 2019) (Concentrations in µg/L)				
Sample ID	**1,1-DCA**	**1,1-DCE**	**1,1,1-TCA**	**TCE**
7R	130	32	330	2.5
ERT-1	31	63	290	21
5R	7	28	130	8.1
Combined Influent	43	27	190	8.5
Effluent	ND	ND	ND	ND
Notes: ND – Non-Detect				

Analytical Results (May 2020) (Concentrations in µg/L)				
Sample ID	**1,1-DCA**	**1,1-DCE**	**1,1,1-TCA**	**TCE**
7R	32	11	81	2.3
ERT-1	10	22	84	6.6
5R	2.8	11	42	3.6
Combined Influent	14	15	64	4.2
Effluent	ND	ND	0.45	ND
Notes: ND – Non-Detect; NS- Not sampled				

Analytical Results (May 2021) (Concentrations in µg/L)				
Sample ID	**1,1-DCA**	**1,1-DCE**	**1,1,1-TCA**	**TCE**
7R	29	10	75	1.8
ERT-1	9.9	23	79	5.9
5R	2.1	9.6	35	2.8
Combined Influent	12	11	56	3.2
Effluent	0.53	ND	0.68	ND
Notes: ND – Non-Detect				

Analytical Results (May 2022) (Concentrations in µg/L)				
Sample ID	**1,1-DCA**	**1,1-DCE**	**1,1,1-TCA**	**TCE**
7R	48.8	15.3	103	1.9
ERT-1	11.2	33.4	95.8	7.9
5R	4.4	20	68.5	ND
Combined Influent	20	21.1	83.1	4.9
Effluent	ND	ND	ND	ND
Notes: ND – Non-Detect				

Table 4 - Summary of 2019 Analytical Data

		Parameter	PFOS	PFOA	1,1,1-TCA	1,1-DCA	1,1-DCE	TCE	1,4-Dioxane
		ROD Cleanup Goal	NA	NA	5	5	5	5	NA
		Proposed MCL	10	10	NA	NA	NA	NA	1
Location	Sample Date	Field Sample ID	(ng/L)	(ng/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
MW-1B	7/12/2019	356023-MW1B	**0.6 J**	**2**	1 U	1 U	**1 U**	1 U	0.2 U
MW-4	7/11/2019	356023-MW4	**2.1 J**	**6.4**	**1,100**	**23**	**130**	**390**	**6.4**
MW-5B	7/11/2019	356023-MW5B	**2**	**2.4**	**1,800**	**42**	**200**	**87**	**10**
MW-5R	7/12/2019	356023-MW5R	**0.74 J**	**1.2 J**	**110**	**6.7**	**24**	**7.6**	**6.1**
MW-6B	7/11/2019	356023-MW6B	1.8 U	**0.92 J**	**8.2**	1 U	**1.8**	1 U	**0.76**
MW-7R	7/12/2019	356023-MW7R	**0.97 J**	**1.5 J**	**41**	**14**	**5.7**	**0.94 J**	**2.3**
MW-8B	7/9/2019	356023-MW8B	**0.53 J / 1.7 U (dup)**	**0.56 J / 0.65 J (dup)**	1 U / 1 U (dup)	1 U / 1 U (dup)	1 U / 1 U (dup)	1 U / 1 U (dup)	**2.4 J / 2.4 J (dup)**
MW-11B	7/10/2019	356023-MW11B	1.6 U	**0.53 J**	**1.4**	**2.4**	**4.9**	**0.93 J**	**3.1**
MW-11C	7/10/2019	356023-MW11C	1.6 U	**0.56 J**	**2.2**	**0.8 J**	**3.2**	**0.64 J**	**1.8**
MW-12B	7/9/2019	356023-MW12B 190	**2.8**	**3.1**	**5.3**	**10**	**15**	**3.5**	**9.2 J**
MW-14B	7/9/2019	356023-MW14B 150	**2.5**	**4.4**	1 U	**1**	**0.66 J**	1 U	**3.4 J**
MW-15B	7/12/2019	356023-MW15B	1.8 U	**0.89 J**	**26**	**8.3**	**19**	**1.2**	**5.9**
MW-16	7/9/2019	356023-MW16	1.6 U	**0.52 J**	**13**	**2.2**	**10**	**1.3**	**4.2 J**
MW-18-1	7/11/2019	356023-MW1801	NT	NT	1 U	**1.1**	**1 U**	1 U	**1**
MW-18-2	7/11/2019	356023-MW1802	NT	NT	1 U	**1.4**	**0.46 J**	1 U	**1.3**
MW-18-3	7/11/2019	356023-MW1803	NT	NT	1 U	**1.4**	**0.43 J**	1 U	**1.4**
ERT-4	7/11/2019	356023-ERT4	**4.5**	**6.8**	**3,100**	**78**	**280**	**140**	**12**

Notes:

Blue shading = exceeds Record of Decision (ROD) cleanup goal.
Gray shading = exceeds proposed NYS MCL
NA = not applicable
NT = not tested
PFOS = Perfluorooctanesulfonic acid
PFOA = Perfluorooctanoic acid
1,1,1-TCA = 1,1,1-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
TCE = Trichloroethene
(dup) = duplicate sample result
(ng/L) = nanograms per liter
(µg/L) = micrograms per liter
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method.
J = result is estimated

Table 5 - Groundwater Monitoring Results Above New York State Standards - January 2022

Parameter			1,4-Dioxane	1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	Chloroethane	Chloroform	cis-1,2-Dichloroethene	Trichloroethene
NYS Class GA Standard			NS	5	1	5	5	0.6	5	7	5	5
Location	**Sample Date**	**Sample ID**	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
ERT-1	1/19/2022	356023 - ERT1	**3**	**47.7**	1 U	**12.4**	**26.3**	1 U	1 U	1 U	1 U	**6.1**
ERT-4	1/20/2022	356023 - ERT4	**1.9**	**1530**	**2.2**	**46.8** J+	**173**	**3.2** J+	**1.1**	**1.3** J+	**4** J+	**120**
MW-1B	1/20/2022	356023 - MW1B	**0.3** U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-4	1/20/2022	356023 - MW4	**1.4**	**653**	1 U	**28.8**	**144**	**1.6**	1 U	1 U	**8.3**	**253**
MW-5B	1/20/2022	356023 - MW5B	**2**	**608**	1 U	**15.8**	**111**	**1.5**	1 U	1 U	**1.1**	**40.5**
MW-5R	1/19/2022	356023 - MW5R	**1.8**	**55.6**	1 U	**6.9**	**27.9**	1 U	1 U	1 U	1 U	**6.4**
MW-6B	1/20/2022	356023 - MW6B	**0.48**	**4**	1 U	1 U	**1.8**	1 U	1 U	1 U	1 U	1 U
MW-7R	1/19/2022	356023 - MW7R	**1.5**	**57.7**	1 U	**50**	**13.2**	1 U	1 U	1 U	**2**	**1.6**
MW-8B	1/18/2022	356023 - MW8B	**0.53**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-9B	1/19/2022	356023 - MW9B	**4.4**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-10B	1/19/2022	356023 - DUP-01	**0.3** U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-10B	1/19/2022	356023 - MW10B	**0.3** U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-11B	1/20/2022	356023 - MW11B	**1.2**	1 U	1 U	**3.5** U	**7**	1 U	1 U	1 U	1 U	**1.1**
MW-12B	1/20/2022	356023 - MW12B	**2.3**	**2.5**	**1**	**8.9**	**16.9**	1 U	1 U	1 U	1 U	**2.9**
MW-14B	1/18/2022	356023 - MW14B	**1.5**	1 U	1 U	**1.8**	1 U	1 U	1 U	1 U	1 U	1 U
MW-15B	1/19/2022	356023 - MW15B	**2.1**	**10.2**	1 U	**9.1**	**19**	1 U	1 U	1 U	1 U	**1.4**
MW-16	1/19/2022	356023 - MW16	**0.76**	**3.2**	1 U	**1.3**	**6.6**	1 U	1 U	1 U	1 U	1 U

Notes:

Dioxane by Method 8270E

Volatile Organic Compounds by Method 8260C

Bold = Exceeds standard or guidance value

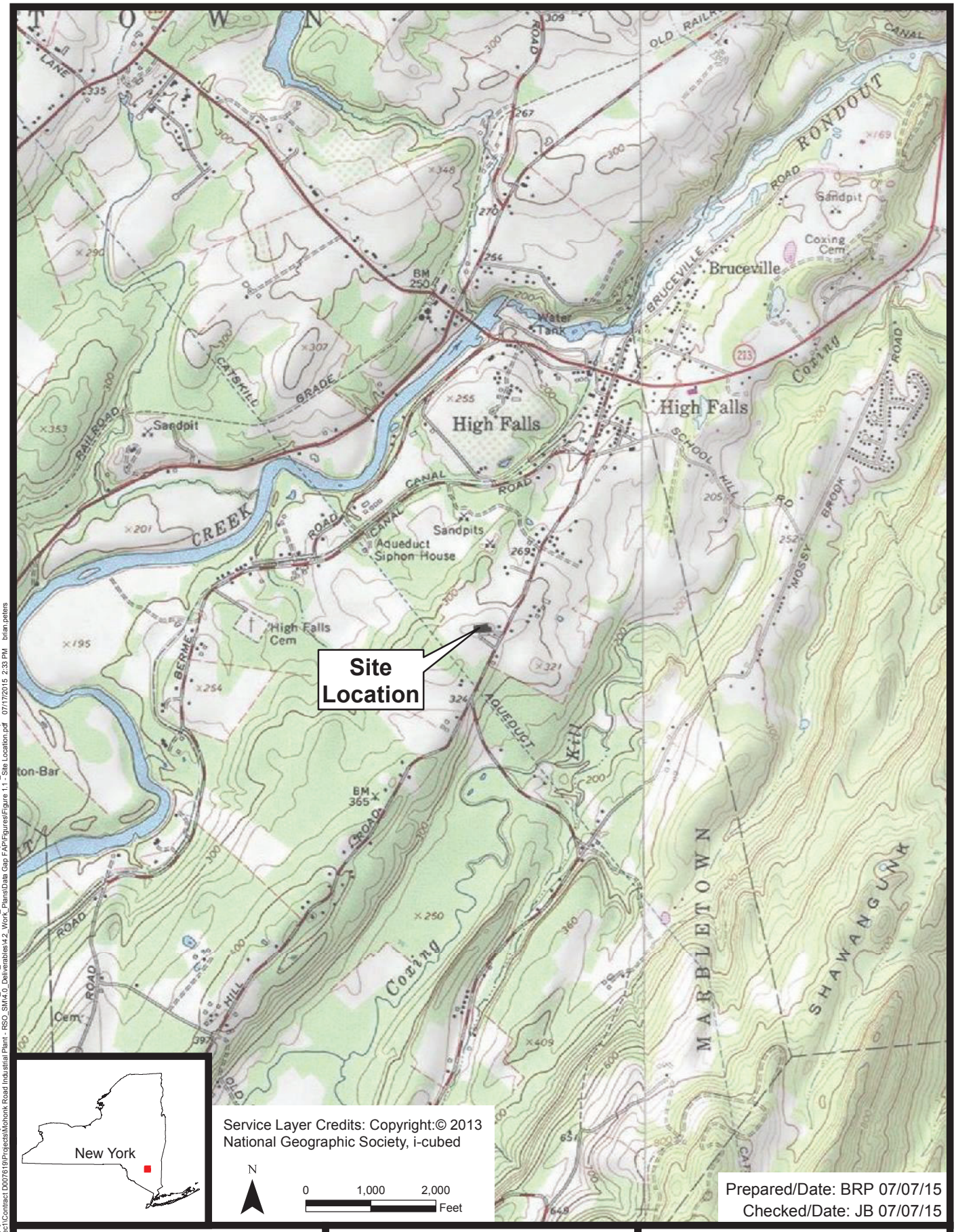
NYS Class GA = New York State Class GA Groundwater Standards

ug/L = micrograms per liter

U = Not Detected

J = Estimated Value

APPENDIX B - FIGURES



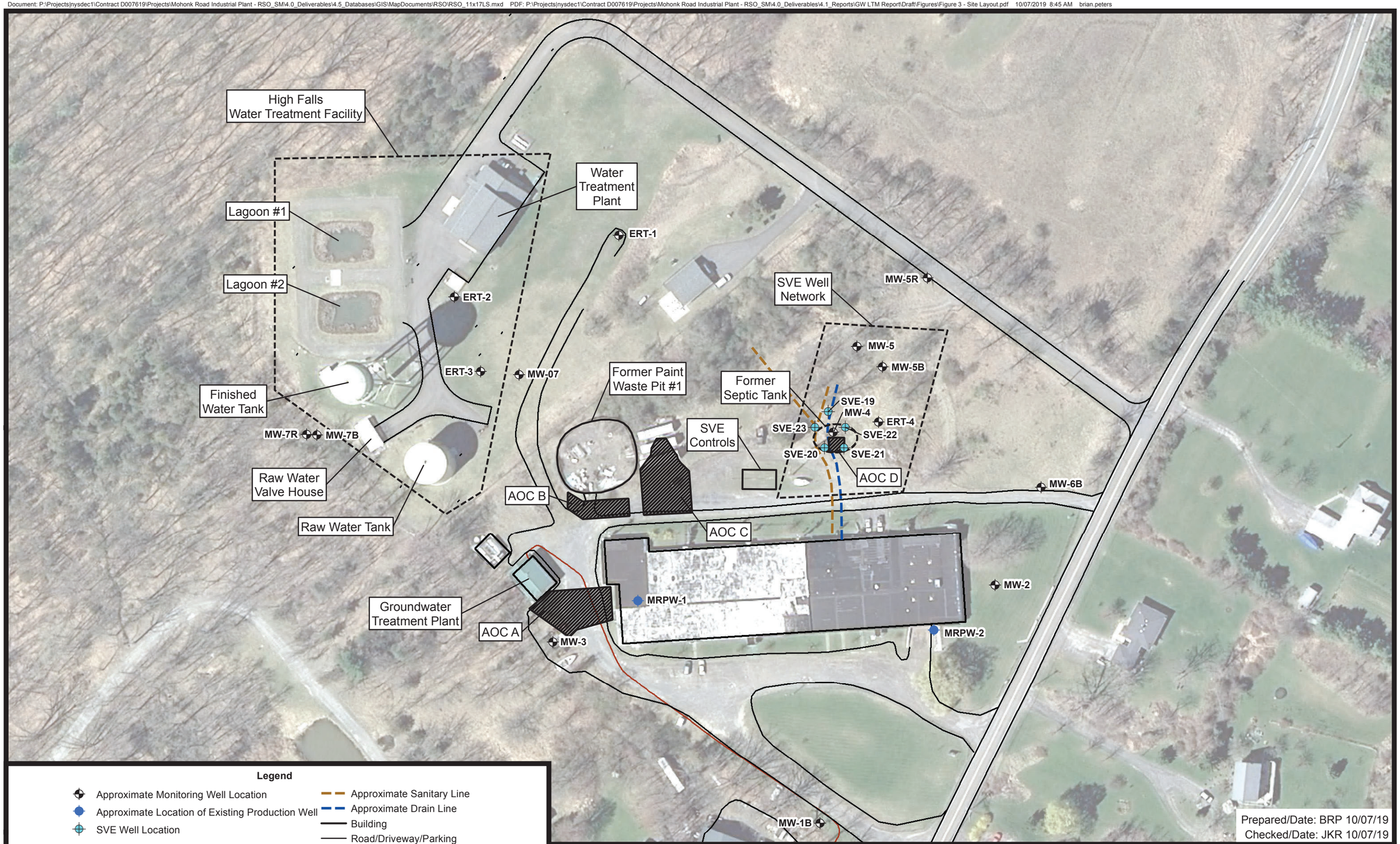
NYSDEC
Mohonk Road Industrial Plant
Marbletown, New York

MACTEC

Site Location Map

Project 7772210116 Figure 1

Document: P:\Projects\nysdec1\Contract D007619\Projects\Mohonk Road Industrial Plant - RSO_SMI4.0_Deliverables\4.5_Databases\GIS\MapDocuments\Mohonk_SiteLocationMap.mxd
PDF: P:\Projects\nysdec1\Contract D007619\Projects\Mohonk Road Industrial Plant - RSO_SMI4.0_Deliverables\4.2_Work_Plans\Data Gap FAP\Figures\Figure 1.1 - Site Location.pdf 07/17/2015 2:33 PM brian.peters

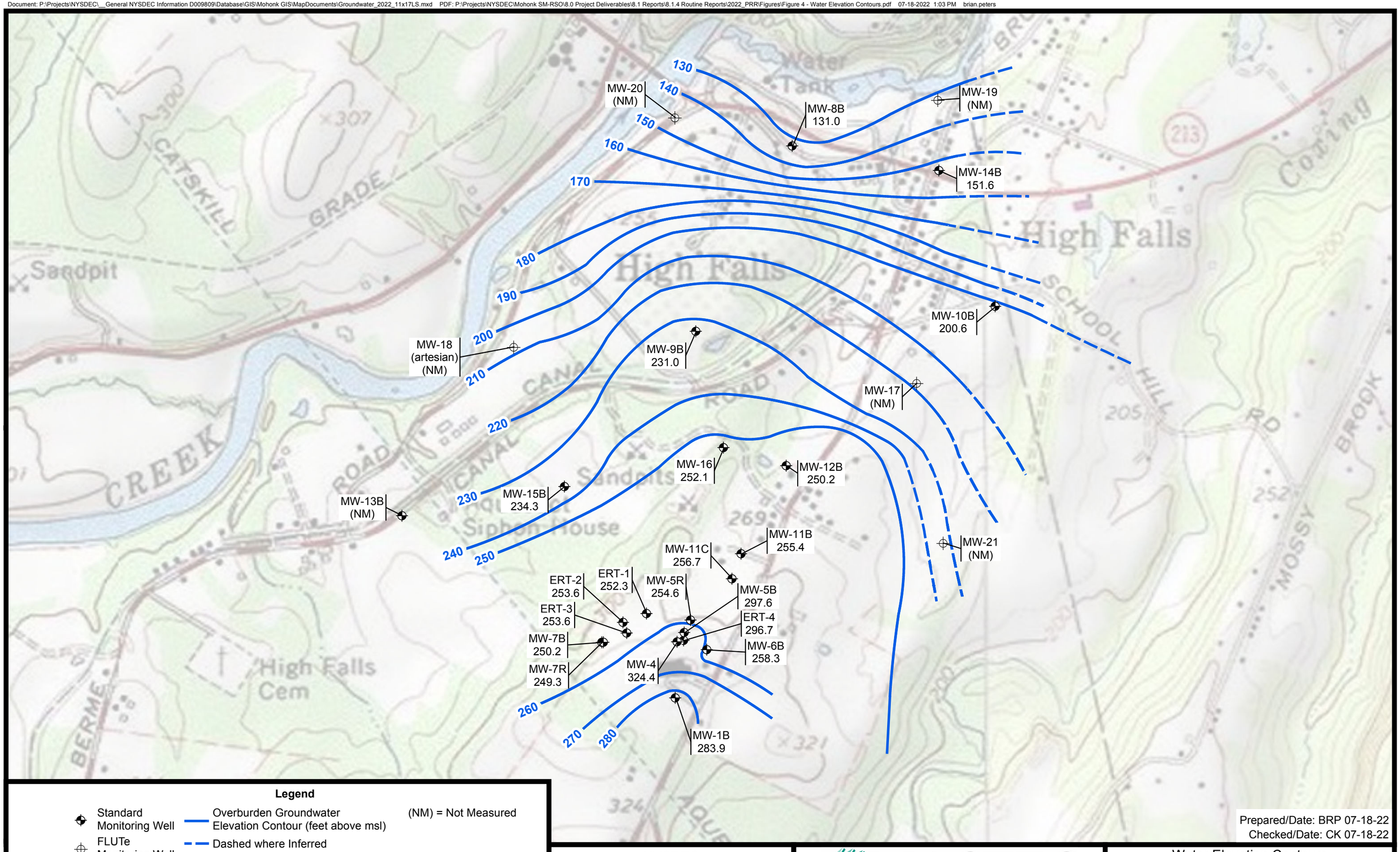


NYSDEC
Mohonk Road Industrial Plant
Marbletown, New York

MACTEC

Site Layout

Project 7772210116 Figure 2



Legend

- Standard Monitoring Well
- FLUTe Monitoring Well
- Overburden Groundwater Elevation Contour (feet above msl)
- Dashed where Inferred

(NM) = Not Measured

N

0 350 700 Feet

Prepared/Date: BRP 07-18-22
Checked/Date: CK 07-18-22

NYSDEC
Mohonk Road Industrial Plant
Marbletown, New York

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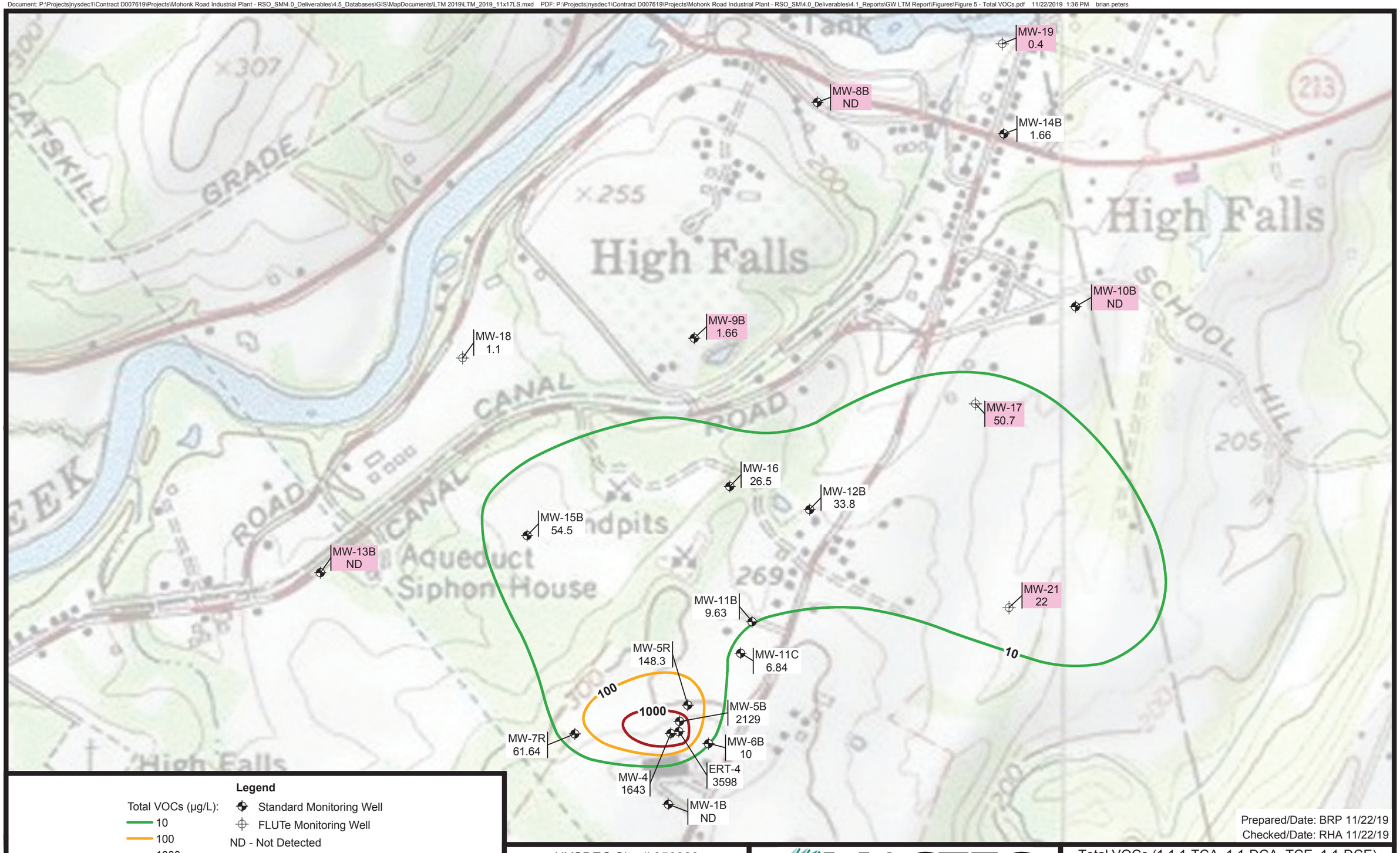
Water Elevation Contours
January 2022
Project 7772210116 Figure 3



Legend

Total VOCs (µg/L):
- 10
- 100
- 1000

- Standard Monitoring Well
- FLUTe Monitoring Well
- ND - Not Detected
- 2017 Sampling Results

N

0 275 550 Feet

Topographic map: Copyright:© 2013 National Geographic Society, i-cubed

Prepared/Date: BRP 11/22/19
Checked/Date: RHA 11/22/19

NYSDEC Site # 356023
Mohonk Road Industrial Plant
Marbletown, New York

MACTEC

Total VOCs (1,1,1-TCA, 1,1-DCA, TCE, 1,1-DCE)
Isoconcentrations in Groundwater (July 2019)
Project 3611191234 Figure 4

MW-8B
ND

MW-14B
1.8

MW-10B
ND

MW-9B
ND

MW-16
11.1

MW-12B
31.2

MW-15B
39.7

MW-11B
11.6

ERT-1
92.5

MW-5R
96.8

MW-7R
122.5

MW-5B
775.3

MW-6B
5.8

MW-4
1078.8

ERT-4
1869.8

MW-1B
ND

100

1000

10

Legend

Total VOCs (µg/L):
- 10
- 100
- 1000

Standard Monitoring Well
ND - Not Detected

N

0 275 550 Feet

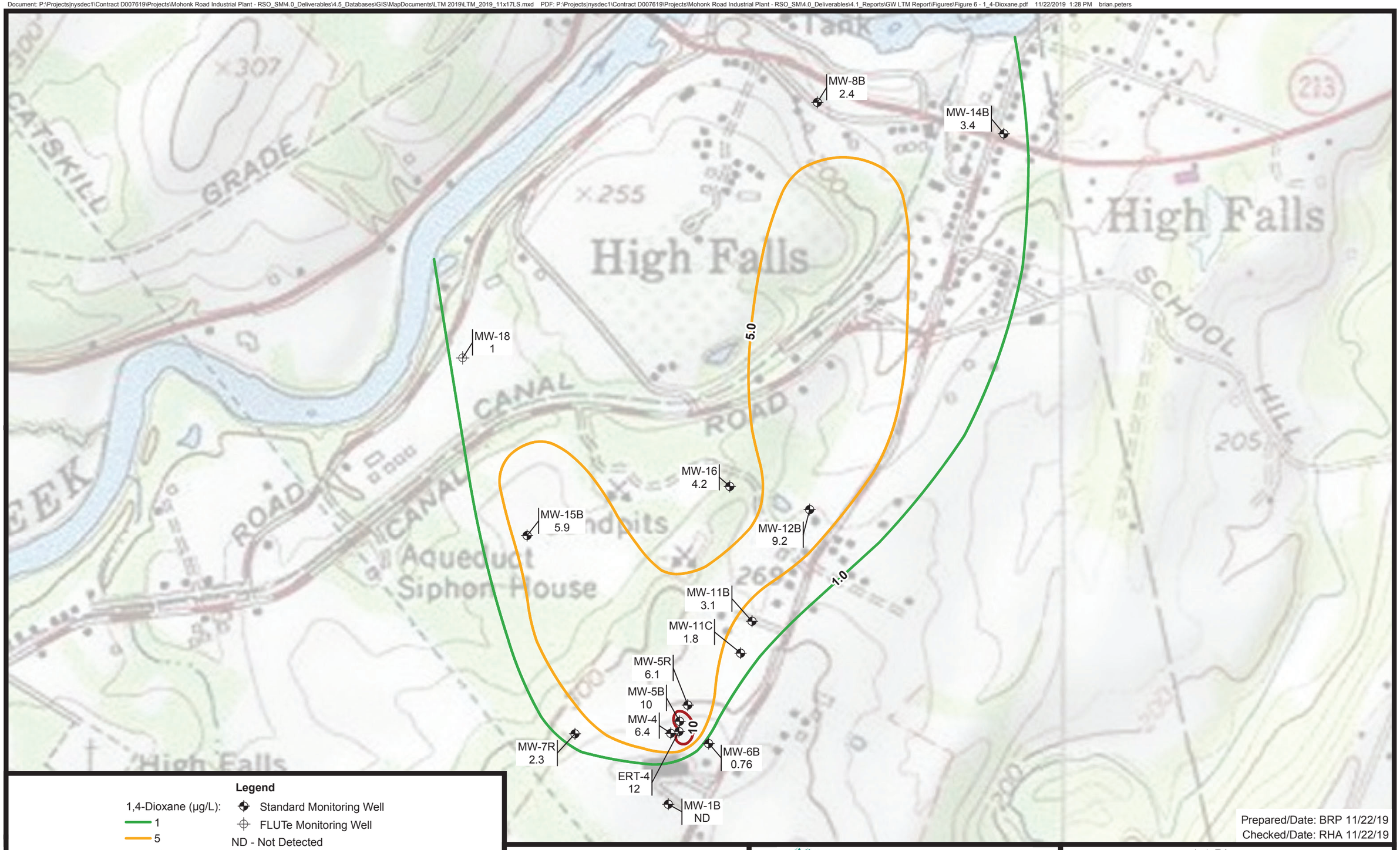
Topographic map: Copyright:© 2013 National Geographic Society, i-cubed

NYSDEC Site # 356023
Mohonk Road Industrial Plant
Marbletown, New York

MACTEC

Total VOCs (1,1,1-TCA, 1,1-DCA, TCE, 1,1-DCE)
Isoconcentrations in Groundwater (2022)
Project 7772210116 Figure 5

Prepared/Date: BRP 12-13-22
Checked/Date: JB 12-13-22



Prepared/Date: BRP 11/22/19
Checked/Date: RHA 11/22/19

NYSDEC Site # 356023
Mohonk Road Industrial Plant
Marbletown, New York

MACTEC

1,4-Dioxane
Isoconcentrations in Groundwater (July 2019)
Project 3611191234 Figure 6

MW-8B
0.53

MW-14B
1.5

MW-10B
ND

MW-9B
4.4

MW-16
0.76

MW-12B
2.3

MW-15B
2.1

MW-11B
1.2

MW-5B
2

MW-5R
1.8

ERT-1
3

MW-7R
1.5

MW-6B
0.48

MW-4
1.4

ERT-4
1.9

MW-1B
ND

1

2

Legend

1,4-Dioxane (µg/L):

1

2

Standard Monitoring Well

ND - Not Detected

N

0 275 550 Feet

NYSDEC Site # 356023
Mohonk Road Industrial Plant
Marbletown, New York

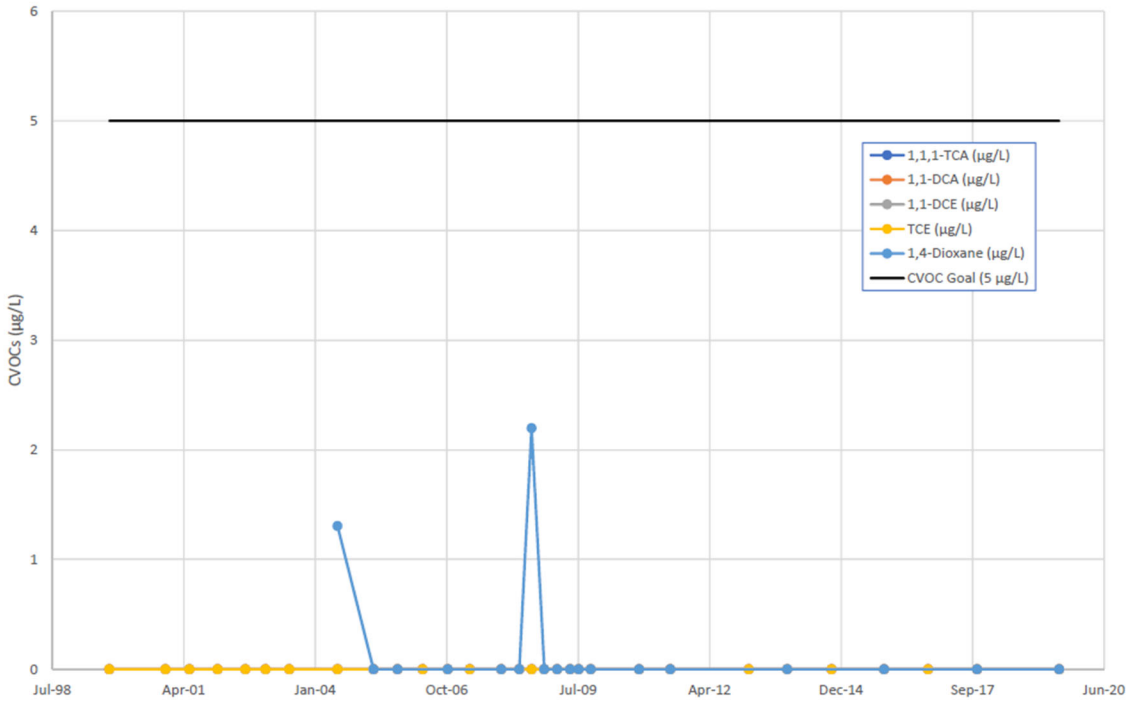
MACTEC

1,4-Dioxane
Isoconcentrations in Groundwater (2022)
Project 7772210116 Figure 7

Prepared/Date: BRP 12-13-22
Checked/Date: JB 12-13-22

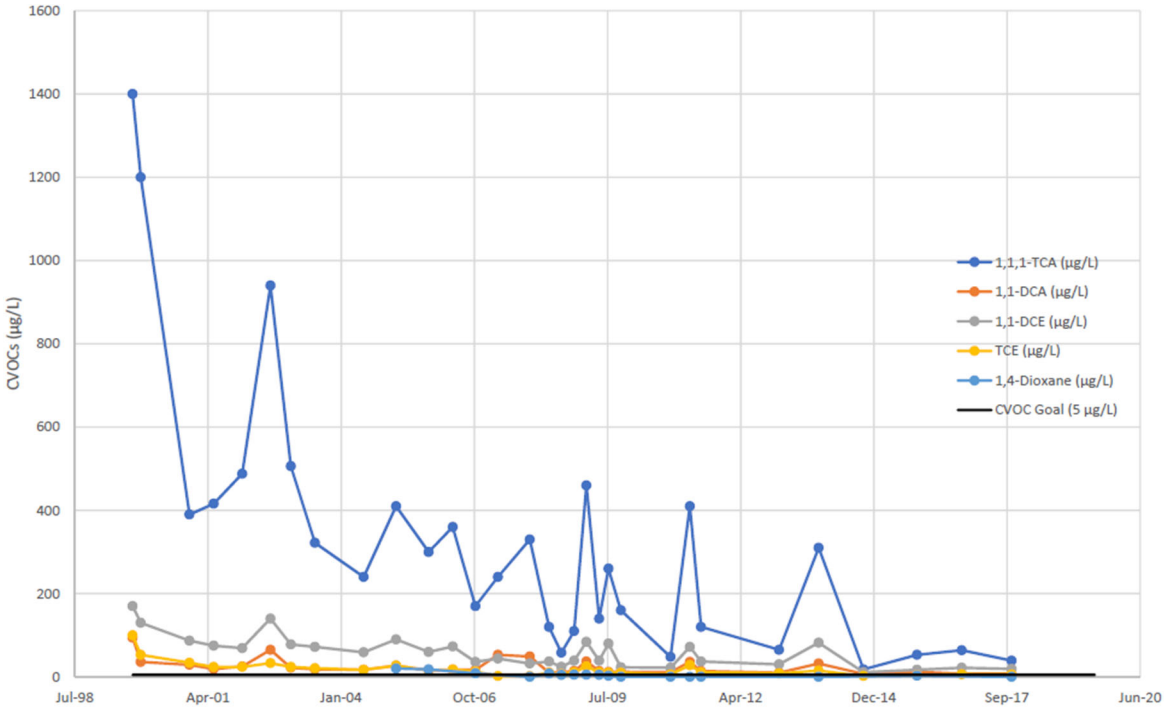
Figure 8 – Groundwater Trend Charts

MW-1B



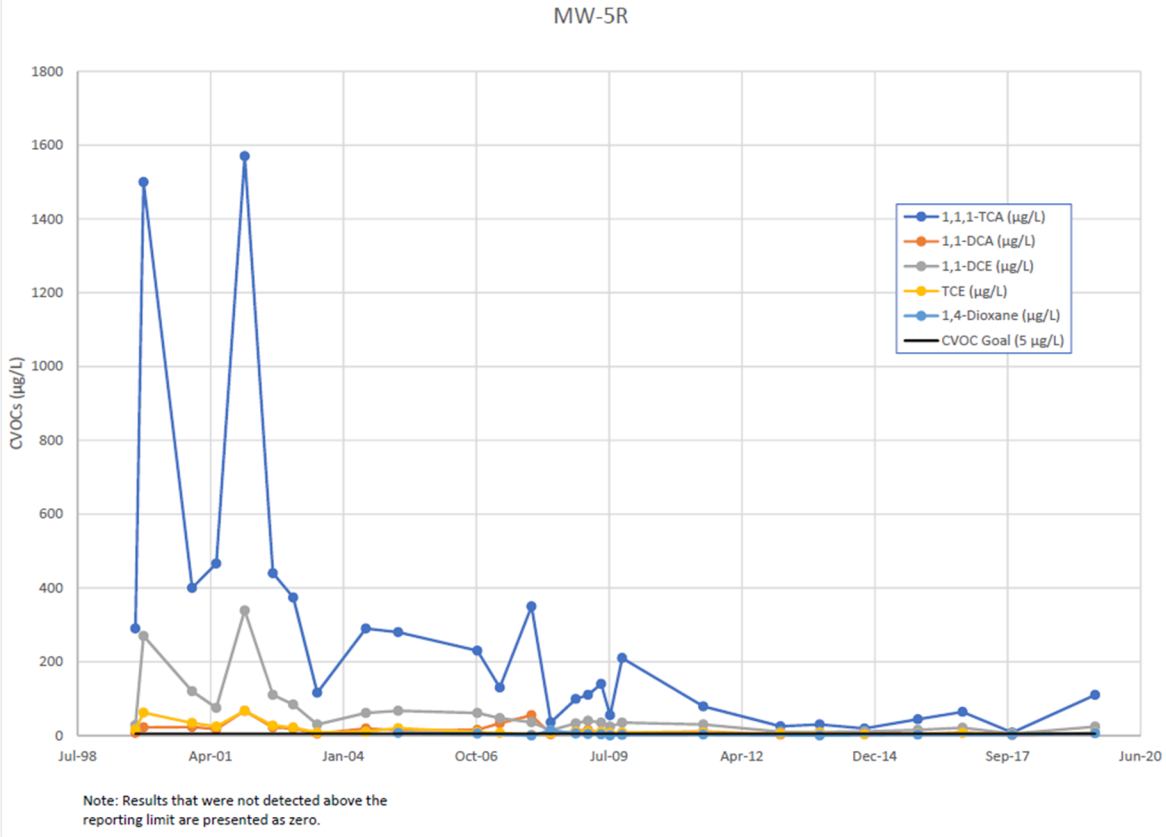
Note: Results that were not detected above the reporting limit are presented as zero.

ERT-1



Note: Results that were not detected above the reporting limit are presented as zero.

Figure 8 (cont) – Groundwater Trend Charts



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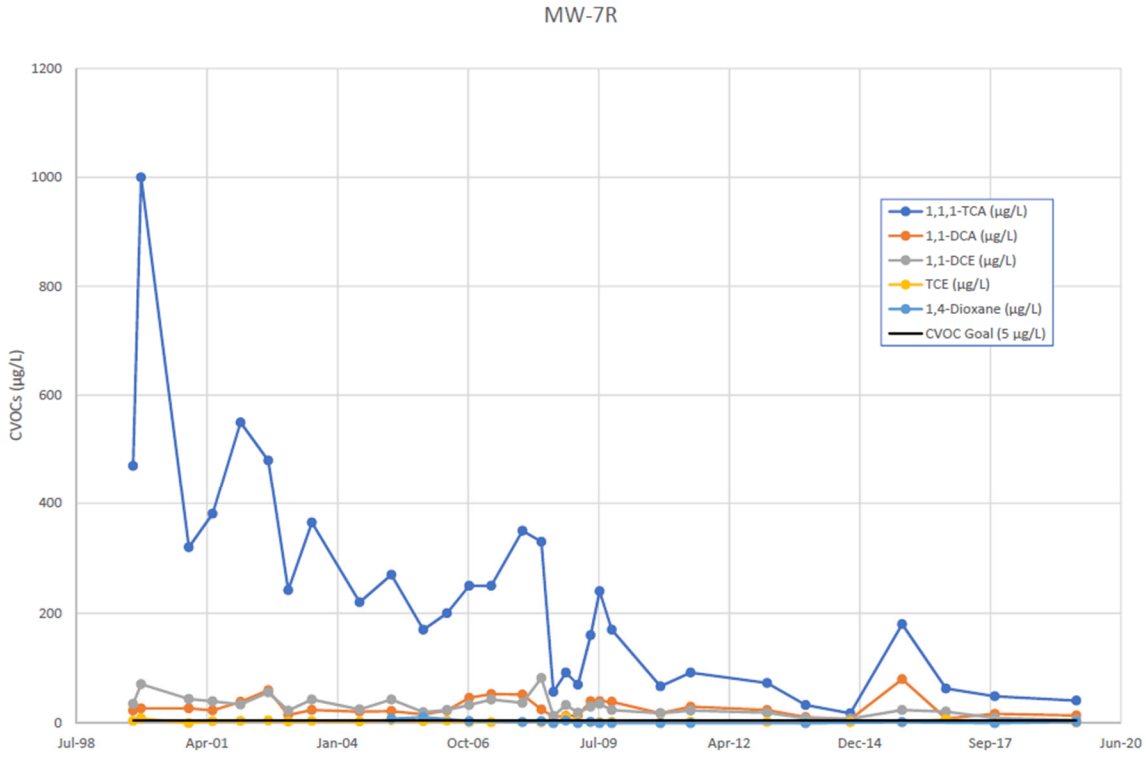
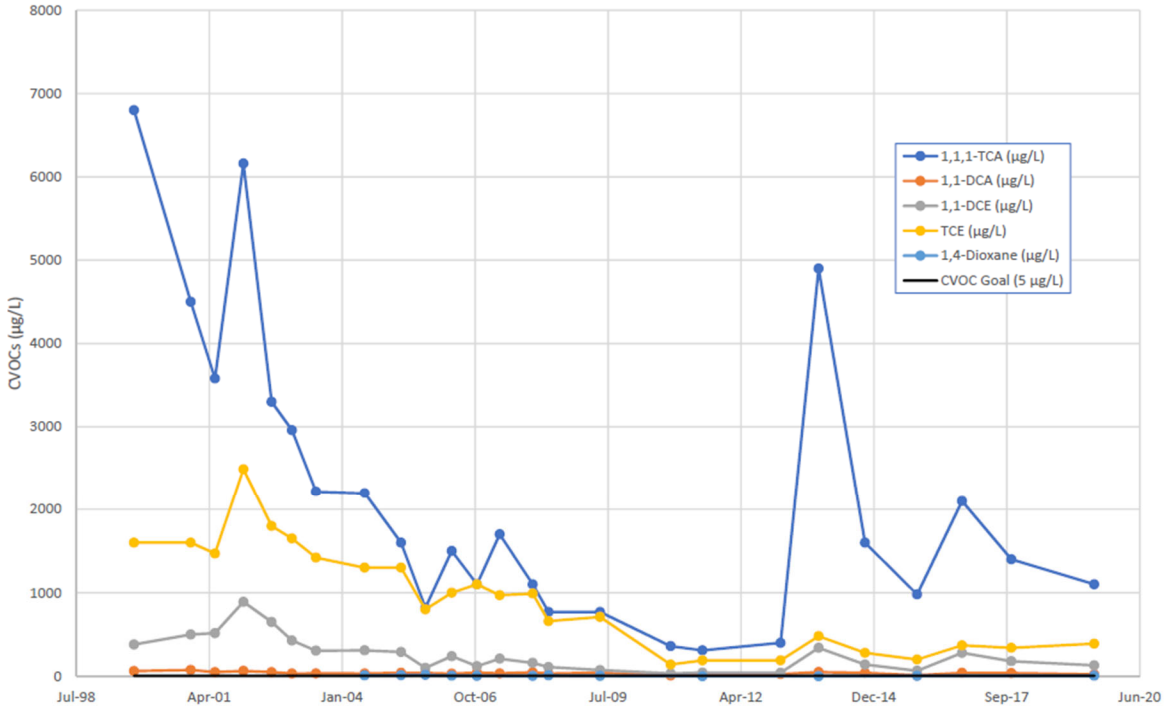


Note: Results that were not detected above the reporting limit are presented as zero.

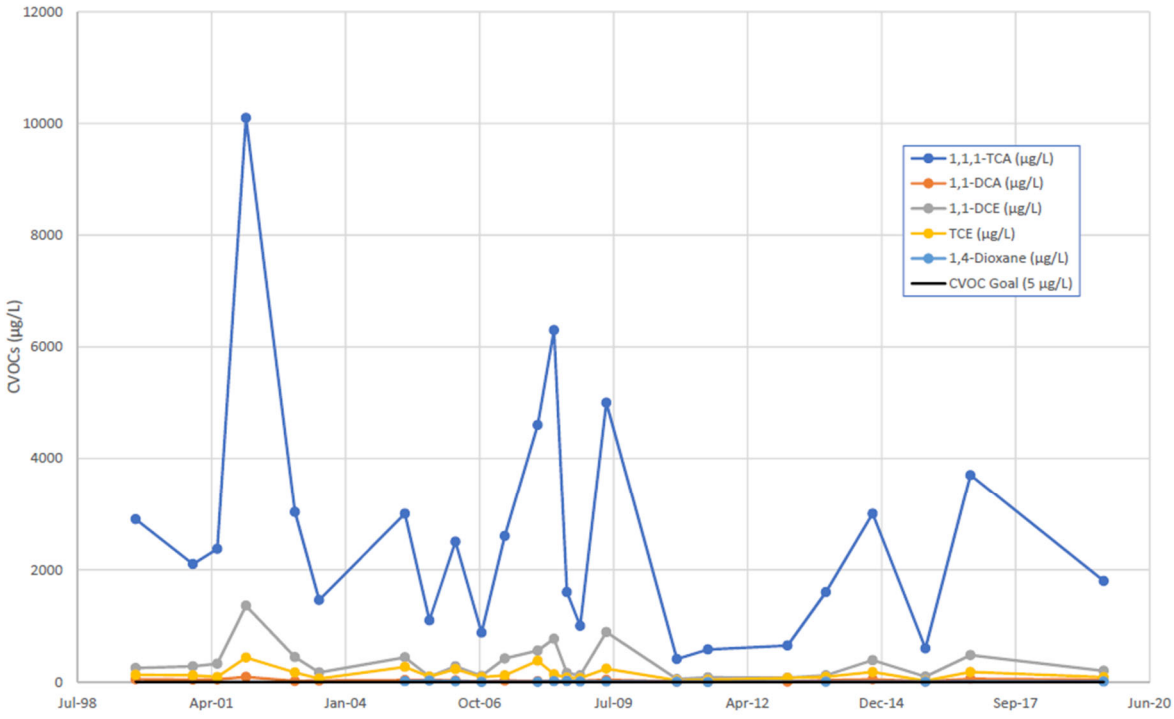
Figure 8 (cont) – Groundwater Trend Charts

MW-4



Note: Results that were not detected above the reporting limit are presented as zero.

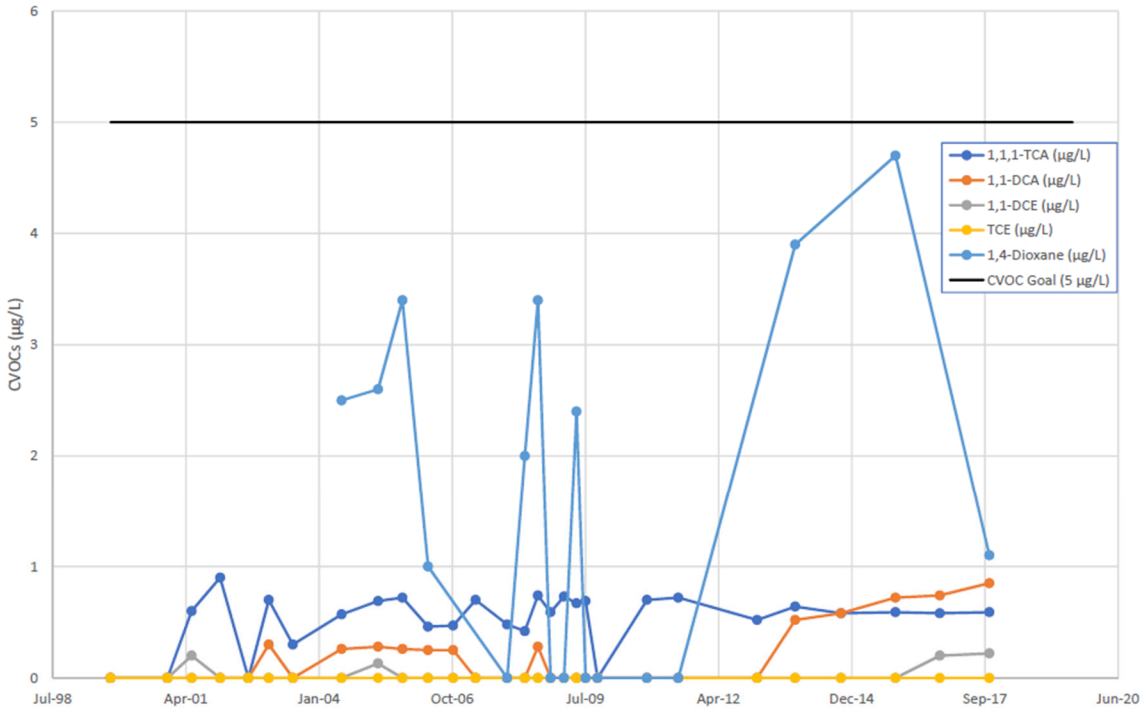
MW-5B



Note: Results that were not detected above the reporting limit are presented as zero.

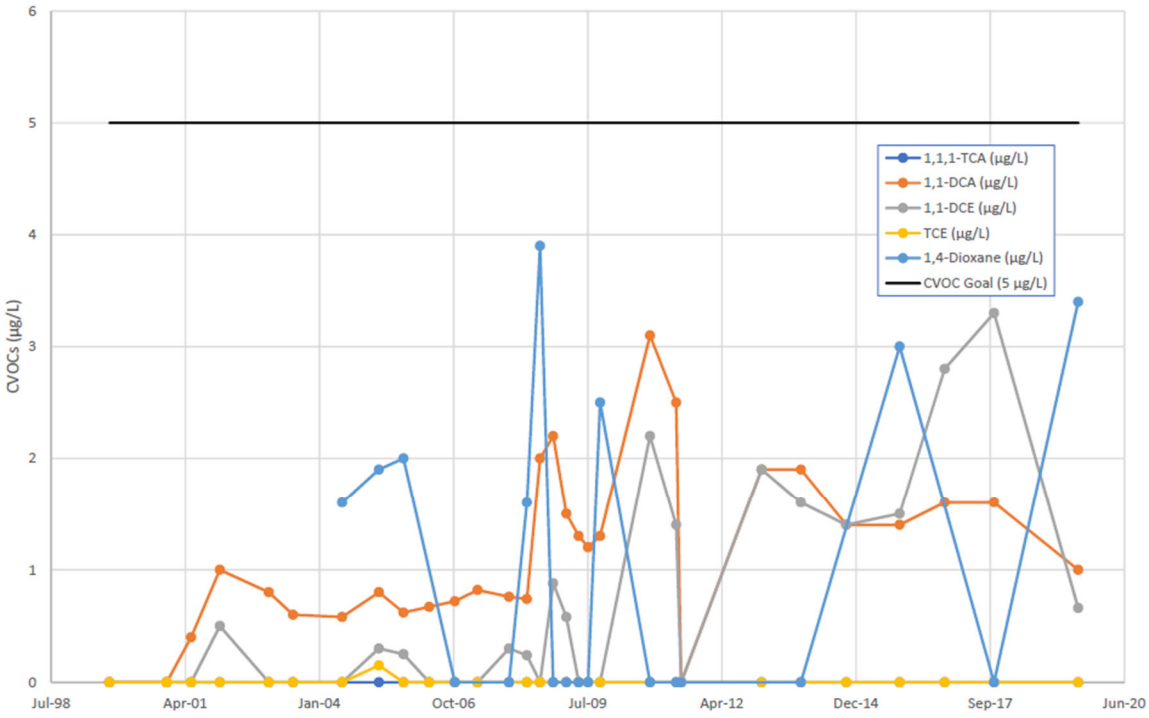
Figure 8 (cont) – Groundwater Trend Charts

MW-9B



Note: Results that were not detected above the reporting limit are presented as zero.

MW-14B



Note: Results that were not detected above the reporting limit are presented as zero.

APPENDIX C - CLIMATE CHANGE ASSESSMENT

According to the Region 2 Guidance for Incorporating Climate Change Considerations in Five Year Reviews, three climate change tools were utilized to assess the MRIP Site. Screenshots from each of the tools assessed are shown below.

The first tool utilized to assess the MRIP Site is called *The Climate Explorer.* According to this tool, High Falls is projected to face an increase of extreme temperatures on the hottest days of the year by 7°F. Intense rainstorms are projected to have between a 1% decrease and a 6% increase. As seen in **Figure C-1**, there is a projected increase in days per year with a maximum temperature >100° F. **Figure C-2** displays a slight increase in potential drought. A summary of the Top Climate Concerns from the tool can be seen in **Figure C-3**.

The second tool utilized is called *Risk Factor (formerly Flood Factor).* According to this tool, there are 78 properties in High Falls that have a greater than 26% chance of being severely affected by flooding. Overall, High Falls has an extreme risk of flooding over the next 30 years, which means flooding is likely to impact day-to-day life within the community. However, as shown in **Figure C-4**, the MRIP site is located outside of the major flood risk area.

The final tool utilized is called *Sea Level Rise.* According to this tool, High Falls is not located near the ocean and is at little risk for effects of sea level rise. As seen in **Figure C-5**, High Falls would be unaffected by high tidal flooding due to its distance from the Hudson River. The Site is also not expected to be affected by an increase in flood frequency due to its location, as shown in **Figure C-6**.

Potential site impacts from climate change have been assessed, and the performance of the remedy is not currently at risk due to the expected effects of climate change in the region. As discussed above, the MRIP site is located outside of the flood risk area in High Falls, and its distance from the coast limits the risk of potential tidal flooding. In the unlikely event of flooding, surface contamination has been removed offsite since 2001 and therefore does not pose a risk to human health.
.

Figure C-1

Figure C-2

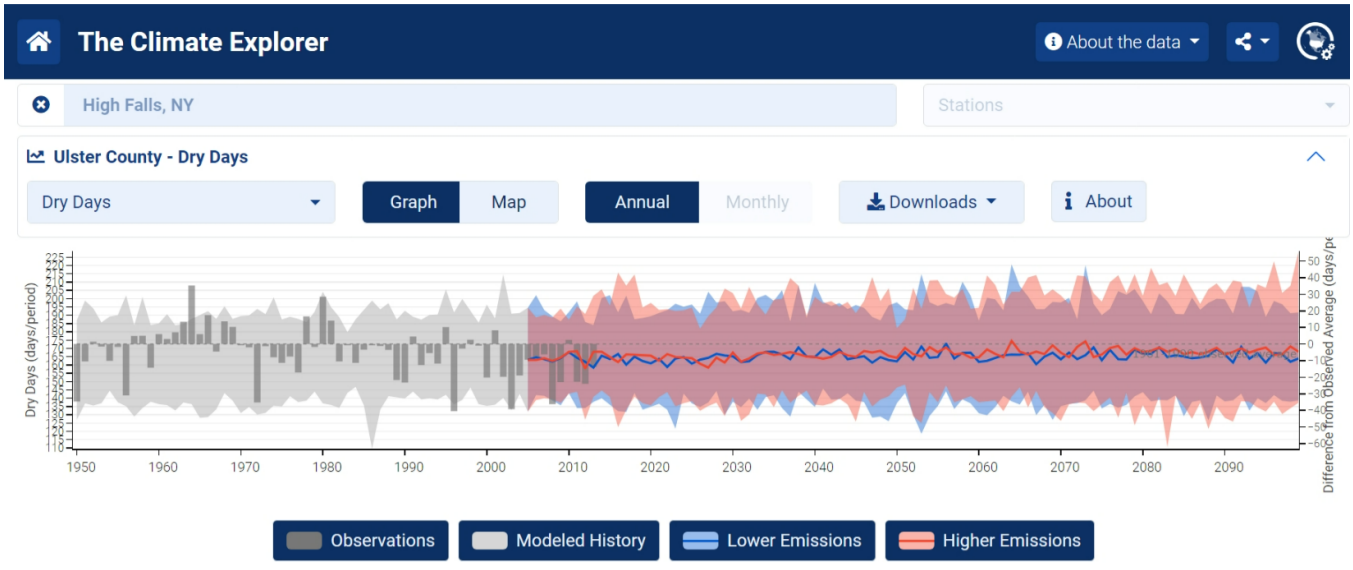


Figure C-3

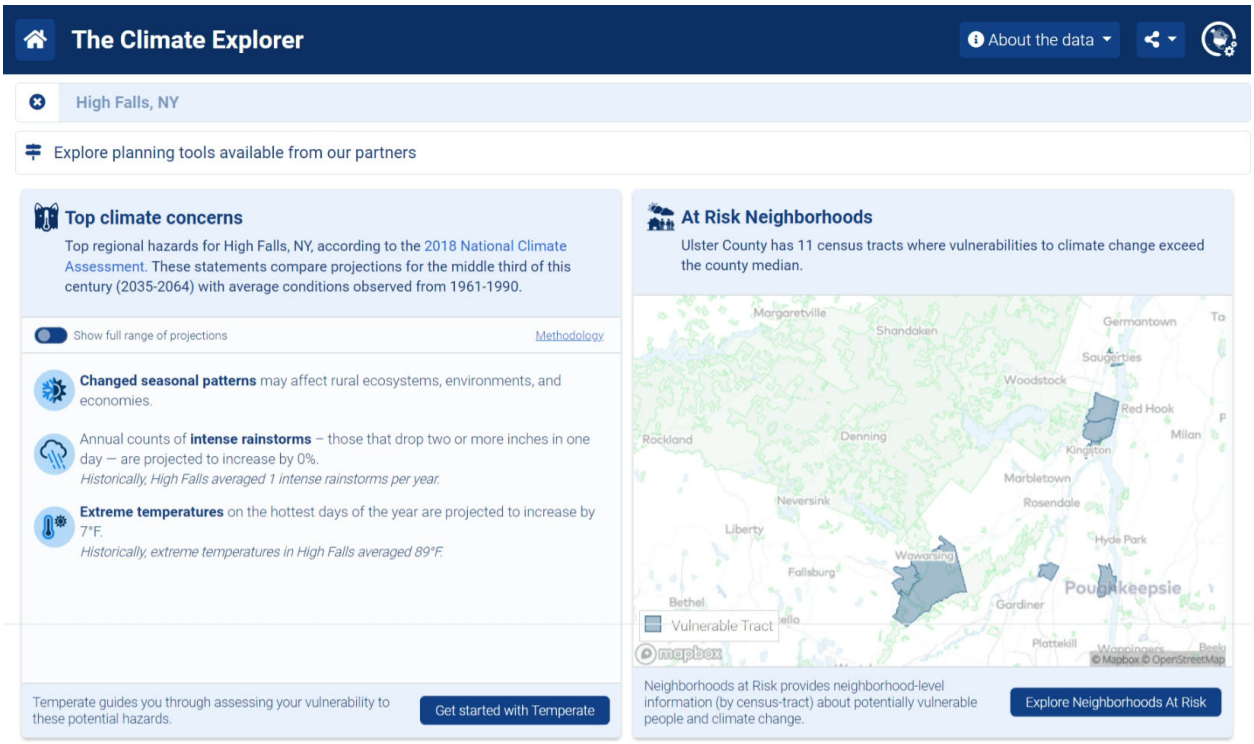


Figure C-4

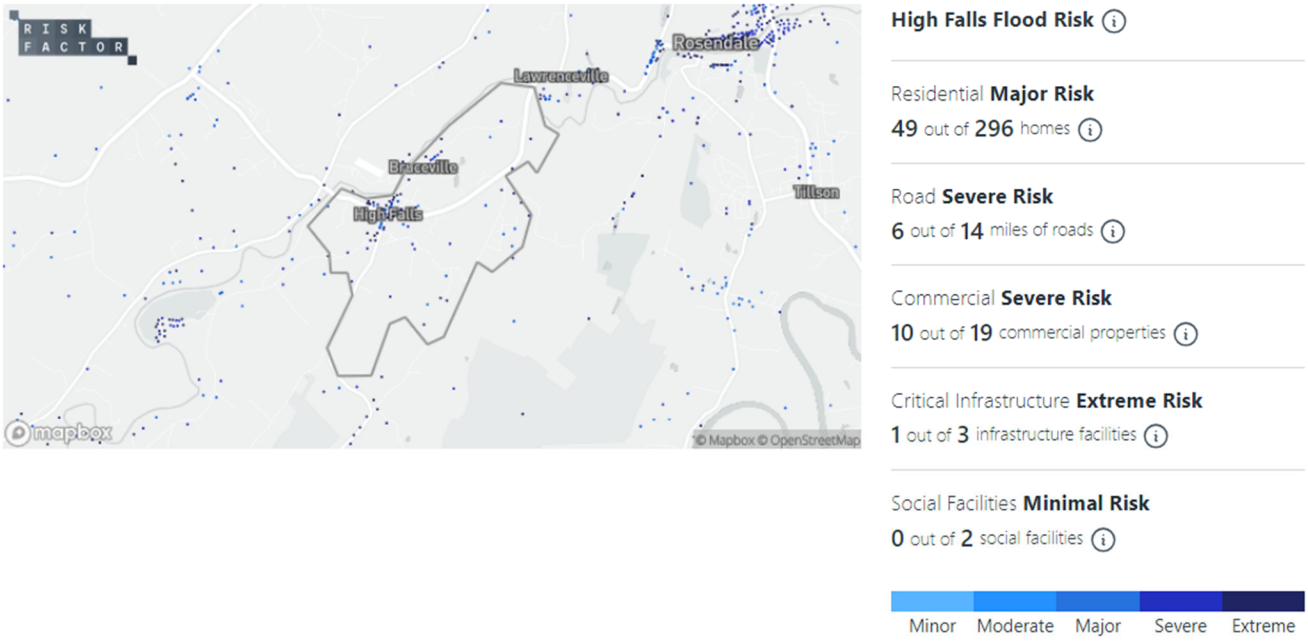


Figure C-5

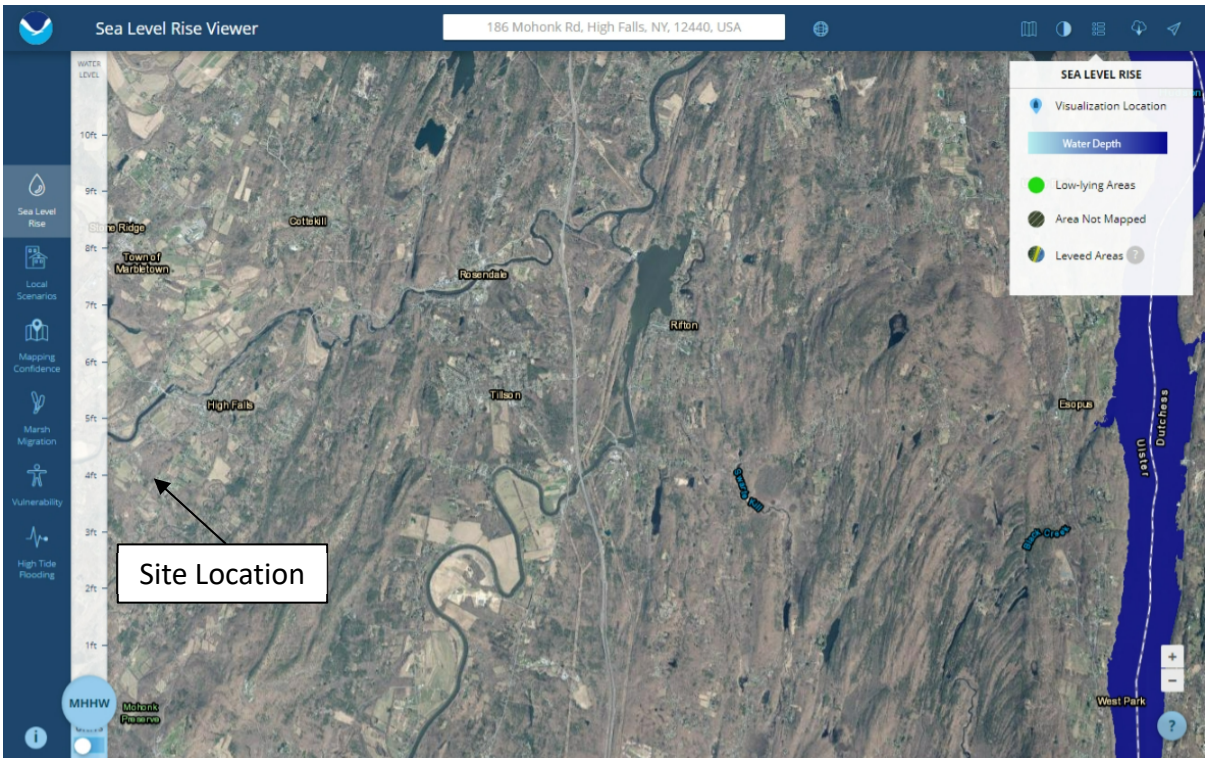


Figure C-6