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7 March 2023

Ms. Stephanie Fitzgerald
Project Manager
Division of Environmental Remediation
New York State Department of Environmental Conservation
615 Erie Boulevard West
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RE: Letter Work Plan for Remedial System Optimization Investigation
Contract/Work Assignment No: D009806-31
Site/Spill No.: Owego Heat Treat (Site No. 754011)
Owego, Tioga County, New York

Dear Ms. Fitzgerald:

This letter work plan describes the activities proposed for the remedial system optimization (RSO) investigation at the Owego Heat Treat Site (No. 754011) located in Apalachin, Tioga County, New York (**Figure 1**). EA Engineering, P.C. and its affiliate EA Science and Technology (EA) will be conducting an RSO investigation to collect sufficient data to evaluate RSO options that would be effective in aiding remedial efforts, and reducing remedial timeframes that are consistent with New York State Department of Environmental Conservation (NYSDEC) Standards, Criteria, and Guidance. Specifically, the objectives of the RSO investigation are as follows:

- Review of project history and associated investigation and monitoring results.
- Evaluate the extent of volatile organic compound (VOC) contamination in groundwater by collecting additional environmental data.
- Evaluate surface soil, surface water, and soil gas contamination across the site.
- Evaluate soil vapor intrusion (SVI) at one residence on the property.
- Evaluate the effectiveness of previously implemented remedial actions including the in situ chemical oxidation (ISCO) pilot test results and conclusions.
- Evaluate the proposed remedies and other remedial alternatives that may have greater potential to reach remedial action objectives presented in the ROD.

This letter work plan in conjunction with EA's Generic Field Activities Plan (FAP)[1] will provide the basis for conducting field activities associated with the RSO investigation at the Site. The protocol and procedures for the investigation activities will be conducted in accordance with

1 EA. 2023. *Generic Field Activities Plan for Work Assignments under NYSDEC Contract D009806.* March

NYSDEC Division of Environmental Remediation-10 Technical Guidance for Site Investigation and Remediation[2], EA's Generic Quality Assurance Project Plan[3], and Health and Safety Plan[4]. A site-specific Health and Safety Plan addendum has been provided as **Attachment A**.

The following activities will be completed as part of the RSO investigation (**Attachment B—Project Schedule**):

- Groundwater sampling
- Surface soil sampling
- Surface water sampling
- Subsurface soil sampling
- Drilling and installation of monitoring wells
- Soil gas point (SGP) installation
- SVI investigation
- Laboratory analysis
- Data validation
- Site surveying.

SITE DESCRIPTION

The subject site is located at 1646 Marshland Road in the town of Apalachin, Tioga County, New York (**Figure 1**). The site occupies approximately 37 acres and is bisected by Marshland Road. The property is bounded to the north by the Susquehanna River, to the east by a golf course, to the south by New York State Route 17, and to the west by a mix of residential and agricultural land. The northern portion of the site is primarily vacant with one residential structure immediately north of Marshland Road. Three primary structures are present on the southern portion of the site which include one residential structure and two buildings (Building-1 and Building-5) formerly associated with historical heat-treating operations. The footprints of former Buildings-4 and -6, also associated with historical heat-treating operations, are present to the south. Building-2, which housed degreasing tanks used to clean metallic parts after cooling via oil quenching, was located between Buildings-1 and -4. Its footprint is no longer visible at the site. A 2-acre pond is present

2 NYSDEC. 2010. *DER-10 Technical Guidance for Site Investigation and Remediation.* May.
3 EA. 2020. *Generic Quality Assurance Project Plan for Work Assignments under NYSDEC Contract D009806.* April.
4 EA. 2020c. *Generic Health and Safety Plan for Work Assignments under NYSDEC Contract D009806.* March.

further south of Marshland Road. A drainage swale that begins to the south of Building-5 flows south towards the pond and was historically used as a discharge point for process water during heat treating operations.

SITE HISTORY

Heat treating operations were conducted at the site from 1953 to September 2011 when operations were discontinued following flooding associated with Tropical Storm Lee. While operational, pre-fabricated metallic parts were heat treated to specific temperatures and then cooled at controlled rates via oil quenching techniques. After metal cooling, the metal parts were immersed in degreasing tanks to remove residual oil. Tetrachloroethene (PCE) was used for the degreasing process until 1992. In 1992, the use of PCE ended, and an alkaline process that used 1,1,1-trichloroethane was adopted. The use of 1,1,1-trichloroethane was gradually phased out and replaced by a citrus-based, environmentally safe, cleaner.

Based on the ROD, during building renovations in December 1987, a strong chemical odor was detected emanating from soils beneath the flooring of Building-2. Upon inspection of the concrete-lined pit underlying a PCE tank in the southeast corner of Building-2, standing water was discovered with noticeable contamination. The standing water was pumped into 55-gallon drums for disposal, and soils underlying the pit were excavated and disposed of in accordance with NYSDEC guidance. Confirmatory soil samples collected after excavation revealed that VOC concentrations in remaining soil were less than 0.05 parts per million.

PREVIOUS INVESTIGATIONS

Several phases of field investigation and remedial activities have taken place at the site since contamination was discovered in 1987. Previous investigations and remedial efforts include:

- 1988/1989 – Groundwater and soil vapor sampling.
- 1989 – Additional groundwater and soil vapor sampling, electrical resistivity survey.
- 1992 – Construction of a groundwater extraction and treatment system (system was operated almost continuously until the 2011 flood event).
- 1994 – Under a consent order from NYSDEC, continue operation of the groundwater treatment system, long-term monitoring of on-site wells, and imposition of a deed restriction prohibiting use of groundwater at the site as potable water.
- 2006 – Soil vapor intrusion evaluation and mitigation of four on-site buildings.
- 2006 – Demolition of four on-site buildings; two of the buildings had mitigation systems, following flooding caused by heavy rains in the region. Resume heat treating operations and operations of groundwater extraction and treatment system.

- 2011 – Discontinue heat treating operations and operations of the groundwater extraction and treatment system due to flooding related to Tropical Storm Lee.

- 2013 – Consent order and administrative settlement with NYSDEC in preparation for sale of the property.

Subsequent to the consent order and administrative settlement in 2013, a site characterization (SC) was completed at the site by Aztech Technologies, Inc. (Aztech)[5]. The SC included well top-of-casing and water level surveying, a membrane interface probe (MIP) study, and groundwater sampling at existing wells and MIP borings within the suspected source area. Findings from the SC included the following:

- The suspected source area is located in the area beneath former Building-2, and impacted source soil is present in the depth interval of 10 to 20 feet (ft) below ground surface (bgs).

- Groundwater PCE concentrations from select MIP boring locations within the suspected source area ranged from 230 micrograms per liter (µg/L) to 390 µg/L.

- PCE concentrations ranged from 2.8 µg/L (MW-7) to 1,100 µg/L (MW-10) in samples collected from existing monitoring wells.

- Groundwater moving through the source area appeared to be undergoing natural attenuation as it continued toward the north (supported by the presence of PCE daughter compounds trichloroethene, dichloroethene, and vinyl chloride). Additionally, the relative percentage of PCE when compared to the total VOC concentration appeared to decline with distance from the source area.

Findings from the SC conducted in 2013 identified data gaps that would need to be addressed in order to evaluate remedial alternatives for the site. As a result, Aztech completed supplemental site characterization (SSC) activities at the site from February to March 2014[6]. Activities completed as part of the SSC included drilling at select locations in and around the suspected source area, soil sampling, installation of temporary monitoring wells, groundwater sampling, infiltration testing, and hydraulic conductivity testing. Select findings from the SSC include the following:

- A layer of glacial till was expected between 30 to 35 ft bgs but was not encountered during the SSC.

5 Aztech. 2013. *Site Characterization Report for the Owego Heat Treat Inactive Hazardous Waste Disposal Site. 1646 Marshland Road, Apalachin, Tioga County, New York*. November.
6 Aztech. 2014. *Supplemental Site Characterization Report for the Owego Heat Treat Inactive Hazardous Waste Disposal Site. 1646 Marshland Road, Apalachin, Tioga County, New York*. June.

- The soil type observed during drilling operations consisted of primarily silt with 10 to 35 percent clay.

- The extent of soil impacted with VOCs in excess of regulatory standards was not defined to the north, west, or south of the suspected source area.

- Historically, the greatest concentrations of dissolved phase total VOCs were detected in MW-2 which is located approximately 50 ft downgradient of the suspected source area. During the SSC the total VOC concentration in MW-2 was 11,515 µg/L.

- Monitoring wells installed within the suspected source area and sampled as part of the SSC revealed total VOC concentrations in groundwater as high as 156,498 µg/L.

- VOC impacted groundwater was identified in excess of groundwater standards in samples obtained from MW-10 which is located north of Marshland Road, approximately 500 ft downgradient of the suspected source area.

Based on findings from the SSC field investigation, the following recommendations were made by Aztech:

- Impacted soil within the suspected source area are likely the source of dissolved-phase VOCs identified in groundwater. As a result, the unrestricted use soil cleanup objective was recommended as the target cleanup criteria for impacted site soil.

- Additional soil borings and soil sampling should be completed to further define the extent of soil contamination in areas to the north and west of the suspected source area.

- Additional monitoring wells should be installed and sampled to define the extent of impacted groundwater.

An RSO was completed by EA in 2017[7] which included a technical evaluation of remedial technologies, collection of environmental data, and the presentation of an updated conceptual site model (CSM). More specifically, the objectives of the RSO investigation were as follows:

- Further delineate and refine the extent of the source area.

- Define in situ soil characteristics using geotechnical data.

- Evaluate potential sediment impacts within a drainage swale that received historical processing operation discharges.

7 EA. 2017. *Final Remedial System Optimization Report, Owego Heat Treat (Site No. 754011, Apalachin, Tioga County, New York*. January.

- Evaluate/confirm the extent of chlorinated VOC (CVOC) contamination in groundwater.

- Assess ongoing natural attenuation processes using general chemistry and compound specific isotope data from a number of groundwater sampling depths.

- Identify mass discharge zones from the source area and within the downgradient extents of the dissolved-phase groundwater plume to determine mass removal rates and estimate the amount of residual contamination in the source area.

Based on findings from the RSO investigation, the following recommendations were made by EA:

- ISCO was suggested as the remedial technology for the source area. Specifically, sodium persulfate would be injected into the source area across a 10 x 10 ft injection grid and would be activated by increasing groundwater pH with sodium hydroxide.

- In situ chemical reduction was suggested as the remedial technology for the dissolved phase CVOC plume. Specifically, zero valent iron would be injected downgradient from the source area in four transects and would be bioaugmented with bacterial cultures and macronutrients to promote anaerobic biodegradation.

Following the RSO investigation, a Pilot Study was performed by Groundwater & Environmental Services, Inc. in 2018[8] to evaluate the effectiveness of an ISCO product on the source area. The pilot study included sodium permanganate injections across the previously proposed treatment grid, and an evaluation of the effectiveness of the product. More specifically, the objectives of the Pilot Study were as follows:

- Inject sodium permanganate into the source area at 16 injection points spaced 10 ft apart.

- Evaluate effectiveness of sodium permanganate for ISCO injections at the site.

Based on findings from the Pilot Study, the following conclusions were made by Groundwater & Environmental Services, Inc.:

- Sodium permanganate was deemed an appropriate technology to address CVOC contamination at the site.

- Following a high failure rate for injections into the tightly packed silt layer associated with the source area, pneumatic fracturing and a more concentrated (35 percent) sodium permanganate was suggested.

8 GES. 2018. *Pilot Test Report*. December.

REMEDIAL SYSTEM OPTIMIZATION INVESTIGATION

The primary focus of this RSO investigation is to collect sufficient data to update the CSM, determine whether the previously identified remedies remain adequate, and evaluate other remedial technologies. The last time a site-wide groundwater sampling event took place was during EA's previous RSO in June 2016; results are shown on **Figure 2**. RSO field activities will be conducted in phases; a site-wide round of groundwater sampling will be conducted during the first phase and will inform the subsequent phase. Field activities are expected to be sequenced as follows:

Phase 1

- Full round of gauging of all wells on-site to get static water level conditions.
- Collection of 54 groundwater samples from existing monitoring wells for VOC analysis (**Tables 1 and 2**).
- Collection of surface soil from 30 locations for analysis of VOCs, semivolatile organic compounds, polychlorinated biphenyls, pesticides, and metals.
- Collection of surface water from the pond on the southern end of the site for VOC analysis.
- An SVI evaluation at the residence south of Marshland Road for VOCs.
- Geophysical Survey of site to prepare for drilling activities to take place during Phase 2.
- Preparation and submittal of a technical memorandum summarizing the results of the Phase 1 groundwater analyses and presenting Phase 2 recommendations including locations of additional monitoring wells.

Phase 2

- Following approval of Phase 1 technical memorandum, installation, development, and sampling of three to four new monitoring wells for VOCs.
- Installation and sampling of six soil gas points across the site for VOCs.
- During drilling activities, collection of up to six subsurface soil samples for chemical oxygen demand (COD).
- Sampling of two on-site residential wells for VOCs.

- Preparation and submittal of a technical memorandum summarizing the results of the Phase 2 groundwater analyses and presenting recommendations for locations of additional monitoring wells (if needed) and Phase 3 sampling recommendations.

- Installation, and development of two to three new monitoring wells (quantity to be determined- total of 6 new monitoring wells in up to two mobilizations).

Phase 3

- Full round of gauging of all wells on-site to get static water level conditions.

- Round of sampling from all new wells and wells/intervals identified based on results of initial sampling for VOCs, monitored natural attenuation parameters, and microbial analysis.

- A land survey to capture all sample locations, monitoring well casing elevations, and surface water elevations.

Analytical data will be evaluated against the existing land use designation—commercial, as well as residential use and unrestricted use to provide a basis for comparison of optimized remedial alternatives for costs and effectiveness.

Field activities are detailed in the sections below.

Groundwater Sampling

Groundwater sampling is expected to be conducted in phases. The Phase 1 sampling event will be performed which will include a total of 54 samples from a selected set of the existing monitoring wells, including continuous multi-channel tubing (CMT) wells. The total sample number does not include samples required for quality assurance/quality control. Two on-site residential wells will also be sampled during the Phase 1 sampling event to assess potential impacts from site related VOC contaminants. The Phase 1 sampling data will inform the placement of new monitoring wells (Phase 2) to help determine the extent of CVOC contamination. Subsequent to new monitoring well installation, newly installed wells will be sampled, and the results will determine whether additional monitoring wells are required. Phase 3 will consist of a site-wide groundwater sampling event, which will include the up to six new monitoring wells and a selected set of existing monitoring wells based on the Phase 1 and Phase 2 groundwater sampling results.

Groundwater sampling procedures will include water level measurements, well purging, field water quality measurements (including dissolved oxygen [DO] and oxidation-reduction potential [ORP]), and sample collection at each well location. Purging and sampling log forms will be used to record well purging, water quality measurements, and sampling flow rates. The objective of the groundwater sampling protocol is to obtain samples that are representative of the aquifer at each

discrete sampling depth so that the analytical results reflect the composition of the groundwater at each depth interval as accurately as possible.

Rapid and significant changes can occur to groundwater samples upon exposure to sunlight, temperature, and pressure changes at ground surface. Therefore, groundwater sampling will be conducted in a manner that will minimize interaction of the sample and the surface environment. The equipment and protocol for collection groundwater samples are described below.

Purging and Sampling Equipment

CMT and monitoring well purging and sampling will be performed using a low flow pump (peristaltic or equivalent) and dedicated sections of polyethylene tubing. Equipment for purging and sampling will include the following:

- Peristaltic pump or equivalent.
- Solinst® 102 Electronic Water Level Indicator with accuracy of 0.01 ft.
- Flow measurement device (containers graduated in milliliters) and stopwatch.
- Water quality meter (Horiba U-52 or similar) with flow-through cell (flushed with distilled water before use at each well) for field measurement of pH, specific conductance, temperature, ORP, turbidity, and DO.
- Photoionization detector instrument (MiniRAE or similar) to monitor vapor concentrations during purging and sampling.

Groundwater Sampling Purge Method

Prior to the start of each groundwater sampling event, total well depths and water levels will be collected from each monitoring point and identified CMT channel (3 of 7 per well head) to be sampled to prepare a groundwater contour map, and to evaluate groundwater flow patterns across the site. The following procedures will be used for sampling the monitoring wells, residential wells, and CMT wells:

- Wear appropriate personal protective equipment. In addition, samplers will use new nitrile sampling gloves for the collection of each sample.
- Unlock and remove the well cap.
- Obtain photoionization detector readings from each channel or well and record them on the field sampling forms.

- Measure the static water level within each channel or well with an electronic water level indicator. The water level indicator will be washed with Alconox® detergent and water, then rinsed with deionized water between individual monitoring wells to prevent cross-contamination.

- Calculate the volume of water in each channel or well.

- Purge 3-5 well volumes of water from the well.

- Allow field parameters of pH, ORP, DO, specific conductivity, turbidity, and temperature to stabilize before sampling. Purging will be considered complete if the following conditions are met:

  — Consecutive pH readings are ±0.1 pH units of each other
  — Consecutive DO readings are ±10 percent of each other
  — Consecutive ORP readings are ±0.10 units of each other
  — Consecutive measured specific conductance is ±3 percent of each other
  — Turbidity less than 50 nephelometric turbidity units
  — Purge rate of 250 milliliters per minute (mL/min) with a draw down less than 0.3 ft.

The flow rate during monitoring well, CMT well, and residential well purging will not exceed 250 mL/min. If these parameters are not met after purging a volume equal to 3–5 times the volume of standing water in each channel or well, the EA Project Manager will be contacted to determine the appropriate action(s).

- If the channel or well is purged dry before the required volumes are removed, the channel or well may be sampled when it recovers (recovery period up to 24 hours).

- Collect the sample aliquot for VOC analysis at a flow rate not exceeding 250 mL/min.

- Obtain field measurement of pH, DO, temperature, and specific conductivity, and record it on the purging and sampling form. The instruments will be decontaminated between wells to prevent cross-contamination.

- Place analytical samples in cooler and chill to 4 degrees Celsius. Samples will be shipped to the analytical laboratories within 24 hours.

- Re-lock well cap.

- Fill out field sampling form, labels, custody seals, and chain-of-custody forms.

All groundwater samples collected during the sampling events will be analyzed for VOCs by U.S. Environmental Protection Agency (EPA) Method 8260B (**Tables 1 and 2**). A subset of samples collected during the Phase 2 sampling event will also be analyzed for biochemical oxygen demand

by EPA Method 405.1, COD by EPA Method 410.4, metals, specifically iron and manganese (total and dissolved) by EPA Method 6010, alkalinity by EPA Method 310.1, methane/ethane/ethene by RSK175, sulfate by EPA Method 375.4, nitrate by EPA Method 352.1, and total organic carbon by EPA Method 9060. All samples will be analyzed in accordance with the NYSDEC Analytical Services Protocol.

Groundwater data generated during the RSO investigation will allow for the following assessments:

- Extent of CVOC contamination across the site.
- Evaluation of site parameters to explore potential in situ remedial technologies for the source area and impacted groundwater zones.
- Update the CSM.

Surface Soil and Surface Water Evaluation

Surface soil sampling will be performed at the request of the New York State Department of Health to determine the extent of soil contamination across the site (**Figure 3**). Surface soil and water data generated during the RSO investigation will allow for the following:

- Evaluation of the extent of contamination in surface soil across the site.
- Evaluation of the extent of contamination in the surface pond.

80 surface soil samples will be collected from 30 locations across the site at depths ranging from 0 to 2 inches (in.) up to 24 in. bgs. 20 of the surface soil sample locations surrounding the residences (as shown on **Figure 3**) will be sampled from three intervals: 0 to 2-in., 2 to 12-in., and 12 to 24-in. The remaining 10 locations will be sampled at two intervals: 0 to 2-in. and 2 to 12-in. Soil samples will be collected from the desired sample interval using decontaminated hand tools, such as a shovel, hand auger, and/or post hole digger. Samples will be collected in accordance with EA Standard Operating Procedure (SOP) No. 025, an attachment to the Generic FAP[1].

One surface water sample will be collected using a peristaltic pump at an accessible point in the pond. The sample will be collected in accordance with EA SOP No. 007, an attachment to the Generic FAP[1].

All surface soil and surface water samples will be analyzed for VOCs by EPA Method 8260B, semivolatile organic compounds by EPA Method 8270C, metals and mercury by EPA Method 6010C/7471B, pesticides by EPA Method SW-846 8081, and polychlorinated biphenyls by EPA Method SW-846 8082A. All samples will be analyzed in accordance with the NYSDEC Analytical Services Protocol.

Soil Vapor Intrusion Evaluation

The SVI evaluation will be conducted at one residential structure on-site, located south of Marshland Road to the east of the former heat treat operations buildings. The SVI evaluation will include concurrent indoor air sample collection, sub-slab vapor sample collection, and outdoor air sample collection. EA Assumes one indoor air sample, one sub-slab vapor sample, and one outdoor air sample will be collected from each residence. Samples will be collected in accordance with Section 11 of the Generic FAP[1] and New York State Department of Health (NYSDOH) Soil Vapor Intrusion Guidance[9].

Structure Inspection/Inventory and Owner Questionnaire

EA will inspect and document the conditions at the structure on the day of sample collection on a Structure Sampling Questionnaire and Building Inventory (**Attachment C**). The pre-sampling inspection will include a record of product inventories for the basement of the structure to identify and pre-screen potential indoor air sources of VOCs. In addition, EA will document weather conditions and indoor air temperature. Subsequently, EA will select air/sub-slab vapor sampling locations and conduct ambient air screening using field equipment (i.e., a parts per billion RAE Model PGM-7340 photoionization detector). A photographic log will be developed for the structure.

Sub-Slab Vapor Sampling

The following procedures listed will be followed during installation of the sub-slab vapor point.

- A visual assessment of the condition of the basement floor will be completed. The location of the sub-slab vapor point will be selected to be out of the line of traffic, away from major cracks and other floor penetrations (e.g., sumps, pipes, etc.), and a minimum of 5 feet (ft) from an exterior wall.

- Once the location is determined, a ¼-in. diameter hole will be drilled to approximately 2-in. below the concrete floor slab using an electric hammer drill. A 1-in. diameter drill bit will then be used to over drill the top ½-in. of the borehole to create an annular space for the surface seal.

- Concrete dust and flooring material will be swept away from the drill hole and wiped with a dampened towel.

- Teflon-lined polyethylene tubing (¼-in. outside diameter × ⅛-in. inside diameter, and approximately 3 ft long) will then be inserted into the borehole drilled in the floor, extending no further than 2 in. below the bottom of the floor slab.

[9] NYSDOH. 2006. *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*. October.

- Melted beeswax will be poured around the tubing at the floor penetration and allowed to set tightly around the tubing.

- Once the sub-slab vapor point is installed, and the beeswax has hardened, a dry leak test will be performed using helium tracer gas. A leak test shroud will be used to infuse the area surrounding the sub-slab vapor point with helium; once helium detector concentrations indicate approximately 100 percent helium within the shroud, a GilAir-5 air pump will be used to purge the sub-slab vapor point of approximately 2 to 3 liters (L) of air. The purge air will be discharged into a Tedlar® bag connected directly to the air pump. The Tedlar® bag will then be purged, first with the helium detector to assess the competency of the sub-slab seal and then with the photoionization detector to record total VOC concentrations. The associated readings will be recorded on the field sampling form.

- A 6-L Summa® canister (provided by an independent laboratory) with a vacuum gauge and flow controller will be connected to the sample tubing using a compression fitting and placed on the floor adjacent to the sampling point. The canister will be individually certified clean in accordance with EPA Method TO-15 and under a vacuum pressure of no less than -25 in. of mercury (inHg). The flow controller will be regulated to collect at 3.8 mL/min over a 24-hour collection period.

The serial number of the canister and associated regulator will be recorded on the field sampling form (provided as **Attachment C**). Sample identification, sample start date/time, vacuum gauge pressure, and required analysis (EPA Method TO-15) will be recorded on the canister identification tag and the field sampling form.

Following the 24-hour collection period, the canister valve will be closed to terminate sample collection. If the vacuum gauge reaches -5 inHg or less before the collection period concludes, the canister valves shall be closed to terminate sample collection before the 24-hour collection period is up. Flow regulator ending gauge pressure and sample end time will be recorded on the canister identification tag and the field sampling form. Once the sample collection is completed, the canister and flow controller will be disconnected from the sample tubing. Pertinent sample information will be recorded on the associated chain-of-custody, and the canister will be repackaged into the originating box. The sub-slab vapor sample will be sent to a call-out laboratory for VOC analysis by EPA Method TO-15.

Indoor and Outdoor Air Sampling

One basement indoor air sample will be collected from the structure as part of the SVI evaluation. An outdoor air sample will be set up in proximity to the structure during the sample period corresponding with the sample collection in the structure. Indoor and outdoor air samples will be set-up to collect a representative air sample from within the breathing zone (i.e., 3–5 ft above the floor). If sample locations are unable to achieve the elevated sampling zone, dedicated Teflon-lined polyethylene tubing will be used to reach the breathing zone. A 6-L Summa® canister with a

vacuum gauge and flow controller will be used to collect the indoor and outdoor air samples. The canisters will be individually certified clean in accordance with EPA Method TO-15 Select Ion Monitoring (SIM) and under a vacuum pressure of no less than -25 inHg. Flow controllers will be regulated to collect at 3.8 mL/min over a 24-hour collection period.

Prior to initiating sampling, the serial number of the canister and associated regulator will be recorded on the field sampling form (provided as **Attachment C**). Sample identification, sample start date/time, vacuum gauge pressure, and required analysis (EPA Method TO-15) will be recorded on the canister identification tag and the field sampling form.

Following the 24-hour collection period, the canister valves will be closed to terminate sample collection. If the vacuum gauges reached -5 inHg or less before the collection period concludes, the canister valves shall be closed terminate sample collection before the 24-hour collection period is up. Flow regulator ending gauge pressures and sample end times will be recorded on the canister identification tags and the field sampling forms. Pertinent sample information will be recorded on the associated chain-of-custody, and the canisters will be repackaged into the originating box. Indoor and outdoor air samples will be sent to a call-out laboratory for VOC analysis by EPA Method TO-15.

Geophysical Survey

Before drilling operations begin a ground penetrating radar survey will be completed by Ground Penetrating Radar Systems, Inc. to identify potential utilities or obstructions.

Soil Gas Point Installation

Six semi-permanent SGPs will be installed in accordance with the NYSDOH Soil Vapor Intrusion Guidance[8] at the locations shown on **Figure 3**. SGPs will be installed within the vadose zone in six boreholes installed by Matrix Environmental Technologies, Inc. The target depth for the SGPs is 2 ft above the groundwater table. Locations will be cleared by the driller prior to mobilization by calling Dig Safely New York to identify the location of any underground utilities. A 6-in. stainless steel screen attached to a dedicated section of ¼-in. diameter Teflon or Teflon-lined tubing that is identified as laboratory or food grade will be installed in the borehole to collect the soil gas samples. Glass beads will be used for the filter pack, extending 6 in. above the top of screen. Granular bentonite will be used to seal from top of filter pack to within 3 in. of ground surface and hydrated concurrently with placement. Bentonite will be allowed to cure for a minimum of 24 hours prior to sampling. A shut-in test using helium as a tracer gas will be performed prior to sample collection to check the integrity of the seal. Sample tubing will be purged with 2-3 implant volumes prior to sample collection to ensure representative samples are collected. SGPs will be sampled with 6-L Summa® canisters for VOCs via EPA Method TO-15 by a call-out laboratory. Canisters will be individually certified and regulated for a 1-hour collection period. Samples will be collected in accordance with EA SOP No. 020 Active Soil Gas Sampling, provided as an appendix to the Generic FAP[1].

The subcontractor will be required to decontaminate all drilling equipment between drilling locations utilizing either a steam cleaner and potable water or an Alconox® wash and rinse with potable water.

Monitoring Well Installation

Up to six monitoring wells will be installed to further delineate and refine the source area and the downgradient dissolved CVOC plume. Each well will be constructed of a 2-in. diameter, 10-ft length of 0.010 slot screen and riser. Once the well casing has been set in the boring a 3-ft sandpack consisting of #0 Morie Sand, or equivalent, will be installed from the base of the boring to approximately 2 ft above the top of the screen. A bentonite seal will be placed above the sand pack to fill the remaining annular space to approximately 0.5 ft bgs. Each well will be secured with a J-plug, and a flush mount well cover.

Monitoring Well Development

The newly installed monitoring wells will be developed no sooner than 48-hours following installation. Wells will be purged of three well volumes using pump and surge techniques. Development water will be discharged to the ground surface away from the well, unless otherwise directed by NYSDEC. If non-aqueous phase liquid or an odor is observed, or if directed by NYSDEC, the development water will be containerized, handled, and disposed of as detailed in Section 13 of the Generic FAP[1]. Well development forms will be completed during purging and development activities. Each well will be allowed to stabilize for 2 weeks prior to sampling to ensure that the samples will be representative of the groundwater and potential contamination in the vicinity of the well.

Subsurface Soil Sampling

Up to six subsurface soil samples will be collected during site drilling activities to be analyzed for COD by EPA Method 410.4. The results of these analyses will help identify oxidant demand by the soil to evaluate conditions for ISCO.

Groundwater and Surface Water Elevation Survey

The objective of the groundwater and surface water elevation survey is to evaluate preferential flow path regimes downgradient of the source area. Groundwater elevations will be collected during all sampling events with a specific water level meter that will fit the CMT channels to track any changes to water elevation. Surface water elevation will be surveyed by a qualified land surveyor.

DECONTAMINATION PROCEDURES

Non-dedicated equipment and tools used to collect samples for chemical analysis will be decontaminated prior to and between each sample. Other non-dedicated sampling equipment (e.g., stainless steel spoons, scoops, hand augers, etc.) will be decontaminated with a non-phosphate detergent wash, potable water rinse, isopropanol rinse, potable water rinse, followed by deionized water rinse. Additional cleaning of the equipment with steam may be needed under some circumstances.

Decontamination fluids will be discharged to the ground surface unless a visible sheen or odor is detected either on the equipment or the fluids, at which point the decontamination water will be staged in an appropriate container and disposed of appropriately.

LABORATORY ANALYSIS AND REPORTING

It is anticipated that preliminary analytical results will be available within 2 weeks of receipt at the laboratory, and final results will be provided to the NYSDEC within the standard turnaround time (i.e., 30 days). Samples collected will be validated by a party independent of the laboratory that performed the analyses and the consultant that performed the field work. A usability analysis will be conducted by a qualified data validator and a Data Validation/Usability Report will be submitted to NYSDEC 30 days following the data validator's data package receipt.

SITE SURVEY

Following completion of the RSO field sampling and the installation of the new monitoring wells, a site survey will be completed by Paul Olszewski Land Surveying, a certified land surveyor. The site survey will capture coordinate data (X, Y, and Z) at the following locations:

- Newly installed monitoring well locations
- Surface soil sample locations
- Groundwater elevations for the Susquehanna River and the pond on southern end of the property.

REMEDIAL SYSTEM OPTIMIZATION EVALUATION AND REPORTING

The primary focus of this work assignment is to evaluate RSO options that would be effective in aiding remedial efforts, and reducing remedial timeframes that are consistent with NYSDEC Standards, Criteria, and Guidance and the existing ROD. Therefore, upon completion of the RSO investigation activities, all data will be evaluated relative to NYSDEC Standards, Criteria, and Guidance, and meetings will be held with the NYSDEC to understand and update the current CSM. Based on this evaluation, an RSO report will be completed to identify necessary requirements and remedial alternatives to optimize the remedial action, including any recommended changes or

additions to the recommended alternatives identified in the 2017 EA RSO Report[7]. The report will include at a minimum:

- Summary of field activities, analytical data, figures depicting impacted media, identification of any remaining data gaps, an updated CSM, and conclusions/ recommendations based upon the RSO investigation results.

- Analytical data will be evaluated against existing land use designation— commercial as well as residential use, and unrestricted use to provide a basis for comparison of optimized remedial alternatives for costs, implementability, and effectiveness.

- Identify other concerns which may affect the public health, the environment, or future land use.

- The RSO report will identify optimization alternatives to supplement remediation efforts at the site. Alternatives will be evaluated for both subsurface soil and groundwater, and each alternative will include a conceptual layout, regulatory requirements, an engineer's estimate, and other design features needed for implementation.

A Draft and Final version of the document will be submitted to the NYSDEC for review, comment, and approval.

If you have any questions, please do not hesitate to contact me at 315-565-6557.

Sincerely yours,

EA SCIENCE AND TECHNOLOGY

Megan Miller
Project Manager

EA ENGINEERING, P.C.

Donald F. Conan, P.E., P.G.
Program Manager

Tables

1. Monitoring Well Summary – CMT Wells
2. Monitoring Well Summary – Monitoring Wells and Piezometers

Figures

1. Site Map and Existing Monitoring Well Network
2. Existing Monitoring Well COC Detections and PCE Isopleth Map – June 2016
3. Proposed Surface Water, Surface Soil, and Soil Gas Sampling Locations

Attachments

A. Health and Safety Plan Addendum
B. Project Schedule
C. Field Forms

Tables

Table 1.
Monitoring Well Summary - CMT Wells

CMT Transect 1

Well ID	Top of CMT Elevation (ft amsl)	Port ID	Depth to Bottom (ft)	Screened Interval	Northing	Easting
CMT1-01	810.26	1	10.19	6" screen	763605.550700	929996.783200
		2	15.19			
		3	20.25			
		4	25.23			
		5	30.21			
		6	35.12			
		7	39.99			
CMT1-02	810.06	1	11.19	6" screen	763597.329800	929977.161500
		2	16.09			
		3	21.15			
		4	26.15			
		5	31.14			
		6	36.1			
		7	41.03			
CMT1-03	809.83	1	10.00	6" screen	763588.012200	929957.793490
		2	14.91			
		3	19.98			
		4	24.98			
		5	29.91			
		6	34.7			
		7	39.39			
CMT1-04	809.39	1	9.90	6" screen	763578.318100	929939.485900
		2	14.82			
		3	19.81			
		4	24.79			
		5	29.8			
		6	34.75			
		7	39.94			
CMT1-05	808.15	1	9.92	6" screen	763572.650700	929918.916300
		2	34.29			
		3	19.91			
		4	24.94			
		5	29.9			
		6	14.98			
		7	39.64			
CMT1-06	807.63	1	11.08	6" screen	763565.257100	929898.337300
		2	15.92			
		3	20.83			
		4	35.76			
		5	30.66			
		6	35.82			
		7	40.86			
CMT1-07	807.32	1	9.24	6" screen	763556.414100	929878.528000
		2	14.18			
		3	19.1			
		4	24.12			
		5	29.51			
		6	34.68			
		7	39.97			
CMT1-08	807.9	1	9.49	6" screen	763550.809500	929858.606800
		2	14.48			
		3	19.52			
		4	24.51			
		5	29.48			
		6	34.45			
		7	24.32			

CMT Transect 2

Well ID	Top of CMT Elevation (ft amsl)	Port ID	Depth to Bottom (ft)	Screened Interval	Northing	Easting
CMT2-01	813.45	1	44.42	6" screen	763902.206000	929918.015800
		2	40.01			
		3	34.98			
		4	29.99			
		5	24.88			
		6	19.62			
		7	49.80			
CMT2-02	811.43	1	45.46	6" screen	763597.329800	929977.161500
		2	40.40			
		3	35.45			
		4	30.4			
		5	25.42			
		6	20.54			
		7	50.64			
CMT2-03	809.76	1	44.70	6" screen	763892.512400	929879.212400
		2	39.67			
		3	34.65			
		4	29.65			
		5	24.65			
		6	19.69			
		7	50.10			
CMT2-04	809.07	1	45.84	6" screen	763887.835500	929860.129700
		2	40.85			
		3	35.81			
		4	30.81			
		5	25.79			
		6	20.81			
		7	50.19			
CMT2-05	809.13	1	43.89	6" screen	763879.659600	929842.182800
		2	38.81			
		3	33.81			
		4	28.81			
		5	23.79			
		6	18.76			
		7	48.76			
CMT2-06	808.46	1	44.58	6" screen	763871.775800	929823.811400
		2	39.55			
		3	34.51			
		4	29.58			
		5	24.55			
		6	19.59			
		7	49.85			
CMT2-07	808.37	1	46.00	6" screen	763864.265800	929805.131000
		2	40.98			
		3	35.95			
		4	29.9			
		5	25.89			
		6	20.91			
		7	50.73			
CMT2-08	808.56	1	46.28	6" screen	763856.454800	929786.649200
		2	41.22			
		3	36.22			
		4	31.2			
		5	26.26			
		6	21.21			
		7	49.66			
CMT2-09	809.14	1	19.79	6" screen	763846.094500	929769.035200
		2	24.79			
		3	29.71			
		4	34.71			
		5	39.68			
		6	44.6			
		7	49.65			
CMT2-10	810.31	1	45.10	6" screen	763841.255700	929748.810700
		2	40.10			
		3	35.78			
		4	29.71			
		5	24.72			
		6	20.03			
		7	49.40			
CMT2-11	811.93	1	45.96	6" screen	763833.252700	929729.988900
		2	40.95			
		3	35.95			
		4	30.91			
		5	25.89			
		6	20.9			
		7	49.45			

Notes:
amsl = Above mean sea level
CMT = Continuous Multichannel Tubing
ft = Foot (feet)
ID = Identification
Shaded cells indicate CMT wells and ports proposed to be sampled during the Phase 1 groundwater sampling event.

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Table 2.
Monitoring Well Summary - Monitoring Wells and Piezometers

Well ID	Top of PVC elevation (ft amsl)	Northing	Easting	Total Depth from top of PVC (ft)	Screen Interval Depth (ft)
MW-1	809.71	763127.3793	929967.4283	25.28	9.0 - 24
MW-2	812.26	763599.5306	929906.2141	31.55	15 - 30
MW-4	817.25	763763.8804	929662.7387	27.32	14.5 - 29.5
MW-5	811.02	763867.3646	929843.8727	24.92	11.5 - 24.5
MW-6	809.15	763569.8605	929963.5108	49.91	39.5 - 49.5
MW-7	812.98	763821.6794	929763.2148	41.13	33.5 - 38.5
MW-8	806.84	764268.6054	929454.2582	47.38	40.5 - 45.5
MW-9	814.00	763624.08	929893.70	49.33	? - 45.5
MW-10	815.28	763995.6702	929814.2927	30.97	? - 28.2
MW-11	809.73	763466.4467	929819.9147	11.91	? - 11.7
MW-12	Not Surveyed			28	15-28
PZ-1D	809.03	763546.6201	929870.4784	60.17	--
PZ-1S	809.06	763546.6201	929870.4784	29.8	--

Notes:
amsl = Above mean sea level
ft = Foot (feet)
ID = Identification
MW = Monitoring Well
PVC = Polyvinyl chloride
PZ = Piezometer
Shaded cells indicate MWs proposed to be sampled during the Phase 1 groundwater sampling event.

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Figures

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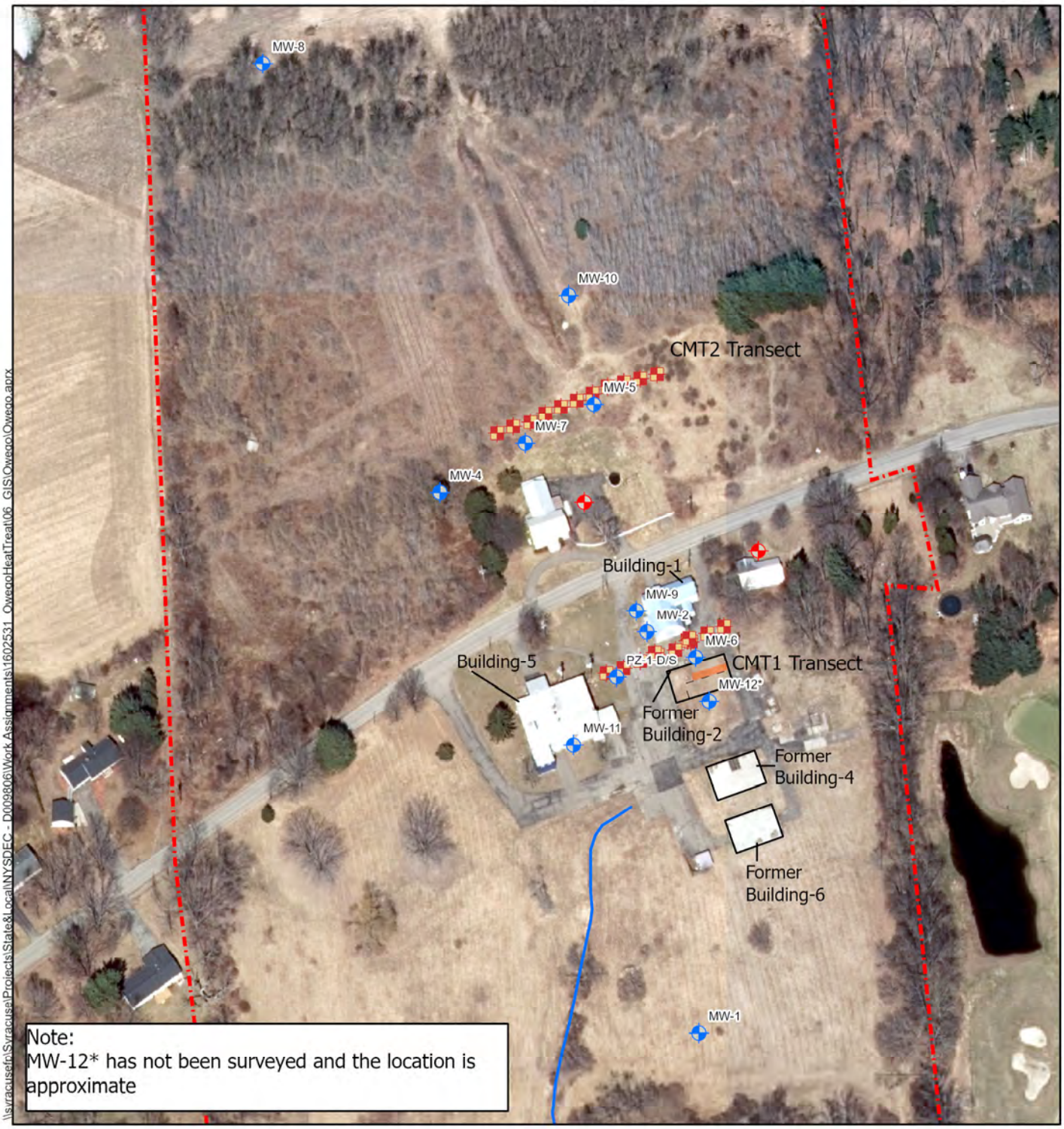

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0 50 100 200
Feet

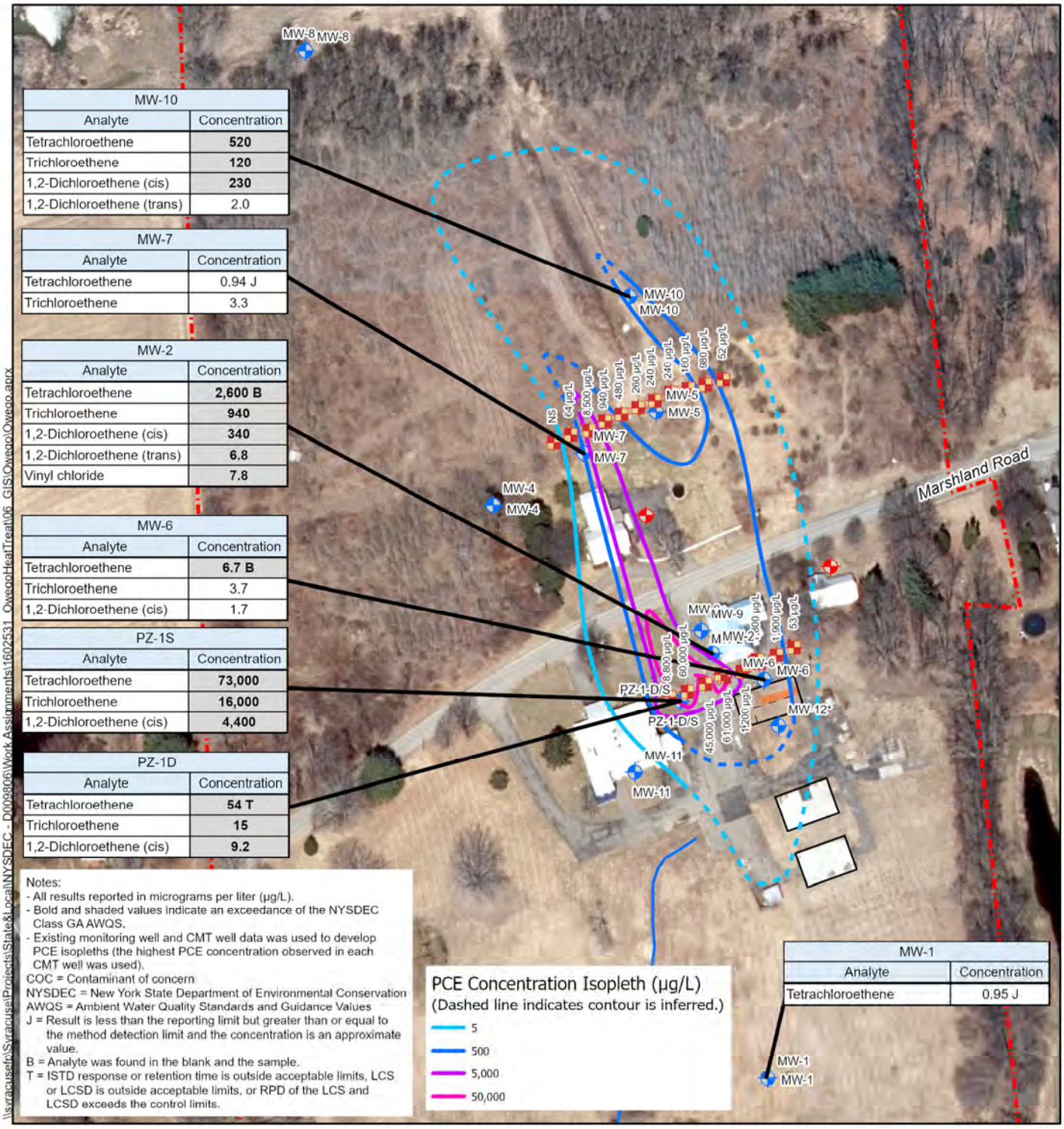
1:2,039

Legend

- Monitoring Well Location
- CMT Well Location
- Residential Well
- Former Pit Location
- Building-2 Original Limit
- Former Building Footprint
- Approximate Property Boundary

Map Date: 2/22/2023
Projection: NAD 1983 State Plane New York Central

Figure 1
Site Map and Existing Monitoring Well Network
Owego Heat Treat (Site No. 754011)
Apalachin, New York



MW-10	
Analyte	Concentration
Tetrachloroethene	**520**
Trichloroethene	**120**
1,2-Dichloroethene (cis)	**230**
1,2-Dichloroethene (trans)	2.0

MW-7	
Analyte	Concentration
Tetrachloroethene	0.94 J
Trichloroethene	3.3

MW-2	
Analyte	Concentration
Tetrachloroethene	**2,600 B**
Trichloroethene	**940**
1,2-Dichloroethene (cis)	**340**
1,2-Dichloroethene (trans)	**6.8**
Vinyl chloride	**7.8**

MW-6	
Analyte	Concentration
Tetrachloroethene	**6.7 B**
Trichloroethene	3.7
1,2-Dichloroethene (cis)	1.7

PZ-1S	
Analyte	Concentration
Tetrachloroethene	**73,000**
Trichloroethene	**16,000**
1,2-Dichloroethene (cis)	**4,400**

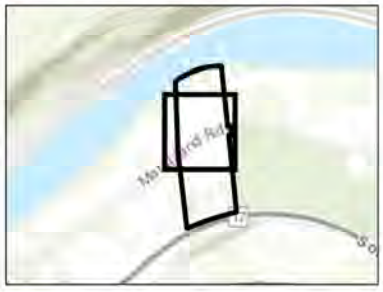
PZ-1D	
Analyte	Concentration
Tetrachloroethene	**54 T**
Trichloroethene	**15**
1,2-Dichloroethene (cis)	**9.2**

Notes:
- All results reported in micrograms per liter (µg/L).
- Bold and shaded values indicate an exceedance of the NYSDEC Class GA AWQS.
- Existing monitoring well and CMT well data was used to develop PCE isopleths (the highest PCE concentration observed in each CMT well was used).

COC = Contaminant of concern
NYSDEC = New York State Department of Environmental Conservation
AWQS = Ambient Water Quality Standards and Guidance Values
J = Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.
B = Analyte was found in the blank and the sample.
T = ISTD response or retention time is outside acceptable limits, LCS or LCSD is outside acceptable limits, or RPD of the LCS and LCSD exceeds the control limits.

PCE Concentration Isopleth (µg/L)
(Dashed line indicates contour is inferred.)
- 5
- 500
- 5,000
- 50,000

MW-1	
Analyte	Concentration
Tetrachloroethene	0.95 J



0 50 100 200
Feet
1:1,925

Legend
- Monitoring Well Location
- CMT Well Location
- Residential Well
- Former Pit Location
- Building-2 Original Limit
- Former Building Footprint
- Approximate Property Boundary

Map Date: 2/22/2023
Projection: NAD 1983 State Plane New York Central

Figure 2
Existing Monitoring Well COC Detections and PCE Isopleth Map - June 2016
Owego Heat Treat (Site No. 754011)
Apalachin, New York

Analyte	NYSDEC Class GA AWQS
Tetrachloroethene	5
Trichloroethene	5
1,2-Dichloroethene (cis)	5
1,2-Dichloroethene (trans)	5
Vinyl chloride	2

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0 50 100 200
Feet

N

1:4,264

Figure 3
Proposed Surface Water, Surface Soil, and Soil Gas Sampling Locations
Owego Heat Treat (Site No. 754011)
Apalachin, New York

Legend

- Proposed Surface Soil Sample Locations - 2 Intervals
- Proposed Surface Soil Sample Locations - 3 Intervals
- Proposed Surface Water Samples
- Proposed Soil Gas Points
- Approximate Property Boundary

Map Date: 2/22/2023
Projection: NAD 1983 State Plane New York Central

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Attachment A

Health and Safety Plan Addendum

(Forthcoming)

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Attachment B

Project Schedule

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Owego Heat Treat - Project Schedule

Project Name	Days	Start	End	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
Owego Heat Treat																					
Task 1 - Preliminary Activities																					
WA Issuance/NTP	0	24-Oct-22	24-Oct-22																		
Develop WA Package	57	24-Oct-22	20-Dec-22																		
NYS DEC Review of WA Package	24	20-Dec-22	13-Jan-23																		
WA Approval	0	**13-Jan-23**	**13-Jan-23**																		
Phase 1 Scoping Meeting with NYSDEC	1	**6-Feb-23**	**6-Feb-23**																		
Task 2 - RSO Investigation																					
Phase 1 RSO Investigation Work Plan	30	6-Feb-23	8-Mar-23																		
NYS DEC Review of Phase 1 Work Plan	14	8-Mar-23	22-Mar-23																		
Phase 1 Work Plan Revisions and Final Submittal	5	**22-Mar-23**	**27-Mar-23**																		
Phase 1.1 Field Activities: GW, SS, SW, SVI, and GPR Survey	25	6-Apr-23	1-May-23																		
Phase 1.2 Field Activities: MW Installation, development, sampling; PW sampling; SG	25	6-May-23	31-May-23																		
Phase 1.1 Field Activities: MW Installation and development	5	5-Jun-23	10-Jun-23																		
Phase 1 Laboratory Analysis and Data Validation	100	17-Apr-23	26-Jul-23																		
Phase 1 Tech Memo with Phase 2 Work Plan	20	26-Jul-23	15-Aug-23																		
NYS DEC Review of Tech Memo	10	15-Aug-23	25-Aug-23																		
Tech Memo Approval	0	**25-Aug-23**	**25-Aug-23**																		
Phase 2 Field Activities	25	1-Sep-23	26-Sep-23																		
Phase 2 Laboratory Analysis and Data Validation	60	26-Sep-23	25-Nov-23																		
Task 2 - RSO Evaluation and Report																					
Develop Draft RSO Report	60	26-Oct-23	25-Dec-23																		
NYSDEC Review of Draft RSO	30	25-Dec-23	24-Jan-24																		
Revise Draft Submit Final RSO Report	14	24-Jan-24	7-Feb-24																		
NYSDEC Approval of Final RSO	14	7-Feb-24	21-Feb-24																		

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Attachment C

Field Forms

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Structure Sampling Questionnaire and Building Inventory

New York State Department of Environmental Conservation

Site Name: _____ Site Code: _____ Operable Unit: _____

Building Code: _____ Building Name: _____

Address: _____ Apt/Suite No: _____

City: _____ State: _____ Zip: _____ County: _____

Contact Information

Preparer's Name: _____ Phone No: _____

Preparer's Affiliation: _____ Company Code: _____

Purpose of Investigation: _____ Date of Inspection: _____

Contact Name: _____ Affiliation: _____

Phone No: _____ Alt. Phone No: _____ Email: _____

Number of Occupants (total): _____ Number of Children: _____

☐ Occupant Interviewed? ☐ Owner Occupied? ☐ Owner Interviewed?

Owner Name (if different): _____ Owner Phone: _____

Owner Mailing Address: _____

Building Details

Bldg Type (Res/Com/Ind/Mixed): _____ Bldg Size (S/M/L): _____

If Commercial or Industrial Facility, Select Operations:

If Residential Select Structure Type:

Number of Floors: _____ Approx. Year Construction: _____ ☐ Building Insulated? ☐ Attached Garage?

Describe Overall Building 'Tightness' and Airflows(e.g., results of smoke tests):

Foundation Description

Foundation Type: _____ Foundation Depth (bgs): _____ Unit: FEET

Foundation Floor Material: _____

Foundation Wall Material: _____

Foundation Floor Thickness: _____

Foundation Wall Thickness: _____ Unit: INCHES

☐ Floor penetrations? Describe Floor Penetrations: _____

☐ Wall penetrations? Describe Wall Penetrations: _____

Basement is: _____ Basement is: _____ ☐ Sumps/Drains? Water In Sump?: _____

Describe Foundation Condition (cracks, seepage, etc.) : _____

☐ Radon Mitigation System Installed? ☐ VOC Mitigation System Installed? ☐ Mitigation System On?

Heating / Cooling / Ventilation Systems

Heating System: _____ Heat Fuel Type: _____ ☐ Central A/C Present?

Vented Appliances

Water Heater Fuel Type: _____ Clothes Dryer Fuel Type: _____

Water Htr Vent Location: _____ Dryer Vent Location: _____

Structure Sampling Questionnaire and Building Inventory

New York State Department of Environmental Conservation

PRODUCT INVENTORY

Building Name: _____ Bldg Code: _____ Date: _____

Bldg Address: _____ Apt/Suite No: _____

Bldg City/State/Zip: _____

Make and Model of PID: _____ Date of Calibration: _____

Location	Product Name/Description	Size (oz)	Condition *	Chemical Ingredients	PID Reading	COC Y/N?
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐

* Describe the condition of the product containers as **Unopened (UO)**, **Used (U)**, or **Deteriorated (D)**

** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

Product Inventory Complete? ☐ Were there any elevated PID readings taken on site? ☐ ☐ Products with COC?

Structure Sampling Questionnaire and Building Inventory

New York State Department of Environmental Conservation

Site Name: _____ Site Code: _____ Operable Unit: _____

Building Code: _____ Building Name: _____

Address: _____ Apt/Suite No: _____

City: _____ State: _____ Zip: _____ County: _____

Factors Affecting Indoor Air Quailty

Frequency Basement/Lowest Level is Occupied?: _____ Floor Material: _____

☐ Inhabited? ☐ HVAC System On? ☐ Bathroom Exhaust Fan? ☐ Kitchen Exhaust Fan?

Alternate Heat Source: _____ ☐ Is there smoking in the building?

☐ Air Fresheners? Description/Location of Air Freshener: _____

☐ Cleaning Products Used Recently?: Description of Cleaning Products: _____

☐ Cosmetic Products Used Recently?: Description of Cosmetic Products: _____

☐ New Carpet or Furniture? Location of New Carpet/Furniture: _____

☐ Recent Dry Cleaning? Location of Recently Dry Cleaned Fabrics: _____

☐ Recent Painting/Staining? Location of New Painting: _____

☐ Solvent or Chemical Odors? Describe Odors (if any): _____

☐ Do Any Occupants Use Solvents At Work? If So, List Solvents Used: _____

☐ Recent Pesticide/Rodenticide? Description of Last Use: _____

Describe Any Household Activities (chemical use,/storage, unvented appliances, hobbies, etc.) That May Affect Indoor Air Quality:

☐ Any Prior Testing For Radon? If So, When?: _____

☐ Any Prior Testing For VOCs? If So, When?: _____

Sampling Conditions

Weather Conditions: _____ Outdoor Temperature: _____ °F

Current Building Use: _____ Barometric Pressure: _____ in(hg)

Product Inventory Complete? _____ ☐ Building Questionnaire Completed?

Structure Sampling Questionnaire and Building Inventory

New York State Department of Environmental Conservation

Building Code: _____ Address: _____

Sampling Information

Sampler Name(s): _____ Sampler Company Code: _____

Sample Collection Date: _____ Date Samples Sent To Lab: _____

Sample Chain of Custody Number: _____ Outdoor Air Sample Location ID: _____

SUMMA Canister Information

Sample ID:					
Location Code:					
Location Type:					
Canister ID:					
Regulator ID:					
Matrix:					
Sampling Method:					

Sampling Area Info

Slab Thickness (inches):					
Sub-Slab Material:					
Sub-Slab Moisture:					
Seal Type:					
Seal Adequate?:	☐	☐	☐	☐	☐

Sample Times and Vacuum Readings

Sample Start Date/Time:					
Vacuum Gauge Start:					
Sample End Date/Time:					
Vacuum Gauge End:					
Sample Duration (hrs):					
Vacuum Gauge Unit:					

Sample QA/QC Readings

Vapor Port Purge:	☐	☐	☐	☐	☐
Purge PID Reading:					
Purge PID Unit:					
Tracer Test Pass:	☐	☐	☐	☐	☐

Sample start and end times should be entered using the following format: MM/DD/YYYY HH:MM

Structure Sampling Questionnaire and Building Inventory

New York State Department of Environmental Conservation

LOWEST BUILDING LEVEL LAYOUT SKETCH

Please click the box with the blue border below to upload a sketch of the lowest building level .
The sketch should be in a standard image format (.jpg, .png, .tiff)

Clear Image

Design Sketch

Design Sketch Guidelines and Recommended Symbology

- Identify and label the locations of all sub-slab, indoor air, and outdoor air samples on the layout sketch.
- Measure the distance of all sample locations from identifiable features, and include on the layout sketch.
- Identify room use (bedroom, living room, den, kitchen, etc.) on the layout sket
- Identify the locations of the following features on the layout sketch, using the appropriate symbols:

B or **F**	Boiler or Furnace	o	Other floor or wall penetrations (label appropriately)
HW	Hot Water Heater	**xxxxxxx**	Perimeter Drains (draw inside or outside outer walls as appropriate)
FP	Fireplaces	**######**	Areas of broken-up concrete
WS	Wood Stoves	● SS-1	Location & label of sub-slab samples
W/D	Washer / Dryer	● IA-1	Location & label of indoor air samples
S	Sumps	● OA-1	Location & label of outdoor air samples
@	Floor Drains	● PFET-1	Location and label of any pressure field test holes.

Structure Sampling Questionnaire and Building Inventory

New York State Department of Environmental Conservation

FIRST FLOOR BUILDING LAYOUT SKETCH

Please click the box with the blue border below to upload a sketch of the first floor of the building.
The sketch should be in a standard image format (.jpg, .png, .tiff)

Clear Image

Design Sketch

Design Sketch Guidelines and Recommended Symbology

- Identify and label the locations of all sub-slab, indoor air, and outdoor air samples on the layout sketch.
- Measure the distance of all sample locations from identifiable features, and include on the layout sketch.
- Identify room use (bedroom, living room, den, kitchen, etc.) on the layout sket
- Identify the locations of the following features on the layout sketch, using the appropriate symbols:

B or **F**	Boiler or Furnace	o	Other floor or wall penetrations (label appropriately)
HW	Hot Water Heater	**xxxxxxx**	Perimeter Drains (draw inside or outside outer walls as appropriate)
FP	Fireplaces	**######**	Areas of broken-up concrete
WS	Wood Stoves	● SS-1	Location & label of sub-slab samples
W/D	Washer / Dryer	● IA-1	Location & label of indoor air samples
S	Sumps	● OA-1	Location & label of outdoor air samples
@	Floor Drains	● PFET-1	Location and label of any pressure field test holes.

Structure Sampling Questionnaire and Building Inventory

New York State Department of Environmental Conservation

OUTDOOR PLOT LAYOUT SKETCH

Please click the box with the blue border below to upload a sketch of the outdoor plot of the building as well as the surrounding area. The sketch should be in a standard image format (.jpg, .png, .tiff)

Clear Image

Design Sketch

Design Sketch Guidelines and Recommended Symbology

- Identify and label the locations of all sub-slab, indoor air, and outdoor air samples on the layout sketch.
- Measure the distance of all sample locations from identifiable features, and include on the layout sketch.
- Identify room use (bedroom, living room, den, kitchen, etc.) on the layout sket
- Identify the locations of the following features on the layout sketch, using the appropriate symbols:

B or **F**	Boiler or Furnace	o	Other floor or wall penetrations (label appropriately)
HW	Hot Water Heater	**xxxxxxx**	Perimeter Drains (draw inside or outside outer walls as appropriate)
FP	Fireplaces	**######**	Areas of broken-up concrete
WS	Wood Stoves	● SS-1	Location & label of sub-slab samples
W/D	Washer / Dryer	● IA-1	Location & label of indoor air samples
S	Sumps	● OA-1	Location & label of outdoor air samples
@	Floor Drains	● PFET-1	Location and label of any pressure field test holes.

FIELD AIR SAMPLING FORM

EA Engineering and Its Affiliate EA Science & Technology 269 W Jefferson St Syracuse, NY 13202	Project #: 1602531 Project Name: NYSDEC - Owego Heat Treat Location: Apalachin, NY Project Manager: Megan Miller

Sample Location Information:

Site ID Number: 633053				Sampler(s):	
PID Meter Used: (Model, Serial #)				Building I.D. No.:	

SUMMA Canister Record:

SUBLAB SOIL GAS DUPLICATE		INDOOR AIR - BASEMENT		SUBSLAB SOIL GAS		OUTDOOR AIR	
Flow Regulator No.:		Flow Regulator No.:		Flow Regulator No.:		Flow Regulator No.:	
Canister Serial No.:		Canister Serial No.:		Canister Serial No.:		Canister Serial No.:	
Start Date/Time:		Start Date/Time:		Start Date/Time:		Start Date/Time:	
Start Pressure: (inches Hg)		Start Pressure: (inches Hg)		Start Pressure: (inches Hg)		Start Pressure: (inches Hg)	
Stop Date/Time:		Stop Date/Time:		Stop Date/Time:		Stop Date/Time:	
Stop Pressure: (inches Hg)		Stop Pressure: (inches Hg)		Stop Pressure: (inches Hg)		Stop Pressure: (inches Hg)	
Sample ID:		Sample ID:		Sample ID:		Sample ID:	

Other Sampling Information:

Basement or Crawl Space?		Story/Level		Basement or Crawl Space?		Direction from Building	
Floor Slab Thickness (inches) *[if present]*		Room		Floor Slab Thickness (inches) *[if present]*		Distance from Building	
Potential Vapor Entry Points Observed?		Indoor Air Temp		Potential Vapor Entry Points Observed?		Intake Height Above Ground Level (ft.)	
Ground Surface Condition (Crawl Space Only)		Barometric Pressure?		Ground Surface Condition (Crawl Space Only)		Intake Tubing Used?	
If slab, intake Depth If Crawl Space, intake height		Intake Height Above Floor Level (ft.)		If slab, intake Depth If Crawl Space, intake height		Distance to nearest Roadway	
Noticeable Odor?		Noticeable Odor?		Noticeable Odor?		Noticeable Odor?	
PID Reading (ppb)		PID Reading (ppb)		PID Reading (ppb)		PID Reading (ppb)	
Duplicate Sample?		Duplicate Sample?		Duplicate Sample?		Duplicate Sample?	

Comments:

Sampler Signature:

EA Engineering, P.C. and Its Affiliate
EA Science and Technology

MONITORING WELL PURGE/DEVELOPMENT LOG

Well I.D.:	**EA Personnel:**	**Client:** NYSDEC
Location: Owego Heat Treat Site, Apalachin, NY	**Well Condition:**	**Weather:**
Sounding Method:	**Gauge Date:**	**Measurement Ref:**
	Gauge Time:	
Stick Up/Down (ft):	**PID Headspace Reading:**	**Well Diameter (in):**

Purge Date:	**Purge Time:**
Purge Method:	**Field Technician:**

Well Volume

A. Well Depth (ft):	**D. Well Volume (ft):**	**Depth/Height of Top of PVC:**
B. Depth to Water (ft):	**E. Well Volume (gal) C*D):**	**Pump Type:**
C. Liquid Depth (ft) (A-B):	**F. Three Well Volumes (gal) (E3):**	**Pump Intake Depth:**

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (mS/cm)	Turbidity (ntu)	DO (mg/L)	Temperature (^{o}C)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)

Total Quantity of Water Removed (gal): _____ **Personnel:** _____

COMMENTS AND OBSERVATIONS: _____

EA Engineering, P.C. and Its Affiliate
EA Science and Technology

SOIL BORING LOG

Coordinates: Northing _____ Easting: _____
Surface Elevation: _____
Casing Below Surface: _____
Reference Elevation: _____
Reference Description: _____

Job. No.	**Client:** NYSDEC	**Location:**
	Project: Owego Heat Treat Site	Apalachin, NY
Drilling Method:		**Soil Boring Number:**
Sampling Method:		**Sheet 1 of**

					Drilling	
Water Level:					**Start**	**Finish**
Time:					DATE	DATE
Date:					TIME	TIME

Surface Conditions:
Weather:
Temperature:

Blow Counts (140-lb)	Ft. Driven/ Ft. Record	Boring Diagram	PID (ppm)	Depth in Feet	USCS Log
				0	
				1	
				2	
				3	
				4	
				5	
				6	
				7	
				8	
				9	
				10	
				11	
				12	
				13	
				14	
				15	
				16	
				17	
				18	
				19	
				20	
				21	
				22	
				23	
				24	
				25	
				26	
				27	
				28	
				29	

Monitoring Well Construction Information

Monitoring Well Diameter: _____ in
Bottom of Monitoring Well: _____ ft bgs
Stick Up or Flush Mount: _____
Screen Interval: _____ To _____ ft bgs
Riser Interval: _____ To _____ ft bgs
Sand Pack Interval: _____ To _____ ft bgs
Bentonite Seal: _____ To _____ ft bgs
Grout Interval: _____ To _____ ft bgs

Soil Vapor Point Installation Information

Depth of Soil Vapor Point: _____ ft
Bottom of Tubing: _____ ft
Top of Sand Pack: _____ ft
Top of Bentonite Seal: _____ ft

Logged by: _____ Date: _____
Drilling Contractor: _____ Driller: _____

FIELD SOIL VAPOR SAMPLING FORM

EA Engineering, P.C. and Its Affiliate EA Science and Technology **SOIL VAPOR SAMPLING LOG**	Project #:	1602531
	Project Name:	Owego Heat Treat Site
	Location:	Apalachin, NY
	Project Manager:	Megan Miller

Sample Location Information:

Site ID Number:				Sampler(s):	
PID Meter Used (Model, Serial #) :				Soil Vapor I.D. No.:	

SUMMA Canister Record:

SOIL VAPOR POINT		DUPLICATE SAMPLE (IF COLLECTED)	
Flow Regulator No.:		Flow Regulator No.:	
Canister Serial No.:		Canister Serial No.:	
Start Date/Time:		Start Date/Time:	
Start Pressure: (inches Hg)		Start Pressure: (inches Hg)	
Stop Date/Time:		Stop Date/Time:	
Stop Pressure: (inches Hg)		Stop Pressure: (inches Hg)	
Sample ID:		Sample ID:	

Other Sampling Information:

Helium percentage achieved in enclosure for Tracer Gas Test:		Depth to sample point:	
Tracer Gas test result (% of Helium):		Nearest Groundwater Elevation:	
Noticeable Odor?		Additional info:	
Purge Volume PID Reading (ppb)			
Duplicate Sample?			
Outdoor Ambient Temperature:			
Wind Direction:			

Comments:

Sampler Signature:

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EA Engineering, P.C. and Its Affiliate
EA Science and Technology

SURFACE SOIL SAMPLING LOG

Coordinates: Northing: _____ Easting: _____
Surface Elevation: _____
Reference Elevation: _____
Reference Description: _____

Job. No.	Client: NYSDEC	Location
	Project: Owego Heat Treat	Apalachin, NY

Sampling Location Description:

Sample Location ID:

Sheet 1 of 1

Sampling Date/Time

Sample Method:	Start	Finish
	DATE TIME	DATE TIME

Surface Conditions:
Weather:
Temperature:

Sample Interval (in.)	PID (ppm)	TCL VOCs	TCL SVOCs	TCL Metals	TCL PCBs/ Pesticides	USCS Log	

Logged by: _____ **Date:** _____

Sample Interval: _____ **Time:** _____

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SURFACE WATER SAMPLE LOG

Job. No.	**Client:** NYSDEC **Project:** Owego Heat Treat	**Location**	Apalachin, NY
Sampling Location Description:		**Sample Location ID:**	
		Sheet 1 of 1	
Sample Method:			
Depth of Water Body:		**Sampling Date/Time**	
Width of Water Body:		**Start**	**Finish**
Water Body Location		DATE	DATE
		TIME	TIME

Coordinates: Northing: Easting:
Surface Water Elevation:
Reference Elevation:
Reference Description:

	Water Quality Parameters							
	Time (hrs)	pH (pH units)	Cond. (mS/cm)	Turb. (ntu)	DO (mg/L)	Temp (°C)	ORP (mV)	Surface Conditions: Weather: Description of Surface Water

Total Quantity of Water Removed (gal):
Samplers:
Sampling Date:

Sampling Time:
Split Sample With:
Sample Type: