



engineering and constructing a better tomorrow

November 17, 2022

Ms. Jenelle Gaylord, Project Manager
New York State Department of Environmental Conservation
Bureau E, Division of Remediation
625 Broadway
Albany, NY 12233-7012

Subject: Final 2021 Annual Report
American Thermostat Site (NYSDEC Site No. 420006)
MACTEC Engineering and Geology, P.C., Project No. 3616206098

Dear Ms. Gaylord,

MACTEC Engineering and Geology, P.C (MACTEC) is pleased to submit the 2021 Annual Report for the New York State Department of Environmental Conservation (NYSDEC) American Thermostat Site No. 420006 located in South Cairo, New York (hereinafter referred to as the "Site"). This Report includes a summary of the following items:

- Site History
- 2021 Activity Summary
- Institutional Controls/Engineering Controls (ICs/ECs)
- Groundwater Extraction and Treatment System (GWETS) Operation, Maintenance, and Monitoring (OM&M) Activities
- Point of Entry Treatment (POET) System OM&M Activities
- Long-Term Groundwater Monitoring
- Semiannual Hydraulic Monitoring
- Sustainability and Resiliency
- Cost Control Summary
- Recommendations for the Coming Year (2022)

Based on activities completed in 2021, the Site use and activities are in compliance with the Site Management Plan (SMP) requirements (MACTEC, 2018a); the ICs/ECs remain in-place, the GWETS is performing as designed, and Site controls are effective to protect the public health and environment.

SITE HISTORY

The Site consists of approximately eight acres and is located in South Cairo, Town of Catskill, Greene County, New York (Figure 1). The Site has been remediated in accordance with the Record of Decision (ROD) for Operable Unit 1 (OU1) (potable water supply) (United States Environmental Protection Agency [USEPA], 1988) and OU2 (soil, sediment, surface water, groundwater, and building contamination) (USEPA, 1990). The Site includes an active GWETS which has been operational since 1998. In 2008, following 10 years of Site Management (SM) by the USEPA, the Site was transferred to the NYSDEC. The contaminants of concern (COC) are volatile organic compounds (VOCs) including tetrachloroethene (PCE), trichloroethene (TCE), 1,2-dichloroethene, and vinyl chloride. Remedial goals outlined in the ROD documents for the Site are instituted to ensure protection of groundwater from site contaminants in soil, to restore groundwater to drinking water standards or until a point has been reached at which contaminant concentrations in the groundwater “level off,” and reduce risk to human health and the environment. Current SM requirements for monitoring the performance and effectiveness of the remedial measures completed at the Site to meet current Remedial Action Objectives (RAOs) (MACTEC, 2013a) consist of operating the groundwater extraction and treatment system to maintain hydraulic control of the bedrock source area (PCE concentrations greater than 5,000 micrograms per liter [$\mu\text{g/L}$]), routine inspection, sampling, and reporting.

2021 ACTIVITY SUMMARY

This report summarizes the SM and Remedial System Optimization (RSO) activities completed at the Site from January 2021 through December 2021. The RSO scope of work and activities to date are being implemented to address recommendations from the 2020 Periodic Review Report (PRR) (MACTEC, 2021b) including:

- Continued implementation, review, and evaluation of the existing ICs/ECs, Operation and Maintenance (O&M) Plan, and groundwater monitoring program, as applicable.

- Continued routine GWETS maintenance including general housekeeping, troubleshooting of well components, annual inspection of building heaters, and semiannual air stripper cleanings.
- Preparation of a final well decommissioning plan and decommissioning of wells no longer used for monitoring purposes on-site, following the NYSDEC's review and approval of a draft plan submitted in 2019.
- Preparation of a plan to evaluate treatment system alternatives to meet the Site remedial objective in a more expeditious and efficient manner based on discussions during the project review meeting with the NYSDEC in September 2020.
- Collection of quarterly influent (pre-treatment) samples, in addition to current between-filter samples collected quarterly, to evaluate future decommissioning of three residential POET systems.

SM requirements are summarized in Table 1. A matrix for GWETS and POET system performance sampling, long-term monitoring (LTM) sampling, and water level gauging locations is presented in Table 2. Figure 2 shows locations of groundwater monitoring well and POET sampling points.

INSTITUTIONAL CONTROLS/ENGINEERING CONTROLS

ICs/ECs provide added measures of protection for potentially exposed receptors over and above natural attenuation mechanisms and source area remedial measures. ICs for the Site consist of restrictions to soil excavation, groundwater use and well installations, and a monitoring plan. Adherence to the ICs is required by and implemented under the SMP. ECs consist of the GWETS, the Site perimeter fence, monitoring wells, residential POET systems, and an alternate water supply (MACTEC, 2018a).

Groundwater is captured by the GWETS to confine the plume extent and migration and to recover contaminant mass. The Site perimeter fence prohibits unauthorized access to the GWETS building and is inspected monthly. Monitoring wells (on- and off-site) are used to verify the effectiveness of the GWETS through the collection of groundwater samples and water level measurements as part of the LTM program. POET systems for three residences without city water, directing potentially affected residential groundwater through two-stage granular activated carbon (GAC) filtration, is monitored through routine maintenance and quarterly collection and analysis of groundwater samples. An alternate water supply consisting of a public water supply line, extended to the vicinity of the Site from the Village of Catskill in 1992, is maintained by the Village of Catskill (MACTEC, 2018a).

GWETS OM&M ACTIVITIES

The GWETS has not been staffed full-time since 2017 and can be monitored and operated remotely. Bimonthly site visits are completed as part of routine operations and include general maintenance, monitoring, inspection, and sampling activities.

A total of 11 extraction wells are active and include 4 bedrock wells (EWs) and 7 overburden wells (OWs):

- EW-6, EW-7, EW-9, EW-16
- OW-2, OW-3, OW-5, OW-7, OW-13, OW-14, OW-16

Extraction well EW-2 has been inoperable since September 2020 due to a likely pump failure. The need to restore operations to meet RAOs is currently under evaluation as part of the Field Activities Plan – Extraction Well Optimization Evaluation discussed at the end of this section (MACTEC, 2021d).

Operating parameters for the GWETS include monitoring the volume of groundwater treated (gallons), flow rate (gallons per minute), system downtime, and total VOCs extracted from groundwater. These quantities are summarized on Tables 3 (groundwater volume treated), 4 (system flow rate and downtime), and 5 (VOC removal quantities). In 2021, the treatment plant processed 12.8 million gallons of groundwater at an average flow rate of 26 gallons per minute and removed 277 pounds of total VOCs. System influent and effluent samples were collected and analyzed monthly for VOCs; therefore, mass removal is an approximation.

Class C standards and guidance values were used for comparison to the treated groundwater (system effluent) being discharged to the swale. These numerical limits are applicable at the point of treated groundwater effluent discharge at the end of the force main which leads to the unnamed Tributary A (a Class C surface water body) prior to discharging to the Catskill Creek. Monthly effluent samples did not exceed Class C standards and guidance values for Site-related VOCs in 2021 and therefore met surface discharge limits. The system performance monitoring results for 2021 are presented in Table 6.

During 2021, approximately 14 days were reported as downtime (Table 4). The GWETS was shut down on several occasions in 2021 due to system alarms, power outages, and maintenance periods. The longest shutdown occurred at the end of January through the beginning of February (a total of 6.5 days) due to repeated alarms triggered by a high water level in the air stripper sump. Inspection revealed the high water level in the sump was a result of restricted flow from the air stripper to the discharge pumps, due to fouling in the discharge pipe, and of a leak coming from Discharge Pump B. Downtime represented approximately 4 percent of total available operating time for the year.

GWETS modifications and improvements implemented in 2021 include, but were not limited to:

- Replacement of the seal assembly on GWETS Discharge Pump B following observation of a leak. As part of this maintenance activity, a new case gasket and impeller O-ring were installed and laser alignment of the pump motor was completed.
- Removal of an extraneous wye strainer filter and screen from the system's discharge pipe, located between the air stripper sump and discharge pumps, and cleaning of this section of pipe, to resolve flow restrictions due to fouling which reduced discharge pump rates.
- Replacement of SYSOP OK indicator light and fuse at OW-7's well panel to restore function to the light.
- Purchase of a replacement Grundfos pump controller remote.
- Replacement of the pressure sensor in bedrock extraction well EW-9 to resolve an erroneous high pressure alarm from the failed sensor.

Additional activities completed as part of OM&M activities at the Site include:

- Decommissioning of six former injection wells (IW-1, IW-2, IW-3, IW-4, IW-5, IW-6) and four unused monitoring wells (UNK Well-02, UNK Well-03, UNK Well-05, and WB-4) on-site. Decommissioning activities were summarized in the Field Activities Report – Well Decommissioning submitted to the NYSDEC on September 30, 2021 (MACTEC, 2021c).
- An inspection of the treatment building by a qualified inspector with the New York State Office of Fire Prevention and Control on May 17, 2021. No violations of the New York State Uniform Fire Prevention and Building Code were identified.
- Purchase of a replacement push lawn mower for maintaining grass within the Site perimeter fence.
- Removal of investigation derived waste, generated as part of cleaning activities of the system's air stripper unit, by ACV Environmental Services, Inc. for off-site transportation and disposal.
- Support in response to basement flooding in Structure 3 (located northwest and adjacent to the Site) from January to April 2021 at the request of the NYSDEC including:

- Monitoring the basement’s water level from the exterior stairwell during routine OM&M visits.
- Coordination and oversight of basement dewatering efforts with NYSDEC’s call-out contractor.
- Inspection of basement following dewatering activities.
- Placement of approximately 0.2 cubic yards of material, approved for re-use by the NYSDEC on March 2, 2021 (Gaylord, J., 2021a), in ruts at the western portion of the wellfield on-site. The re-use material consists of native soil from below Structure 3’s basement slab generated during sump replacement activities and of solids generated during cleanout and inspection activities of the sump within the treatment building.

RSO - Extraction Well Optimization Evaluation

At the request of the NYSDEC, MACTEC prepared and submitted an RSO Field Activities Plan in 2021 to evaluate if bedrock extraction wells EW-2 and EW-9 can ultimately be removed from service to further optimize contaminant mass removal and operational efficiency of the GWETS while still meeting RAOs (MACTEC, 2021d). As part of the field activities described in the plan, a passive diffusion bag (PDB) was deployed in EW-2 in December 2021 and will be sampled in 2022. Other activities outlined in the plan are scheduled to be implemented in 2022.

POET SYSTEM OM&M ACTIVITIES

Municipal water is supplied through the town distribution system to the majority of houses in the area. Three residences located outside the area of the municipal water supply, and within the former off-site plume footprint, are equipped with POET systems. Maintenance and monitoring of the three residential POET systems is performed on a quarterly basis or as needed at the request of the resident. Quarterly samples were collected in 2021 before and between the GAC filters, and no exceedances of NYS Class GA standards for Site-related VOCs were observed. POET sampling results summarized in Table 7 indicate that the POET systems are operating as intended and can be evaluated for sampling frequency reduction and future decommissioning.

In 2021, routine maintenance and monitoring of the three individual POET systems¹ was completed and included the following:

¹ Residential Well/POET system names are redacted within report text, tables, figures, and appendices for privacy purposes.

■ Residence

- Quarterly inspections of the POET system.
- Quarterly sample collection of water before and between GAC filters.
- Replacement of particulate filters, GAC filters, and ultraviolet bulb, as necessary.

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- Replacement of particulate filter and ultraviolet bulb, as necessary.

■ Residence

- Quarterly inspections of the POET system.
- Quarterly sample collection of water before and between GAC filters.
- Replacement of particulate filter and ultraviolet bulb, as necessary.
- Replacement of a leaking particulate filter housing by a licensed plumber.

LONG-TERM GROUNDWATER MONITORING

The LTM program has been designed to monitor the effect of the GWETS on contaminant levels in groundwater in the vicinity of the Site, to monitor long-term trends in concentrations of contaminants in groundwater, and to evaluate the effectiveness of the remedial actions (MACTEC, 2018a). This is accomplished through groundwater sampling and analysis and through water level measurements collected from select wells to generate bedrock and overburden potentiometric surface maps. Since 2014, groundwater sampling events for the Site have been performed on a 15-month frequency.

The most recent LTM sampling event was conducted in April 2021. Groundwater samples were collected and analyzed for VOCs from 35 locations (Table 2) and the data were used to delineate the PCE plume. Figures depicting well locations, bedrock and overburden potentiometric surfaces, and the inferred bedrock groundwater PCE plume from the April 2021 LTM event are included as Figures 2, 3, 5, and 6, respectively. Field records from this event are included in Appendix A.

The April 2021 LTM results for Site COCs are summarized in Table 9. The highest concentrations of Site VOCs (PCE) in overburden groundwater were observed in OW-3 and OW-14. The highest

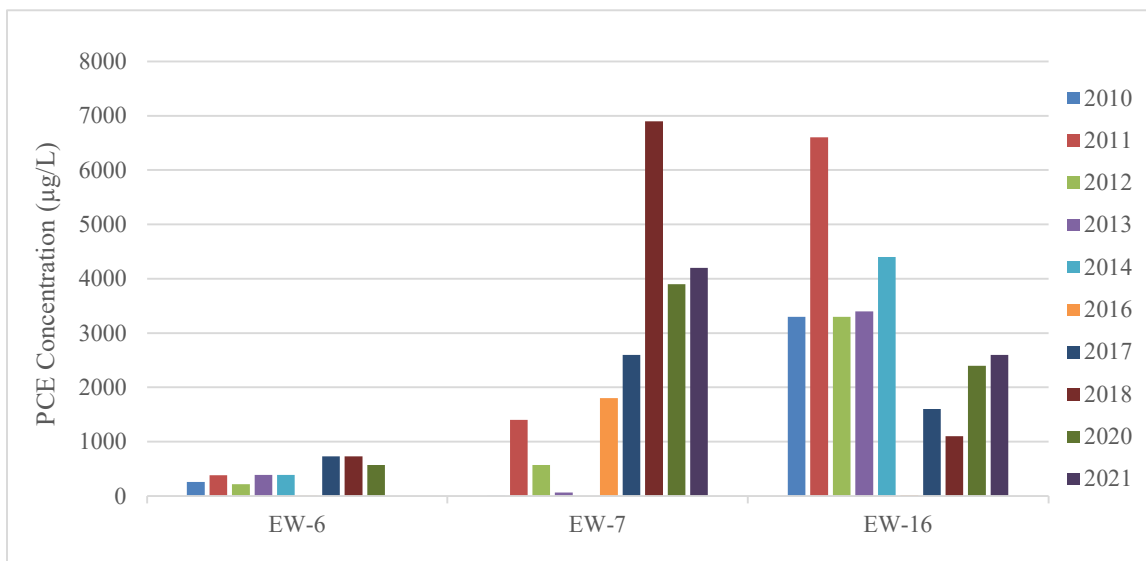
concentrations of PCE in bedrock groundwater were observed at EW-7 and EW-16. These findings are consistent with results observed since the reconfiguration of the GWETS (MACTEC, 2013b). Laboratory results for samples were provided to NYSDEC in electronic document delivery format for loading into EQulS. Historical groundwater results for Site VOCs were provided in the 2020 PRR (MACTEC, 2021b).

The nature and extent of the overburden groundwater plume is largely heterogenous with multiple hot spots related to interpreted residual source areas with steep concentration gradients that are consistent with previous sampling events at the Site. These observations are in agreement with the conceptual site model that overburden groundwater is not migrating horizontally beyond the influence of the overburden extraction well network and is primarily vertically flow-dominated within the fractured till. For the bedrock source area extraction well network, the core of the groundwater plume has shifted to the north from EW-16 to EW-7. The off-site plume continues to migrate to the northeast² towards Catskill Creek away from historical receptors (private water supply wells).

The histogram plot below presents PCE concentrations from 2010 to 2021 in bedrock source area core extraction wells EW-6, EW-7, and EW-16. These wells exhibit generally higher PCE concentrations, compared to bedrock extraction wells EW-2 and EW-9, with relatively stable or increasing trends due to the GWETS optimization activities implemented between 2013 and 2017, including more efficient plume capture by limiting extraction of clean water from off-site.

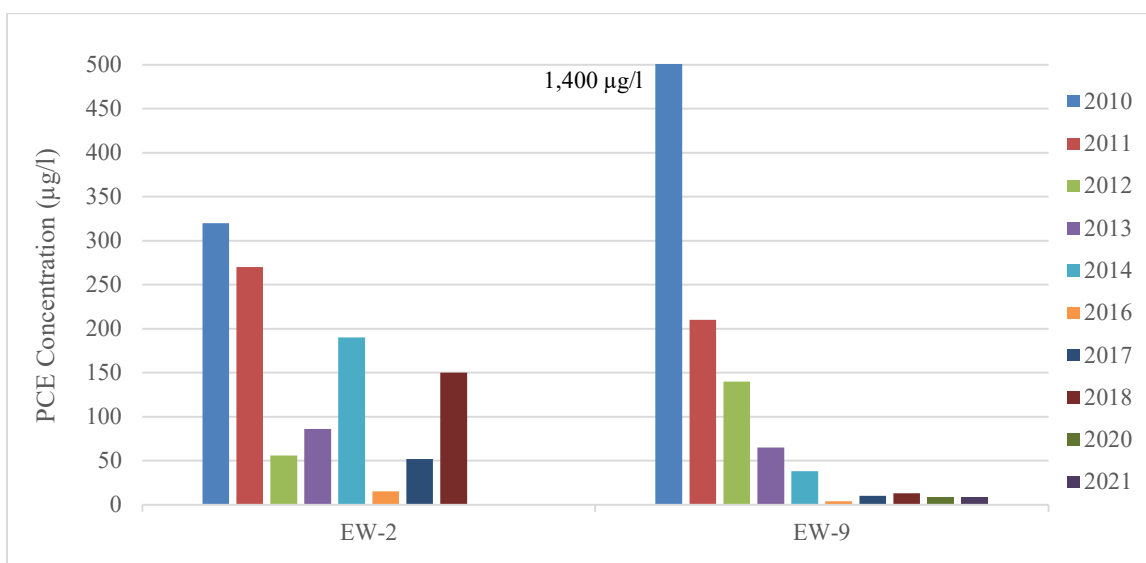
² As hypothesized within the 2013 RSO Implementation Activities Report (MACTEC, 2013a), discontinued pumping from off-site extraction wells (shut down in September 2021) has allowed the lower concentration portion of the PCE plume in that area to migrate northeastward as documented through sampling results from 2012 through 2021 (MACTEC, 2013c, 2014, 2015, 2017, 2018c, 2019, 2020, 2021b).

PCE Concentrations in Bedrock Source Area Core Extraction Wells



The cross-gradient bedrock source area boundary extraction wells EW-2 and EW-9 have PCE concentrations consistently lower than the other extraction wells in the bedrock source area and generally declining concentration trends as shown in the histogram plot below. EW-2 has been out of service since 2020 due to equipment and piping failures. These two wells are being assessed under the Extraction Well Optimization Evaluation for potential conversion to a monitoring point at EW-2 and extraction reduction with an ultimate goal of ceasing extraction at EW-9.

PCE Concentrations in Extraction Wells EW-2 and EW-9



Time-series plots of PCE concentrations for select wells were prepared for extraction wells OW-14, EW-7, and EW-16 and off-site monitoring wells CE-2, EW-13, and MW-5 and are included in Appendix B.

Overburden extraction well OW-14 and bedrock extraction wells EW-7 and EW-16 were selected to monitor the on-site changes in groundwater quality. Wells OW-14 and EW-16 have historically shown high concentrations of PCE but have exhibited a general downward trend in PCE concentrations beginning in 2013/2014 through 2021. In contrast, PCE levels at well EW-7 have increased through time likely as a result of optimization efforts to pumping rates that have limited the overextraction of clean off-site groundwater.

Time series plots have been prepared for off-site monitoring wells CE-2, EW-13, and M-5 to track the progression of the of the residual off-site plume to the northeast towards Catskill Creek. Country Estates primary supply well, CE-2, has previously been used to track the distal end (i.e., northwest tip) of the residual, off-site plume. LTM sample results from December 2014 to April 2021 have demonstrated a reduction of PCE concentrations in CE-2 to below the NYS Class GA Standard for PCE of 5 µg/L (Appendix B), indicating that the off-site groundwater plume continues to migrate away from historical receptors (residential water supply wells). The highest PCE concentrations for the off-site plume, observed in EW-13 (located to the southeast of CE-2), remain relatively low with a stable to slight declining trend. Monitoring well M-5 was selected as a sentinel well to monitor the northeastward (off-site) progression of the plume beyond EW-13³. Although PCE was not detected in M-5 during the April 2021 LTM event, daughter compounds cis-1,2-DCE and vinyl chloride above applicable NYS Class GA Standards were observed, demonstrating degradation of PCE either at or upgradient of this location. Concentrations in the off-site plume are expected to continue to decrease through natural degradation and dilution processes as the plume migrates to the northeast towards Catskill Creek.

The next LTM sampling event will be conducted in July 2022. The objective of establishing hydraulic capture of highly contaminated bedrock groundwater (>5,000 µg/L) in close proximity to the Site is being maintained while achieving improved extraction efficiency.

³ Developed properties in the area of M-5 and EW-13 are supplied by public drinking water.

SEMIANNUAL HYDRAULIC MONITORING

Water level measurements are collected semiannually, typically during the spring and fall seasons, to monitor the hydraulic gradient resulting from previous GWETS modifications (2013 to 2017 and 2018 to 2019) and to evaluate hydraulic control of the bedrock groundwater plume in the near vicinity of the Site. The April 2021 water level measurements were collected as part LTM activities for the Site and represent a site-wide set of hydraulic monitoring measurements for the 2021 spring season. Water levels were measured in select monitoring wells, bedrock extraction wells, and overburden extraction wells for the fall monitoring event in October 2021. Water levels for each event are presented in Table 8.

In April 2021, depth to water levels were manually measured in 23 monitoring wells, and groundwater elevation measurements from 12 extraction wells were recorded via transducer measurements at the GWETS main control panel. In October 2021, depth to water levels were manually measured in nine monitoring wells, and groundwater elevation measurements from 12 extraction wells were recorded via transducer measurements at each extraction well's panel.

Bedrock potentiometric surface figures were generated for the April and October 2021 events (Figures 3 and 4). These figures indicate that groundwater flow of the highly contaminated bedrock groundwater in the source area remains inwards toward the Site through the GWETS operation. An overburden potentiometric surface map was generated for the April 2021 event from well measurements collected as part of the LTM synoptic round (Figure 5). The overburden extraction wells essentially operate as sumps and do not represent the overall overburden potentiometric surface. Groundwater flow in the overburden from the Site is generally to the north and northeast in the direction of Catskill Creek.

Consistent with historical data, the groundwater elevation at IW-10 is significantly higher than the groundwater elevation of IW-8, which is located approximately 200 feet to the southeast. It is assumed that the man-made pond in Tributary B, to the west of IW-10, is hydraulically connected through the thin overburden material in this area to IW-10 via bedrock fractures and is therefore creating a mound of groundwater and a localized high point in groundwater elevation. This groundwater mound may be further exaggerated by the previously identified bedrock knob in the area (MACTEC, 2013a). Because this pond and associated mound are “upgradient” from the

surrounding groundwater system, it is not at risk of contamination, nor does it negatively impact pumping operations and may even aid the GWETS system in controlling the groundwater plume.

SUSTAINABILITY AND RESILIENCY

In 2018, MACTEC submitted a Ground Source Heating and Solar Photovoltaic Evaluation to the NYSDEC summarizing an assessment of energy conservation measures to reduce utility expenditures as well as greenhouse gas output at the Site (MACTEC, 2018b). The evaluation proposed a ground source heat pump system to heat and cool the treatment building utilizing infrastructure already present as part of the GWETS and a solar photovoltaic system for local electric power generation. This evaluation will be updated in 2022 with current cost estimates, a plan for tracking reductions in carbon emissions and a plan for implementation.

In 2021, renewed discussions pertaining to the evaluation began between the NYSDEC and MACTEC and will continue in 2022. Ongoing site activities regarding sustainability and resiliency have been evaluated and implemented to reduce energy usage, waste generation, emissions, and water usage at the Site (MACTEC, 2018a). Site activities currently implemented include the following:

- Use of PDBs for LTM groundwater sampling events. PDBs generate minimal purge water waste and do not require use of a power source, as is necessary with other sampling methods.
- Disposal of used oil from the treatment system's transfer and discharge pumps at an appropriate recycling facility.
- Scheduling the collection of residential POET system samples and non-routine groundwater samples to coincide with collection of routine monthly system performance samples to reduce mobilizations for Site sampling and laboratory sample drop-off.
- Utilizing local staff for routine site visits and carpooling, when possible, to minimize environmental impacts related to transportation.
- Application of window insulation film to exterior windows of the treatment building office to reduce heat loss from November to April.
- Remote monitoring of the treatment system as needed to potentially reduce non-routine visits to the Site.
- Reuse of investigation derived waste on-site, when possible, and as approved by the NYSDEC.
- Optimization of the treatment system to improve operational efficiency and cost effectiveness.

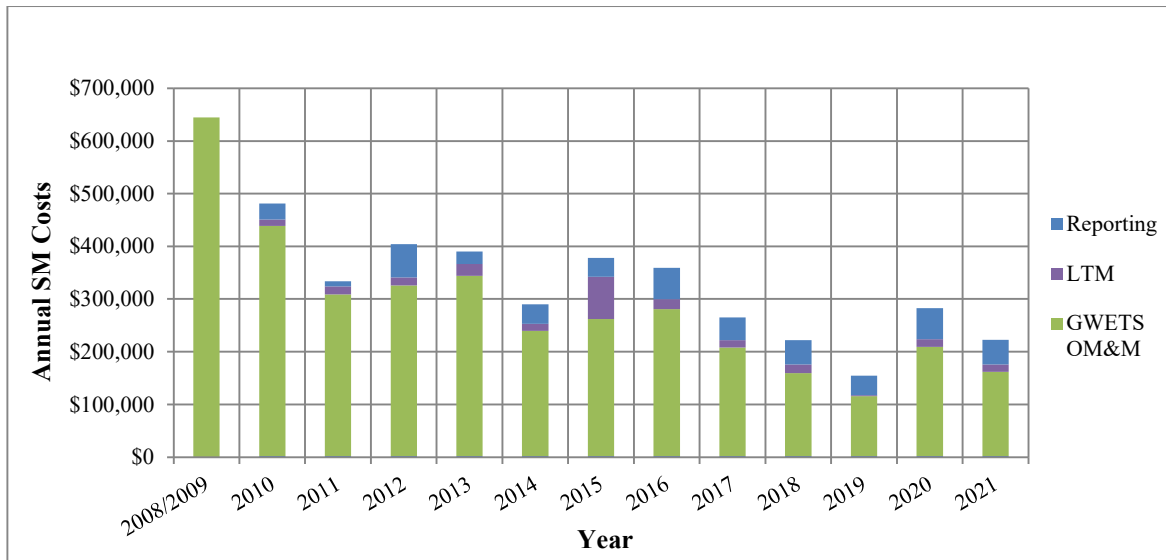
Further evaluation of energy conservation measures for the Site is proposed in the recommendations section of this report.

COST CONTROL SUMMARY

A cost summary for 2021 is provided in the following table by task. As shown, most of the SM costs for the reporting period were incurred for operation and maintenance of the GWETS.

Task 1 (Preliminary Activities)	
Labor	\$4,765
Task 2 (Site Management Plan)	
Labor	\$8,736
Task 3 (Operation and Maintenance) ^(a)	
Labor	\$93,882
Lodging, Travel, and MI&E	\$4,006
Shipping	\$121
Waste Disposal	\$1,140
Internet	\$1,738
Plowing	\$7,488
Supplies & Equipment	\$930
Subcontractors	\$29,094
Electricity*	\$13,008
Propane*	\$4,565
Water*	\$327
Laboratory Services* ^(b)	\$3,293
	\$159,592
Task 4 (Monitoring and Reporting)	
Labor	\$7,509
Lodging, Travel, and MI&E	\$2,122
Shipping	\$35
Supplies & Equipment	\$1,375
Laboratory Services* ^(b)	\$2,978
	\$14,019
Task 5 (Periodic Review and Reporting)	
Labor	\$46,788
Annual Total: \$233,900	
Notes:	
^(a) Includes residential POET system operation, maintenance, and monitoring, and April 2021 well decommissioning event.	
^(b) Individual costs for Laboratory Services under Tasks 3 and 4 were estimated using the total laboratory services cost provided by the NYSDEC for 2021. Analytical costs for monthly system performance samples and quarterly residential POET samples are included in the Laboratory Services cost under Task 3. Analytical costs for the April 2021 LTM sampling event are included in the Laboratory Services cost under Task 4.	
* NYSDEC direct expense	

Optimization measures to reduce the overall operating expenses have been and will continue to be implemented in an effort to provide further cost savings at the Site. Since the NYSDEC assumed responsibility from the USEPA for the Site in 2008, annual SM costs associated with reporting, LTM, and GWETS OM&M have reduced by 66 percent. A breakdown of these costs from 2008 to 2021 are depicted in the chart below.



Notes:

GWETS OM&M includes Country Estates and residential POET system OM&M, as applicable.

2008/2009: Costs as of 10/1/2008.

2010: Reporting includes preparation of 2008/2009 PRR.

2012: GWETS OM&M includes preparation of detailed design drawings for GWETS improvements; Reporting includes preparation of SMP and 2010/2011 PRR.

2013: GWETS OM&M does not include preparation of detailed design drawings for GWETS improvements or implementation of RSO improvements. LTM includes conducting hydraulic effectiveness monitoring and EW-9 step test.

2014: Reporting includes 2014 PRR and drafting SMP update. OM&M does not include GWETS modifications.

2015: GWETS OM&M includes oversight and coordination of GWETS upgrades/modifications; LTM reflects quarterly residential POET system OM&M, extraction well decommissioning, EW-5 over drilling/MW conversion, and EW-5 investigation derived waste disposal.

2016 & 2017: GWETS OM&M includes modifications, GWETS commissioning; Reporting includes PRR preparation and SMP updates.

2018: GWETS OM&M includes GWETS commissioning and optimization and monitoring well decommissioning inventory; Reporting includes annual report preparation and SMP updates.

2019: GWETS OM&M includes regular inspections and maintenance; LTM reflects quarterly residential POET system OM&M; Reporting includes annual report preparation.

2020: GWETS OM&M includes routine and non-routine inspections and maintenance, pump replacements, and quarterly residential POET system OM&M; LTM reflects January and July 2020 groundwater monitoring & sampling event, and emerging contaminants sampling in October 2020; Reporting includes 2019 Annual Report, initial 2020 PRR preparation, and 2020 MPRs.

2021: GWETS OM&M includes routine and non-routine inspections and maintenance, quarterly residential POET system OM&M, and well decommissioning event; LTM reflects April 2021 groundwater monitoring and sampling event; Reporting includes 2020 Periodic Review Report edits, 2021 MPRs, Field Activities Plans for Well Decommissioning and Extraction Well Optimization Evaluation, Field Activities Report for Well Decommissioning, initial 2021 Annual Report preparation, and data management and validation.

RECOMMENDATIONS FOR THE COMING YEAR (2022)

As mentioned previously, the RAOs were redefined in 2012 to focus on hydraulic containment of the highly contaminated bedrock groundwater in the on-site source area. For the 2021 reporting period, inward gradients to the Site were maintained. In an effort to continue optimizing system efficiency and remedial progress, and to provide further cost savings at the Site, the following are recommended:

- Continued implementation, review, and evaluation of the existing ICs/ECs, O&M Plan, and groundwater monitoring program, as applicable.
- Continued routine GWETS maintenance.
 - Maintain air stripper efficiency through regularly scheduled (semiannual) air stripper cleaning using the washer wand. This does not require disassembly of the air stripper, rather the trays are power washed through the viewports using a washer wand.
 - Perform annual inspection of building heaters.
 - Conduct general housekeeping activities to improve work processes and eliminate general clutter.
 - Troubleshoot well components as needed to maintain normal system operation.
- Evaluate the findings of the current ongoing RSO for the potential to continue the shutdown of EW-2 and an eventual shutdown of EW-9 to further optimize contaminant mass removal and operational efficiency of the GWETS as detailed in the Field Activities Plan – Extraction Well Optimization Evaluation and approved by the NYSDEC.
- Reduce sampling frequency at the three residences containing POET systems from quarterly to semiannually and to evaluate future decommissioning of the POET systems.
- Decommission the building's septic holding tank and associated plumbing facilities to reduce costs associated with its maintenance. The GWETS has not been staffed full-time since 2017 and the septic tank and plumbing facilities are no longer necessary.

- Complete a high level sustainability and resiliency evaluation to determine the applicability of a basis of design memorandum in 2022 for site-specific sustainability and resiliency goals including an ongoing geothermal evaluation.

Please feel free to contact us at (207) 775-5401 with questions on the material provided herein.

Sincerely,

MACTEC Engineering and Geology, P.C.



Jean Firth, PG

Site Project Manager/Program Manager



Nicole Bonsteel, PE

Technical Reviewer

Enclosures (17)

Figure 1	Site Location
Figure 2	Groundwater Well Locations
Figure 3	April 2021 Interpreted Bedrock Potentiometric Surface (Pumping)
Figure 4	October 2021 Interpreted Bedrock Potentiometric Surface (Pumping)
Figure 5	April 2021 Interpreted Overburden Potentiometric Surface (Pumping)
Figure 6	Bedrock Groundwater PCE Plume April 2021
Table 1	Site Management Requirements
Table 2	Long-Term Monitoring and System Performance Sampling Matrix
Table 3	Groundwater Extraction and Treatment System Monthly Throughput
Table 4	Groundwater Extraction and Treatment System Operational Data
Table 5	Total VOCs Extracted from Groundwater (lbs.)

Table 6 Groundwater Extraction and Treatment System Performance Sampling Results -
2021

Table 7 Residential Point of Entry Treatment System Sampling Results - 2021

Table 8 LTM and Semiannual Groundwater Elevations

Table 9 Groundwater Monitoring Results – Site-Specific Contaminants of Concern

Appendix A: Field Records

Appendix B: Time-Series Plots of Key Wells

cc: File

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FIGURES

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Greene County digital orthoimagery (2013) obtained from
New York State GIS Clearinghouse at: <https://gis.ny.gov>



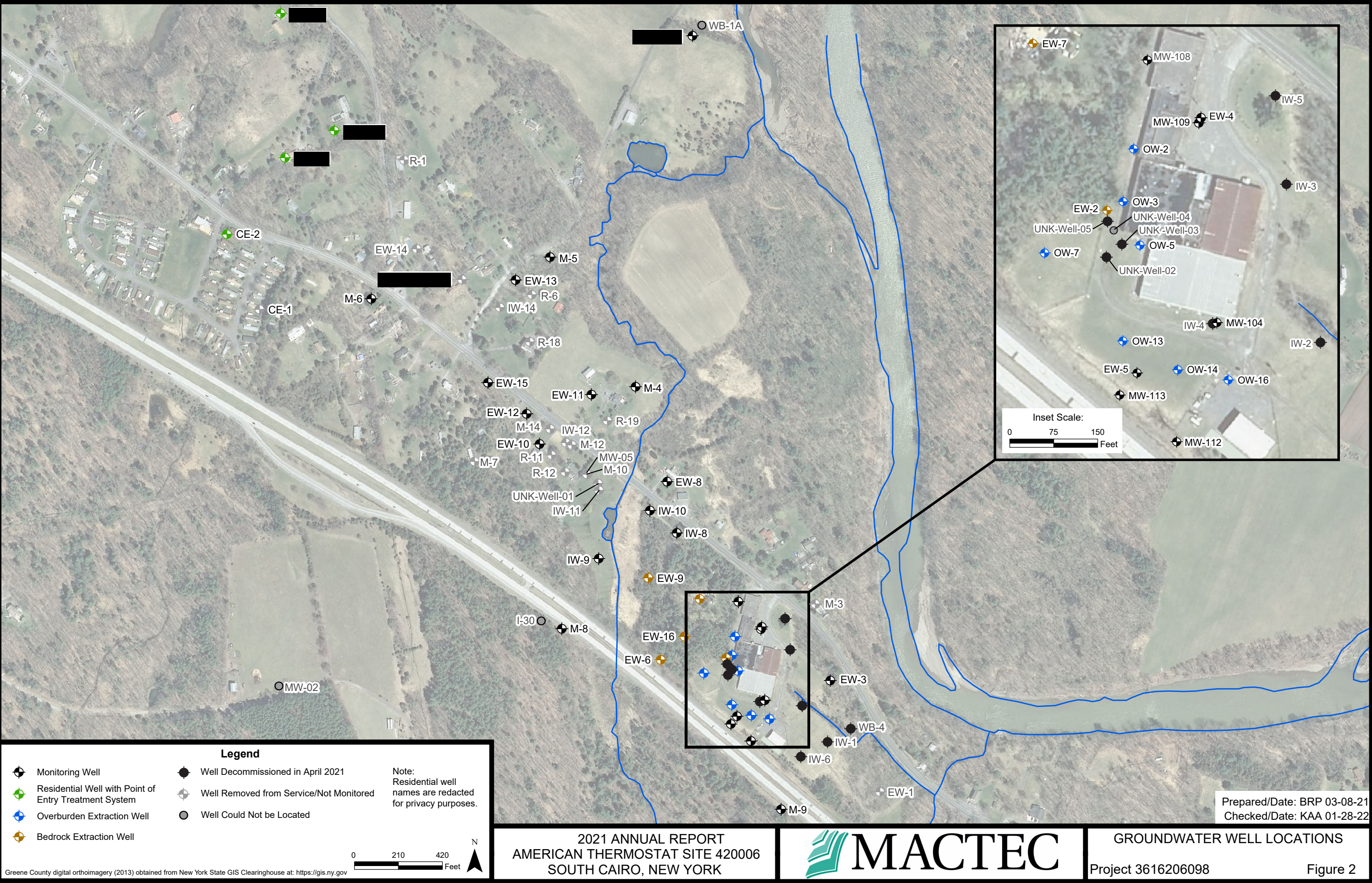
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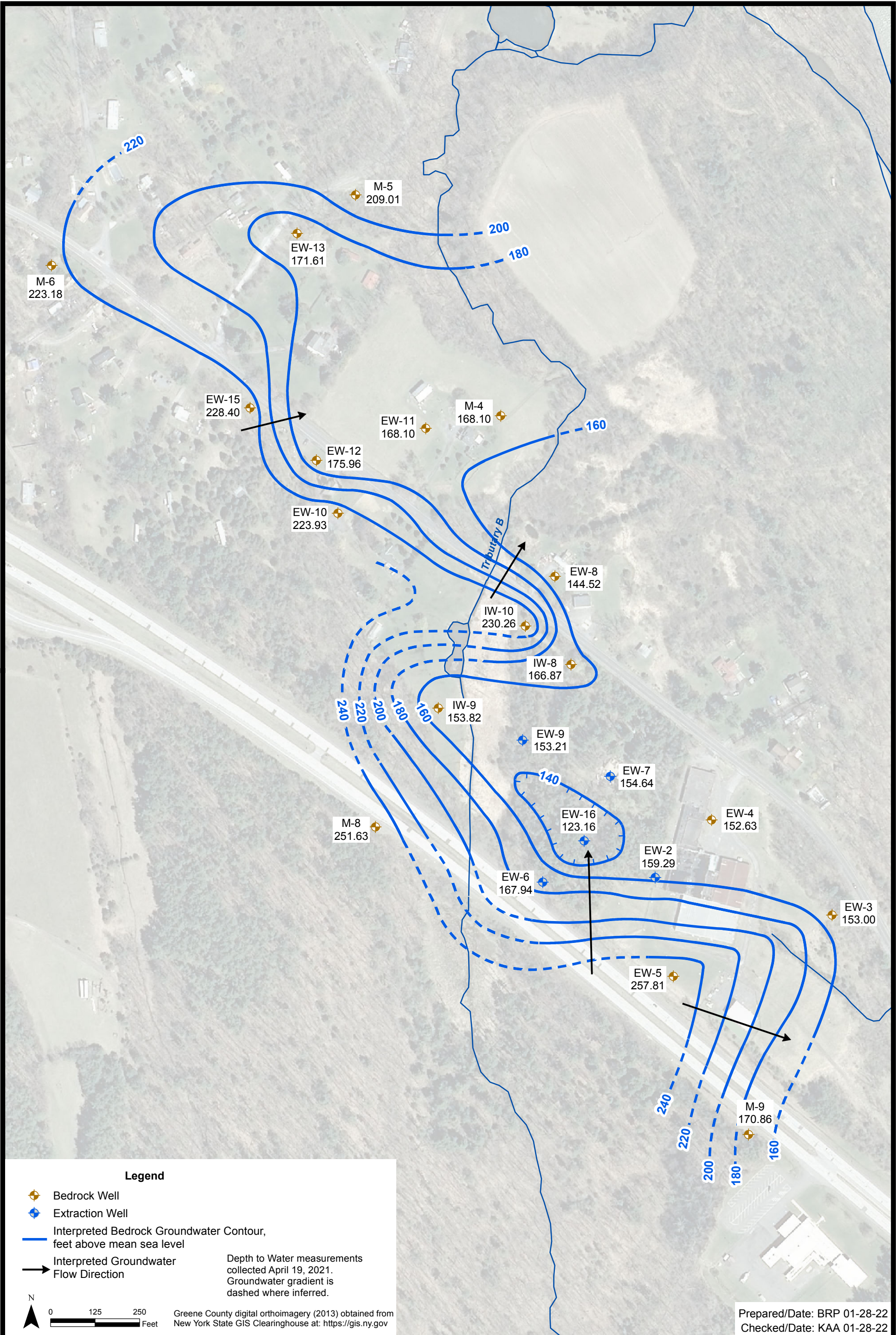


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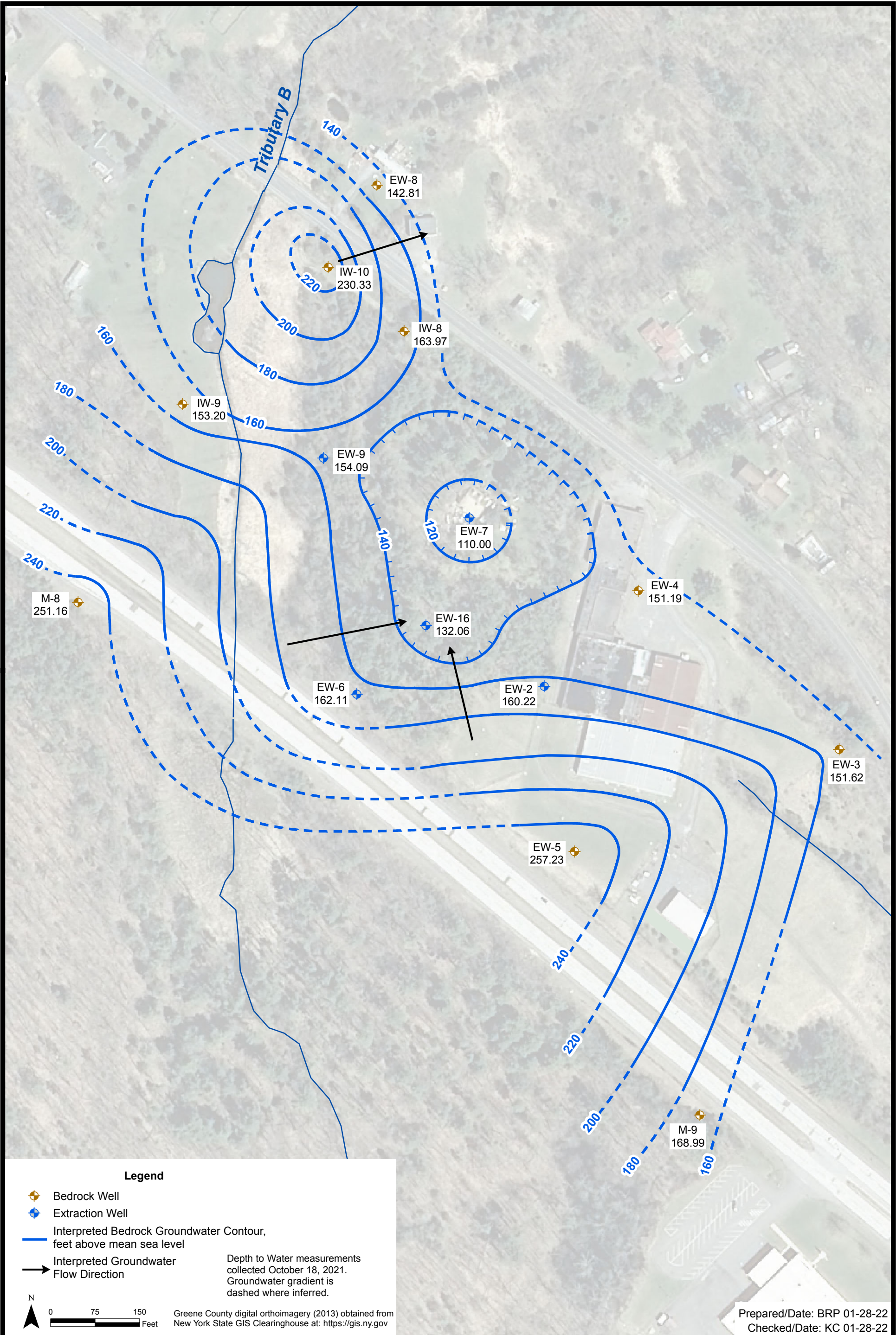
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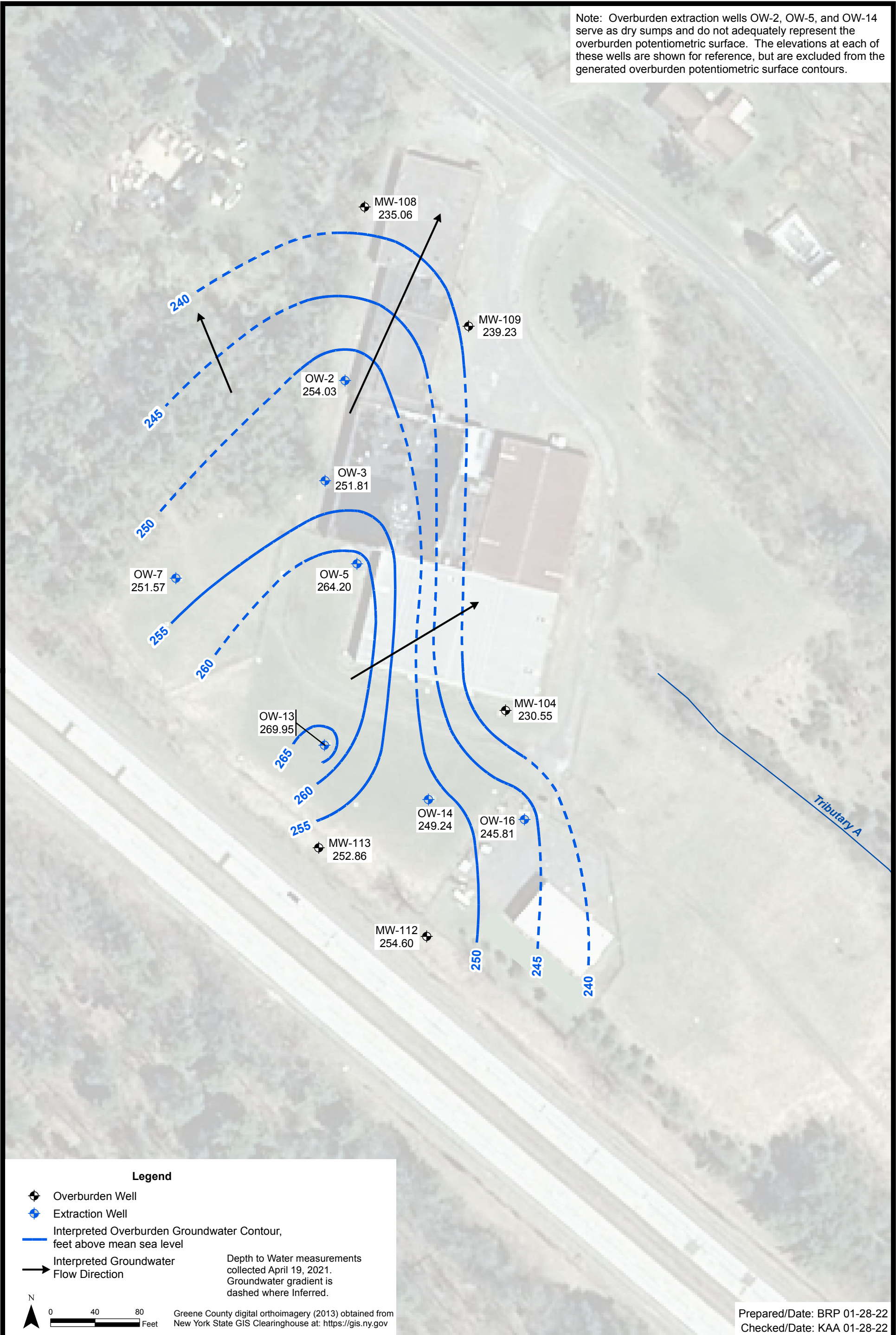


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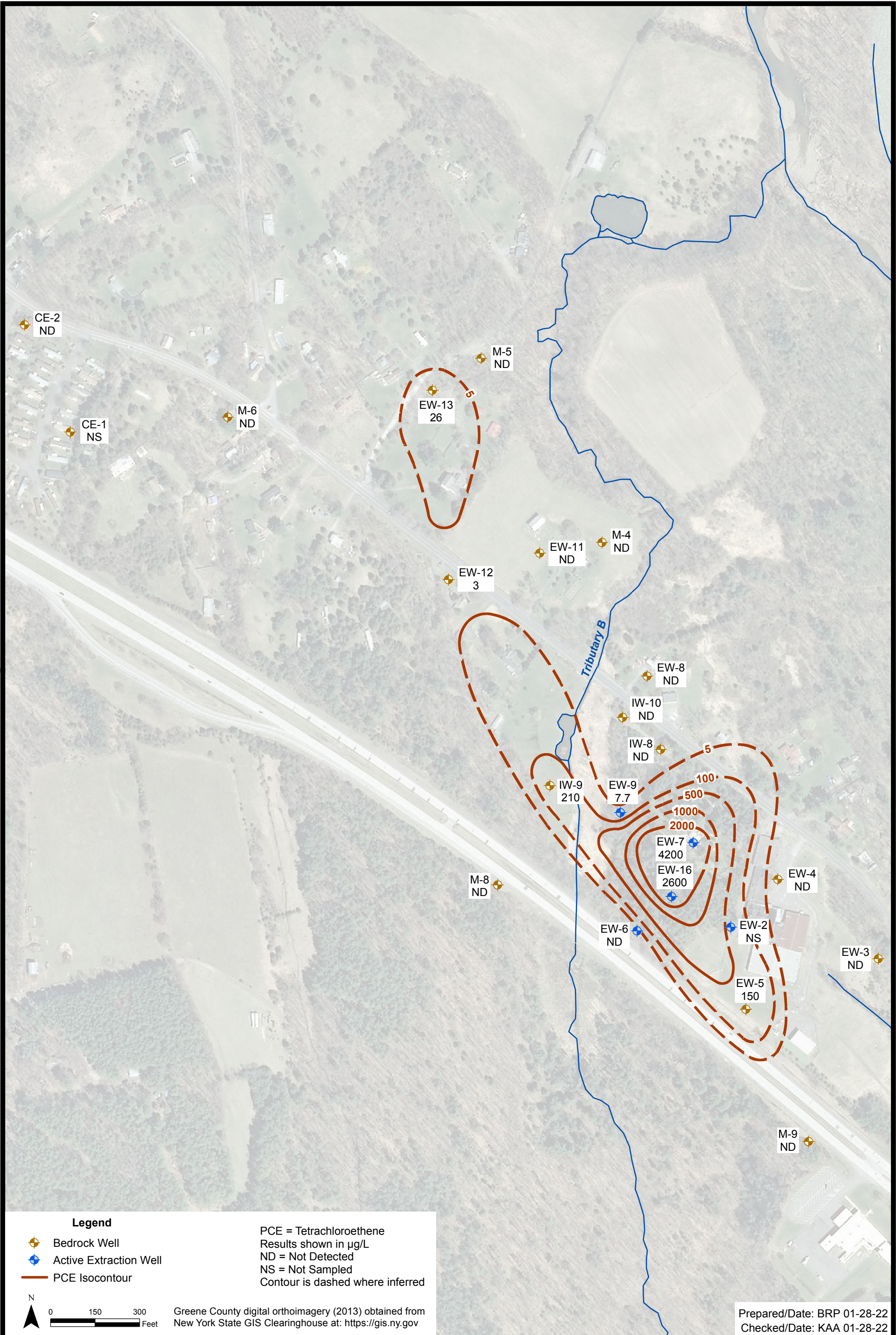
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Note: Overburden extraction wells OW-2, OW-5, and OW-14 serve as dry sumps and do not adequately represent the overburden potentiometric surface. The elevations at each of these wells are shown for reference, but are excluded from the generated overburden potentiometric surface contours.



Prepared/Date: BRP 01-28-22
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TABLES

Table 1: Site Management Requirements

Component	Action	Required Frequency	Comments/Recommendations
Groundwater Extraction and Treatment System			
GWETS Operation Checklist	Inspection	Each O&M visit	Check groundwater treatment system operation: flow rates, meter readings, system components.
Extraction Wells	Inspection	Each O&M visit	Check extraction wells, housing, control panels.
Control Panel, Heaters	Inspection	Each O&M visit	Check function of control panel indicating lights. In cold weather verify pilot light operation of heaters.
Safety Equipment, Treatment Plant Lighting	Inspection	Monthly	Inspect safety equipment (ladders, eyewash, fire extinguishers, etc.). Inspect plant lighting for proper operation.
Site Security	Inspection	Monthly	Check treatment building door locks, fencing, and site perimeter fence for defects.
Air Stripper	Inspection/Maintenance	Annually	Perform cleaning of air stripper unit trays and sump, if necessary.
Treatment Plant Heaters	Inspection/Maintenance	Annually	Annual inspection and cleaning of heaters; to be performed by a licensed subcontractor.
Groundwater Monitoring System	Inspection	15-Month	Visually inspect well pads/locks at site wells; repair as necessary to maintain integrity and security.
System Performance Monitoring			
Influent Header (SP-1)	Plant influent water sampling	Monthly	Grab sample collected to monitor and evaluate GWETS performance.
Treatment Plant Discharge (SP-39)	Plant effluent water sampling	Monthly	Grab sample collected to monitor and evaluate GWETS performance.
Point of Entry Treatment System			
POET System	Residential water supply sampling and inspection	Quarterly	Grab sample collected between carbon filters to monitor and evaluate water supply and GAC performance. Perform system maintenance on carbon filters and UV system as needed, annual at a minimum.
Environmental Monitoring			
Groundwater Elevation Monitoring	Groundwater elevation measurements	Semiannually (spring and fall)	Collect groundwater elevation measurements for active extraction wells and select monitoring wells to monitor hydraulic control of the plume near the site.
Environmental Groundwater Sampling	Groundwater sampling of 36 wells	15-Month sampling interval	Grab/PDB samples collected from 36 locations including: 1 public supply well, 20 monitoring wells, 12 active bedrock and overburden extraction wells, and 3 residential water supply wells before GAC filters.

Notes:

GAC = Granular activated carbon	PDB = Passive diffusion bag
GWETS = Groundwater extraction and treatment system	POET = Point of entry treatment
O&M = Operation and maintenance	UV = Ultraviolet

Table 2: Long-Term Monitoring and System Performance Sampling Matrix

Well ID/Sampling Location	Water Level Measurements		VOCs	Sample Description
	Seminannual	15-Month LTM		
Monitoring Wells (15-Month LTM) ⁽¹⁾				
CE-1 ⁽²⁾			X	Grab, before filters
CE-2			X	Grab, before filters
EW-3	X	X	X	PDB
EW-4	X	X	X	PDB
EW-5	X	X	X	PDB
EW-8	X	X	X	PDB
EW-10		X		Not Applicable
EW-11		X	X	PDB
EW-12		X	X	PDB
EW-13		X	X	PDB
EW-15		X		Not Applicable
IW-8	X	X	X	PDB
IW-9	X	X	X	PDB
IW-10	X	X	X	PDB
M-4		X	X	PDB
M-5		X	X	PDB
M-6		X	X	Grab
M-8 ⁽³⁾	X	X	X	PDB
M-9 ⁽³⁾	X	X	X	PDB
██████		X	X	PDB
MW-104 ⁽³⁾		X	X	Grab
MW-108		X		Grab
MW-109 ⁽³⁾		X	X	Grab
MW-112 ⁽³⁾		X	X	Grab
MW-113 ⁽³⁾		X	X	Grab
Active Bedrock Extraction Wells (15-Month LTM) ⁽¹⁾				
EW-2 ⁽⁴⁾	X	X	X	Grab
EW-6	X	X	X	Grab
EW-7	X	X	X	Grab
EW-9	X	X	X	Grab
EW-16	X	X	X	Grab

Table 2: Long-Term Monitoring and System Performance Sampling Matrix

Well ID/Sampling Location	Water Level Measurements		VOCs	Sample Description
	Seminannual	15-Month LTM		
Active Overburden Extraction Wells (15-Month LTM) ⁽¹⁾				
OW-2	X	X	X	Grab
OW-3	X	X	X	Grab
OW-5	X	X	X	Grab
OW-7	X	X	X	Grab
OW-13	X	X	X	Grab
OW-14	X	X	X	Grab
OW-16	X	X	X	Grab
Residential Wells (15-Month LTM) ⁽¹⁾				
██████			X	Grab, before filters
██████			X	Grab, before filters
██████			X	Grab, before filters
Residential Well POET System Performance (Quarterly)				
████████████████████			X	Grab, before and between filters
████████████████████			X	Grab, before and between filters
████████████████████			X	Grab, before and between filters
GWETS Performance (Monthly)				
PS-INFLUENT	Influent		VOCs, Metals, TDS, TSS	Grab
PS-AS-EFFLUENT	Air stripper effluent water		VOCs	Grab

Notes:

- ⁽¹⁾ = 15-Month LTM occurred April 19-21, 2021.
- ⁽²⁾ = CE-1 not in service; acts as an emergency backup well to CE-2 for Country Estates. Not sampled as part of the 2021 LTM event.
- ⁽³⁾ = Well added to LTM network as a result of recommendations from the 2018 EPA Five-Year Review for the site.
- ⁽⁴⁾ = EW-2 has been off-line since 9/26/2020 likely due to a pump failure and was therefore not sampled as part of the 2021 LTM event.

GWETS = Groundwater extraction and treatment system

LTM = Long-term monitoring

PDB = Passive diffusion bag

POET = Point of entry treatment

TDS = Total dissolved solids

TSS = Total suspended solids

VOCs = Volatile organic compounds

Table 3: Groundwater Extraction and Treatment System Monthly Throughput

Year	Month												Total for Calendar Year (Gallons)	Cumulative Total Throughput (Gallons)
	January	February	March	April	May	June	July	August	September	October	November	December		
1998	-	-	-	-	-	-	-	1,845,307	2,326,580	2,000,099	1,387,734	1,515,814	9,075,534	9,075,534
1999	2,327,342	1,946,464	1,570,828	1,986,297	1,876,550	1,810,328	1,880,672	2,865,086	2,849,292	2,967,620	2,840,040	2,996,042	27,916,561	36,992,095
2000	2,188,662	1,828,969	2,782,069	2,625,243	2,689,205	2,515,671	2,845,066	2,656,221	2,790,754	3,191,008	2,906,470	3,089,535	32,108,873	69,100,968
2001	3,154,385	3,202,253	3,397,280	3,325,592	3,507,403	3,241,052	2,846,350	3,323,930	3,116,812	3,172,179	2,668,748	2,676,774	37,632,758	106,733,726
2002	2,643,561	2,400,906	2,581,039	3,015,136	2,827,722	3,087,176	3,109,504	2,969,001	2,826,453	3,126,848	3,151,070	3,043,354	34,781,770	141,515,496
2003	3,112,140	2,640,103	3,032,627	2,956,081	2,279,599	2,817,292	2,828,580	2,862,294	2,805,159	2,889,540	2,703,444	1,743,574	32,670,433	174,185,929
2004	1,452,060	1,323,679	1,433,444	1,621,998	1,511,813	1,378,343	1,829,427	2,488,132	2,214,838	2,016,922	2,147,628	2,218,612	21,636,896	195,822,825
2005	1,969,101	1,627,579	1,505,083	1,888,648	1,679,210	1,635,094	1,679,658	1,675,021	1,668,387	1,048,462	1,753,165	1,804,582	19,933,990	215,756,815
2006	1,850,648	1,724,943	1,726,705	1,860,726	2,038,414	2,225,379	1,700,523	1,505,840	1,573,918	2,365,602	2,542,691	1,570,319	22,685,708	238,442,523
2007	1,860,431	1,484,866	1,797,869	1,651,491	1,595,631	1,567,880	1,656,624	1,680,981	1,559,100	1,624,903	1,628,116	1,779,807	19,887,699	258,330,222
2008	1,621,909	1,661,136	1,872,515	1,922,613	1,496,402	1,519,804	1,344,964	2,366,862	2,053,268	2,649,688	2,172,569	2,466,153	23,147,883	281,478,105
2009	2,009,299	1,973,492	2,109,251	2,164,940	2,086,536	2,069,749	2,413,904	1,461,639	1,572,872	1,962,537	1,782,527	2,171,560	23,778,306	305,256,411
2010	1,715,140	1,562,130	2,144,107	1,972,606	1,692,254	1,657,835	1,710,898	1,814,591	1,502,900	1,736,300	1,505,900	1,799,400	20,814,061	326,070,472
2011	1,660,400	1,608,200	1,677,100	1,807,700	1,869,800	1,617,700	1,626,100	1,676,400	1,764,200	1,646,400	1,806,000	1,966,500	20,726,500	346,796,972
2012	1,617,600	1,592,100	1,545,800	976,300	1,050,200	655,200	435,000	1,572,000	1,098,900	1,363,800	1,223,500	1,351,200	14,481,600	361,278,572
2013	1,287,600	1,165,900	1,213,400	1,213,400	1,024,000	560,000	-	368,300	282,600	1,133,000	1,240,188	950,031	10,438,419	371,716,991
2014	605,868	537,554	828,412	1,311,895	1,181,124	1,036,409	1,101,365	968,790	516,422	771,419	643,451	804,076	10,306,785	382,023,776
2015	1,055,444	726,839	818,456	829,691	918,585	1,174,145	1,364,309	1,069,571	1,424,510	890,175	-	251,416	10,523,141	392,546,917
2016	1,028,212	1,142,661	1,197,620	1,176,265	1,105,646	1,027,389	1,159,271	1,156,925	1,179,487	1,145,887	936,208	953,286	13,208,857	405,755,774
2017	1,492,216	906,043	1,123,788	1,197,556	1,049,899	1,426,931	1,168,068	1,576,200	928,859	1,428,789	863,212	1,231,949	14,393,510	420,149,284
2018	1,225,869	1,362,944	983,689	968,599	1,548,696	1,134,499	1,470,999	97,588	287,744	1,076,410	863,088	1,227,285	12,247,410	432,396,694
2019	1,589,576	1,274,721	1,562,495	1,217,017	1,343,215	1,222,569	1,222,569	1,063,488	1,114,585	1,141,511	902,426	755,511	14,409,683	446,806,377
2020	499,106	1,258,095	679,114	720,765	523,678	409,470	731,479	860,427	1,191,122	784,850	1,149,568	1,037,075	9,844,749	456,651,126
2021	859,906	937,650	981,620	951,290	1,260,945	914,353	1,355,500	1,152,711	1,016,565	1,269,408	1,061,188	1,017,492	12,778,628	469,429,754

Note:

- Treatment system modifications resulted in plant shutdown during the months of July 2013 and November 2015.

Table 4: Groundwater Extraction and Treatment System Operational Data

Year	Reporting Month	Reporting Period Interval		System Downtime (approximate) (days)	System Runtime During Reporting Period ⁽¹⁾ (days)	Effluent Totalizer Reading Start (gallons)	Effluent Totalizer Reading End (gallons)	Monthly System Throughput (gallons)	Average Flow Rate per Reporting Period (gpm)
		Start Date	End Date						
2021	January	1/5/2021	2/3/2021	6.53	22	81,599,046	82,458,952	859,906	27
	February	2/3/2021	3/3/2021	0.80	27	82,458,952	83,396,602	937,650	24
	March	3/3/2021	4/5/2021	0.09	33	83,396,602	84,378,222	981,620	21
	April	4/5/2021	5/3/2021	0.03	28	84,378,222	85,329,512	951,290	24
	May	5/3/2021	6/1/2021	0.03	29	85,329,512	86,590,457	1,260,945	30
	June	6/1/2021	7/1/2021	1.64	28	86,282,829	87,197,182	914,353	22
	July	7/1/2021	8/2/2021	0.00	32	87,197,182	88,552,682	1,355,500	29
	August	8/2/2021	9/1/2021	0.03	30	88,552,682	89,705,393	1,152,711	27
	September	9/1/2021	10/4/2021	1.10	32	89,705,393	90,721,958	1,016,565	22
	October	10/4/2021	11/1/2021	0.14	28	90,721,958	91,991,366	1,269,408	32
	November	11/1/2021	12/1/2021	3.92	26	91,991,366	93,052,554	1,061,188	28
	December	12/1/2021	1/4/2022	0.07	34	93,052,554	94,070,046	1,017,492	21

Notes:

gpm = gallons per minute

⁽¹⁾ = Calculated by subtracting system downtime in days from days during reporting period interval.

Table 5: Total VOCs Extracted from Groundwater (lbs.)

Calendar Year	Calendar Month												Total for Calendar Year (lbs.)	Cumulative Total VOCs (lbs.)
	January	February	March	April	May	June	July	August	September	October	November	December		
1998	-	-	-	-	-	-	-	104.7	24.5	42.4	26.6	35.0	233	233
1999	26.5	49.3	43.7	39.2	26.7	31.0	23.9	47.3	39.0	63.2	58.1	66.9	515	748
2000	57.5	47.2	62.3	58.7	43.7	50.0	40.8	41.5	33.9	34.6	42.7	49.9	563	1,311
2001	42.7	42.6	50.5	44.1	54.4	45.5	34.7	41.2	29.5	71.5	23.9	27.9	509	1,820
2002	28.1	26.0	28.3	43.4	42.5	44.8	40.5	38.5	37.3	36.9	42.3	42.8	451	2,271
2003	38.2	37.3	43.8	44.8	34.1	45.5	32.7	42.0	51.9	49.3	35.1	34.4	489	2,760
2004	29.7	31.3	39.2	42.0	34.6	32.6	32.1	31.6	26.9	36.0	26.8	34.3	397	3,157
2005	39.4	33.0	20.5	21.8	29.6	23.6	24.3	14.3	17.5	15.2	31.8	31.3	302	3,460
2006	33.8	28.5	27.2	29.0	40.2	44.1	13.1	14.1	24.4	40.1	40.4	23.1	358	3,818
2007	32.3	19.8	28.8	34.4	19.8	18.7	20.2	16.4	15.8	15.8	20.2	21.9	264	4,082
2008	23.9	24.3	34.0	30.6	22.7	14.7	11.8	24.7	21.8	24.8	24.1	25.3	283	4,364
2009	23.0	18.5	20.0	21.0	23.8	19.4	25.3	15.8	14.8	16.9	19.9	26.5	245	4,609
2010	19.0	19.4	30.6	23.6	15.1	13.9	12.0	9.8	13.7	21.8	18.0	30.4	227	4,836
2011	18.2	15.9	35.5	26.3	25.1	22.9	19.5	19.8	25.0	22.5	19.8	22.5	273	5,109
2012	18.5	18.6	18.0	18.8	24.0	5.4	27.5	39.6	12.8	29.2	23.9	17.0	253	5,363
2013	21.8	27.9	30.2	18.7	18.6	13.1	-	20.0	10.4	17.1	18.5	14.1	211	5,573
2014	7.5	11.0	25.1	18.1	26.1	15.6	13.0	40.3	7.0	8.9	14.0	10.7	197	5,770
2015	14.1	6.4	6.1	15.5	15.5	16.8	16.9	14.2	17.4	10.5	-	8.9	142	5,912
2016	24.0	19.1	18.0	32.1	14.4	17.6	14.1	9.5	9.5	13.4	8.6	16.1	196	6,109
2017	13.9	37.0	10.3	27.0	10.5	18.6	10.0	20.5	10.9	7.1	6.1	8.0	180	6,289
2018	25.1	21.5	10.8	20.6	18.1	14.1	13.5	7.8	9.2	23.9	15.5	18.7	199	6,487
2019	17.8	17.7	20.4	15.8	14.6	12.4	20.7	16.9	71.6	8.3	27.8	22.5	267	6,754
2020	9.8	23.4	10.0	20.2	13.2	22.2	20.3	7.5	14.5	9.1	25.9	14.1	190	6,944
2021	24.3	34.6	15.2	17.0	20.8	11.2	41.8	16.8	30.8	21.7	17.1	26.0	277	7,221

Notes:

- VOCs extracted from groundwater is calculated by multiplying GWETS monthly influent site-specific VOC concentrations by average monthly flow rate and monthly system runtime.
- Plant modifications resulted in plant shut down during the months of July 2013 and November 2015.
- lbs. = Pounds
- VOCs = Volatile organic compounds

Table 6: Groundwater Extraction and Treatment System Performance Sampling Results - 2021

Parameter				1,2-DCE (total)	PCE	TCE	Vinyl chloride	Barium	Iron	Total Dissolved Solids
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
NYS Class C Criteria				-	1 ^(a)	40 ^(b)	-	-	300 ^(a)	-
Location	Matrix	Date	Field Sample ID							
PS-Influent	L	1/5/2021	PS-INFLUENT	670	2,100	600	20 U	88.8	63.8	459
PS-Influent	L	2/3/2021	PS-INFLUENT	840	2,800	760	19	111	113	454
PS-Influent	L	3/3/2021	PS-INFLUENT	610	950	290	20 U	61.1	70.4	417
PS-Influent	L	4/5/2021	PS-AS-INFLUENT	1000	850	260	27	93.5	125	361
PS-Influent	L	5/3/2021	PS - INFLUENT	950	770	240	18 J	69.4	50 U	350 J-
PS-Influent	L	6/1/2021	PS-INFLUENT	610	670	190	20 U	55	50 U	397
PS-Influent	L	7/1/2021	PS- INFLUENT	800	2300	570	21	68.1	131	322
PS-Influent	L	8/2/2021	PS-AS-INFLUENT	730	770	250	20 U	56.1	50 U	389
PS-Influent	L	9/1/2021	PS-INFLUENT	1,000	2,100	530	20 U	47.9	275	421
PS-Influent	L	10/4/2021	PS-INFLUENT	860	950	220	40 U	48.2	156	359
PS-Influent	L	11/1/2021	PS-INFLUENT	650	920	360	11	53.6	50 U	352
PS-Influent	L	12/1/2021	PS-INFLUENT	751	1,680	611	16.8 v3	200 U	100 U	376
Air Stripper Eff	L	1/5/2021	PS-AS EFFLUENT	2 U	1 U	1 U	1 U	99.1	107	473
Air Stripper Eff	L	2/3/2021	PS-AS EFFLUENT	2 U	1 U	1 U	1 U	118	209	458
Air Stripper Eff	L	3/3/2021	PS-AS EFFLUENT	2 U	1 U	1 U	1 U	63.5	122	402
Air Stripper Eff	L	4/5/2021	PS-AS-EFFLUENT	2 U	1 U	1 U	1 U	63.5	101	305
Air Stripper Eff	L	5/3/2021	PS-AS EFFLUENT	2 U	1 U	1 U	1 U	70.4	68.1	333 J-
Air Stripper Eff	L	6/1/2021	PS-AS-EFFLUENT	2 U	1 U	1 U	1 U	55	50 U	387
Air Stripper Eff	L	7/1/2021	PS-AS EFFLUENT	2 U	1 U	1 U	1 U	80.9	285	372
Air Stripper Eff	L	8/2/2021	PS-AS-EFFLUENT	2 U	1 U	1 U	1 U	59.5	50 U	367
Air Stripper Eff	L	9/1/2021	PS-AS EFFLUENT	2 U	1 U	1 U	1 U	37.9	50.5	450
Air Stripper Eff	L	10/4/2021	PS-AS-EFFLUENT	2 U	1 U	1 U	1 U	46.2	91.1	399
Air Stripper Eff	L	11/1/2021	PS-AS-EFFLUENT	2 U	1 U	1 U	1 U	53.5	50 U	388
Air Stripper Eff	L	12/1/2021	PS-AS EFFLUENT	2 U	1 U	1 U	1 U,v3	200 U,M1	144	380

Notes:

- | | | |
|--|--|--|
| (a) = Guidance value | J- = Estimated value, biased low | PCE = Tetrachloroethene |
| (b) = Standard | L = Liquid | TCE = Trichloroethene |
| " - " = No criteria | M1 = Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample recovery. | µg/L = Micrograms per liter |
| Bold = Exceeds standard or guidance value | | U = Not detected |
| 1,2-DCE = 1,2-Dichloroethene | mg/L = Milligrams per liter | v3 = The continuing calibration verification was below the method acceptance limit. Detection for the analyte may have a low bias. |
| J = Estimated value | NYS = New York State | |

Table 7: Residential Point of Entry Treatment System Sampling Results - 2021

Parameter		1,2-DCE (total)		cis-1,2-DCE		trans-1,2 DCE		PCE		TCE		Vinyl chloride	
Units		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
NYS Class GA Standard		5		5		5		5		5		2	
Location	Sample Date	Before Filtration	Between Filtration	Before Filtration	Between Filtration	Before Filtration	Between Filtration	Before Filtration	Between Filtration	Before Filtration	Between Filtration	Before Filtration	Between Filtration
	2/3/2021	2.9	2 U	2.9	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	4/20/2021	1.1 J	2 U	1.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	7/15/2021	2 U	1 J	1 U	1.0	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	10/4/2021	2 U	2.3	1 U	2.3	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	2/3/2021	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	4/20/2021	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	7/15/2021	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	10/4/2021	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	2/3/2021	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	4/20/2021	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	7/15/2021	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	10/4/2021	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

Notes:

1,2-DCE = 1,2-Dichloroethene
 cis-1,2-DCE = cis-1,2-Dichloroethene
 J = Estimated value
 NYS = New York State
 PCE = Tetrachloroethene
 TCE = Trichloroethene
 trans-1,2 DCE = trans-1,2-Dichloroethene
 U = Not detected
 µg/L = Micrograms per liter

Table 8: LTM and Semiannual Groundwater Elevations

Well ID/ Sampling Location	Measurement Point Elevation (ft. msl)	Well Depth (ft.)	Monitoring Interval	Measurement Point Reference	DTW April 2021 ⁽¹⁾ (ft. btoc)	GW Elevation April 2021 ⁽¹⁾ (ft. msl)	DTW October 2021 (ft. btoc)	GW Elevation October 2021 (ft. msl)
Monitoring Wells								
CE-1 ⁽³⁾	224.91	535.00	bedrock	TOC	NM	NM	NM	NM
CE-2	224.95	287.00	bedrock	TOC	NM	NM	NM	NM
EW-3	259.67	295.00	bedrock	TOC	106.67	153.00	108.05	151.62
EW-4	256.01	322.00	bedrock	TOC	103.38	152.63	104.82	151.19
EW-5	259.85	235.20	bedrock	TOC	2.04	257.81	2.62	257.23
EW-8	223.93	318.00	bedrock	TOC	79.41	144.52	81.12	142.81
EW-10	234.09	225.00	unknown	TOC	10.16	223.93	NM	NM
EW-11	231.40	172.20	bedrock	TOC	63.30	168.10	NM	NM
EW-12	232.76	270.50	bedrock	TOC	56.80	175.96	NM	NM
EW-13	217.06	360.00	bedrock	TOC	45.45	171.61	NM	NM
EW-15	236.37	275.00	unknown	TOC	7.97	228.40	NM	NM
IW-8	239.47	391.80	bedrock	TOC	72.60	166.87	75.50	163.97
IW-9	224.37	358.10	bedrock	TOC	70.55	153.82	71.17	153.20
IW-10	235.57	176.30	bedrock	TOC	5.31	230.26	5.24	230.33
M-4	232.19	200.00	bedrock	TOC	64.09	168.10	NM	NM
M-5	213.88	200.00	bedrock	TOC	4.87	209.01	NM	NM
M-6	248.31	100.00	bedrock	TOC	25.13	223.18	NM	NM
M-8	261.57	200.00	bedrock	TOC	9.94	251.63	10.41	251.16
M-9	256.39	200.00	bedrock	TOC	85.53	170.86	87.40	168.99
	183.25	114.00	bedrock	TOC	16.33	166.92	NM	NM
MW-104	258.00	81.60	overburden	TOC	27.45	230.55	NM	NM
MW-108	254.72	86.10	overburden	TOC	19.66	235.06	NM	NM
MW-109	255.96	87.50	overburden	TOC	16.73	239.23	NM	NM
MW-112	256.60	25.10	overburden	TOC	2.00	254.60	NM	NM
MW-113	257.38	25.00	overburden	TOC	4.52	252.86	NM	NM
Active Bedrock Extraction Wells								
EW-2 ⁽²⁾	255.29	322.00	bedrock	TOC/PLC	NM	159.29 ⁽⁴⁾	NM	160.22 ⁽⁵⁾
EW-6	242.94	325.00	bedrock	TOC/PLC	NM	167.94 ⁽⁴⁾	NM	162.11 ⁽⁵⁾
EW-7	251.64	227.00	bedrock	TOC/PLC	NM	154.64 ⁽⁴⁾	NM	110.00 ⁽⁵⁾
EW-9	236.21	365.00	bedrock	TOC/PLC	NM	153.21 ⁽⁴⁾	NM	154.09 ⁽⁵⁾
EW-16	248.16	417.00	bedrock	TOC/PLC	NM	123.16 ⁽⁴⁾	NM	132.06 ⁽⁵⁾

Table 8: LTM and Semiannual Groundwater Elevations

Well ID/ Sampling Location	Measurement Point Elevation (ft. msl)	Well Depth (ft.)	Monitoring Interval	Measurement Point Reference	DTW April 2021 ⁽¹⁾ (ft. btoc)	GW Elevation April 2021 ⁽¹⁾ (ft. msl)	DTW October 2021 (ft. btoc)	GW Elevation October 2021 (ft. msl)
Active Overburden Extraction Wells								
OW-2	257.03	30.00	overburden	TOC/PLC	NM	254.03 ⁽⁴⁾	NM	253.95 ⁽⁵⁾
OW-3	256.81	25.00	overburden	TOC/PLC	NM	251.81 ⁽⁴⁾	NM	251.90 ⁽⁵⁾
OW-5	258.20	30.00	overburden	TOC/PLC	NM	264.20 ⁽⁴⁾	NM	262.05 ⁽⁵⁾
OW-7	254.57	25.00	overburden	TOC/PLC	NM	251.57 ⁽⁴⁾	NM	251.42 ⁽⁵⁾
OW-13	259.95	29.50	overburden	TOC/PLC	NM	269.95 ⁽⁴⁾	NM	244.45 ⁽⁵⁾
OW-14	261.24	30.00	overburden	TOC/PLC	NM	249.24 ⁽⁴⁾	NM	250.00 ⁽⁵⁾
OW-16	259.81	30.00	overburden	TOC/PLC	NM	245.81 ⁽⁴⁾	NM	248.45 ⁽⁵⁾

Notes:

- ⁽¹⁾ = Water level measurements coincided with and were collected as part of the long-term monitoring sampling event for the site.
- ⁽²⁾ = Water levels were measured under pumping conditions with EW-2 offline. EW-2 has been off-line since 9/26/2020 due to a pump fault alarm.
- ⁽³⁾ = CE-1 is not in service; acts as an emergency backup well to CE-2 for Country Estates.
- ⁽⁴⁾ = Measurement collected from treatment system's main control panel
- ⁽⁵⁾ = Measurement collected from extraction well panel

btoc = Below top of casing

DTW = Depth to water

ft. = Feet

GW = Groundwater

msl = Mean sea level

LTM = Long-term monitoring

NM = Not measured

PLC = Programmable logic controller

TOC = Top of casing

Table 9: Groundwater Monitoring Results – Site-Specific Contaminants of Concern

Parameter			1,2-DCE (total)	cis-1,2- DCE	trans-1,2- DCE	PCE	TCE	Vinyl chloride
Units			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
NYS Class GA Standard			5	5	5	5	5	2
Location	Sample Date	Sample ID						
CE-2	4/19/2021	CE-2	2 U	1 U	1 U	1 U	1 U	1 U
EW-3	4/21/2021	EW-3	3.5	3.5	1 U	1 U	1 U	5.4
EW-4	4/21/2021	EW-4	8.2	6.8	1.4	1 U	1 U	1 U
EW-5	4/21/2021	EW-5	240	240	8 U	150	67	8 U
EW-6	4/20/2021	EW-6	790	790	15	8 U	8 U	21
EW-7	4/20/2021	EW-7	890	890	100 U	4,200	1,400	100 U
EW-8	4/21/2021	EW-8	2.4	2.4	1 U	1 U	1 U	1 U
EW-9	4/20/2021	EW-9	45	45	2 U	7.7	4.3	14
EW-11	4/21/2021	EW-11	16	16	1 U	1 U	1	1 U
EW-12	4/21/2021	EW-12	2 U	1 U	1 U	3	1 U	1 U
EW-13	4/21/2021	EW-13	3.3	3.3	1 U	26	3	1 U
EW-16	4/20/2021	EW-16	1,300	1,300	50 U	2,600	1,100	50 U
IW-8	4/21/2021	IW-8	2 U	1 U	1 U	1 U	1 U	1 U
IW-9	4/21/2021	IW-9	570	570	25 U	210	320	25 U
IW-10	4/21/2021	IW-10	2.7	2.7	1 U	1 U	0.9 J	1 U
	4/20/2021		1.1 J	1.1	1 U	1 U	1 U	1 U
	4/20/2021		2 U	1 U	1 U	1 U	1 U	1 U
M-4	4/21/2021	M-4	2 U	1 U	1 U	1 U	1 U	1 U
M-5	4/21/2021	M-5	15	15	1 U	1 U	1 U	2.9
M-6	4/20/2021	M-6	2 U	1 U	1 U	1 U	1 U	1 U
M-8	4/21/2021	M-8	9.8	9.8	1 U	1 U	1.4	1 U
M-9	4/21/2021	M-9	2 U	1 U	1 U	1 U	1 U	1 U
	4/21/2021		2 U	1 U	1 U	1 U	1 U	1 U
MW-104	4/21/2021	MW-104	2 U	1 U	1 U	1 U	1 U	1 U
MW-109	4/21/2021	MW-109	2 U	1 U	1 U	1 U	1 U	1 U
MW-112	4/21/2021	MW-112	2 U	1 U	1 U	1 U	0.57 J	1 U
MW-113	4/21/2021	MW-113	40 U	20 U	20 U	890	10 J	20 U
OW-2	4/20/2021	OW-2	91	91	20 U	1,100	30	20 U
OW-3	4/20/2021	OW-3	190 J	190 J	200 U	5,300	140 J	200 U
OW-5	4/20/2021	OW-5	24	24	1 U	72	6.2	1 U
OW-7	4/20/2021	OW-7	1,100	1,100	10 U	1,800	840	35
OW-13	4/20/2021	OW-13	710	710	20 U	860	340	20 U
OW-14	4/19/2021	OW-14	1,600	1,600	100 U	9,800	1,100	98 J
OW-16	4/19/2021	OW-16	1,000	1,000	10 U	1,600	420	24
	4/20/2021		2 U	1 U	1 U	1 U	1 U	1 U

Notes:

Bold = Exceeds standard
 1,2-DCE = 1,2-Dichloroethene
 cis-1,2-DCE = cis-1,2-Dichloroethene
 J = Estimated value
 NYS = New York State
 PCE = Tetrachloroethene
 TCE = Trichloroethene
 trans-1,2-DCE = trans-1,2-Dichloroethene
 U = Not detected
 µg/L = Micrograms per liter

APPENDIX A
FIELD RECORDS

WATER LEVEL MONITORING AND WELL INSPECTION CHECKLIST

Checked By: KAA 8/4/2021

Location ID	Measurement Point Elevation (ft. above msl)	Well Depth (ft.)	Measure Point Reference	Measure Point Marked (Y/N)	Protective Casing Stickup (ft.)	TOC-TOR Difference (ft.)	Depth to Water (ft. BMP)	Depth to Bottom of Well (ft. BMP)	Well ID Present (Y/N)	Well Lock/Cap (G/F/P)*	Protective Casing (G/F/P)*	Water in Annular Space (Y/N)	Concrete Pad (G/F/P)*	Well Riser/Cap (G/F/P)*	Comments
Monitoring Wells															
FW-3	259.67	295	TOR	N	NA	0.5 (to TOR)	106.67	295	Y	G	G	N	G	F	2' x 2' vault
FW-4	256.01	322	TOR	Y	NA	0.2 (to TOR)	103.38	322	Y	G	G	N	G	F	2' x 2' vault
FW-5	259.85	235.2	TOV	N	0.67	TOC-NA (KAA 8/4/21)	2.04	233.93	Y	G	G	N	G	G	Located in aboveground vault
FW-8	223.93	318	TOR	N	NA	0.5 (to sur)	79.41	318	Y	G	G	Y	G	F	15" flush-mount road box
FW-10	234.09	225	TOR	N	NA	0.45 (to sur)	10.16	225	Y	G	G	N	G	G	15" flush-mount road box
FW-11	231.40	172.2	TOR	N	NA	0.75 (to sur)	63.30	172.2	Y	G	G	N	G	F	15" flush-mount road box
FW-12	232.76	270.5	TOR	N	NA	0.5 (to sur)	56.80	270.5	Y	G	G	N	G	F	2' x 2' vault
FW-13	217.06	360	TOR	N	NA	0.5 (to sur)	45.45	360	Y	F	F	N	G	F	15" flush-mount road box
FW-14	234.85	185	TOC	N	NA	3.58 (to TOR)	7.97	275	Y	G	G	N	G	NA	Well inaccessible: located within a storage shed on private property
FW-15	236.37	275	TOV	Y	NA	0.25 (to TOR)	72.60	291.8	Y	G	G	Y	G	G	2' x 2' vault (TOV = reference point)
FW-8	239.47	391.8	TOR	N	NA	1.0 (to sur)	70.55	358.1	Y	G	G	Y	G	G	2' x 2' vault
FW-9	224.37	358.1	TOR	N	NA	1.0 (to sur)	5.31	176.3	Y	G	G	N	G	F	15" flush-mount road box
FW-10	235.57	176.3	TOR	N	0.50	NA	64.09	200	Y	G	G	N	NA	G	Located in EW-9's aboveground vault
M-4	232.19	200	TOR	N	2.35	0.50	4.87	200	Y	G	G	N	NA	NA	4" PVC in 6" steel casing
M-5	213.88	200	TOR	N	2.32	0.97	25.13	100	N	G	G	N	NA	NA	4" PVC in 6" steel casing
M-6	248.31	100	TOC	N	1.04	NA	9.94	200.90	Y	G	G	N	G	G	6" steel casing, homeowner utilizes well for yard
M-8	261.57	200	TOR	N	2.17	0.50	85.53	200.63	Y	G	G	N	G	G	4" PVC in 6" steel casing
M-9	256.39	200	TOR	N	2.17	0.50	16.33	114	Y	G	G	N	G	G	4" PVC in 6" steel casing
M-10	183.25	114	TOC	N	1.47	NA	27.45	83.29	Y	G	G	N	G	G	6" steel casing
MW-104	258.00	81.6	TOR	N	NA	0.30 (to sur)	19.66	86.1	Y	G	G	N	G	G	8" flush-mount road box
MW-108	254.72	86.1	TOR	N	NA	0.40 (to sur)	16.73	85.50	Y	G	G	N	G	G	8" flush-mount road box
MW-109	255.96	87.5	TOR	N	NA	0.50 (to sur)	2.00	24.85	Y	G	G	N	G	G	8" flush-mount road box, well ID on gripper plug
MW-112	256.60	25.1	TOR	N	NA	0.50 (to sur)	4.52	22.52	Y	G	G	N	G	G	8" flush-mount road box
MW-113	257.38	25.0	TOR	N	NA	0.30 (to sur)			Y	G	G	N	G	G	8" flush-mount road box
Active Extraction Wells (Values Collected from Well Panels)															
EW-2	255.29	322	TOC/PLC	NA	NA	NA	159.29	NA	Y	G	G	N	G	G	Was pump running at time of inspection? Yes or No
EW-6	242.94	325	TOC/PLC	NA	NA	NA	167.94	NA	Y	G	G	N	G	G	Was pump running at time of inspection? Yes or No
EW-7	251.64	227	TOC/PLC	NA	NA	NA	154.64	NA	Y	G	G	N	G	G	Was pump running at time of inspection? Yes or No
EW-9	236.21	365	TOC/PLC	NA	NA	NA	153.21	NA	Y	G	G	N	G	G	Was pump running at time of inspection? Yes or No
EW-16	248.16	417	TOC/PLC	NA	NA	NA	123.16	NA	Y	G	G	N	G	NA	Was pump running at time of inspection? Yes or No
OW-2	257.03	30	TOC/PLC	NA	NA	NA	254.03	NA	Y	G	G	N	G	G	Was pump running at time of inspection? Yes or No
OW-3	256.81	25	TOC/PLC	NA	NA	NA	251.81	NA	Y	G	G	N	G	G	Was pump running at time of inspection? Yes or No
OW-5	258.20	30	TOC/PLC	NA	NA	NA	264.20	NA	Y	G	G	N	G	G	Was pump running at time of inspection? Yes or No
OW-7	254.57	25	TOC/PLC	NA	NA	NA	251.57	NA	Y	G	G	N	G	G	Was pump running at time of inspection? Yes or No
OW-13	259.95	29.5	TOC/PLC	NA	NA	NA	269.95	NA	Y	G	G	N	G	G	Was pump running at time of inspection? Yes or No
OW-14	261.24	30	TOC/PLC	NA	NA	NA	249.24	NA	Y	G	G	N	G	G	Was pump running at time of inspection? Yes or No
OW-16	259.81	30	TOC/PLC	NA	NA	NA	245.81	NA	Y	G	G	N	G	G	Was pump running at time of inspection? Yes or No

Notes:

* = poor or notable observations require input into "Comment"
 BMP = below measurement point
 F = fair
 ft. = feet
 G = good

in. = inches
 msl = mean sea level
 N = no
 NA = not applicable
 P = poor

PLC = programmable logic controller
 TOC = top of casing
 TOR = top of riser
 TOV = top of vault
 Y = yes

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: American Thermostat LTM
 PROJECT NUMBER: 3616206098.04. 2222
 PROJECT LOCATION: South Cairo, N.Y.
 WEATHER CONDITIONS (AM): 59°F, PARTLY CLOUDY
 WEATHER CONDITIONS (PM): Not Recorded

TASK NO: **** DATE: 4/19/21
 MACTEC CREW: K. AMANN, A. NORVILLE,
 SAMPLER NAME: K. CHICK KATIE AMANN
 SAMPLER SIGNATURE: *K. Amann*
 CHECKED BY: KLS DATE: 1/27/22

MULTI-PARAMETER WATER QUALITY METER

METER TYPE YSI
 MODEL NO. 556MPS
 UNIT ID NO. M015-01

AM CALIBRATION
 Start Time 1336 /End Time 1406

Units	Standard Value	Meter Value	*Acceptance Criteria (AM)
pH (4)	SU 4.0	4.00	+/- 0.1 pH Units
pH (7)	SU 7.0	7.00	+/- 0.1 pH Units
pH (10)	SU 10.0	10.00	+/- 0.1 pH Units
Redox	+/- mV 240	240.0	+/- 10 mV
Conductivity	mS/cm 1.413	1.413	+/- 0.5 % of standard
DO (saturated)	% 100	98.7	+/- 2% of standard
DO (saturated) mg/L ¹ (see Chart 1)	9.30	9.28	+/- 0.2 mg/L
DO (<0.1)	mg/L <0.1		< 0.5 mg/L
Temperature	°C	18.31	
Baro. Press.	mmHg	749.9	

POST CALIBRATION CHECK
 Start Time 1636 /End Time 1700

Standard Value	Meter Value	*Acceptance Criteria (PM)
7.0	7.08	+/- 0.3 pH Units
240	238.9	+/- 10 mV
1.413	1.367	+/- 5% of standard
9.12	8.83	+/- 0.5 mg/L of standard
	18.71	
	749.81	

TURBIDITY METER

METER TYPE HACH
 MODEL NO. 2100Q
 UNIT ID NO. M024-28

Units	Standard Value	Meter Value	*Acceptance Criteria (PM)
NTU	10	9.78	+/- 0.3 NTU of stan.
NTU	20	19.8	+/- 5% of standard
NTU	100	99.6	+/- 5% of standard
NTU	800	809	+/- 5% of standard

Standard Value	Meter Value	*Acceptance Criteria (PM)
10	9.96	+/- 0.3 NTU of stan.
20	20.1	+/- 5% of standard
100	101	+/- 5% of standard
800	791	+/- 5% of standard

PHOTOIONIZATION DETECTOR

METER TYPE Background
 MODEL NO. Span Gas
 UNIT ID NO. ppmv

Units	Standard Value	Meter Value	*Acceptance Criteria (PM)
ppmv	<0.1		within 5 ppmv of BG
ppmv	100		+/- 10% of standard

Standard Value	Meter Value	*Acceptance Criteria (PM)
<0.1		within 5 ppmv of BG
100		+/- 10% of standard

O₂-LEL 4 GAS METER

METER TYPE Methane
 MODEL NO. O₂
 UNIT ID NO. H₂S
 CO

Units	Standard Value	Meter Value	*Acceptance Criteria (PM)
%	50	50	+/- 10% of standard
%	20.9	20.9	+/- 10% of standard
ppmv	25	25	+/- 10% of standard
ppmv	50	50	+/- 10% of standard

Standard Value	Meter Value	*Acceptance Criteria (PM)
50		+/- 10% of standard
20.9		+/- 10% of standard
25		+/- 10% of standard
50		+/- 10% of standard

OTHER METER

METER TYPE Water level indicator
 MODEL NO. Heron Dipper -T
 UNIT ID NO.

See Notes Below for Additional Information



Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above.



Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source: Portland FOS
 Lot#/Date Produced:
 Trip Blank Source: TESTAMERICA
 Sample Preservatives Source: LAB
 Disposable Filter Type: 0.45µm cellulose
 Calibration Fluids / Standard Source:
 - DO Calibration Fluid (<0.1 mg/L) Portland FOS 4/19/21
 - Other
 - Other
 - Other

Cal. Standard Lot Number	Exp. Date
pH (4) 06F965	12/22
pH (7) 06G815	7/22
pH (10)	
ORP 06J306	7/21
Conductivity 06I1033	9/21
<0.1 Turb. Stan. A0187 A0181	OCT-21
20 Turb. Stan. A0177	OCT-21
100 Turb. Stan. A0195	OCT-21
800 Turb. Stan. A0182	OCT-21
PID Span Gas	
O ₂ -LEL Span Gas	
Other	

NOTES:

* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: American Thermostat LTM
 PROJECT NUMBER: 3616206098.04 ***
 PROJECT LOCATION: South Cairo, N.Y.
 WEATHER CONDITIONS (AM): 43°F Cloudy
 WEATHER CONDITIONS (PM): Not Recorded

TASK NO: **** DATE: 4/20/21
 MACTEC CREW: A Norvelly, K Chick
 SAMPLER NAME:
 SAMPLER SIGNATURE:
 CHECKED BY: K. Amann DATE: 8/4/2021

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: YSI
 MODEL NO.: 556MPS
 UNIT ID NO.: M015-01

Start Time: 0736 /End Time: Not Recorded

Units	Standard Value	Meter Value	*Acceptance Criteria (AM)
pH (4)	SU	4.0	+/- 0.1 pH Units
pH (7)	SU	7.0	+/- 0.1 pH Units
pH (10)	SU	10.0	+/- 0.1 pH Units
Redox	+/- mV	243	+/- 10 mV
Conductivity	mS/cm	1.409	+/- 0.5 % of standard
DO (saturated)	%	100	+/- 2% of standard
DO (saturated) mg/L	1 (see Chart 1)	9.929.70	+/- 0.2 mg/L
DO (<0.1)	mg/L	<0.1	Not applicable < 0.5 mg/L
Temperature	°C	15.33	
Baro. Press.	mmHg	751.3	

POST CALIBRATION CHECK

Start Time: 1645 /End Time: Not Recorded

Standard Value	Meter Value	*Acceptance Criteria (PM)
7.0	7.05	+/- 0.3 pH Units
240	236.5	+/- 10 mV
1.413	1.423	+/- 5% of standard
9.30	9.25	+/- 0.5 mg/L of standard
	17.63	
	751.7	

TURBIDITY METER

METER TYPE: HACH
 MODEL NO.: 2100Q
 UNIT ID NO.: M024-28

Units	Standard Value	Meter Value	*Acceptance Criteria (PM)
NTU	10	10.0	+/- 0.3 NTU of stan.
NTU	20	20.0	+/- 5% of standard
NTU	100	102	+/- 5% of standard
NTU	800	805	+/- 5% of standard

Standard Value	Meter Value	*Acceptance Criteria (PM)
<0.1	10.2	+/- 0.3 NTU of stan.
20	20.1	+/- 5% of standard
100	101	+/- 5% of standard
800	814	+/- 5% of standard

PHOTOIONIZATION DETECTOR

METER TYPE: Background
 MODEL NO.:
 UNIT ID NO.: Span Gas

Units	Standard Value	Meter Value	*Acceptance Criteria (PM)
ppmv	<0.1		within 5 ppmv of BG
ppmv	100		+/- 10% of standard

Standard Value	Meter Value	*Acceptance Criteria (PM)
<0.1		within 5 ppmv of BG
100		+/- 10% of standard

O₂-LEL 4 GAS METER

METER TYPE: Methane
 MODEL NO.:
 UNIT ID NO.:
 O₂
 H₂S
 CO

Units	Standard Value	Meter Value	*Acceptance Criteria (PM)
%	50		+/- 10% of standard
%	20.9		+/- 10% of standard
ppmv	25		+/- 10% of standard
ppmv	50		+/- 10% of standard

Standard Value	Meter Value	*Acceptance Criteria (PM)
50		+/- 10% of standard
20.9		+/- 10% of standard
25		+/- 10% of standard
50		+/- 10% of standard

OTHER METER

METER TYPE: Water level indicator
 MODEL NO.: Heron Dipper-T
 UNIT ID NO.:

See Notes Below for Additional Information

- ☒ Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above.
☐ Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source: Portland FOS
 Lot#/Date Produced:
 Trip Blank Source: Test America
 Sample Preservatives Source: Lab
 Disposable Filter Type: 0.45µm cellulose
 Calibration Fluids / Standard Source:
 - DO Calibration Fluid (<0.1 mg/L) - Portland FOS ksc 4/20/21
 - Other
 - Other
 - Other

Cal. Standard Lot Number	Exp. Date
pH (4) 06F965	6/22
pH (7) 06B815	7/22
pH (10)	
ORP 06J306	7/21
Conductivity 06I1033	9/21
100 Turb. Stan. A0181	Oct-21
800 Turb. Stan. A0177	Oct-21
100 Turb. Stan. A0195	Oct-21
800 Turb. Stan. A0182	Oct-21
PID Span Gas	
O ₂ -LEL Span Gas	
Other	

NOTES:

* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.
 ** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.
 1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

MACTEC
 511 Congress Street, Portland Maine 04101

15-Month LTM Sampling

Sampling Location	Sample Description	Well Depth (ft)	Sample Depth (ft)	Sample ID	Sampler Initials	Sample Date	Sample Time	Comments
Monitoring Wells								
CE-1 ¹	Before filters	535	unknown	CE-1				
CE-2	Before filters	287	unknown	CE-2 BEF	A.N.	4-19-21	1615	
EW-3	PDB	295	275	EW-3	A.N.	4-21-21	1320	
EW-4	PDB	322	302	EW-4	A.N.	4-21-21	1300	
EW-5	PDB	235.2	150	EW-5	A.N.	4-21-21	0755	
EW-8	PDB	318	200	EW-8	A.N.	4-21-21	1130	
EW-11	PDB	172.2	117	EW-11	A.N.	4-21-21	1035	
EW-12	PDB	270.5	115	EW-12	A.N.	4-21-21	1010	
EW-13	PDB	360	200	EW-13	A.N.	4-21-21	0950	
IW-8	PDB	391.8	339	IW-8	A.N.	4-21-21	1200	
IW-9	PDB	358.1	333	IW-9	A.N.	4-21-21	1110	
IW-10	PDB	176.3	40	IW-10	A.N.	4-21-21	1145	
M-4	PDB	200	130	M-4	A.N.	4-20-21	1050	
M-5	PDB	200	129	M-5	A.N.	4-20-21	0940	
M-6	grab	100	unknown	M-6	A.N.	4-20-21	1616	
M-8	PDB	100	unknown	M-8	A.N.	4-21-21	0835	
M-9	PDB	100	unknown	M-9	A.N.	4-21-21	0855	
	PDB	114	69		A.N.	4-21-21	0915	
MW-104	PDB	81.6	83.29	MW-104	A.N.	4-21-21	1225	
MW-109	PDB	87.5	85.50	MW-109	A.N.	4-21-21	1245	
MW-112	PDB	24.9	21	MW-112	A.N.	4-21-21	1350	
MW-113	PDB	22.5	20	MW-113	A.N.	4-21-21	1340	
Active Bedrock Extraction Wells								
EW-2 ²	grab	322	unknown	EW-2				
EW-6	grab	325	unknown	EW-6	A.N.	4-20-21	1430	
EW-7	grab	227	unknown	EW-7	A.N.	4-20-21	1458	
EW-9	grab	365	unknown	EW-9	A.N.	4-20-21	1535	
EW-16	grab	417	unknown	EW-16	A.N.	4-20-21	1405	
Active Overburden Extraction Wells								
OW-2	grab	30	unknown	OW-2	A.N.	4-20-21	1311	
OW-3	grab	25	unknown	OW-3	A.N.	4-20-21	1249	
OW-5	grab	30	unknown	OW-5	A.N.	4-20-21	1225	
OW-7	grab	25	unknown	OW-7	A.N.	4-20-21	1345	
OW-13	grab	29.5	unknown	OW-13	A.N.	4-20-21	1156	
OW-14	grab	30	unknown	OW-14	A.N.	4-19-21	1554	
OW-16	grab	30	unknown	OW-16	A.N.	4-19-21	1448	
Residential Wells								
	Before filters	240	NA		A.N.	4-20-21	1045	
	Before filters	300	NA		A.N.	4-20-21	0945	
	Before filters	300	NA		A.N.	4-20-21	1015	
	PDB			Field Blank	A.N.	4-21-21	1400	

Notes:

-Wells listed above are to be analyzed for Site-related VOCs by Method 8260

¹ = CE-1 not in service; acts as an emergency backup well to CE-2 for Country Estates and therefore does not get sampled if CE-2 is in service.

² = EW-2 off-line due to a pump fault alarm.

PDB = passive diffusion bag

Checked by: KAA 8/4/2021

MONITORING WELLS - SUBMERSIBLE PUMP
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: CE-2

Sampling Date: 4/19/2021

Sampler Name(s): K. AMANN, A. NORVELLE, K. CHICK

Weather Conditions: Light Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 61

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: N/A feet TOV or TOC K/A 4/19/2021

Depth to Bottom: N/A feet

Well Diameter: N/A feet

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH	Turbidity (NTU)

Sample Method: Grab

Sample Collection Time: 16:15

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Supply well for Country Estates. Met with Paul to gain access to shed/pump house where sample is collected before filtration. Paul's # (516) 821-4797. Purged for 2 minutes then collected sample.

Checked by:

KLS 1/27/2022

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: EW-3

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, KaiHgn Chick

Weather Conditions: Rain ☐ Snow ☐ ~~Sun~~ ☒ Cloudy ☒ Dry ☐ Humid ☐

Temperature (F°): 52

Well Condition: ☒ Satisfactory ☐ Unsatisfactory (explain in notes)

Depth to Water: 106.67 feet TOV or ☒ TOC

Depth to Bottom: 295 feet

Well Diameter: 0.5 feet

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
		<u>A.N.</u>	

Sample Method: PDB

Sample Collection Time: 13:20

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/4/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: EW-4

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 52

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 103.38 feet TOV or TOC

Depth to Bottom: 322 feet

Well Diameter: 0.5 feet

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
		<u>AN</u>	

Sample Method: PDB

Sample Collection Time: 13:00

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/4/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: EW-5

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chicks

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 39

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 2.04 feet TOV or TOC

Depth to Bottom: 233.93 feet

Well Diameter: 0.5 feet

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
		<u>N.A.</u>	

Sample Method: PDB

Sample Collection Time: 07:55

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/4/2021

ACTIVE EXTRACTION WELLS
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: FW-6

Sampling Date: 4-20-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain ☐ Snow ☐ Sun ☐ Cloudy ☒ Dry ☒ Humid ☐

Temperature (F°): 68

Well Condition: ☒ Satisfactory ☐ Unsatisfactory (explain in notes)

Initial DTW Reading: 168.92 feet amsl Reading: ☒ transducer or manual DTW

Depth to Pump Intake: 42.06 feet amsl Pump Operation: ☒ Auto or ~~Manual~~ A.N.

Depth To Water: 168.92 feet amsl

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH	Turbidity (NTU)
1420	Start Purge			
1422	14.65	0.997	8.60	5.20
1424	13.92	0.988	8.63	1.59
1426	12.40	1.000	8.70	4.22
1428	11.79	0.983	8.72	1.92
1430	11.14	0.984	8.76	3.14
		A.N.		

Purge Water Description: Color: Clear Odor: Sulfur

NAPL present? Yes ☐ No ☒ Other:

Sample Collection Time: 14:30

Number of Containers: 3

Intended Analysis: Volatiles

Final Transducer Readings: 168.92 feet reading: ☒ transducer or manual DTW

Notes: amsl = above mean sea level

Checked by: KAA 8/4/2021

ACTIVE EXTRACTION WELLS
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: EW-7

Sampling Date: 4-20-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain ☐ Snow ☐ Sun ☐ Cloudy Dry Humid ☐

Temperature (F°): 68

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Initial DTW Reading: 155 feet amsl Reading: transducer or manual DTW

Depth to Pump Intake: 51.64 feet amsl Pump Operation: Auto or Manual

Depth To Water: 155 feet amsl

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH	Turbidity (NTU)
<u>1448</u>	<u>Start Purge</u>			
<u>1450</u>	<u>13.18</u>	<u>0.779</u>	<u>7.66</u>	<u>1.66</u>
<u>1452</u>	<u>13.17</u>	<u>0.779</u>	<u>7.67</u>	<u>1.20</u>
<u>1454</u>	<u>13.14</u>	<u>0.779</u>	<u>7.67</u>	<u>1.38</u>
<u>1456</u>	<u>13.15</u>	<u>0.779</u>	<u>7.67</u>	<u>1.57</u>
<u>1458</u>	<u>13.14</u>	<u>0.778</u>	<u>7.67</u>	<u>1.02</u>
		<u>A.N.</u>		

Purge Water Description: Color: Clear* Odor: None

NAPL present? Yes / No Other: —

Sample Collection Time: 14:58

Number of Containers: 3

Intended Analysis: Volatiles

Final Transducer Readings: 155 feet reading: transducer or manual DTW

Notes: *Gray sediment at first clearing up quickly
amsl = above mean sea level

Checked by: KAA 8/4/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: EW-8

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 48

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 79.41 feet TOV or TOC

Depth to Bottom: 318 feet

Well Diameter: 0.5 feet

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
	<u>A.N.</u>		

Sample Method: PDB

Sample Collection Time: 11:30

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/4/2021

ACTIVE EXTRACTION WELLS
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: EW-9

Sampling Date: 4-20-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 61

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Initial DTW Reading: 154.11 feet amsl Reading: transducer or manual DTW

Depth to Pump Intake: 70.79 feet amsl Pump Operation: Auto or Manual

Depth To Water: 154.11 feet amsl

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH	Turbidity (NTU)
<u>1525</u>	<u>Start Purge</u>			
<u>1527</u>	<u>11.55</u>	<u>0.722</u>	<u>8.99</u>	<u>1.79</u>
<u>1529</u>	<u>11.53</u>	<u>0.720</u>	<u>9.00</u>	<u>2.04</u>
<u>1531</u>	<u>11.53</u>	<u>0.720</u>	<u>9.00</u>	<u>2.12</u>
<u>1533</u>	<u>11.52</u>	<u>0.720</u>	<u>9.00</u>	<u>2.28</u>
<u>1535</u>	<u>11.51</u>	<u>0.718</u>	<u>9.01</u>	<u>3.06</u>
<u>1537 A.N.</u>				
		<u>A.N.</u>		

Purge Water Description: Color: Clear Odor: None

NAPL present? Yes / No Other:

Sample Collection Time: 15:35

Number of Containers: 3

Intended Analysis: Volatiles

Final Transducer Readings: 154.11 feet reading: transducer or manual DTW

Notes: amsl = above mean sea level

Checked by: KAA 8/4/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: EW-11

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 45

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 63.30 feet TOV or TOC

Depth to Bottom: 172.2 feet

Well Diameter: 0.5 feet

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
		<u>A.N.</u>	

Sample Method: PDB

Sample Collection Time: 10:35

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/4/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: EW-12

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 45

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 56.80 feet TOV of AN TOC

Depth to Bottom: 270.5 feet

Well Diameter: 0.5 feet

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
		<u>AN</u>	

Sample Method: PDB

Sample Collection Time: 10:10

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/4/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: EW-13

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chide

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 45

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 45.45 feet TOV or TOC

Depth to Bottom: 360 feet

Well Diameter: 0.5 feet

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
		<u>A.N.</u>	

Sample Method: PDB

Sample Collection Time: 09:50

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/4/2021

ACTIVE EXTRACTION WELLS
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: EW-16

Sampling Date: 4-20-2021

Sampler Name(s): Adam Norville, Kaitlyn Chick

Weather Conditions: Rain ☐ Snow ☐ Sun ☐ Cloudy Dry Humid ☐

Temperature (F°): 68

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Initial DTW Reading: 124.40 feet amsl Reading: transducer or manual DTW

Depth to Pump Intake: 91.16 feet amsl Pump Operation: Auto or Manual

Depth To Water: 124.38 feet amsl

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH	Turbidity (NTU)
<u>1355</u>	<u>Start Purge</u>			
<u>1357</u>	<u>12.64</u>	<u>0.823</u>	<u>7.70</u>	<u>1.26</u>
<u>1359</u>	<u>12.23</u>	<u>0.828</u>	<u>7.69</u>	<u>0.92</u>
<u>1401</u>	<u>12.01</u>	<u>0.830</u>	<u>7.68</u>	<u>1.42</u>
<u>1403</u>	<u>11.92</u>	<u>0.823</u>	<u>7.67</u>	<u>0.91</u>
<u>1405</u>	<u>11.79</u>	<u>0.821</u>	<u>7.68</u>	<u>1.33</u>
		<u>A.N.</u>		

Purge Water Description: Color: Clear Odor: None

NAPL present? Yes ☒ No ☐ Other:

Sample Collection Time: 14:05

Number of Containers: 3

Intended Analysis: Volatiles

Final Transducer Readings: 124.38 feet reading: transducer or manual DTW

Notes: amsl = above mean sea level

Checked by: KAA 8/4/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: IW-8

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 48

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 72.60 feet TOV or TOC

Depth to Bottom: 391.8 feet

Well Diameter: 0.5 feet

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
		<u>A-N</u>	

Sample Method: PDB

Sample Collection Time: 12:00

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/6/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: IW-9

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, KaiHyn Chirk

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 45

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 70.55 feet TOV or TOC

Depth to Bottom: 358.1 feet

Well Diameter: 0.5 feet

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
		<u>A.N.</u>	

Sample Method: PDB

Sample Collection Time: 11:10

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/6/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: Iw-10

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, Kai-Hyun Chieck

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 48

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 5.31 feet TOV or TOC

Depth to Bottom: 176.3 feet

Well Diameter: 0.5 feet

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
		<u>A.N.</u>	

Sample Method: PDB

Sample Collection Time: 11:45

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/6/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: M-4

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chicks

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 45

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 64.09 feet TOV or TOC

Depth to Bottom: 200 feet

Well Diameter: 4 feet inch stainless steel

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
		<u>NL</u>	

Sample Method: PDB

Sample Collection Time: 10:50

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/6/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID:

M-5

Sampling Date:

4-21-2021

Sampler Name(s):

Adam Norvelle, KaiHyn Chicks

Weather Conditions:

Rain

Snow

Sun

Cloudy

Dry

Humid

Temperature (F°):

45

Well Condition:

Satisfactory

Unsatisfactory (explain in notes)

Depth to Water:

4.87 feet

TOV of TOC

Depth to Bottom:

200 feet

Well Diameter:

~~0.5 feet~~ 4 inches (KAA 8/6/2021)

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
		<u>A.N.</u>	

Sample Method:

PDB

Sample Collection Time:

09:40

Number of Containers:

3

Intended Analysis:

Volatiles

Notes:

Replaced PDB

Checked by: KAA 8/6/2021

MONITORING WELLS - SUBMERSIBLE PUMP
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: M-6

Sampling Date: 4-20-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 60

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 25.13 feet TOV or TOC

Depth to Bottom: feet

Well Diameter: 0.5 feet

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH	Turbidity (NTU)
<u>1606</u>	<u>Start Purge</u>	<u> </u>	<u> </u>	<u> </u>
<u>1616</u>	<u>Sample</u>	<u> </u>	<u> </u>	<u> </u>
<u>1620</u>	<u>12.10</u>	<u>0.560</u>	<u>6.77</u>	<u>0.42</u>
		<u>A.N.</u>		

Sample Method: Grab

Sample Collection Time: 16:16

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Final depth to water = 27.40 feet TOC; well purged via dedicated pump and hose for 10 minutes at 4 gallons/minute

Checked by: KAA 8/6/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: M-8

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: ☒ Rain ☐ Snow ☐ Sun ☒ Cloudy ☐ Dry ☐ Humid
Temperature (F°): 39

Well Condition: ☒ Satisfactory ☐ Unsatisfactory (explain in notes)

Depth to Water: 9.94 feet TOV or ☒ TOC

Depth to Bottom: 200.90 feet

Well Diameter: 4 ~~feet~~ inch stainless steel

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
	NA		

Sample Method: PDB

Sample Collection Time: 08:35

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/6/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: M-9

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, KaiHgn Chick

Weather Conditions: Rain Snow Sun Cloudy Dry Humid
Temperature (F°): 39

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 85.53 feet TOV on TOC

Depth to Bottom: 200.63 feet

Well Diameter: 4 feet inch stainless steel

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
	<u>A.M.</u>		

Sample Method: PDB

Sample Collection Time: 08:55

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/6/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: _____

Sampling Date: _____

Sampler Name(s): _____

Weather Conditions:

Rain

Snow

Sun

Cloudy

Dry

Humid

Temperature (F°):

45

Well Condition:

Satisfactory

Unsatisfactory (explain in notes)

Depth to Water: _____

16.33 feet

TOV or TOC

Depth to Bottom: _____

114 feet

Well Diameter: _____

0.5 feet

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
		AN	

Sample Method:

PDB

Sample Collection Time: _____

09:15

Number of Containers: _____

3

Intended Analysis:

Volatiles

Notes: _____

Replaced PDB

Checked by: KAA 8/6/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: MW-104

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 52

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 27.45 feet TOV or TOC

Depth to Bottom: 83.29 feet

Well Diameter: 2 feet inch

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
		<u>N.</u>	

Sample Method: PDB

Sample Collection Time: 12:25

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/6/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: MW-109

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain ☐ Snow ☐ Sun ☐ Cloudy Dry Humid ☐

Temperature (F°): 52

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 16.73 feet TOV or TOC

Depth to Bottom: 85.50 feet

Well Diameter: 2 feet inch

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
		<u>A.N.</u>	

Sample Method: PDB

Sample Collection Time: 12:45

Number of Containers: 3

Intended Analysis: Volatiles

Notes: PDB located at approximately 69 feet below TOC due to
unknown restriction; ^{new} PDB located at same depth.
replacement

Checked by: KAA 8/6/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: MW-112

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 52

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 2.00 feet TOV or TOC

Depth to Bottom: 24.85 feet
A.N. 25.10

Well Diameter: 2 feet inch

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
	<u>A.N.</u>		

Sample Method: PDB

Sample Collection Time: 13:50

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/6/2021

MONITORING WELLS - PASSIVE DIFFUSION BAG
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: MW-113

Sampling Date: 4-21-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 52

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Depth to Water: 4.52 feet TOV or TOC

Depth to Bottom: 22.52 feet
A.N. 25.00

Well Diameter: 2 feet inch

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH
		<u>A.N.</u>	

Sample Method: PDB

Sample Collection Time: 13:40

Number of Containers: 3

Intended Analysis: Volatiles

Notes: Replaced PDB

Checked by: KAA 8/6/2021

ACTIVE EXTRACTION WELLS
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: OW-2

Sampling Date: 4-20-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chicks

Weather Conditions: Rain ☐ Snow ☐ Sun ☐ Cloudy Dry Humid ☐

Temperature (F°): 70

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Initial DTW Reading: 254.00 feet amsl Reading: transducer or manual DTW

Depth to Pump Intake: 234.03 feet amsl Pump Operation: Auto or Manual

Depth To Water: 242.06 feet amsl

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH	Turbidity (NTU)
1301	Start Purge			
1303	8.15	0.465	7.18	4.36
1305	8.04	0.465	7.19	4.15
1307	8.05	0.466	7.25	5.37
1309	8.23	0.468	7.30	42.9
1311	8.68	0.479	7.35	271
		A.N.		

Purge Water Description: Color: Clear* Odor: None

NAPL present? Yes ☐ No Other:

Sample Collection Time: 13:11

Number of Containers: 3

Intended Analysis: Volatiles

Final Transducer Readings: 242.06 feet reading: transducer or manual DTW

Notes: * Turbidity increase and color change to cloudy/light brown at 1309; pump cavitation / some air in discharge.
amsl = above mean sea level

Checked by: KAA 8/6/2021

ACTIVE EXTRACTION WELLS
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: OW-3

Sampling Date: 4-20-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 70°F

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Initial DTW Reading: 252.15 feet amsl Reading: transducer or manual DTW

Depth to Pump Intake: — feet amsl Pump Operation: Auto or Manual

Depth To Water: 250.99 feet amsl

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH	Turbidity (NTU)
1239	Start Purge			
1241	9.29	0.512	7.25	2.99
1243	9.25	0.509	7.25	1.64
1245	9.25	0.504	7.26	2.28
1247	9.27	0.503	7.28	1.39
1249	9.39	0.502	7.32	1.21
		A.N.		

Purge Water Description: Color: Clear Odor: None

NAPL present? Yes / No Other: —

Sample Collection Time: 12:49

Number of Containers: 3

Intended Analysis: Volatiles

Final Transducer Readings: 250.99 feet reading: transducer or manual DTW

Notes: _____

Checked by: KAA 8/6/2021

ACTIVE EXTRACTION WELLS
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: OW-5

Sampling Date: 4-20-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 70° A.M.

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Initial DTW Reading: 264.88 feet amsl Reading: transducer or manual DTW

Depth to Pump Intake: 235.2 feet amsl Pump Operation: Auto or Manual

Depth To Water: 263.27 feet amsl

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH	Turbidity (NTU)
1215	Start Purge			1.44 A.M.
1217	10.31	0.510	7.72	1.44
1219	10.01	0.439	7.57	2.53
1221	10.19	0.420	7.55	1.81
1223	10.27	0.415	7.58	1.32
1225	10.29	0.413	7.60	1.88
		A.M.		

Purge Water Description: Color: Clear Odor: None

NAPL present? Yes No Other: —

Sample Collection Time: 12:25

Number of Containers: 3

Intended Analysis: Volatiles

Final Transducer Readings: 263.27 feet reading: transducer or manual DTW

* Notes: amsl = above mean sea level

Checked by: KAA 8/6/2021

ACTIVE EXTRACTION WELLS
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: OW-7

Sampling Date: 4-20-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain ☐ Snow ☐ Sun ☐ Cloudy Dry Humid ☐

Temperature (F°): 68

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Initial DTW Reading: 251.91 feet amsl Reading: * transducer or manual DTW

Depth to Pump Intake: 231.37 feet amsl Pump Operation: * Auto or Manual A.N.

Depth To Water: 251.91 feet amsl

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH	Turbidity (NTU)
1335	Start Purge			
1337	13.09	0.975	7.83	23.3
1339	12.72	0.957	7.82	4.69
1341	12.67	0.927	7.76	2.39
1343	12.66	0.877	7.71	1.90
1345	12.65	0.859	7.68	1.77
		A.N.		

Purge Water Description: Color: Clear Odor: Slight Sulfur

NAPL present? Yes ☐ No Other: _____

Sample Collection Time: 13:45

Number of Containers: 3

Intended Analysis: Volatiles

Final Transducer Readings: 251.91 feet reading: * transducer or manual DTW

Notes: *Grundfos controller and well control screen do not show pump running; however, flow is available from sample port.
amsl = above mean sea level

Checked by: KAA 8/6/2021

ACTIVE EXTRACTION WELLS
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: OW-13

Sampling Date: 4-20-2021

Sampler Name(s): Adam Norvelle, Kaitlyn Chick

Weather Conditions: Rain Snow Sun Cloudy Dry Humid

Temperature (F°): 70

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Initial DTW Reading: 270.08 feet amsl Reading: transducer or manual DTW

Depth to Pump Intake: 236.95 feet amsl Pump Operation: Auto or Manual

Depth To Water: 270.09 feet amsl

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH	Turbidity (NTU)
1146	Start Purge			
1148	12.94	0.826	7.28	0.88
1150	11.90	0.797	7.35	0.92
1152	11.40	0.766	7.46	1.43
1154	11.21	0.723	7.54	2.17
1156	11.18	0.707	7.70	1.97
		A.N.		

Purge Water Description: Color: Clear Odor: None

NAPL present? Yes No Other: —

Sample Collection Time: 11:56

Number of Containers: 3

Intended Analysis: Volatiles

Final Transducer Readings: 270.09 feet reading: transducer or manual DTW

Notes: amsl = above mean sea level

Checked by: KAA 8/6/2021

ACTIVE EXTRACTION WELLS
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: OW-14

Sampling Date: ~~251.67~~ 4/19/21

Sampler Name(s): Adam Norvelle and Kaitlyn Chick (KAA 8/6/2021)

Weather Conditions: Rain Snow Sun Cloudy Dry Humid
Temperature (F°): 64

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Initial DTW Reading: 251.67 feet ^{above} msl Reading: transducer or manual DTW

Depth to Pump Intake: 237.24 feet ^{above} msl Pump Operation: Auto or Manual

Depth To Water: 247.39 feet ^{above} msl

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH	Turbidity (NTU)
15:48	11.19	1.411	7.35	6.80
15:50	11.29	1.437	7.36	3.37
15:52	11.42	1.429	7.37	3.73
15:54	11.65	1.440	7.36	6.71

Purge Water Description: Color: orange Odor: None
NAPL present? Yes / No Other: _____

Sample Collection Time: 15:54
Number of Containers: 3

Intended Analysis: Volatiles

Final Transducer Readings: 247.39 feet reading: transducer or manual DTW
KAA 8/6/2021

Notes: Air present in line. Orange particulates present upon initial purge, then cleared up.

Checked by: KAA 8/6/2021

ACTIVE EXTRACTION WELLS
SAMPLING RECORD

AMERICAN THERMOSTAT
ROUTE 23B, SOUTH CAIRO, NEW YORK

Well ID: DW-16

Sampling Date: 4/19/2021

Sampler Name(s): K. AMANN, K. CHICK, A. NORVELLE

Weather Conditions: Rain ☐ Snow ☐ Sun ☒ Cloudy ☐ Dry ☐ Humid ☐

Temperature (F°): 67

Well Condition: Satisfactory Unsatisfactory (explain in notes)

Initial DTW Reading: 243.76 feet ^{above} _{msl} Reading: transducer or manual DTW

Depth to Pump Intake: 236.81 feet ^{above} _{msl} Pump Operation: Auto or Manual

Depth To Water: 243.76 feet ^{above} _{msl}

Field Measurements

Time	Temperature(C°)	Conductivity(mS/cm)	pH	Turbidity (NTU)
<u>14:40</u>	<u>10.76</u>	<u>0.738</u>	<u>7.23</u>	<u>10.7</u>
<u>14:42</u>	<u>11.09</u>	<u>0.822</u>	<u>7.23</u>	<u>9.03</u>
<u>14:44</u>	<u>11.53</u>	<u>0.884</u>	<u>7.25</u>	<u>6.60</u>
<u>14:46</u>	<u>11.57</u>	<u>0.920</u>	<u>7.26</u>	<u>5.27</u>
<u>14:48</u>	<u>11.85</u>	<u>0.934</u>	<u>7.27</u>	<u>4.46</u>

Purge Water Description: Color: N Odor: N

NAPL present? Yes / No Other: _____

Sample Collection Time: 14:48

Number of Containers: 3 x 40 mL / HCl

Intended Analysis: Volatiles

Final Transducer Readings: 243.76 feet _{msl} reading: transducer or manual DTW

Notes: msl = mean sea level

Checked by: J. Rausch 8/11/21

American Thermostat - Residential POET System Inspection and Maintenance Checklist

Date(s): 4-20-2021
Time: 1030
Initials: AN, KC

Residence Name: _____
Residence Address: _____

Routine Inspection:

Has the owner complained/commented on any issues with the POET System?

No ☒
Yes _____

Describe: _____

Has the owner replaced any filters since last inspection?

No ☒
Yes _____

Describe: _____

while pumping (before

Pressure Gauge (psi)

Before 56

After: 55

Between: 60

Other: _____

Check system for leaks and confirm that all valves are set properly.

Leaks?

Yes or No ☒

Describe: _____

If leaks were observed, were measures taken to stop/control them?

No ☒
Yes _____

Describe: _____

Check filters and replace if necessary.

Filters Replaced (list):

20" sediment filter replaced

Record pressure gages while pumping and record flow meter readings (after filter replacement)

Pressure Gauge (psi)

Before: 42

After: 43

Between: 48

Other: _____

Check UV lamp for adequate power and replace if necessary.

Adequate Power?

No _____

Yes ☒

Replacement Required?

No ☒

Yes _____

205 days until replacement

Check UV lamp quartz sleeve; clean if necessary. Note condition of sleeve:

Condition (1-5, 1=very dirty, 5=very clean): _____

Remove all trash from job site

Carbon exchange required?

No _____

Yes _____

(If no, skip steps 1-6 below)

(If yes, continue to step 1 below)

American Thermostat - Residential POET System Inspection and Maintenance Checklist

Date(s): 4/20/21
Time: 0930
Initials: AN, KC

Residence Name: [REDACTED]
Residence Address: [REDACTED]

Routine Inspection:

Has the owner complained/commented on any issues with the POET System?

No ☒
Yes ☐

Describe: _____

Has the owner replaced any filters since last inspection?

No ☒
Yes ☐

Describe: _____

while pumping (before

Pressure Gauge (psi) Before System: 53 Between: 32
After System: 36 Other: _____

Check system for leaks and confirm that all valves are set properly.

Leaks? Yes or No Describe: _____

If leaks were observed, were measures taken to stop/control them?

No ☒
Yes ☐

Describe: _____

Check filters and replace if necessary.

Filters Replaced (list): 10" sediment filter replaced

Record pressure gages while pumping and record flow meter readings (after filter replacement)

Pressure Gauge (psi) Before System: _____ Between: _____
After System: _____ Other: _____

Check UV lamp for adequate power and replace if necessary.

Adequate Power? No _____ Replacement Required? No _____
Yes _____ 208 days until replacement Yes _____

Check UV lamp quartz sleeve; clean if necessary. Note condition of sleeve:

Condition (1-5, 1=very dirty, 5=very clean): _____

Remove all trash from job site

Carbon exchange required?

No _____
Yes _____

(If no, skip steps 1-6 below)

(If yes, continue to step 1 below)

American Thermostat - Residential POET System Inspection and Maintenance Checklist

Date(s): 4-20-2021
Time: 1000
Initials: AN, KC

Residence Name: [REDACTED]
Residence Address: [REDACTED]

Routine Inspection:

Has the owner complained/commented on any issues with the POET System?

No ☒
Yes ☐

Describe: _____

Has the owner replaced any filters since last inspection?

No ☐
Yes ☒

Describe: Replaced with universal 5Mm filter

while pumping (before

Pressure Gauge (psi) Before: 60

Check system for leaks and confirm that all valves are set properly.

Leaks? Yes or No

Describe: _____

If leaks were observed, were measures taken to stop/control them?

No ☒
Yes ☐

Describe: _____

Check filters and replace if necessary.

Filters Replaced (list): Before: 56 10" sediment filter replaced

Record pressure gages while pumping and record flow meter readings (after filter replacement)

Pressure Gauge (psi) Before: 56

Check UV lamp for adequate power and replace if necessary.

Adequate Power? No ☐ Replacement Required? No ☒
Yes ☒ 205 days until replacement Yes ☐

Check UV lamp quartz sleeve; clean if necessary. Note condition of sleeve:

Condition (1-5, 1=very dirty, 5=very clean): _____

Remove all trash from job site

Carbon exchange required?

No ☐
Yes ☐

(If no, skip steps 1-6 below)

(If yes, continue to step 1 below)

APPENDIX B
TIME-SERIES PLOTS OF KEY WELLS

