New York Twist Drill OU-2
OFF-SITE
SUFFOLK COUNTY, NEW YORK

Site Management Plan

NYSDEC Site Number: 1-52-169

Prepared for:
Respondents
Drico Corporation
Robert, Mark and Jeffrey Hammer
and Suzanne Eliot
Order on Consent
Index Number W1-0998-04-04

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Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date
2	12/3/2015	Address DEC Comments	
3	1/20/2016	Finalize Document	

Certification Statement
Site Management Plan

I, Gregory Shkuda, PhD. Certify that I am currently a Qualified Environmental Professional and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with DER Technical Guidance for Site Investigation and Remediation (DER-10)

Gregory K. Shkuda, PhD

1-19-2016

Date

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1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 INTRODUCTION

This document is required as an element of the remedial program the New York Twist Drill OU-2 Off-Site (hereinafter referred to as the “Site”) under the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program administered by New York State Department of Environmental Conservation (NYSDEC). The Site was investigated by Respondents, Drico Corporation; Robert, Mark and Jeffrey Hammer and Suzanne Eliot (hereafter “Respondents”), in accordance with Order on Consent Index # W1-0998-04-04, Site #1-52-169, which was executed on November 16, 2004.

1.1.1 General

Respondents entered into the Order on Consent with the NYSDEC to investigate and remediate contaminated media off-site of New York Twist Drill. A figure showing the location and boundaries of the area subject to this plan is provided in Figure 1 (hereafter OU-2 Off-Site Area).

After completion of the Remedial Investigation/Feasibility Study (RI/FS) for OU-2 Off-Site Area, groundwater contamination remained in the subsurface at the OU-2 Off-Site Area, which is hereafter referred to as “remaining contamination.” This Site Management Plan (SMP) was prepared to address monitoring of the remaining contamination in the OU-2 Off-Site Area as required in the NYSDEC January 15, 2015, Record of Decision (ROD). All reports associated with the OU-2 Off-Site Area can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by ERM Consulting & Engineering, Inc., on behalf of Respondents, in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, dated May, 2010, and the guidelines provided by NYSDEC. This SMP addresses the implementation of the Monitoring Activities that are required by the New York Twist Drill OU-2 Off-Site Contamination ROD dated January 15, 2015.

1.1.2 Purpose

The OU-2 Off-Site Area is limited to groundwater contamination that was defined in the RI. The FS identified remedial alternatives to address the OU-2 contaminants, one of which – “No Further Action” - was selected in the ROD. Monitoring requirements have been incorporated into the OU-2 Off-Site Area remedy to control exposure to remaining contamination in the OU-2 Off-Site Area to ensure protection of public health and the environment. This SMP specifies the monitoring methods necessary to ensure compliance with the ROD. This plan has been approved by the NYSDEC, and compliance with this plan is required by Respondents and their successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

This SMP provides a detailed description of all procedures required to manage remaining contamination in the OU-2 Off-Site area including: media monitoring and submittal of Periodic Review Reports.

To address these needs, this SMP includes: a Monitoring Plan for implementation of Site Monitoring of impacted media and a description of Periodic Review Reports for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the Order on Consent (Index #W1-0998-04-04; Site #152169) for the OU-2 Off-Site Area, and thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. The NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.2 SITE BACKGROUND

1.2.1 Site Location and Description

The Site is located in the Melville, County of Suffolk, New York. The OU-2 Off-Site Area is an approximately 100-acre area bounded by Melville Park Road to the north, Ruland Road to the south, with a west to east width ranging from 1,500 feet on the northern edge to 1,050 feet on the southern (see Figure 3).

1.2.2 Site History

The former New York Twist Drill Site ("Former NYTD Site or OU-1") is located at 25 Melville Park Road in a large commercial/industrial area immediately south of the Long Island Expressway in Melville, New York. The main facility feature is a two-story office building. Paved parking lots are located to the east and north of the building and a grass lawn is located to the south. Current Zoning/Use(s): Commercial.

The former NYTD Site is zoned for commercial use and currently used for offices. The Form NYTD Site was initially developed in 1966 and occupied by the New York Twist Drill Company (NYTD) until 1984. NYTD manufactured carbon steel and other hardened metal twist drills. Operations included heat treatment with salt baths, nitriding, and vapor degreasing with chlorinated solvents. A State Pollutant Discharge Elimination System (SPDES) permit was in place from the mid-1960s to early 1980s, which permitted discharging industrial wastewater from Site operations to the environment. In 1985, the building was converted into a two-story office complex.

OU-1 covers on-Site activities for this Class 2 site which are being undertaken under the Voluntary Cleanup Program (Site number V00128) by the current Site owners. Remedial actions are being performed at the Former NYTD Site to address contamination and prevent the migration of contamination off-Site in accordance with the ROD for OU-

1, dated March, 2004. Remedial actions include reductive dechlorination, free-phase product removal and a vapor control system. OU-2 covers off-Site activities, which were conducted by Drico Corporation and Robert, Mark, and Jeffery Hammer, and Suzanne Eliot under the State Superfund Program. A ROD, dated January 15, 2015, selected "A No Further Action" with groundwater and vapor monitoring Remedy for the Off-Site contamination. This Site Management Plan was prepared to satisfy the requirements of the ROD which requires Site management activities to evaluate the performance of the OU-1 remedy on Off-Site Conditions. A detailed report on the investigation of the Off-Site contamination may be found in the Remedial Investigation/Feasibility Study, dated September 2014.

1.2.3 Geologic Conditions

Glacial deposits consisting of stratified sand and gravel are present from the surface to a depth of approximately 100 feet. The Magothy formation underlies the glacial deposits and consists of fine grained sand with interbedded layers of clayey sand, silty sand, and clay. Groundwater is approximately 45 feet below ground surface and flows southeast.

A geologic section is shown in Figure 2.

A groundwater flow figure is shown in Figure 3.

1.3 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

A Remedial Investigation (RI) was performed to characterize the nature and extent of contamination at the OU-2 Off-Site Area. The results of the RI are described in detail in the following reports:

New York Twist Drill
OU-2 Off-Site Remedial Investigation
September 2014

Generally, the RI determined that the primary contaminants of concern for OU-2 include tetrachlorethene (PCE), trichloroethene (TCE), cis-1,2-Dichloroethene (DCE), trans-1,2-dichloroethene, 1,1 dichloroethene, 1,1,1-trichloroethane and 1,1-

dichloroethane. Table 1 and Figure 4 show a summary of the remedial investigation groundwater sampling results.

PCE and its associated degradation products TCE and DCE, considered the primary contaminants, were detected above the groundwater standard of 5 parts per billion. In 2012, the leading edge of the PCE contamination was detected approximately 4,600 feet downgradient of the former NYTD Site along Ruland Road at a concentration of 180 parts per billion (ppb). However, a subsequent sample detected PCE at 23 ppb. The depth of contamination is approximately 50 feet below ground surface (bgs) at the northern boundary of the OU-2 Off-Site Area and descends to approximately 300 feet bgs south of Baylis Road (Figure 1). The width of the groundwater contamination plume is approximately 400 feet near Baylis Road where the highest detections of PCE (211 ppb) and DCE (286 ppb) were located. The detection of DCE within the plume at a greater concentration than PCE indicates that natural degradation of PCE is occurring, insofar as PCE is the primary contaminant detected on-Site and DCE is a known degradation product of PCE. Remedial activities conducted since 2003 at OU-1 have significantly reduced Site impacts to off-site groundwater. As a result groundwater conditions near the Former NYTD Site have improved and reduced the length of the plume to 4,300 feet. Groundwater contamination is attenuating further down-gradient of the Former NYTD Site demonstrated by low levels detected at the furthest monitoring well from the Former NYTD Site located along Ruland Road, the decreasing trend of contamination at the Former NYTD Site detected at ERM-MW-09 from 2008 to 2012 and the detection of the final degradation product of PCE, known as ethane/ethene, within the plume.

Below is a summary of OU-2 Site conditions documented during the performance of the RI in from 2005 - 2012:

Former NYTD Site-Related Groundwater

Remediation of the Former NYTD Site has been carried out by the creation of an “anaerobic in situ reductive zone (IRZ)” through the injection of a carbon substrate. The reducing zone is maintained by continued injection of the carbon substrate into the subsurface. The carbon substrate is used as a carbon source by soil bacteria. As the bacteria consume the carbon substrate, oxygen is depleted lowering the oxidation/reduction potential (ORP) of the injection zone, creating the IRZ. The bacteria that dechlorinate PCE are anaerobic and as the ORP and oxygen content of the subsurface decreases, dechlorination of PCE/TCE by these bacteria increases.

Enhanced reductive dechlorination at the Former NYTD Site was designed to remediate:

- on-Site sources of the downgradient plume; and
- enhance dense non-aqueous liquid (DNAPL) dissolution.

Review of OU-2 groundwater monitoring data indicates that the IRZ created on the Former NYTD Site was effective in reducing the concentrations of PCE/TCE leaving the Site. Specifically, in April 2007, (the first round of groundwater sampling) cis-1,2,-DCE was the VOC detected at highest concentration in the monitoring wells installed immediately across Melville Park Road from the Former NYTD Site. This observation suggested that the IRZ was effective in the dechlorination of PCE/TCE to cis-DCE, but complete dechlorination had not yet occurred. In contrast in 2006, when the vertical profiles in which these wells were installed, PCE was the VOC detected at highest concentration. Over time, the concentrations of the parent compounds (PCE/TCE) and daughter products (TCE/cis-1,2-DCE) have decreased at the former NYTD Site and "clean" i.e., non-impacted groundwater is leaving the former NYTD Site and replacing contaminated groundwater. By 2011, PCE and daughter products were no longer detected in along Melville Park Road. In 2010, the highest concentrations of VOCs in the plume were centered on Maxess Road and in 2011 the highest VOC concentrations were observed in the vicinity of the intersection of Baylis and of Maxess Roads. The cleanup of the plume is the result of:

- replacement of contaminated groundwater by "clean" groundwater downgradient of the Former NYTD Site;
- dechlorination of PCE/TCE downgradient of the Former NYTD Site by in-situ bacteria using the carbon source injected on the Former NYTD Site and/or organic carbon containing material known to be present in the Magothy Aquifer; and

- natural dilution/dispersion.

Former NYTD Site-Related Soil Vapor Intrusion

One structure down-gradient of the Former NYTD Site (10 Melville Park Road) has been evaluated for vapor intrusion. Sampling detected elevated PCE, TCE and DCE concentrations beneath the building, but has not detected PCE, TCE or DCE within the indoor air. In 2007, sub-slab soil vapor concentrations of PCE, TCE and DCE were detected at 1,010 micrograms per cubic meter (ug/m3), 67 ug/m3 and 14.6 ug/m3, respectively. Subsequent sub-slab soil vapor sampling in 2014 detected PCE up to 74 ug/m3, but TCE and DCE were not detected. Clean groundwater is located above the zone of contaminated groundwater southeast (downgradient) of the Former NYTD Site; therefore, soil vapor will not be impacted by groundwater contamination. A summary of the 2007 and 2014 vapor intrusion sample results can be found in Table 2 and Figure 5.

2.0 SITE MONITORING PLAN

2.1 INTRODUCTION

2.1.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the OU-1 remedy on off-site conditions. This Monitoring Plan may only be revised with the approval of NYSDEC.

2.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air and sub-slab soil vapor);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards;
- Assessing achievement of the remedial performance criteria;
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);
- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Annual monitoring of the performance of the OU-1 remedy and overall reduction in contamination in the OU-2 Off-Site Area will be conducted. Trends in contaminant levels in groundwater and soil vapor monitoring in the OU-2 Off-Site Area will be evaluated to determine if the OU-1 remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in the table below and outlined in detail in Sections 2.2 and 2.3 below. All work will be conducted in accordance with the procedures defined in the Health and Safety Plan (HASP) prepared for the Site. The HASP can be found in Appendix A.

Monitoring/Inspection Schedule

Monitoring Program	Frequency*	Matrix	Analysis
Vapor Intrusion	Annual	Soil Vapor/Indoor Air/Ambient Air	TO-15
Groundwater	Annual	Groundwater	USEPA SW-846 Method 8260B
Well Installation Records Review	Annual	Groundwater	NA

* The frequency and duration of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH

2.2 MEDIA MONITORING PROGRAM

The media to be monitored as part of this Site Management Plan are described below.

2.2.1 Vertical Profile Installation

Two Vertical Profile Borings (VPBs), located on Ruland Road near the intersection with Maxess Road, will be drilled using mud rotary drilling techniques to a total depth of 400-feet below grade surface (bgs) at the locations shown on Figure **6.** These VPBs will complete the fourth transect and define the lateral plume extent at the downgradient plume boundary. Geologic samples will be collected every 10-feet using a split-barrel core sampler (split spoon) starting at the top of the borehole and groundwater samples will be collected every 10-feet starting at the water table using a hydro punch. Collection of both types of samples will be to the total depth of the boring hole. A slide hammer will be used to drive the split spoon and hydro punch into the substrate and on the hydro punch to open the screen to the formation water. A period of 30 minutes will be allowed for formation groundwater to flow into the hydro punch. After the 30-minute period has elapsed, the hydro punch sampler will be withdrawn from the borehole and the groundwater collected in the sampler will be poured into three 40 milliliter (ml) vials for shipment to the analytical laboratory. If poor recovery is experienced, increased collection times will be increased to obtain samples. All geologic samples will be screened with a Photoionization Detector equipped instrument (PID) and logged using the Unified Soil Classification System (USCS). The PID and USCS logged soil descriptions will be recorded in the field book for all samples collected. The groundwater water samples will be analyzed for volatile organic compounds (VOCs) using USEPA SW-846 Method 8260C on an accelerated basis to permit selection of the screen zone. All drill cuttings will be containerized and disposed of at an approved facility in accordance with all local and state regulations.

2.2.2 Monitoring Well Construction – Deep Well

A monitoring well will then be constructed, with the well screened in the zone exhibiting the highest concentrations of VOCs. The monitoring well will be constructed of 2-inch ID Schedule 40 threaded flush joint polyvinyl chloride (PVC) casing with 0.010-inch slot PVC well screen. A sand pack consisting of Morie #2 grade sand will be used to fill the annular space between the well screen and the borehole wall to approximately 2-feet above the well screen. Following placement of the well screen sand pack, a fine sand barrier consisting of Morie #00 sand will be placed between the Morie #2 sand and the bentonite well seal to prevent grout from entering the san pack. A bentonite seal will extend 5’feet from the top of the Morie #00 layer. Unless a second well is constructed in the same borehole, the remainder of the borehole annulus will be filled with a high solids bentonite grout to within 4-inches of land surface. The well will be finished with a 6-inch diameter flush mounted steel well vault and locking cover. A 1-inch piezometer will also be installed at the groundwater table in the same borehole as the monitoring well to facilitate modeling groundwater flow direction.

2.2.3 Monitoring Well Construction – Shallow Well

If the vertical profiling data indicate that a second interval should be monitored, a second monitoring may be constructed in the same borehole. The second shallow well will be constructed of 1-inch ID Schedule 40 threaded flush joint polyvinyl chloride (PVC) casing with 0.010-inch slot PVC well screen. High solids bentonite grout will be used to fill the borehole starting above the bentonite seal of the first “deeper” well. The bentonite solids will extend to within 5-feet of the interval to be monitored in the second well. The 1-inch diameter well screen and riser will then be placed in the borehole and a sand pack consisting of Morie #2 grade sand will be used to fill the annular space between the well screen and the borehole wall to approximately 2-feet above the well screen. Following placement of the well screen sand pack, a fine sand barrier consisting of Morie #00 sand will be placed between the Morie #2 sand and the bentonite well seal to prevent grout from entering the san pack. A bentonite seal will extend 5’feet from the top of the Morie #00 layer. The remainder of the borehole annulus will be filled with a high solids bentonite grout to within 4-inches of land surface The well will be finished with a 6-inch diameter flush mounted steel well vault and locking cover. The well will be finished with a 6-inch diameter flush mounted steel well vault and locking cover.

2.2.4 Monitoring Well Development

After construction, the well will be developed by air-lift method to ensure the removal of any drilling fluids and to restore the hydraulic properties of the surrounding formation. The well will be developed to remove at a minimum, the volume of water introduced during drilling, and to the point that the turbidity of the recovered well water is less than 50 NTUs. Well development monitoring will be supplemented by measurement of the development water for pH, conductivity, Oxidation Reduction Potential (ORP) and temperature that will be within 10 percent for a minimum of three consecutive measurements before development is considered complete. After the well is constructed and developed, its horizontal and vertical location will be established by a New York State Licensed surveyor.

2.2.5 Groundwater Monitoring in the OU-2 Off-Site Area

Groundwater monitoring will be performed in the OU-2 Off-Site Area on an annual basis to assess the performance of the OU-1 remedy.

A network of new and existing monitoring wells has been identified to monitor both up-gradient and down-gradient groundwater conditions in the OU-2 Off-Site Area. The network of monitoring wells was identified based on the following criteria:

- Groundwater Flow; and
- Groundwater concentrations for compounds of concern

After the installation of the two VPBs/monitoring wells, the two new wells (ERM-MW-13 and ERM-MW-14) and existing monitoring wells ERM-MW-01, ERM-MW-02D, ERM-MW-05, ERM-MW-09, ERM-MW-11A, ERM-MW-11B, ERM-MW-11C, ERM-MW-12S and ERM-MW-12M will be sampled on a yearly basis to assess the effectiveness of the remedy at the Former NYTD Site on the off-site groundwater (OU-2) including any changes in the plume configuration. All monitoring wells will be gauged prior to sampling to determine groundwater flow direction. Figure 6 shows the proposed and existing monitoring well network and Table 3 summarizes existing monitoring well construction details.

The sampling frequency may be modified with the approval NYSDEC. The SMP will be modified to reflect changes in sampling plans approved by NYSDEC.

Deliverables for the groundwater monitoring program are specified below.

2.2.5.1 Sampling Protocol

All monitoring well sampling activities will be recorded in a field book and a groundwater-sampling. Other observations (e.g., well integrity, etc.) will be noted on the well sampling log. The well sampling log will serve as the inspection form for the groundwater monitoring well network.

Samples will be collected using passive diffusion sampling methods. Prior to sample collection, the elevation of the water table will be determined and recorded for each of the wells sampled.

The passive diffusion bags (PDBs) will be hung in the wells on stainless-steel tethers with the PDB centered in the wells screen. The PDBs will be allowed to equilibrate for a period of two weeks. The PDBs will be removed from the wells; the equilibrated groundwater will be poured into 40-milliliter (ml) sampling vials and analyzed for VOCs using USEPA SW-846 Method 8260C by an ELAP certified laboratory with category B deliverables.

2.2.5.2 Monitoring Well Repairs, Replacement and Decommissioning

If biofouling or silt accumulation occurs in the OU-2 Off-Site Area monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (as per the Monitoring Plan), if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

2.2.6 Vapor Intrusion Monitoring

Vapor Intrusion Sampling will be carried out annually at 10 Melville Park Road (assuming access is granted) to ensure that: soil vapor VOC concentrations are decreasing as a result of the continuing On-Site clean up at 25 Melville Park Road and that Indoor VOC concentrations are below New York Department of Health (NYSDOH) Guidance Values. Two sub-slab soil vapor, one outdoor and a ground floor indoor air sample, will be collected from 10 Melville Park Road (Marcum, LLP), an office building located on the south side of Melville Park Road from the former NYTD Site.

The 10 Melville Park building, which is slab on grade construction, has a very small footprint actually resting on the ground surface. The portion of the building that rests on the ground surface is the building lobby, elevator shafts and reception area, with the remainder of the tenant space on floors two and three above the lobby/reception area. In essence, the building resembles a “T” with the small vertical arm resting on the ground surface. A parking area is located under the first floor at grade level. With the consent of Property Owner, the sub-slab soil vapor samples will be collected from beneath the ground floor slab in a closet and a storage room and adjacent to the building outdoors. If still in place, the soil vapor sampling ports installed in the closet and store room will be used to collect the sub-slab samples. If these ports have been removed or are damaged, a new set will be installed. The ground floor indoor air sample will be collected from with the lobby area. An ambient air sample will collected outside of the building under the overhang of the canopy.

2.2.6.1 Sampling Protocol

The sampling will be carried out using the methodologies presented in the New York State Department of Health document entitled Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October, 2006. Prior to sub-slab sample collection, one to three volumes of air will be purged from the probe line and a Helium gas leak test will be conducted. Sub-slab soil gas, indoor air and ambient air samples will be collected over a 24-hour period using a 6 liter laboratory certified SUMMA® canister. All samples will be analyzed by an ELAP certified laboratory for VOCs using USEPA Method TO-15. New York State Category B deliverable will be requested from the laboratory.

2.2.7 Well Installation Reporting

Annually, the New York State Department of Environmental Conservation (NYSDEC) Office in Stony Brook, New York, will be visited to review the Long Island Well Completion records for the previous year. The review will be focused on the OU-2 Off-Site area and will seek to determine if any new air conditioning, monitoring or diffusion wells were installed. The location, use and owner of any new wells will be identified and list of these data recorded. The owners of any wells will be contacted if possible, or the NYSDEC will be notified as soon as they are identified so they can be contacted by the NYSDEC.

2.3 MONITORING QUALITY ASSURANCE/QUALITY CONTROL

All sampling and analyses will be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) prepared for the Site (Appendix B). Main Components of the QAPP include:

- QA/QC Objectives for Data Measurement;
- Sampling Program:
    - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
    - Sample holding times will be in accordance with the NYSDEC ASP requirements.
    - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody;
- Calibration Procedures:
    - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
    - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;
- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary

assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.

- Internal QC and Checks;
- QA Performance and System Audits;
- Preventative Maintenance Procedures and Schedules;
- Corrective Action Measures.

2.4 MONITORING REPORTING REQUIREMENTS

Forms and any other information generated during regular monitoring events and inspections will be kept on file. All forms, and other relevant reporting formats used during the monitoring/inspection events, will be (1) subject to approval by NYSDEC and (2) submitted at the time of the Periodic Review Report, as specified in the Reporting Plan of this SMP.

All monitoring results will be reported to NYSDEC on an annual basis in a Periodic Review Report. The report will include, at a minimum:

- Date of event;
- Personnel conducting sampling;
- Description of the activities performed;
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc.);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);

- A Data Usability Summary Report (DUSR) for vapor intrusion sampling and a DUSR for groundwater sampling when termination of groundwater sampling activities is requested;
- Any observations, conclusions, or recommendations; and
- A determination as to whether groundwater conditions have changed since the last reporting event.

Data will be reported in hard copy or digital format as determined by NYSDEC.

A summary of the monitoring program deliverables are summarized in the table below.

Schedule of Monitoring/Inspection Reports

Task	Reporting Frequency*
Groundwater	Annual
Vapor Intrusion	Annual
Well Inspection/Records Review	Annual

* The frequency and duration of events will be conducted as specified until otherwise instructed by NYSDEC

3.0 REPORTING AND CERTIFICATIONS

3.1 PERIODIC REVIEW REPORT

A Periodic Review Report will be submitted to the Department every year, beginning fifteen months after the SMP is approved. The report will be prepared in accordance with NYSDEC DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the Periodic Review Report. The report will include:

- Results of the required annual Site inspections and severe condition inspections, if applicable;
- All applicable inspection forms and other records generated for the Site during the reporting period in electronic format;
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;
- A Site evaluation, which will include the following:
    - The compliance of the remedy with the requirements of the Site-specific RAWP, ROD or Decision Document;
    - Any new conclusions or observations regarding Site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored;
    - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and

- The overall performance and effectiveness of the remedy.

3.2 CORRECTIVE MEASURES PLAN

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional control, a corrective measures plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it is approved by the NYSDEC.

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:

SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-01 04/13/2007	ERM-MW-01 07/08/2008	ERM-MW-01 02/22/2010	ERM-MW-01 12/10/2012	ERM-MW-02 04/13/2007
1,1,1-Trichloroethane	(ug/l)	5	0.07 U	1.0 U	1 U	1.0 U	0.07 U
1,1,2,2-Tetrachloroethane	(ug/l)	5	0.16 U	1.0 U	1 U	1.0 U	0.16 U
1,1,2-Trichloroethane	(ug/l)	1	0.19 U	1.0 U	1 U	1.0 U	0.19 U
1,1-Dichloroethane	(ug/l)	5	1.37	1.0 U	1 U	1.0 U	0.11 U
1,1-Dichloroethene	(ug/l)	5		1.0 U	1 U	1.0 U	
1,2,3-Trichlorobenzene	(ug/l)	5	0.16 U		1 U	5.0 U	0.16 U
1,2,4-Trichlorobenzene	(ug/l)	5	0.14 U	5.0 U	1 U	5.0 U	0.14 U
1,2-Dibromo-3-chloropropane	(ug/l)	0.04		10 U		10 U	
1,2-Dibromoethane	(ug/l)	0.0006	0.1 U	2.0 U	1 U	2.0 U	0.1 U
1,2-Dichlorobenzene	(ug/l)	3	0.09 U	1.0 U	1 U	1.0 U	0.09 U
1,2-Dichloroethane	(ug/l)	0.6	0.1 U	1.0 U	1 U	1.0 U	0.1 U
1,2-Dichloropropane	(ug/l)	1	0.11 U	1.0 U	1 U	1.0 U	0.11 U
1,3-Dichlorobenzene	(ug/l)	3	0.11 U	1.0 U	1 U	1.0 U	0.11 U
1,4-Dichlorobenzene	(ug/l)	3	0.07 U	1.0 U	1 U	1.0 U	0.07 U
1,4-Dioxane	(ug/l)					130 U J	
2-Butanone	(ug/l)	50	0.42 U	8.3 J	1 U	10 U	0.42 U
2-Hexanone	(ug/l)	50		5.0 U		5.0 U	
4-Methyl-2-Pentanone	(ug/l)			5.0 U	1 U	5.0 U	
Acetone	(ug/l)	50	2.7 U	48.0	5 U	13.1	2.7 U
Benzene	(ug/l)	1	0.09 U	1.0 U	1 U	[4.1]	0.09 U
Bromochloromethane	(ug/l)	5	0.17 U		1 U	5.0 U	0.17 U
Bromodichloromethane	(ug/l)	50	0.06 U	1.0 U	1 U	1.0 U	0.06 U
Bromoform	(ug/l)	50	0.16 U	4.0 U	1 U	4.0 U	0.16 U
Bromomethane	(ug/l)	5	0.85 U	2.0 U	1 U	2.0 U	0.85 U
Carbon Disulfide	(ug/l)	60	0.13 U	2.0 U	1 U	2.0 U	0.13 U
Carbon Tetrachloride	(ug/l)	5	1.58 U	1.0 U	5 U	1.0 U	1.58 U
Chlorobenzene	(ug/l)	5	0.14 U	1.0 U	1 U	1.0 U	0.14 U
Chloroethane	(ug/l)	5	0.32 U	1.0 U	1 U	1.0 U	0.32 U
Chloroform	(ug/l)	7	0.07 U	1.0 U	1 U	1.0 U	0.07 U

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-01 04/13/2007	ERM-MW-01 07/08/2008	ERM-MW-01 02/22/2010	ERM-MW-01 12/10/2012	ERM-MW-02 04/13/2007
Chloromethane	(ug/l)	5	0.42 U	1.0 U	1 U	1.0 U	0.42 U
cis-1,2-Dichloroethene	(ug/l)	5	[499]	1.7	10 U	1.0 U	0.18 U
cis-1,3-Dichloropropene	(ug/l)	0.4	0.06 U	1.0 U	1 U	1.0 U	0.06 U
Cyclohexane	(ug/l)			5.0 U		0.53 J	
Dibromochloromethane	(ug/l)	50	0.16 U	1.0 U	1 U	1.0 U	0.16 U
Dichlorodifluoromethane	(ug/l)	5	0.3 U	5.0 U	1 U	5.0 U	0.3 U
Ethylbenzene	(ug/l)	5	0.09 U	1.0 U	1 U	1.0 U	0.09 U
Freon 113	(ug/l)	5	0.17 U	5.0 U	1 U	5.0 U	0.17 U
Isopropylbenzene	(ug/l)	5	0.07 U	2.0 U	1 U	2.0 U	0.07 U
m+p-Xylene	(ug/l)	5	0.15 U	1.0 U	1 U	1.0 U	0.15 U
Methyl Acetate	(ug/l)			5.0 U		5.0 U	
Methyl Cyclohexane	(ug/l)			5.0 U		5.0 U	
Methyl Tertiary Butyl Ether	(ug/l)	10	0.45 U	1.0 U	1 U	1.0 U	0.45 U
Methylene Chloride	(ug/l)	5	0.19 U	2.0 U	1 U	2.0 U	0.19 U
o-Xylene	(ug/l)	5	0.14 U	1.0 U	1 U	1.0 U	0.14 U
Styrene	(ug/l)	5	0.08 U	5.0 U	1 U	5.0 U	0.08 U
Tetrachloroethene	(ug/l)	5	[38.9]	5.0	1 U	1.0 U	0.14 U
Toluene	(ug/l)	5	0.09 U	0.28 J	1 U	1.0 U	0.09 U
trans-1,2-Dichloroethene	(ug/l)	5	2.63	1.0 U	1 U	1.0 U	[11.4]
trans-1,3-Dichloropropene	(ug/l)	0.4		1.0 U		1.0 U	
Trichloroethene	(ug/l)	5	[25.1]	0.65 J	1 U	1.0 U	0.09 U
Trichlorofluoromethane	(ug/l)	5	0.22 U	5.0 U	1 U	5.0 U	0.22 U
Vinyl chloride	(ug/l)	2	0.39 U	1.0 U	1 U	1.0 U	0.39 U
Xylene (total)	(ug/l)	5				1.0 U	

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-02 07/08/2008	ERM-MW-02 02/22/2010	ERM-MW-02 12/10/2012	ERM-MW-02D 04/13/2007	ERM-MW-02D 07/08/2008
1,1,1-Trichloroethane	(ug/l)	5	2.0	1 U	1.0 U	0.07 U	1.0 U
1,1,2,2-Tetrachloroethane	(ug/l)	5	1.0 U	1 U	1.0 U	0.16 U	1.0 U
1,1,2-Trichloroethane	(ug/l)	1	1.0 U	1 U	1.0 U	0.19 U	1.0 U
1,1-Dichloroethane	(ug/l)	5	[39.3]	1.2	0.20 J	0.11 U	1.0 U
1,1-Dichloroethene	(ug/l)	5	1.0 U	1 U	1.0 U		1.0 U
1,2,3-Trichlorobenzene	(ug/l)	5		1 U	5.0 U	0.16 U	
1,2,4-Trichlorobenzene	(ug/l)	5	5.0 U	1 U	5.0 U	0.14 U	5.0 U
1,2-Dibromo-3-chloropropane	(ug/l)	0.04	10 U		10 U		10 U
1,2-Dibromoethane	(ug/l)	0.0006	2.0 U	1 U	2.0 U	0.1 U	2.0 U
1,2-Dichlorobenzene	(ug/l)	3	1.0 U	1 U	1.0 U	0.09 U	1.0 U
1,2-Dichloroethane	(ug/l)	0.6	1.0 U	1 U	1.0 U	0.1 U	1.0 U
1,2-Dichloropropane	(ug/l)	1	1.0 U	1 U	1.0 U	0.11 U	1.0 U
1,3-Dichlorobenzene	(ug/l)	3	1.0 U	1 U	1.0 U	0.11 U	1.0 U
1,4-Dichlorobenzene	(ug/l)	3	1.0 U	1 U	1.0 U	0.07 U	1.0 U
1,4-Dioxane	(ug/l)				130 U J		
2-Butanone	(ug/l)	50	28.3	1 U	10 U	0.42 U	4.7 J
2-Hexanone	(ug/l)	50	5.0 U		5.0 U		5.0 U
4-Methyl-2-Pentanone	(ug/l)		5.0 U	1 U	5.0 U		5.0 U
Acetone	(ug/l)	50	[52.2]	5 U	4.5 J	2.7 U	[69.2]
Benzene	(ug/l)	1	1.0 U	1 U	1.0 U	0.09 U	1.0 U
Bromochloromethane	(ug/l)	5		1 U	5.0 U	0.17 U	
Bromodichloromethane	(ug/l)	50	1.0 U	1 U	1.0 U	0.06 U	1.0 U
Bromoform	(ug/l)	50	4.0 U	1 U	4.0 U	0.16 U	4.0 U
Bromomethane	(ug/l)	5	2.0 U	1 U	2.0 U	0.85 U	2.0 U
Carbon Disulfide	(ug/l)	60	2.0 U	1 U	2.0 U	0.13 U	2.0 U
Carbon Tetrachloride	(ug/l)	5	1.0 U	5 U	1.0 U	1.58 U	1.0 U
Chlorobenzene	(ug/l)	5	1.0 U	1 U	1.0 U	0.14 U	1.0 U
Chloroethane	(ug/l)	5	[6.7]	1 U	0.37 J	0.32 U	1.0 U
Chloroform	(ug/l)	7	1.0 U	1 U	1.0 U	0.07 U	1.0 U

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:

SAMPLE TYPE: Water

CONSTITUENT	SITE	NYSDEC	ERM-MW-02	ERM-MW-02	ERM-MW-02	ERM-MW-02D	ERM-MW-02D
	DATE	TOGS	07/08/2008	02/22/2010	12/10/2012	04/13/2007	07/08/2008
Chloromethane	(ug/l)	5	1.0 U	1 U	1.0 U	0.42 U	1.0 U
cis-1,2-Dichloroethene	(ug/l)	5	1.0 U	10 U	1.0 U	[295]	[6.2]
cis-1,3-Dichloropropene	(ug/l)	0.4	1.0 U	1 U	1.0 U	0.06 U	1.0 U
Cyclohexane	(ug/l)		5.0 U		0.53 J		5.0 U
Dibromochloromethane	(ug/l)	50	1.0 U	1 U	1.0 U	0.16 U	1.0 U
Dichlorodifluoromethane	(ug/l)	5	5.0 U	1 U	5.0 U	0.3 U	5.0 U
Ethylbenzene	(ug/l)	5	0.64 J	1 U	1.0 U	0.09 U	1.0 U
Freon 113	(ug/l)	5	5.0 U	1 U	5.0 U	0.17 U	5.0 U
Isopropylbenzene	(ug/l)	5	2.0 U	1 U	2.0 U	0.07 U	2.0 U
m+p-Xylene	(ug/l)	5	1.9	1 U	0.42 J	0.15 U	1.0 U
Methyl Acetate	(ug/l)		5.0 U		5.0 U		5.0 U
Methyl Cyclohexane	(ug/l)		5.0 U		5.0 U		5.0 U
Methyl Tertiary Butyl Ether	(ug/l)	10	1.0 U	1 U	1.0 U	0.45 U	1.0 U
Methylene Chloride	(ug/l)	5	2.0 U	1 U	2.0 U	0.19 U	2.0 U
o-Xylene	(ug/l)	5	3.0	1 U	0.35 J	0.14 U	1.0 U
Styrene	(ug/l)	5	5.0 U	1 U	5.0 U	0.08 U	5.0 U
Tetrachloroethene	(ug/l)	5	1.0 U	1 U	1.0 U	0.14 U	1.0 U
Toluene	(ug/l)	5	4.0	1 U	0.30 J	0.09 U	0.80 J
trans-1,2-Dichloroethene	(ug/l)	5	[68.2]	[9.2]	3.9	2.7	0.74 J
trans-1,3-Dichloropropene	(ug/l)	0.4	1.0 U		1.0 U		1.0 U
Trichloroethene	(ug/l)	5	1.0 U	1 U	1.0 U	0.97	[5.2]
Trichlorofluoromethane	(ug/l)	5	5.0 U	1 U	5.0 U	0.22 U	5.0 U
Vinyl chloride	(ug/l)	2	1.0 U	1 U	1.0 U	0.39 U	[3.3]
Xylene (total)	(ug/l)	5			0.77 J		

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:

SAMPLE TYPE: Water

CONSTITUENT	SITE	NYSDEC	ERM-MW-02D	ERM-MW-02D	ERM-MW-03	ERM-MW-03	ERM-MW-03
	DATE	TOGS	02/22/2010	12/10/2012	04/13/2007	07/08/2008	02/22/2010
1,1,1-Trichloroethane	(ug/l)	5	1 U	1.0 U	0.07 U	1.0 U	1 U
1,1,2,2-Tetrachloroethane	(ug/l)	5	1 U	1.0 U	0.16 U	1.0 U	1 U
1,1,2-Trichloroethane	(ug/l)	1	1 U	1.0 U	0.19 U	1.0 U	1 U
1,1-Dichloroethane	(ug/l)	5	[8.3]	0.71 J	0.11 U	1.0 U	1 U
1,1-Dichloroethene	(ug/l)	5	1 U	1.0 U		1.0 U	1 U
1,2,3-Trichlorobenzene	(ug/l)	5	1 U	5.0 U	0.16 U		1 U
1,2,4-Trichlorobenzene	(ug/l)	5	1 U	5.0 U	0.14 U	5.0 U	1 U
1,2-Dibromo-3-chloropropane	(ug/l)	0.04		10 U		10 U	
1,2-Dibromoethane	(ug/l)	0.0006	1 U	2.0 U	0.1 U	2.0 U	1 U
1,2-Dichlorobenzene	(ug/l)	3	1 U	1.0 U	0.09 U	1.0 U	1 U
1,2-Dichloroethane	(ug/l)	0.6	1 U	1.0 U	0.1 U	1.0 U	1 U
1,2-Dichloropropane	(ug/l)	1	1 U	1.0 U	0.11 U	1.0 U	1 U
1,3-Dichlorobenzene	(ug/l)	3	1 U	1.0 U	0.11 U	1.0 U	1 U
1,4-Dichlorobenzene	(ug/l)	3	1 U	1.0 U	0.07 U	1.0 U	1 U
1,4-Dioxane	(ug/l)			130 U J			
2-Butanone	(ug/l)	50	1 U	10 U	0.42 U	10 U	1 U
2-Hexanone	(ug/l)	50		5.0 U		5.0 U	
4-Methyl-2-Pentanone	(ug/l)		1 U	5.0 U		5.0 U	1 U
Acetone	(ug/l)	50	5 U	4.2 J	2.7 U	3.5 J	5 U
Benzene	(ug/l)	1	1 U	1.0 U	0.09 U	1.0 U	1 U
Bromochloromethane	(ug/l)	5	1 U	5.0 U	0.17 U		1 U
Bromodichloromethane	(ug/l)	50	1 U	1.0 U	0.06 U	1.0 U	1 U
Bromoform	(ug/l)	50	1 U	4.0 U	0.16 U	4.0 U	1 U
Bromomethane	(ug/l)	5	1 U	2.0 U	0.85 U	2.0 U	1 U
Carbon Disulfide	(ug/l)	60	1 U	2.0 U	0.13 U	2.0 U	1 U
Carbon Tetrachloride	(ug/l)	5	5 U	1.0 U	1.58 U	1.0 U	5 U
Chlorobenzene	(ug/l)	5	1 U	1.0 U	0.14 U	1.0 U	1 U
Chloroethane	(ug/l)	5	1 U	1.0 U	0.32 U	1.0 U	1 U
Chloroform	(ug/l)	7	1 U	1.0 U	0.07 U	0.69 J	1 U

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:

SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-02D 02/22/2010	ERM-MW-02D 12/10/2012	ERM-MW-03 04/13/2007	ERM-MW-03 07/08/2008	ERM-MW-03 02/22/2010
Chloromethane	(ug/l)	5	1 U	1.0 U	0.42 U	1.0 U	1 U
cis-1,2-Dichloroethene	(ug/l)	5	[16]	1.3	0.18 U	[14.9]	[31.9]
cis-1,3-Dichloropropene	(ug/l)	0.4	1 U	1.0 U	0.06 U	1.0 U	1 U
Cyclohexane	(ug/l)			0.63 J		5.0 U	
Dibromochloromethane	(ug/l)	50	1 U	1.0 U	0.16 U	1.0 U	1 U
Dichlorodifluoromethane	(ug/l)	5	1 U	5.0 U	0.3 U	5.0 U	1 U
Ethylbenzene	(ug/l)	5	1 U	1.0 U	0.09 U	1.0 U	1 U
Freon 113	(ug/l)	5	1 U	5.0 U	0.17 U	5.0 U	1 U
Isopropylbenzene	(ug/l)	5	1 U	2.0 U	0.07 U	2.0 U	1 U
m+p-Xylene	(ug/l)	5	1 U	1.0 U	0.15 U	1.0 U	1 U
Methyl Acetate	(ug/l)			5.0 U		5.0 U	
Methyl Cyclohexane	(ug/l)			5.0 U		5.0 U	
Methyl Tertiary Butyl Ether	(ug/l)	10	1 U	1.0 U	0.45 U	1.0 U	1 U
Methylene Chloride	(ug/l)	5	1 U	2.0 U	0.19 U	2.0 U	1 U
o-Xylene	(ug/l)	5	1 U	0.35 J	0.14 U	1.0 U	1 U
Styrene	(ug/l)	5	1 U	5.0 U	0.08 U	5.0 U	1 U
Tetrachloroethene	(ug/l)	5	1 U	1.0 U	3.38	[40.8]	[42.6]
Toluene	(ug/l)	5	1 U	0.27 J	0.09 U	0.31 J	1 U
trans-1,2-Dichloroethene	(ug/l)	5	[33.1]	1.7	0.18 U	1.0 U	1 U
trans-1,3-Dichloropropene	(ug/l)	0.4		1.0 U		1.0 U	
Trichloroethene	(ug/l)	5	1 U	1.0 U	0.09 U	[5.6]	4.4
Trichlorofluoromethane	(ug/l)	5	1 U	5.0 U	0.22 U	5.0 U	1 U
Vinyl chloride	(ug/l)	2	1 U	0.58 J	0.39 U	1.0 U	1 U
Xylene (total)	(ug/l)	5		0.74 J			

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-03 12/10/2012	ERM-MW-04 04/13/2007	ERM-MW-04 07/08/2008	ERM-MW-04 02/22/2010	ERM-MW-04 12/10/2012
1,1,1-Trichloroethane	(ug/l)	5	1.0 U	0.07 U	1.0 U	1 U	1.0 U
1,1,2,2-Tetrachloroethane	(ug/l)	5	1.0 U	0.16 U	1.0 U	1 U	1.0 U
1,1,2-Trichloroethane	(ug/l)	1	1.0 U	0.19 U	1.0 U	1 U	1.0 U
1,1-Dichloroethane	(ug/l)	5	1.0 U	0.11 U	1.0 U	1 U	1.0 U
1,1-Dichloroethene	(ug/l)	5	1.0 U		1.0 U	1 U	1.0 U
1,2,3-Trichlorobenzene	(ug/l)	5	5.0 U	0.16 U		1 U	5.0 U
1,2,4-Trichlorobenzene	(ug/l)	5	5.0 U	0.14 U	5.0 U	1 U	5.0 U
1,2-Dibromo-3-chloropropane	(ug/l)	0.04	10 U		10 U		10 U
1,2-Dibromoethane	(ug/l)	0.0006	2.0 U	0.1 U	2.0 U	1 U	2.0 U
1,2-Dichlorobenzene	(ug/l)	3	1.0 U	0.09 U	1.0 U	1 U	1.0 U
1,2-Dichloroethane	(ug/l)	0.6	1.0 U	0.1 U	1.0 U	1 U	1.0 U
1,2-Dichloropropane	(ug/l)	1	1.0 U	0.11 U	1.0 U	1 U	1.0 U
1,3-Dichlorobenzene	(ug/l)	3	1.0 U	0.11 U	1.0 U	1 U	1.0 U
1,4-Dichlorobenzene	(ug/l)	3	1.0 U	0.07 U	1.0 U	1 U	1.0 U
1,4-Dioxane	(ug/l)		130 U J				130 U J
2-Butanone	(ug/l)	50	10 U	0.42 U	10 U	1 U	10 U
2-Hexanone	(ug/l)	50	5.0 U		5.0 U		5.0 U
4-Methyl-2-Pentanone	(ug/l)		5.0 U		5.0 U	1 U	5.0 U
Acetone	(ug/l)	50	10.2	2.7 U	10 U	5 U	13.9
Benzene	(ug/l)	1	1.0 U	0.09 U	0.75 J	1 U	1.0 U
Bromochloromethane	(ug/l)	5	5.0 U	0.17 U		1 U	5.0 U
Bromodichloromethane	(ug/l)	50	1.0 U	0.06 U	1.0 U	1 U	1.0 U
Bromoform	(ug/l)	50	4.0 U	0.16 U	4.0 U	1 U	4.0 U
Bromomethane	(ug/l)	5	2.0 U	0.85 U	2.0 U	1 U	2.0 U
Carbon Disulfide	(ug/l)	60	2.0 U	0.13 U	2.0 U	1 U	2.0 U
Carbon Tetrachloride	(ug/l)	5	1.0 U	1.58 U	1.0 U	5 U	1.0 U
Chlorobenzene	(ug/l)	5	1.0 U	0.14 U	1.0 U	1 U	1.0 U
Chloroethane	(ug/l)	5	1.0 U	0.32 U	1.0 U	1 U	1.0 U
Chloroform	(ug/l)	7	1.0 U	0.07 U	1.0 U	1 U	1.0 U

U - Not Detected
J - Estimated Value

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-03 12/10/2012	ERM-MW-04 04/13/2007	ERM-MW-04 07/08/2008	ERM-MW-04 02/22/2010	ERM-MW-04 12/10/2012
Chloromethane	(ug/l)	5	1.0 U	0.42 U	1.0 U	1 U	1.0 U
cis-1,2-Dichloroethene	(ug/l)	5	1.0 U	0.18 U	1.0 U	1 U	1.0 U
cis-1,3-Dichloropropene	(ug/l)	0.4	1.0 U	0.06 U	1.0 U	1 U	1.0 U
Cyclohexane	(ug/l)		5.0 U		5.0 U		5.0 U
Dibromochloromethane	(ug/l)	50	1.0 U	0.16 U	1.0 U	1 U	1.0 U
Dichlorodifluoromethane	(ug/l)	5	5.0 U	0.3 U	5.0 U	1 U	5.0 U
Ethylbenzene	(ug/l)	5	1.0 U	0.09 U	1.0 U	1 U	1.0 U
Freon 113	(ug/l)	5	5.0 U	0.17 U	5.0 U	1 U	5.0 U
Isopropylbenzene	(ug/l)	5	2.0 U	0.07 U	2.0 U	1 U	2.0 U
m+p-Xylene	(ug/l)	5	1.0 U	0.15 U	1.0 U	1 U	1.0 U
Methyl Acetate	(ug/l)		5.0 U		5.0 U		5.0 U
Methyl Cyclohexane	(ug/l)		5.0 U		5.0 U		5.0 U
Methyl Tertiary Butyl Ether	(ug/l)	10	1.0 U	0.45 U	1.0 U	1 U	0.39 J
Methylene Chloride	(ug/l)	5	2.0 U	0.19 U	2.0 U	1 U	2.0 U
o-Xylene	(ug/l)	5	1.0 U	0.14 U	1.0 U	1 U	1.0 U
Styrene	(ug/l)	5	5.0 U	0.08 U	5.0 U	1 U	5.0 U
Tetrachloroethene	(ug/l)	5	1.6	0.14 U	1.0 U	1 U	1.0 U
Toluene	(ug/l)	5	1.0 U	0.09 U	1.1	1 U	1.0 U
trans-1,2-Dichloroethene	(ug/l)	5	1.0 U	0.18 U	1.0 U	1 U	1.0 U
trans-1,3-Dichloropropene	(ug/l)	0.4	1.0 U		1.0 U		1.0 U
Trichloroethene	(ug/l)	5	1.0 U	0.09 U	1.0 U	1 U	0.67 J
Trichlorofluoromethane	(ug/l)	5	5.0 U	0.22 U	5.0 U	1 U	5.0 U
Vinyl chloride	(ug/l)	2	1.0 U	0.39 U	1.0 U	1 U	1.0 U
Xylene (total)	(ug/l)	5	1.0 U				1.0 U

U - Not Detected
J - Estimated Value

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-05 04/13/2007	ERM-MW-05 07/08/2008	ERM-MW-05 02/22/2010	ERM-MW-05 12/10/2012	ERM-MW-06 04/13/2007
1,1,1-Trichloroethane	(ug/l)	5	0.07 U	1.0 U	1 U	0.92 J	3.76
1,1,2,2-Tetrachloroethane	(ug/l)	5	0.16 U	1.0 U	1 U	1.0 U	0.16 U
1,1,2-Trichloroethane	(ug/l)	1	0.19 U	1.0 U	1 U	1.0 U	0.19 U
1,1-Dichloroethane	(ug/l)	5	0.11 U	0.94 J	1 U	4.7	0.11 U
1,1-Dichloroethene	(ug/l)	5		1.0 U	1 U	0.61 J	
1,2,3-Trichlorobenzene	(ug/l)	5	0.16 U		1 U	5.0 U	0.16 U
1,2,4-Trichlorobenzene	(ug/l)	5	0.14 U	5.0 U	1 U	5.0 U	0.14 U
1,2-Dibromo-3-chloropropane	(ug/l)	0.04		10 U		10 U	
1,2-Dibromoethane	(ug/l)	0.0006	0.1 U	2.0 U	1 U	2.0 U	0.1 U
1,2-Dichlorobenzene	(ug/l)	3	0.09 U	1.0 U	1 U	1.0 U	0.09 U
1,2-Dichloroethane	(ug/l)	0.6	0.1 U	1.0 U	1 U	1.0 U	0.1 U
1,2-Dichloropropane	(ug/l)	1	0.11 U	1.0 U	1 U	1.0 U	0.11 U
1,3-Dichlorobenzene	(ug/l)	3	0.11 U	1.0 U	1 U	1.0 U	0.11 U
1,4-Dichlorobenzene	(ug/l)	3	0.07 U	1.0 U	1 U	1.0 U	0.07 U
1,4-Dioxane	(ug/l)					130 U J	
2-Butanone	(ug/l)	50	0.42 U	10 U	1 U	10 U	0.42 U
2-Hexanone	(ug/l)	50		5.0 U		5.0 U	
4-Methyl-2-Pentanone	(ug/l)			5.0 U	1 U	5.0 U	
Acetone	(ug/l)	50	2.7 U	47.1	5 U	13.8	2.7 U
Benzene	(ug/l)	1	0.09 U	1.0 U	1 U	1.0 U	0.09 U
Bromochloromethane	(ug/l)	5	0.17 U		1 U	5.0 U	0.17 U
Bromodichloromethane	(ug/l)	50	0.06 U	1.0 U	1 U	1.0 U	0.06 U
Bromoform	(ug/l)	50	0.16 U	4.0 U	1 U	4.0 U	0.16 U
Bromomethane	(ug/l)	5	0.85 U	2.0 U	1 U	2.0 U	0.85 U
Carbon Disulfide	(ug/l)	60	0.13 U	2.0 U	1 U	2.0 U	0.13 U
Carbon Tetrachloride	(ug/l)	5	1.58 U	1.0 U	5 U	1.0 U	1.58 U
Chlorobenzene	(ug/l)	5	0.14 U	0.44 J	1 U	1.0 U	0.14 U
Chloroethane	(ug/l)	5	0.32 U	1.9	1 U	0.75 J	0.32 U
Chloroform	(ug/l)	7	0.07 U	1.0 U	1 U	1.0 U	0.07 U

U - Not Detected
J - Estimated Value

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-05 04/13/2007	ERM-MW-05 07/08/2008	ERM-MW-05 02/22/2010	ERM-MW-05 12/10/2012	ERM-MW-06 04/13/2007
Chloromethane	(ug/l)	5	0.42 U	1.0 U	1 U	1.0 U	0.42 U
cis-1,2-Dichloroethene	(ug/l)	5	[312]	[189]	1 U	[177]	[107]
cis-1,3-Dichloropropene	(ug/l)	0.4	0.06 U	1.0 U	1 U	1.0 U	0.06 U
Cyclohexane	(ug/l)			5.0 U		0.35 J	
Dibromochloromethane	(ug/l)	50	0.16 U	1.0 U	1 U	1.0 U	0.16 U
Dichlorodifluoromethane	(ug/l)	5	0.3 U	5.0 U	1 U	5.0 U	0.3 U
Ethylbenzene	(ug/l)	5	0.09 U	1.0 U	1 U	1.0 U	0.09 U
Freon 113	(ug/l)	5	0.17 U	5.0 U	1 U	5.0 U	0.17 U
Isopropylbenzene	(ug/l)	5	0.07 U	2.0 U	1 U	2.0 U	0.07 U
m+p-Xylene	(ug/l)	5	0.15 U	1.0 U	1 U	1.0 U	0.15 U
Methyl Acetate	(ug/l)			5.0 U		5.0 U	
Methyl Cyclohexane	(ug/l)			5.0 U		5.0 U	
Methyl Tertiary Butyl Ether	(ug/l)	10	0.45 U	1.0 U	1 U	1.0 U	0.45 U
Methylene Chloride	(ug/l)	5	0.19 U	2.0 U	1 U	2.0 U	0.19 U
o-Xylene	(ug/l)	5	0.14 U	1.0 U	1 U	0.67 J	0.14 U
Styrene	(ug/l)	5	0.08 U	5.0 U	1 U	5.0 U	0.08 U
Tetrachloroethene	(ug/l)	5	0.74	2.6	2.4	1.5	[86.3]
Toluene	(ug/l)	5	0.09 U	0.76 J	1 U	1.0 U	0.09 U
trans-1,2-Dichloroethene	(ug/l)	5	3.48	[7.2]	1 U	[6.6]	1.15
trans-1,3-Dichloropropene	(ug/l)	0.4		1.0 U		1.0 U	
Trichloroethene	(ug/l)	5	0.09 U	[5.8]	1.1	0.76 J	[164]
Trichlorofluoromethane	(ug/l)	5	0.22 U	5.0 U	1 U	5.0 U	0.22 U
Vinyl chloride	(ug/l)	2	0.39 U	[3.8]	1 U	[7.4]	0.39 U
Xylene (total)	(ug/l)	5				0.67 J	

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-06 07/08/2008	ERM-MW-06 02/22/2010	ERM-MW-06 12/10/2012	ERM-MW-07D 07/08/2008	ERM-MW-07D 02/22/2010
1,1,1-Trichloroethane	(ug/l)	5	0.89 J	1 U	1.0 U	2.6	1 U
1,1,2,2-Tetrachloroethane	(ug/l)	5	1.0 U	1 U	1.0 U	1.0 U	1 U
1,1,2-Trichloroethane	(ug/l)	1	1.0 U	1 U	1.0 U	1.0 U	1 U
1,1-Dichloroethane	(ug/l)	5	1.1	1 U	1.0 U	1.7	1 U
1,1-Dichloroethene	(ug/l)	5	1.0 U	1 U	1.0 U	3.1	2.4
1,2,3-Trichlorobenzene	(ug/l)	5		1 U	5.0 U		1 U
1,2,4-Trichlorobenzene	(ug/l)	5	5.0 U	1 U	5.0 U	5.0 U	1 U
1,2-Dibromo-3-chloropropane	(ug/l)	0.04	10 U		10 U	10 U	
1,2-Dibromoethane	(ug/l)	0.0006	2.0 U	1 U	2.0 U	2.0 U	1 U
1,2-Dichlorobenzene	(ug/l)	3	1.0 U	1 U	1.0 U	1.0 U	1 U
1,2-Dichloroethane	(ug/l)	0.6	1.0 U	1 U	1.0 U	1.0 U	1 U
1,2-Dichloropropane	(ug/l)	1	1.0 U	1 U	1.0 U	1.0 U	1 U
1,3-Dichlorobenzene	(ug/l)	3	1.0 U	1 U	1.0 U	1.0 U	1 U
1,4-Dichlorobenzene	(ug/l)	3	1.0 U	1 U	1.0 U	1.0 U	1 U
1,4-Dioxane	(ug/l)				130 U J		
2-Butanone	(ug/l)	50	10 U	1 U	10 U	10 U	1 U
2-Hexanone	(ug/l)	50	5.0 U		5.0 U	5.0 U	
4-Methyl-2-Pentanone	(ug/l)		5.0 U	1 U	5.0 U	5.0 U	1 U
Acetone	(ug/l)	50	47.9	5 U	19.4	45.9	5 U
Benzene	(ug/l)	1	1.0 U	1 U	1.0 U	1.0 U	1 U
Bromochloromethane	(ug/l)	5		1 U	5.0 U		1 U
Bromodichloromethane	(ug/l)	50	1.0 U	1 U	1.0 U	1.0 U	1 U
Bromoform	(ug/l)	50	4.0 U	1 U	4.0 U	4.0 U	1 U
Bromomethane	(ug/l)	5	2.0 U	1 U	2.0 U	2.0 U	1 U
Carbon Disulfide	(ug/l)	60	2.0 U	1 U	2.0 U	2.0 U	1 U
Carbon Tetrachloride	(ug/l)	5	1.0 U	5 U	1.0 U	1.0 U	5 U
Chlorobenzene	(ug/l)	5	1.0 U	1 U	1.0 U	1.0 U	1 U
Chloroethane	(ug/l)	5	1.0 U	1 U	1.0 U	1.0 U	1 U
Chloroform	(ug/l)	7	1.0 U	1 U	1.0 U	1.0 U	1 U

U - Not Detected
J - Estimated Value

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-06 07/08/2008	ERM-MW-06 02/22/2010	ERM-MW-06 12/10/2012	ERM-MW-07D 07/08/2008	ERM-MW-07D 02/22/2010
Chloromethane	(ug/l)	5	1.0 U	1 U	1.0 U	1.0 U	1 U
cis-1,2-Dichloroethene	(ug/l)	5	[146]	1 U	0.45 J	[37.0]	[16.9]
cis-1,3-Dichloropropene	(ug/l)	0.4	1.0 U	1 U	1.0 U	1.0 U	1 U
Cyclohexane	(ug/l)		5.0 U		0.69 J	5.0 U	
Dibromochloromethane	(ug/l)	50	1.0 U	1 U	1.0 U	1.0 U	1 U
Dichlorodifluoromethane	(ug/l)	5	5.0 U	1 U	5.0 U	5.0 U	1 U
Ethylbenzene	(ug/l)	5	1.0 U	1 U	1.0 U	1.0 U	1 U
Freon 113	(ug/l)	5	5.0 U	1 U	5.0 U	5.0 U	1 U
Isopropylbenzene	(ug/l)	5	2.0 U	1 U	2.0 U	2.0 U	1 U
m+p-Xylene	(ug/l)	5	1.0 U	1 U	1.0 U	1.0 U	1 U
Methyl Acetate	(ug/l)		5.0 U		5.0 U	5.0 U	
Methyl Cyclohexane	(ug/l)		5.0 U		5.0 U	5.0 U	
Methyl Tertiary Butyl Ether	(ug/l)	10	1.0 U	1 U	1.0 U	1.0 U	1 U
Methylene Chloride	(ug/l)	5	2.0 U	1 U	2.0 U	2.0 U	1 U
o-Xylene	(ug/l)	5	1.0 U	1 U	1.0 U	1.0 U	1 U
Styrene	(ug/l)	5	5.0 U	1 U	5.0 U	5.0 U	1 U
Tetrachloroethene	(ug/l)	5	[19.4]	1 U	0.42 J	[129]	[66.6]
Toluene	(ug/l)	5	0.60 J	1 U	1.0 U	1.0 U	1 U
trans-1,2-Dichloroethene	(ug/l)	5	1.2	1 U	1.0 U	1.0 U	1 U
trans-1,3-Dichloropropene	(ug/l)	0.4	1.0 U		1.0 U	1.0 U	
Trichloroethene	(ug/l)	5	[40.1]	1 U	0.58 J	[348]	[144]
Trichlorofluoromethane	(ug/l)	5	5.0 U	1 U	5.0 U	5.0 U	1 U
Vinyl chloride	(ug/l)	2	1.0 U	1 U	1.0 U	1.0 U	1 U
Xylene (total)	(ug/l)	5			1.0 U		

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:

SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-07D 06/13/2011	ERM-MW-07D 12/10/2012	ERM-MW-08 07/08/2008	ERM-MW-08 02/22/2010	ERM-MW-08 06/13/2011
1,1,1-Trichloroethane	(ug/l)	5	1.0 U	1.0 U	0.76 J	1 U	1.0 U
1,1,2,2-Tetrachloroethane	(ug/l)	5	1.0 U	1.0 U	1.0 U	1 U	1.0 U
1,1,2-Trichloroethane	(ug/l)	1	1.0 U	1.0 U	1.0 U	1 U	1.0 U
1,1-Dichloroethane	(ug/l)	5	1.0 U	1.0 U	0.50 J	1 U	1.0 U
1,1-Dichloroethene	(ug/l)	5	1.0 U	1.0 U	0.97 J	1 U	0.85 J
1,2,3-Trichlorobenzene	(ug/l)	5		5.0 U		1 U	
1,2,4-Trichlorobenzene	(ug/l)	5	5.0 U	5.0 U	5.0 U	1 U	5.0 U
1,2-Dibromo-3-chloropropane	(ug/l)	0.04	10 U	10 U	10 U		10 U
1,2-Dibromoethane	(ug/l)	0.0006	2.0 U	2.0 U	2.0 U	1 U	2.0 U
1,2-Dichlorobenzene	(ug/l)	3	1.0 U	1.0 U	1.0 U	1 U	1.0 U
1,2-Dichloroethane	(ug/l)	0.6	1.0 U	1.0 U	1.0 U	1 U	1.0 U
1,2-Dichloropropane	(ug/l)	1	1.0 U	1.0 U	1.0 U	1 U	1.0 U
1,3-Dichlorobenzene	(ug/l)	3	1.0 U	1.0 U	1.0 U	1 U	1.0 U
1,4-Dichlorobenzene	(ug/l)	3	1.0 U	1.0 U	1.0 U	1 U	1.0 U
1,4-Dioxane	(ug/l)			130 U			
2-Butanone	(ug/l)	50	10 U	10 U	10 U	1 U	13.1
2-Hexanone	(ug/l)	50	5.0 U	5.0 U	5.0 U		5.0 U
4-Methyl-2-Pentanone	(ug/l)		5.0 U	5.0 U	5.0 U	1 U	5.0 U
Acetone	(ug/l)	50	10 U	10.6	45.3	5 U	12.2
Benzene	(ug/l)	1	1.0 U	1.0 U	1.0 U	1 U	1.0 U
Bromochloromethane	(ug/l)	5		5.0 U		1 U	
Bromodichloromethane	(ug/l)	50	1.0 U	1.0 U	1.0 U	1 U	1.0 U
Bromoform	(ug/l)	50	4.0 U	4.0 U	4.0 U	1 U	4.0 U
Bromomethane	(ug/l)	5	2.0 U	2.0 U	2.0 U	1 U	2.0 U
Carbon Disulfide	(ug/l)	60	2.0 U	2.0 U	2.0 U	1 U	2.0 U
Carbon Tetrachloride	(ug/l)	5	1.0 U	1.0 U	1.0 U	5 U	1.0 U
Chlorobenzene	(ug/l)	5	1.0 U	1.0 U	1.0 U	1 U	1.0 U
Chloroethane	(ug/l)	5	1.0 U	1.0 U	1.0 U	1 U	1.0 U
Chloroform	(ug/l)	7	1.0 U	1.0 U	0.25 J	1 U	1.0 U

U - Not Detected
J - Estimated Value

TABLE 1

SUMMARY OF

GROUNDWATER SAMPLING RESULTS

OU-2 OFF-SITE RI

NEW YORK TWIST DRILL

PERIOD:

SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-07D 06/13/2011	ERM-MW-07D 12/10/2012	ERM-MW-08 07/08/2008	ERM-MW-08 02/22/2010	ERM-MW-08 06/13/2011
Chloromethane	(ug/l)	5	1.0 U	1.0 U	1.0 U	1 U	1.0 U
cis-1,2-Dichloroethene	(ug/l)	5	1.0 U	1.0 U	[12.3]	[7.2]	4.2
cis-1,3-Dichloropropene	(ug/l)	0.4	1.0 U	1.0 U	1.0 U	1 U	1.0 U
Cyclohexane	(ug/l)		5.0 U	5.0 U	5.0 U		5.0 U
Dibromochloromethane	(ug/l)	50	1.0 U	1.0 U	1.0 U	1 U	1.0 U
Dichlorodifluoromethane	(ug/l)	5	5.0 U	5.0 U	5.0 U	1 U	5.0 U
Ethylbenzene	(ug/l)	5	1.0 U	1.0 U	1.0 U	1 U	1.0 U
Freon 113	(ug/l)	5	5.0 U	5.0 U	5.0 U	1 U	2.7 J
Isopropylbenzene	(ug/l)	5	2.0 U	2.0 U	2.0 U	1 U	2.0 U
m+p-Xylene	(ug/l)	5		1.0 U	1.0 U	1 U	
Methyl Acetate	(ug/l)		5.0 U	5.0 U	5.0 U		5.0 U
Methyl Cyclohexane	(ug/l)		5.0 U	5.0 U	5.0 U		5.0 U
Methyl Tertiary Butyl Ether	(ug/l)	10	1.0 U	1.0 U	1.0 U	1 U	1.0 U
Methylene Chloride	(ug/l)	5	2.0 U	2.0 U	2.0 U	1 U	2.0 U
o-Xylene	(ug/l)	5		1.0 U	1.0 U	1 U	
Styrene	(ug/l)	5	5.0 U	5.0 U	5.0 U	1 U	5.0 U
Tetrachloroethene	(ug/l)	5	4.3	3.3	[90.9]	[7.5]	[11.9]
Toluene	(ug/l)	5	1.0 U	1.0 U	1.0 U	1 U	0.15 J
trans-1,2-Dichloroethene	(ug/l)	5	1.0 U	1.0 U	1.0 U	1 U	1.0 U
trans-1,3-Dichloropropene	(ug/l)	0.4	1.0 U	1.0 U	1.0 U		1.0 U
Trichloroethene	(ug/l)	5	[12.0]	[5.8]	[279]	[116]	[192]
Trichlorofluoromethane	(ug/l)	5	5.0 U	5.0 U	5.0 U	1 U	5.0 U
Vinyl chloride	(ug/l)	2	1.0 U	1.0 U	1.0 U	1 U	1.0 U
Xylene (total)	(ug/l)	5	1.0 U	1.0 U			1.0 U

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-08 12/10/2012	ERM-MW-09 07/08/2008	ERM-MW-09 02/22/2010	ERM-MW-09 06/13/2011	ERM-MW-09 12/10/2012
1,1,1-Trichloroethane	(ug/l)	5	1.0 U	2.0	1 U	0.57 J	0.75 J
1,1,2,2-Tetrachloroethane	(ug/l)	5	1.0 U	1.0 U	1 U	1.0 U	1.0 U
1,1,2-Trichloroethane	(ug/l)	1	1.0 U	1.0 U	1 U	1.0 U	1.0 U
1,1-Dichloroethane	(ug/l)	5	0.31 J	1.9	1 U	1.6	3.0
1,1-Dichloroethene	(ug/l)	5	0.87 J	0.75 J	1.1	1.0 U	0.40 J
1,2,3-Trichlorobenzene	(ug/l)	5	5.0 U		1 U		5.0 U
1,2,4-Trichlorobenzene	(ug/l)	5	5.0 U	5.0 U	1 U	5.0 U	5.0 U
1,2-Dibromo-3-chloropropane	(ug/l)	0.04	10 U	10 U		10 U	10 U
1,2-Dibromoethane	(ug/l)	0.0006	2.0 U	2.0 U	1 U	2.0 U	2.0 U
1,2-Dichlorobenzene	(ug/l)	3	1.0 U	1.0 U	1 U	1.0 U	1.0 U
1,2-Dichloroethane	(ug/l)	0.6	1.0 U	1.0 U	1 U	1.0 U	1.0 U
1,2-Dichloropropane	(ug/l)	1	1.0 U	1.0 U	1 U	1.0 U	1.0 U
1,3-Dichlorobenzene	(ug/l)	3	1.0 U	1.0 U	1 U	1.0 U	1.0 U
1,4-Dichlorobenzene	(ug/l)	3	1.0 U	1.0 U	1 U	0.55 J	0.84 J
1,4-Dioxane	(ug/l)		130 U				130 U J
2-Butanone	(ug/l)	50	10 U	10 U	1 U	19.3	10 U
2-Hexanone	(ug/l)	50	5.0 U	5.0 U		5.0 U	5.0 U
4-Methyl-2-Pentanone	(ug/l)		5.0 U	5.0 U	1 U	5.0 U	5.0 U
Acetone	(ug/l)	50	4.9 J	46.0	5 U	15.3	4.0 J
Benzene	(ug/l)	1	1.0 U	1.0 U	1 U	1.0 U	1.0 U
Bromochloromethane	(ug/l)	5	5.0 U		1 U		5.0 U
Bromodichloromethane	(ug/l)	50	1.0 U	1.0 U	1 U	1.0 U	1.0 U
Bromoform	(ug/l)	50	4.0 U	4.0 U	1 U	4.0 U	4.0 U
Bromomethane	(ug/l)	5	2.0 U	2.0 U	1 U	2.0 U	2.0 U
Carbon Disulfide	(ug/l)	60	2.0 U	2.0 U	1 U	2.0 U	2.0 U
Carbon Tetrachloride	(ug/l)	5	1.0 U	1.0 U	5 U	1.0 U	1.0 U
Chlorobenzene	(ug/l)	5	1.0 U	1.0 U	1 U	2.3	2.4
Chloroethane	(ug/l)	5	1.0 U	1.0 U	1 U	1.0 U	1.0 U
Chloroform	(ug/l)	7	0.22 J	1.0 U	1 U	1.0 U	1.0 U

U - Not Detected
J - Estimated Value

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-08 12/10/2012	ERM-MW-09 07/08/2008	ERM-MW-09 02/22/2010	ERM-MW-09 06/13/2011	ERM-MW-09 12/10/2012
Chloromethane	(ug/l)	5	1.0 U	1.0 U	1 U	1.0 U	0.24 J
cis-1,2-Dichloroethene	(ug/l)	5	1.6	[99.3]	[39.5]	[27.9]	[14.0]
cis-1,3-Dichloropropene	(ug/l)	0.4	1.0 U	1.0 U	1 U	1.0 U	1.0 U
Cyclohexane	(ug/l)		5.0 U	5.0 U		5.0 U	5.0 U
Dibromochloromethane	(ug/l)	50	1.0 U	1.0 U	1 U	1.0 U	1.0 U
Dichlorodifluoromethane	(ug/l)	5	5.0 U	5.0 U	1 U	5.0 U	5.0 U
Ethylbenzene	(ug/l)	5	1.0 U	1.0 U	1 U	1.0 U	1.0 U
Freon 113	(ug/l)	5	0.74 J	5.0 U	1 U	5.0 U	5.0 U
Isopropylbenzene	(ug/l)	5	2.0 U	2.0 U	1 U	2.0 U	2.0 U
m+p-Xylene	(ug/l)	5	1.0 U	1.0 U	1 U		1.0 U
Methyl Acetate	(ug/l)		5.0 U	5.0 U		5.0 U	5.0 U
Methyl Cyclohexane	(ug/l)		5.0 U	5.0 U		5.0 U	5.0 U
Methyl Tertiary Butyl Ether	(ug/l)	10	1.0 U	1.0 U	1 U	1.0 U	1.0 U
Methylene Chloride	(ug/l)	5	2.0 U	2.0 U	1 U	2.0 U	2.0 U
o-Xylene	(ug/l)	5	1.0 U	1.0 U	1 U		1.0 U
Styrene	(ug/l)	5	5.0 U	5.0 U	1 U	5.0 U	5.0 U
Tetrachloroethene	(ug/l)	5	2.8	[188]	[28.8]	[37.9]	[29.5]
Toluene	(ug/l)	5	1.0 U	1.0 U	1 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	(ug/l)	5	1.0 U	1.5	1 U	0.33 J	1.0 U
trans-1,3-Dichloropropene	(ug/l)	0.4	1.0 U	1.0 U		1.0 U	1.0 U
Trichloroethene	(ug/l)	5	[158]	[155]	[71.1]	[19.4]	[13.0]
Trichlorofluoromethane	(ug/l)	5	5.0 U	5.0 U	1 U	5.0 U	5.0 U
Vinyl chloride	(ug/l)	2	1.0 U	1.0 U	1 U	1.0 U	0.21 J
Xylene (total)	(ug/l)	5	1.0 U			1.0 U	1.0 U

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-10 02/22/2010	ERM-MW-10 06/13/2011	ERM-MW-10 12/10/2012	ERM-MW-11D 05/20/2011	ERM-MW-11D 06/13/2011
1,1,1-Trichloroethane	(ug/l)	5	1 U	1.0 U	1.0 U	[7.0]	[12.1]
1,1,2,2-Tetrachloroethane	(ug/l)	5	1 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	(ug/l)	1	1 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	(ug/l)	5	1 U	1.0 U	1.0 U	4.6	[7.2]
1,1-Dichloroethene	(ug/l)	5	1 U	1.0 U	1.0 U	[5.8]	[14.4]
1,2,3-Trichlorobenzene	(ug/l)	5	1 U		5.0 U		
1,2,4-Trichlorobenzene	(ug/l)	5	1 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dibromo-3-chloropropane	(ug/l)	0.04		10 U	10 U	10 U	10 U
1,2-Dibromoethane	(ug/l)	0.0006	1 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	(ug/l)	3	1 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	(ug/l)	0.6	1 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	(ug/l)	1	1 U	0.96 J	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	(ug/l)	3	1 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	(ug/l)	3	1 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dioxane	(ug/l)				130 U		
2-Butanone	(ug/l)	50	1 U	10 U	10 U	10 U	25.3
2-Hexanone	(ug/l)	50		5.0 U	5.0 U	5.0 U	5.0 U
4-Methyl-2-Pentanone	(ug/l)		1 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	(ug/l)	50	5 U	10 U	5.0 J	10 U	15.3
Benzene	(ug/l)	1	1 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromochloromethane	(ug/l)	5	1 U		5.0 U		
Bromodichloromethane	(ug/l)	50	1 U	1.7	1.0 U	1.0 U	1.0 U
Bromoform	(ug/l)	50	1 U	0.73 J	4.0 U	4.0 U	4.0 U
Bromomethane	(ug/l)	5	1 U	2.0 U	2.0 U	2.0 U	2.0 U
Carbon Disulfide	(ug/l)	60	1 U	2.0 U	2.0 U	2.0 U	2.0 U
Carbon Tetrachloride	(ug/l)	5	5 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	(ug/l)	5	1 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	(ug/l)	5	1 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	(ug/l)	7	1 U	3.9	[10.6]	1.0 U	1.0 U

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:

SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-10 02/22/2010	ERM-MW-10 06/13/2011	ERM-MW-10 12/10/2012	ERM-MW-11D 05/20/2011	ERM-MW-11D 06/13/2011
Chloromethane	(ug/l)	5	1 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	(ug/l)	5	10 U	1.0 U	1.0 U	[88.8]	[164]
cis-1,3-Dichloropropene	(ug/l)	0.4	1 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	(ug/l)			5.0 U	5.0 U	5.0 U	5.0 U
Dibromochloromethane	(ug/l)	50	1 U	2.2	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane	(ug/l)	5	1 U	5.0 U	5.0 U	5.0 U	5.0 U
Ethylbenzene	(ug/l)	5	1 U	1.0 U	1.0 U	1.0 U	1.0 U
Freon 113	(ug/l)	5	1 U	5.0 U	5.0 U	5.0 U	5.0 U
Isopropylbenzene	(ug/l)	5	1 U	2.0 U	2.0 U	2.0 U	2.0 U
m+p-Xylene	(ug/l)	5	1 U		1.0 U		
Methyl Acetate	(ug/l)			5.0 U	5.0 U	5.0 U	5.0 U
Methyl Cyclohexane	(ug/l)			5.0 U	5.0 U	5.0 U	5.0 U
Methyl Tertiary Butyl Ether	(ug/l)	10	1 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	(ug/l)	5	1 U	2.0 U	2.0 U	2.0 U	2.0 U
o-Xylene	(ug/l)	5	1 U		1.0 U		
Styrene	(ug/l)	5	1 U	5.0 U	5.0 U	5.0 U	5.0 U
Tetrachloroethene	(ug/l)	5	1 U	1.0 U	1.0 U	[200]	[107]
Toluene	(ug/l)	5	1 U	1.0 U	1.0 U	[6.5]	0.71 J
trans-1,2-Dichloroethene	(ug/l)	5	1 U	1.0 U	1.0 U	3.1	3.1
trans-1,3-Dichloropropene	(ug/l)	0.4		1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	(ug/l)	5	1 U	1.0 U	0.48 J	[75.8]	[122]
Trichlorofluoromethane	(ug/l)	5	1 U	5.0 U	5.0 U	5.0 U	5.0 U
Vinyl chloride	(ug/l)	2	1 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	(ug/l)	5		1.0 U	1.0 U	1.0 U	1.0 U

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:
SAMPLE TYPE: Water

CONSTITUENT	SITE	NYSDEC	ERM-MW-11D	ERM-MW-11M	ERM-MW-11M	ERM-MW-11S	ERM-MW-11S
	DATE	TOGS	12/10/2012	06/13/2011	12/10/2012	06/13/2011	12/10/2012
1,1,1-Trichloroethane	(ug/l)	5	[18.4]	0.94 J	[7.1] J	4.5	[5.5]
1,1,2,2-Tetrachloroethane	(ug/l)	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	(ug/l)	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	(ug/l)	5	[14.1]	1.4	[14.5]	[8.6]	[15.5]
1,1-Dichloroethene	(ug/l)	5	[27.5]	1.4	[8.5] J	4.2	[6.7]
1,2,3-Trichlorobenzene	(ug/l)	5	5.0 U		5.0 U		5.0 U
1,2,4-Trichlorobenzene	(ug/l)	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dibromo-3-chloropropane	(ug/l)	0.04	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	(ug/l)	0.0006	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	(ug/l)	3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	(ug/l)	0.6	0.48 J	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	(ug/l)	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	(ug/l)	3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	(ug/l)	3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dioxane	(ug/l)		130 U J		130 U J		130 U
2-Butanone	(ug/l)	50	10 U	18.3	10 U	10 U	10 U
2-Hexanone	(ug/l)	50	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Methyl-2-Pentanone	(ug/l)		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	(ug/l)	50	4.4 J	15.1	12.6	14.0	10.4
Benzene	(ug/l)	1	1.0 U	1.0 U	1.0 U	1.0 U	0.30 J
Bromochloromethane	(ug/l)	5	5.0 U		5.0 U		5.0 U
Bromodichloromethane	(ug/l)	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	(ug/l)	50	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Bromomethane	(ug/l)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Carbon Disulfide	(ug/l)	60	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Carbon Tetrachloride	(ug/l)	5	1.0 U	1.0 U	1.0 U J	1.0 U	1.0 U
Chlorobenzene	(ug/l)	5	1.0 U	1.0 U	0.62 J	0.38 J	0.86 J
Chloroethane	(ug/l)	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	(ug/l)	7	0.22 J	1.1	1.0 U	1.0 U	1.0 U

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:

SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-11D 12/10/2012	ERM-MW-11M 06/13/2011	ERM-MW-11M 12/10/2012	ERM-MW-11S 06/13/2011	ERM-MW-11S 12/10/2012
Chloromethane	(ug/l)	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	(ug/l)	5	[286]	[16.9]	[90.9] J	[97.8]	[120]
cis-1,3-Dichloropropene	(ug/l)	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	(ug/l)		5.0 U	5.0 U	5.0 U J	5.0 U	5.0 U
Dibromochloromethane	(ug/l)	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane	(ug/l)	5	5.0 U	5.0 U	5.0 U J	5.0 U	5.0 U
Ethylbenzene	(ug/l)	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Freon 113	(ug/l)	5	5.0 U	5.0 U	5.0 U J	5.0 U	5.0 U
Isopropylbenzene	(ug/l)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
m+p-Xylene	(ug/l)	5	1.0 U		1.0 U		1.0 U
Methyl Acetate	(ug/l)		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methyl Cyclohexane	(ug/l)		5.0 U	5.0 U	5.0 U J	5.0 U	5.0 U
Methyl Tertiary Butyl Ether	(ug/l)	10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	(ug/l)	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
o-Xylene	(ug/l)	5	1.0 U		1.0 U		1.0 U
Styrene	(ug/l)	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Tetrachloroethene	(ug/l)	5	[125]	[78.9]	[174] J	[166]	[211]
Toluene	(ug/l)	5	1.0 U	1.0 U	1.0 U	[9.1]	[14.5]
trans-1,2-Dichloroethene	(ug/l)	5	[5.7]	1.0 U	1.7	1.8	2.2
trans-1,3-Dichloropropene	(ug/l)	0.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	(ug/l)	5	[205]	[26.9]	[202] J	[91.4]	[155]
Trichlorofluoromethane	(ug/l)	5	5.0 U	5.0 U	5.0 U J	5.0 U	5.0 U
Vinyl chloride	(ug/l)	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	(ug/l)	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-12M 12/10/2012	ERM-MW-12S 12/10/2012
1,1,1-Trichloroethane	(ug/l)	5	4.2	1.0 U
1,1,2,2-Tetrachloroethane	(ug/l)	5	1.0 U	1.0 U
1,1,2-Trichloroethane	(ug/l)	1	1.0 U	1.0 U
1,1-Dichloroethane	(ug/l)	5	1.0	1.0 U
1,1-Dichloroethene	(ug/l)	5	[6.3]	1.0 U
1,2,3-Trichlorobenzene	(ug/l)	5	5.0 U	5.0 U
1,2,4-Trichlorobenzene	(ug/l)	5	5.0 U	5.0 U
1,2-Dibromo-3-chloropropane	(ug/l)	0.04	10 U	10 U
1,2-Dibromoethane	(ug/l)	0.0006	2.0 U	2.0 U
1,2-Dichlorobenzene	(ug/l)	3	1.0 U	1.0 U
1,2-Dichloroethane	(ug/l)	0.6	1.0 U	1.0 U
1,2-Dichloropropane	(ug/l)	1	1.0 U	1.0 U
1,3-Dichlorobenzene	(ug/l)	3	1.0 U	1.0 U
1,4-Dichlorobenzene	(ug/l)	3	1.0 U	1.0 U
1,4-Dioxane	(ug/l)		130 U J	130 U J
2-Butanone	(ug/l)	50	10 U	10 U
2-Hexanone	(ug/l)	50	5.0 U	5.0 U
4-Methyl-2-Pentanone	(ug/l)		5.0 U	5.0 U
Acetone	(ug/l)	50	4.0 J	15.2
Benzene	(ug/l)	1	1.0 U	1.0 U
Bromochloromethane	(ug/l)	5	5.0 U	5.0 U
Bromodichloromethane	(ug/l)	50	1.0 U	1.0 U
Bromoform	(ug/l)	50	4.0 U	4.0 U
Bromomethane	(ug/l)	5	2.0 U	2.0 U
Carbon Disulfide	(ug/l)	60	2.0 U	2.0 U
Carbon Tetrachloride	(ug/l)	5	1.0 U	1.0 U
Chlorobenzene	(ug/l)	5	1.0 U	1.0 U
Chloroethane	(ug/l)	5	1.0 U	1.0 U
Chloroform	(ug/l)	7	1.0 U	0.29 J

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

TABLE 1
SUMMARY OF
GROUNDWATER SAMPLING RESULTS
OU-2 OFF-SITE RI
NEW YORK TWIST DRILL

PERIOD:
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	NYSDEC TOGS	ERM-MW-12M 12/10/2012	ERM-MW-12S 12/10/2012
Chloromethane	(ug/l)	5	1.0 U	1.0 U
cis-1,2-Dichloroethene	(ug/l)	5	2.4	0.90 J
cis-1,3-Dichloropropene	(ug/l)	0.4	1.0 U	1.0 U
Cyclohexane	(ug/l)		5.0 U	5.0 U
Dibromochloromethane	(ug/l)	50	1.0 U	1.0 U
Dichlorodifluoromethane	(ug/l)	5	5.0 U	5.0 U
Ethylbenzene	(ug/l)	5	1.0 U	1.0 U
Freon 113	(ug/l)	5	5.0 U	5.0 U
Isopropylbenzene	(ug/l)	5	2.0 U	2.0 U
m+p-Xylene	(ug/l)	5	1.0 U	1.0 U
Methyl Acetate	(ug/l)		5.0 U	5.0 U
Methyl Cyclohexane	(ug/l)		5.0 U	5.0 U
Methyl Tertiary Butyl Ether	(ug/l)	10	1.0 U	1.0 U
Methylene Chloride	(ug/l)	5	2.0 U	2.0 U
o-Xylene	(ug/l)	5	1.0 U	1.0 U
Styrene	(ug/l)	5	5.0 U	5.0 U
Tetrachloroethene	(ug/l)	5	[23.2]	2.4
Toluene	(ug/l)	5	1.0 U	1.0 U
trans-1,2-Dichloroethene	(ug/l)	5	1.0 U	1.0 U
trans-1,3-Dichloropropene	(ug/l)	0.4	1.0 U	1.0 U
Trichloroethene	(ug/l)	5	[18.0]	1.6
Trichlorofluoromethane	(ug/l)	5	5.0 U	5.0 U
Vinyl chloride	(ug/l)	2	1.0 U	1.0 U
Xylene (total)	(ug/l)	5	1.0 U	1.0 U

U - Not Detected
J - Estimated Value

[x]=Greater than Action Level

Table 2
Subslab, Indoor and Outdoor Air Sampling Results
10 Melville Park Road
NYTD OU-2 Off-Site RI

PERIOD: From 03/19/2007 thru 01/18/2014 - Inclusive
SAMPLE TYPE: Air

CONSTITUENT	SITE		10MPR-IA-01	10MPR-OA-01	10MPR-SS-01	10MPR-SS-02	AA-01
	LAB SAMPLE ID	NYSDOH	JB58394-3	JB58394-4	JB58394-1	JB58394-2	0703999_2
	DATE	Guidance	01/18/2014	01/18/2014	01/18/2014	01/18/2014	03/19/2007
1,1,1,2-Tetrachloroethane	(ug/m3)						1.7U
1,1,2-Trichloroethane	(ug/m3)		1.1U	1.1U	4.4U	4.4U	1.4U
1,1-Dichloroethane	(ug/m3)		0.81U	0.81U	3.2U	3.2U	0.89U
1,2,4-Trichlorobenzene	(ug/m3)		1.5U	1.5U	5.9U	5.9U	6.2U
1,2,4-Trimethylbenzene	(ug/m3)		0.98U	0.98U	3.9U	3.9U	3.1U
1,2-Dichloroethane	(ug/m3)		0.81U	0.81U	3.2U	3.2U	6.96U
1,2-Dichloropropane	(ug/m3)		0.92U	0.92U	3.7U	3.7U	2.0U
1,3,5-Trimethylbenzene	(ug/m3)		0.98U	0.98U	3.9U	3.9U	2.2U
1,3-Butadiene	(ug/m3)		0.44U	0.44U	1.8U	1.8U	1.1U
1,3-Dichloropropane	(ug/m3)						1.3U
1,4-Dioxane	(ug/m3)		0.72U	0.72U	2.9U	2.9U	2.1U
111-TCA	(ug/m3)	100	1.1U	1.1U	4.4U	4.4U	2U
2-Hexanone	(ug/m3)		0.82U	0.82U	3.3U	3.3U	1.5U
Acetone	(ug/m3)		7.4	5.2	233	121	1.5U
Benzene	(ug/m3)		0.18J	0.83	2.6U	2.6U	1.0U
Benzyl chloride	(ug/m3)		1.0U	1.0U	4.1U	4.1U	1.7U
Bromodichloromethane	(ug/m3)		1.3U	1.3U	5.4U	5.4U	2U
Carbon Disulfide	(ug/m3)		0.62U	0.62U	2.5U	2.5U	0.50U
Carbon Tetrachloride	(ug/m3)	5	1.3U	1.3U	5.0U	5.0U	1.8U
Chlorobenzene	(ug/m3)		0.92U	0.92U	3.7U	3.7U	1.7U
Chloroethane	(ug/m3)		0.53U	0.53U	2.1U	2.1U	0.61U
Chloroform	(ug/m3)		0.98U	0.98U	3.9U	12	1.2U
Dibromochloromethane	(ug/m3)		1.7U	1.7U	6.8U	6.8U	2.7U
Dichlorodifluoromethane	(ug/m3)		3.4	2.6	4.5	11	2U
EDB	(ug/m3)		1.5U	1.5U	6.1U	6.1U	1.8U
Ethanol	(ug/m3)		21.3	5.7	70.8	69.5	0.93U
Ethyl acetate	(ug/m3)		0.72U	2.3	2.9U	2.9U	1.5U
Ethylbenzene	(ug/m3)		0.87U	0.87U	1.1J	3.5U	2U
Freon 113	(ug/m3)		3.2	3.0	4.8J	18	2.0U

[x] - Greater than NYSDOH Matrix 1 & 2 Values
J - Estimated Concentration; U - Non-Detect

Table 2
Subslab, Indoor and Outdoor Air Sampling Results
10 Melville Park Road
NYTD OU-2 Off-Site RI

PERIOD: From 03/19/2007 thru 01/18/2014 - Inclusive
SAMPLE TYPE: Air

CONSTITUENT	SITE LAB SAMPLE ID DATE	NYSDOH Guidance	10MPR-IA-01 JB58394-3 01/18/2014	10MPR-OA-01 JB58394-4 01/18/2014	10MPR-SS-01 JB58394-1 01/18/2014	10MPR-SS-02 JB58394-2 01/18/2014	AA-01 0703999_2 03/19/2007
Isopropanol	(ug/m3)		1.5	0.98	15	4.2	1.1U
Methyl Isobutyl Ketone	(ug/m3)		0.82U	0.82U	3.3U	3.3U	4.1U
Methyl bromide	(ug/m3)		0.78U	0.78U	3.1U	3.1U	2.3U
Methyl chloride	(ug/m3)		1.6	1.4	1.7U	1.7U	1.0U
Methyl ethyl ketone	(ug/m3)		0.59U	0.50J	7.7	5.9	0.91U
Methyl tert butyl ether	(ug/m3)		0.72U	0.72U	2.9U	2.9U	2.1U
Methylene Chloride	(ug/m3)		4.9	2.4	4.5	28	1U
Naphthalene	(ug/m3)						2.1U
Styrene	(ug/m3)		0.85U	0.85U	2.7J	2.9J	1.7U
Tetrachloroethylene	(ug/m3)	30	0.27U	0.27U	[32]	[73.9]	1.8U
Toluene	(ug/m3)		0.75U	1.1	3.1	3.0	3.3U
Trichloroethylene	(ug/m3)	2	0.21U	0.21U	0.86U	0.86U	1.3U
Trichlorofluoromethane	(ug/m3)		2.6	1.1	2.4J	7.9	1.6U
Vinyl chloride	(ug/m3)	5	0.51U	0.51U	2.0U	2.0U	1.2U
cis-1,2-Dichloroethylene	(ug/m3)	100	0.79U	0.79U	3.2U	3.2U	1.3U
cis-1,3-Dichloropropene	(ug/m3)		0.91U	0.91U	3.6U	3.6U	1.1U
m,p-Xylene	(ug/m3)		0.87U	0.56J	3.5U	3.3J	1.8U
m-Dichlorobenzene	(ug/m3)		1.2U	1.2U	4.8U	4.8U	1.9U
n-Heptane	(ug/m3)						1.4U
n-Hexane	(ug/m3)		0.46J	1.1	2.0J	9.2	5.85U
o-Dichlorobenzene	(ug/m3)		1.2U	1.2U	4.8U	4.8U	4.6U
o-Xylene	(ug/m3)		0.87U	0.87U	0.91J	3.5U	1.7U
p-Dichlorobenzene	(ug/m3)		1.2U	1.2U	4.8U	4.8U	4.4U
1,1,2,2-Tetrachloroethane	(ug/m3)		1.4U	1.4U	5.5U	5.5U	
1,1-Dichloroethene	(ug/m3)	100	0.79U	0.79U	3.2U	3.2U	
2,2,4-Trimethylpentane	(ug/m3)		0.93U	0.93U	3.7U	3.7U	
2-Chlorotoluene	(ug/m3)		1.0U	1.0U	4.1U	4.1U	
3-Chloropropene	(ug/m3)		0.63U	0.63U	2.5U	2.5U	
4-Ethyltoluene	(ug/m3)		0.98U	0.98U	3.9U	3.9U	

[x] - Greater than NYSDOH Matrix 1 & 2 Values
J - Estimated Concentration; U - Non-Detect

Table 2
Subslab, Indoor and Outdoor Air Sampling Results
10 Melville Park Road
NYTD OU-2 Off-Site RI

PERIOD: From 03/19/2007 thru 01/18/2014 - Inclusive
SAMPLE TYPE: Air

CONSTITUENT	SITE LAB SAMPLE ID DATE	NYSDOH Guidance	10MPR-IA-01 JB58394-3 01/18/2014	10MPR-OA-01 JB58394-4 01/18/2014	10MPR-SS-01 JB58394-1 01/18/2014	10MPR-SS-02 JB58394-2 01/18/2014	AA-01 0703999_2 03/19/2007
Bromoethene	(ug/m3)		0.87U	0.87U	3.5U	3.5U	
Bromoform	(ug/m3)		2.1U	2.1U	8.3U	8.3U	
Cyclohexane	(ug/m3)		0.69U	0.69U	2.8U	2.8U	
Freon 114	(ug/m3)		1.4U	1.4U	5.6U	15	
Heptane	(ug/m3)		0.82U	0.74J	3.3U	3.3U	
Hexachlorobutadiene	(ug/m3)		2.1U	2.1U	8.5U	8.5U	
Methylmethacrylate	(ug/m3)		0.82U	0.82U	3.3U	3.3U	
Propylene	(ug/m3)		0.86U	0.86U	3.4U	3.4U	
Tertiary Butyl Alcohol	(ug/m3)		0.61U	0.61U	2.4U	2.5	
Tetrahydrofuran	(ug/m3)		0.59U	0.59U	2.4U	2.4U	
trans-1,2-Dichloroethene	(ug/m3)		0.79U	0.79U	3.2U	3.2U	
trans-1,3-Dichloropropene	(ug/m3)		0.91U	0.91U	3.6U	3.6U	
Vinyl Acetate	(ug/m3)		0.70U	0.70U	2.8U	2.8U	

[x] - Greater than NYSDOH Matrix 1 & 2 Values
J - Estimated Concentration; U - Non-Detect

Table 2

Subslab, Indoor and Outdoor Air Sampling Results
10 Melville Park Road
NYTD OU-2 Off-Site RI

PERIOD: From 03/19/2007 thru 01/18/2014 - Inclusive
SAMPLE TYPE: Air

CONSTITUENT	SITE LAB SAMPLE ID DATE	NYSDOH Guidance	IA-01 0703999_1 03/19/2007	SS-01 0703999_3 03/19/2007	SS-02 0703999_4 03/19/2007
1,1,1,2-Tetrachloroethane	(ug/m3)		1.7U	1.7U	1.7U
1,1,2-Trichloroethane	(ug/m3)		1.4U	1.4U	1.4U
1,1-Dichloroethane	(ug/m3)		0.89U	0.89U	0.89U
1,2,4-Trichlorobenzene	(ug/m3)		6.2U	6.2U	6.2U
1,2,4-Trimethylbenzene	(ug/m3)		3.1U	3.1U	3.1U
1,2-Dichloroethane	(ug/m3)		6.96U	6.96U	6.96U
1,2-Dichloropropane	(ug/m3)		2.0U	2.0U	2.0U
1,3,5-Trimethylbenzene	(ug/m3)		2.2U	2.2U	2.2U
1,3-Butadiene	(ug/m3)		1.1U	1.1U	1.1U
1,3-Dichloropropane	(ug/m3)		1.3U	1.3U	1.3U
1,4-Dioxane	(ug/m3)		2.1U	2.1U	2.1U
111-TCA	(ug/m3)	100	2U	2U	2U
2-Hexanone	(ug/m3)		1.5U	1.5U	1.5U
Acetone	(ug/m3)		1.5U	1.5U	1.5U
Benzene	(ug/m3)		1.0U	1.0U	1.0U
Benzyl chloride	(ug/m3)		1.7U	1.7U	1.7U
Bromodichloromethane	(ug/m3)		2U	2U	2U
Carbon Disulfide	(ug/m3)		0.50U	0.50U	0.50U
Carbon Tetrachloride	(ug/m3)	5	1.8U	1.8U	1.8U
Chlorobenzene	(ug/m3)		1.7U	1.7U	1.7U
Chloroethane	(ug/m3)		0.61U	0.61U	0.61U
Chloroform	(ug/m3)		1.2U	1.2U	21.2
Dibromochloromethane	(ug/m3)		2.7U	2.7U	2.7U
Dichlorodifluoromethane	(ug/m3)		2U	2U	2U
EDB	(ug/m3)		1.8U	1.8U	1.8U
Ethanol	(ug/m3)		0.93U	0.93U	0.93U
Ethyl acetate	(ug/m3)		1.5U	1.5U	1.5U
Ethylbenzene	(ug/m3)		2U	2U	2U
Freon 113	(ug/m3)		2.0U	2.0U	2.0U

[x] - Greater than NYSDOH Matrix 1 & 2 Values
J - Estimated Concentration; U - Non-Detect

Table 2

Subslab, Indoor and Outdoor Air Sampling Results

10 Melville Park Road

NYTD OU-2 Off-Site RI

PERIOD: From 03/19/2007 thru 01/18/2014 - Inclusive

SAMPLE TYPE: Air

CONSTITUENT	SITE LAB SAMPLE ID DATE	NYSDOH Guidance	IA-01 0703999_1 03/19/2007	SS-01 0703999_3 03/19/2007	SS-02 0703999_4 03/19/2007
Isopropanol	(ug/m3)		1.1U	1.1U	1.1U
Methyl Isobutyl Ketone	(ug/m3)		4.1U	4.1U	4.1U
Methyl bromide	(ug/m3)		2.3U	2.3U	2.3U
Methyl chloride	(ug/m3)		1.0U	1.0U	1.0U
Methyl ethyl ketone	(ug/m3)		0.91U	0.91U	0.91U
Methyl tert butyl ether	(ug/m3)		2.1U	2.1U	2.1U
Methylene Chloride	(ug/m3)		1U	1U	1U
Naphthalene	(ug/m3)		2.1U	2.1U	2.1U
Styrene	(ug/m3)		1.7U	1.7U	1.7U
Tetrachloroethylene	(ug/m3)	30	1.8U	[111]	[1010]
Toluene	(ug/m3)		3.3U	3.3U	3.3U
Trichloroethylene	(ug/m3)	2	1.3U	1.3U	[66.6]
Trichlorofluoromethane	(ug/m3)		1.6U	1.6U	1.6U
Vinyl chloride	(ug/m3)	5	1.2U	1.2U	1.2U
cis-1,2-Dichloroethylene	(ug/m3)	100	1.3U	1.3U	14.6
cis-1,3-Dichloropropene	(ug/m3)		1.1U	1.1U	1.1U
m,p-Xylene	(ug/m3)		1.8U	1.8U	1.8U
m-Dichlorobenzene	(ug/m3)		1.9U	1.9U	1.9U
n-Heptane	(ug/m3)		1.4U	1.4U	1.4U
n-Hexane	(ug/m3)		5.85U	5.85U	5.85U
o-Dichlorobenzene	(ug/m3)		4.6U	4.6U	4.6U
o-Xylene	(ug/m3)		1.7U	1.7U	1.7U
p-Dichlorobenzene	(ug/m3)		4.4U	4.4U	4.4U
1,1,2,2-Tetrachloroethane	(ug/m3)				
1,1-Dichloroethene	(ug/m3)	100			
2,2,4-Trimethylpentane	(ug/m3)				
2-Chlorotoluene	(ug/m3)				
3-Chloropropene	(ug/m3)				
4-Ethyltoluene	(ug/m3)				

[x] - Greater than NYSDOH Matrix 1 & 2 Values

J - Estimated Concentration; U - Non-Detect

Table 2
Subslab, Indoor and Outdoor Air Sampling Results
10 Melville Park Road
NYTD OU-2 Off-Site RI

PERIOD: From 03/19/2007 thru 01/18/2014 - Inclusive
SAMPLE TYPE: Air

CONSTITUENT	SITE LAB SAMPLE ID DATE	NYSDOH Guidance	IA-01 0703999_1 03/19/2007	SS-01 0703999_3 03/19/2007	SS-02 0703999_4 03/19/2007
Bromoethene	(ug/m3)				
Bromoform	(ug/m3)				
Cyclohexane	(ug/m3)				
Freon 114	(ug/m3)				
Heptane	(ug/m3)				
Hexachlorobutadiene	(ug/m3)				
Methylmethacrylate	(ug/m3)				
Propylene	(ug/m3)				
Tertiary Butyl Alcohol	(ug/m3)				
Tetrahydrofuran	(ug/m3)				
trans-1,2-Dichloroethene	(ug/m3)				
trans-1,3-Dichloropropene	(ug/m3)				
Vinyl Acetate	(ug/m3)				

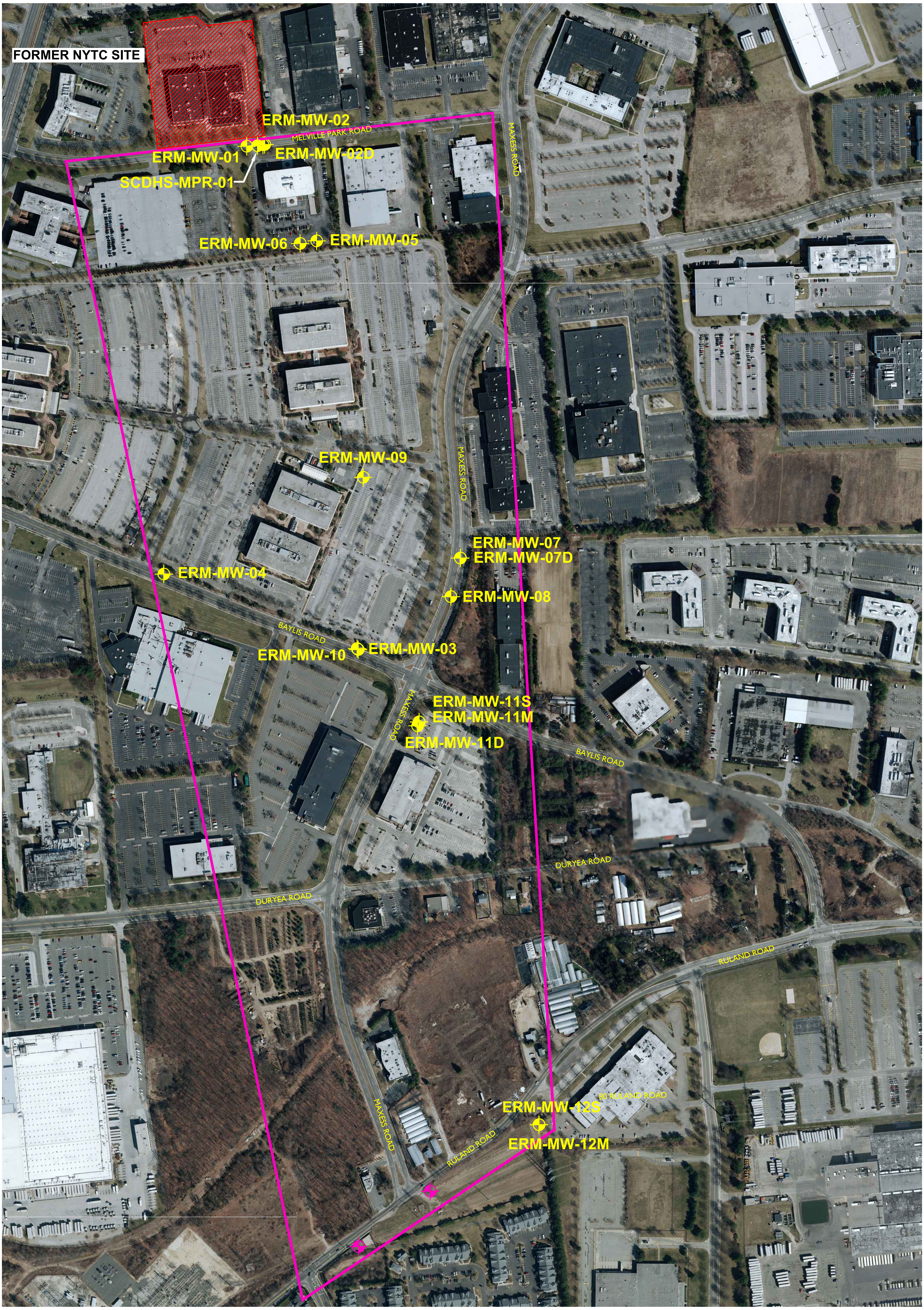
[x] - Greater than NYSDOH Matrix 1 & 2 Values
J - Estimated Concentration; U - Non-Detect

TABLE 3
NEW TORK TWIST DRILL
OFF-SITE INVESTIGATION
Melville Park Road
Monitoring Well Elevation and Construction Data

Well	VP	MP	North	East	Lat	Long	Daimeter (inches)	Well Depth (feet-bgs)	Screen Interval (feet)	Screen Midpoint
SCDHS-MPR-01		116.14	222588.4712	1145829.706	40.77615333	-73.41659983	2	60.6	50-60	55
ERM-MW-01	VP-01	116.21	222586.0558	1145783.468	40.77614755	-73.41676683	2	60.5	55.5-60.5	58
ERM-MW-02	VP-02	116.05	222593.8399	1145860.479	40.77616751	-73.41648859	2	95.5	90.5-95.5	93.2
ERM-MW-03		109.51	220430.397	1146260.783	40.77022223	-73.41509545	1	60	55-60	57.5
ERM-MW-04		111.21	220753.8975	1145428.618	40.77112534	-73.41809195	1	60	55-60	57.5
ERM-MW-02D	VP-02	115.96	222592.5035	1145852.984	40.77616397	-73.41651568	2	170.5	165.5-170.5	168
ERM-MW-05	VP-03	115.91	222180.746	1146083.202	40.77502962	-73.4156944	2	150	145-150	147.5
ERM-MW-06	VP-04	116.41	222169.9301	1146012.069	40.77500124	-73.41595148	2	100	95-100	97.5
ERM-MW-07	VP-05	109.15	220822.2631	1146698.196	40.77128974	-73.41350684	1	60	50-60	55
ERM-MW-07D	VP-05	109.03	220822.1554	1146698.503	40.77128944	-73.41350574	2	290	280-290	285
ERM-MW-08	VP-06	108.9	220656.916	1146657.895	40.77083666	-73.41365633	2	296	285-295	290
ERM-MW-09	VP-07	114.84	221168.045	1146282.009	40.77224644	-73.41500104	2	175	165-175	170
ERM-MW-10		109.94	220434.589	1146256.058	40.77023382	-73.41511241	2	235	225-235	230
ERM-MW-11S	VP-08	108.07	220120.474	1146521.346	40.76936681	-73.41416226	1	195	185-195	190
ERM-MW-11M	VP-08	108.06	220120.283	1146521.377	40.76936628	-73.41416215	2	245	235-245	240
ERM-MW-011D	VP-08	107.7	220103.525	1146515.079	40.7693204	-73.41418529	2	295	285-295	290
ERM-MW-012S	VP-09	103.84	218395.073	1147035.444	40.76462168	-73.41234809	1	100	90-100	95
ERM-MW-012M		103.81	218395.041	1147035.206	40.7646216	-73.41234895	2	238	228-238	233

NOTES

Horizontal Datum NAD83
Vertical Datum NAVD88



Legend

◐ Monitoring Well Location

◐ Proposed Vertical Profile/Monitoring Well Location

N

0 400' 800'

GRAPHIC SCALE IN FEET

TITLE

NYTD OU2 BOUNDARY

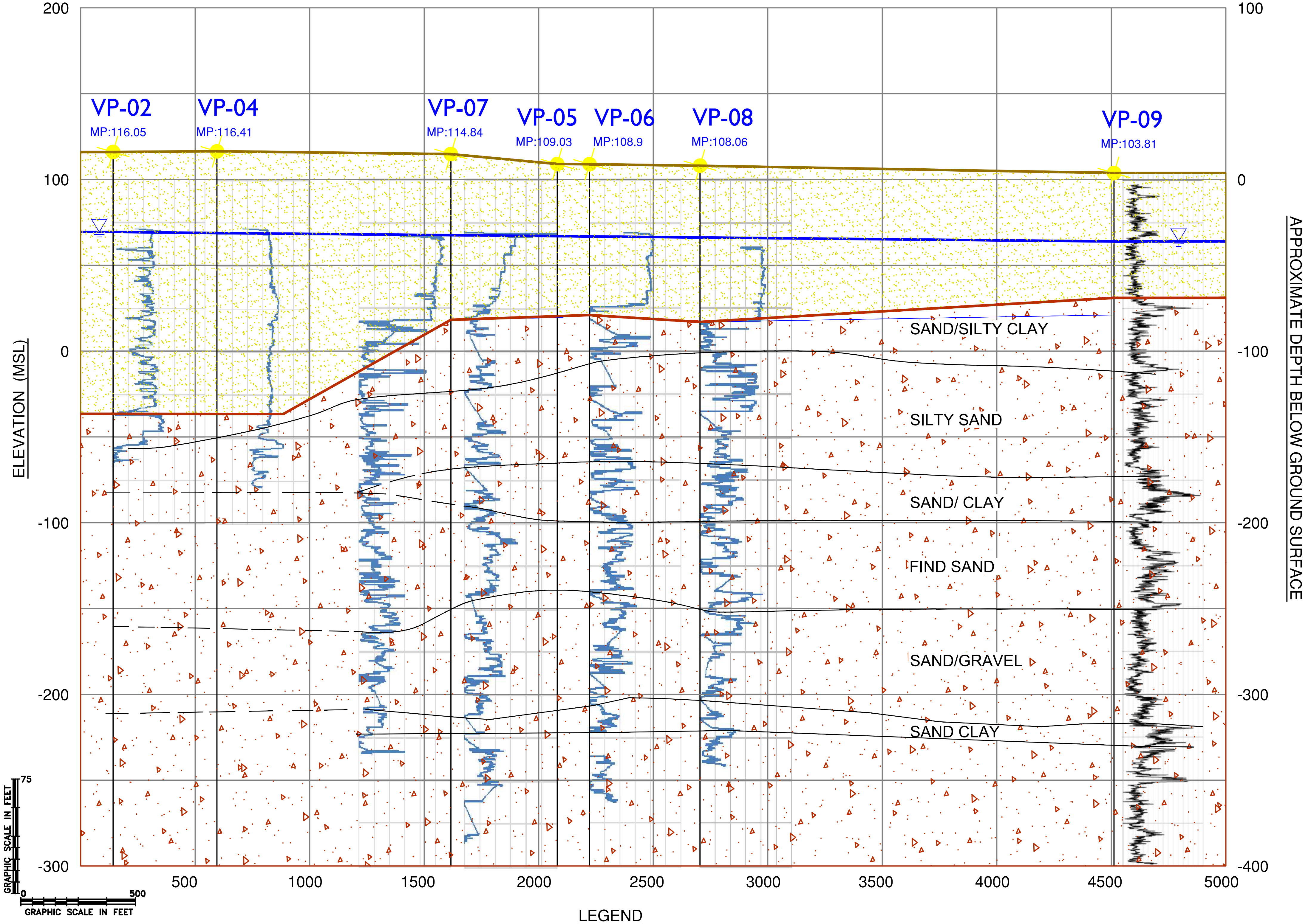
PREPARED FOR

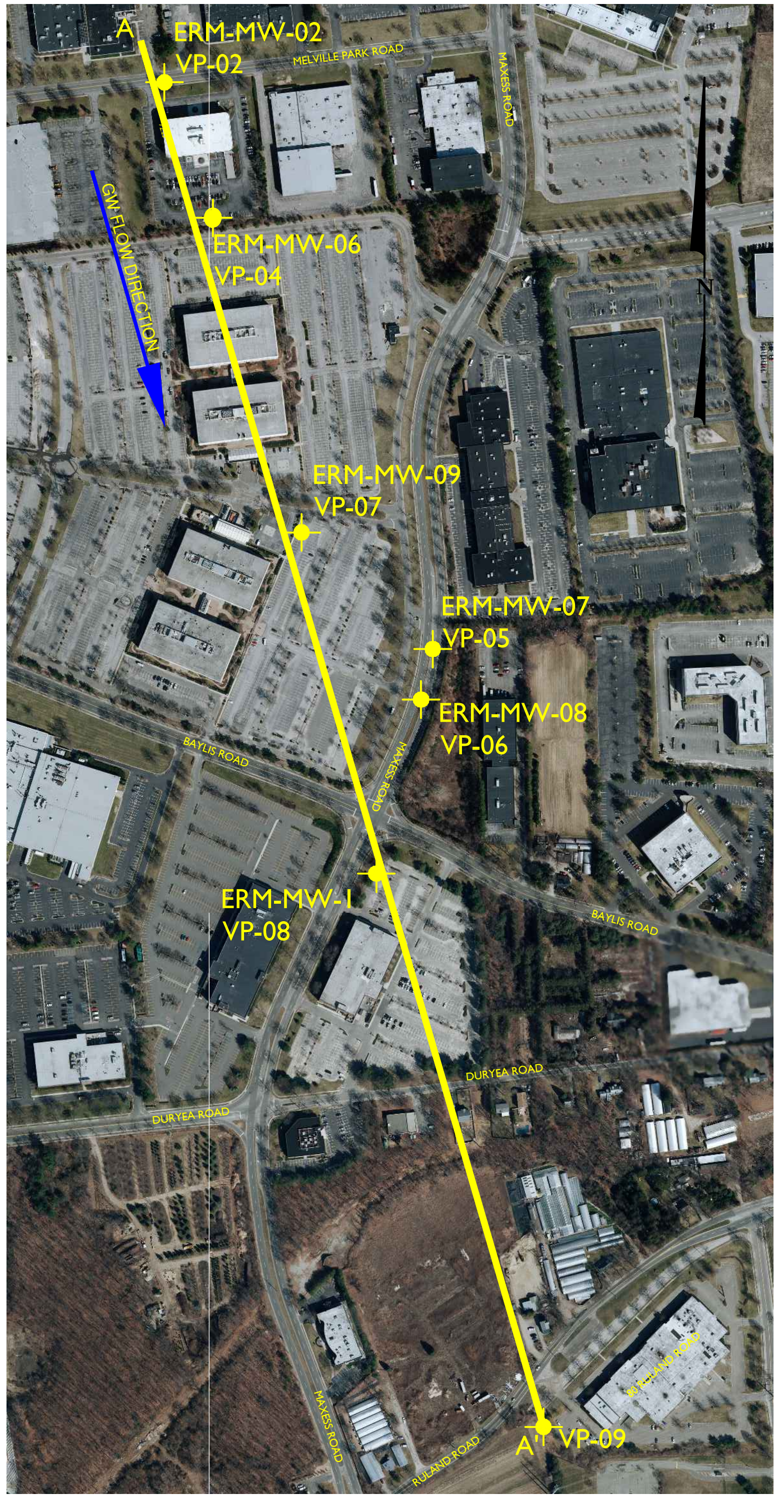
RESPONDANTS ORDER ON CONSENT
NO. W1-0998-04-04

Environmental Resources Management

DRAWN BY	SCALE	DATE	JOB NO.	FIGURE
GKS/EMF	AS SHOWN	10/16/15	0300219	1

R:\Scout\Projects\NY Twist Drill\CAD\2015 October\2015-10 - NY Twist Drill - GW MW Network.dwg (10/16/2015 - 3:44pm Melville)





LEGEND

UPPER GLACIAL	▨
MAGOTHY	▨
WATER TABLE ELEVATION (11/21/2012)	▽ —
GROUND SURFACE	—
UPPER GLACIAL/MAGOTHY INTERFACE	—
INDEX OF HYDRAULIC CONDUCTIVITY	—
GAMMA LOG	—

NOTES:

1. ORTHO IMAGE SOURCE NEW YORK STATE GIS
2. CONDUCTIVITY DATA FROM STONE ENVIRONMENTAL INC GROUNDWATER QUALITY PROFILING DATA, VARIOUS REPORTS FROM 03-2006 TO 03-2008
3. GAMMA LOG DATA FROM DELTA WELL AND PUMP INC. GAMMA LOG STUDY 10-2012
4. GAMMA LOG DATA SHOWN HAS BEEN INVERTED ACROSS THE Y-AXIS.

TITLE

GEOLOGIC CROSS SECTION

PREPARED FOR

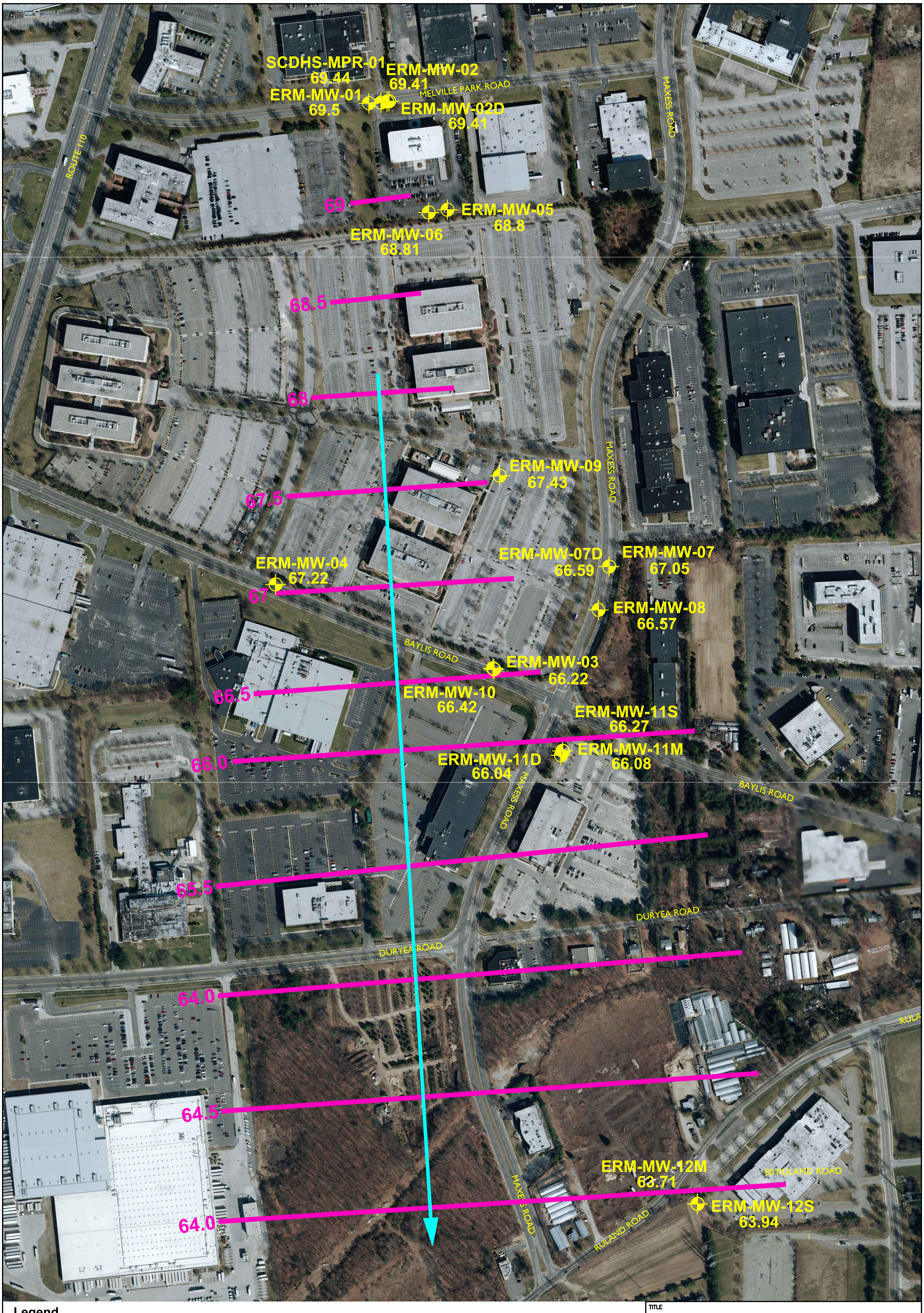
RESPONDANTS ORDER ON CONSENT
NO. W1-0998-04-04

ERM Environmental Resources Management

FIGURE
2

DRAWN BY	SCALE	DATE	JOB NO.
JMC/MCW	GRAPHIC	07/23/15	0025381

R:\Scout\Projects\NY Twist Drill\CAD\2013 RI Report\CAD\2013-03 - NY Twist Drill - RIR - Fig X - Cross Section v08.dwg (07/23/2015 - 3:57pm Melville)



Legend

⊕	Monitoring Well Location
66.08	Water Table Elevation - November 2012
68.5 ▬	Water Table Elevation Contour - November 2012
→	Groundwater Flow Direction

North American Datum 1983 (NAD83)

0 350' 700'
GRAPHIC SCALE IN FEET

N

TITLE

GROUNDWATER FLOW AND ELEVATION OF THE WATER TABLE NOVEMBER 2012

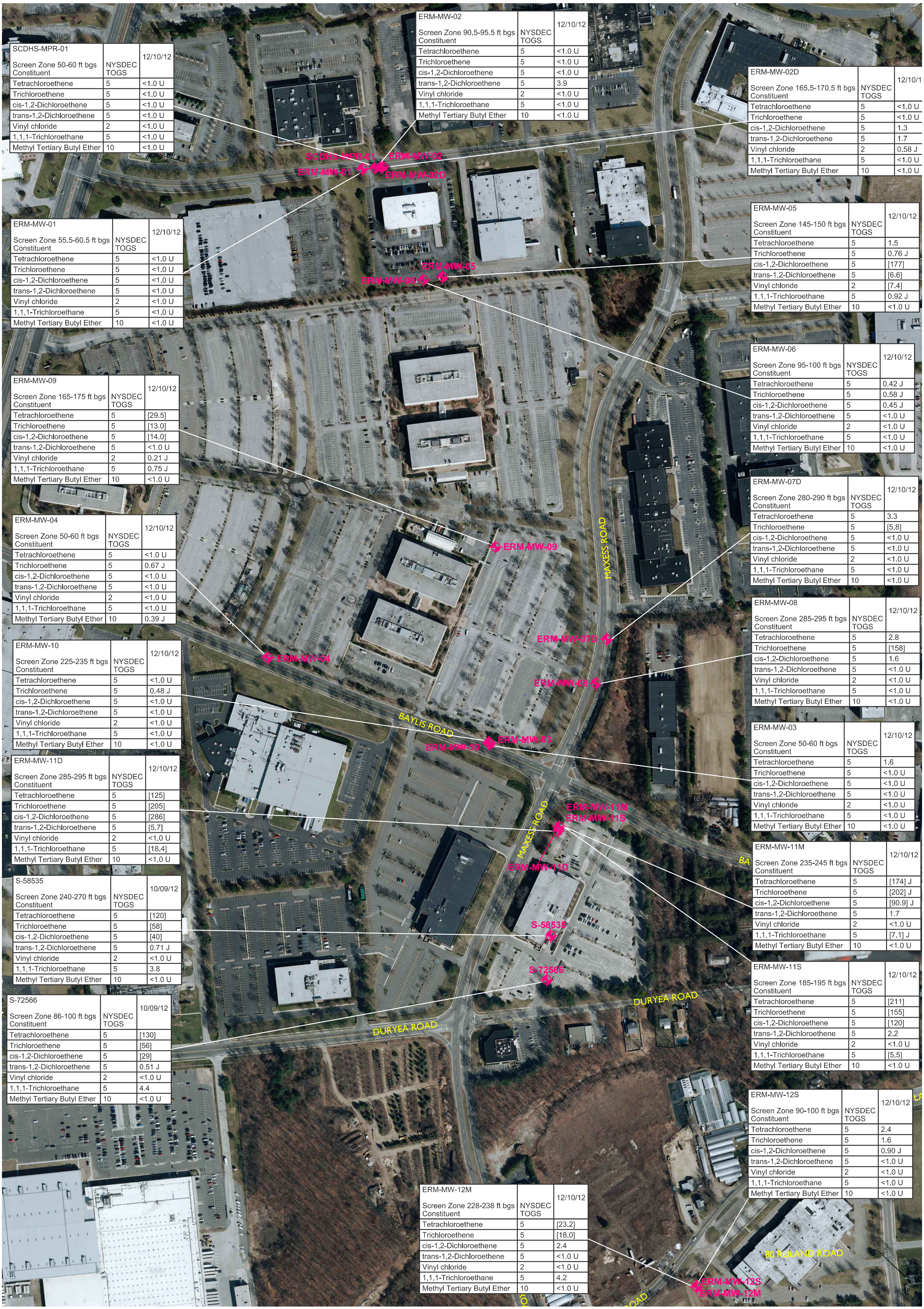
PREPARED FOR
RESPONDANTS ORDER ON CONSENT
NO. W1-0998-04-04

Environmental Resources Management

FIGURE
3

DRAWN BY	SCALE	DATE	JOB NO.
GKS/EMF	GRAPHIC	07/23/15	0025381

R:\Scout\Projects\NY Twist Drill\CAD\2013 RI Report\CAD\2013-05-03 - NY Twist Drill - November 2012 WTE.dwg (07/23/2015 - 3:55pm Melville)



SCDHS-MPR-01 Screen Zone 50-60 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	<1.0 U
Trichloroethene	5	<1.0 U
cis-1,2-Dichloroethene	5	<1.0 U
trans-1,2-Dichloroethene	5	<1.0 U
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	<1.0 U
Methyl Tertiary Butyl Ether	10	<1.0 U

ERM-MW-02 Screen Zone 90.5-95.5 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	<1.0 U
Trichloroethene	5	<1.0 U
cis-1,2-Dichloroethene	5	<1.0 U
trans-1,2-Dichloroethene	5	3.9
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	<1.0 U
Methyl Tertiary Butyl Ether	10	<1.0 U

ERM-MW-02D Screen Zone 165.5-170.5 ft bgs Constituent	NYSDEC TOGS	12/10/1
Tetrachloroethene	5	<1.0 U
Trichloroethene	5	<1.0 U
cis-1,2-Dichloroethene	5	1.3
trans-1,2-Dichloroethene	5	1.7
Vinyl chloride	2	0.58 J
1,1,1-Trichloroethane	5	<1.0 U
Methyl Tertiary Butyl Ether	10	<1.0 U

ERM-MW-01 Screen Zone 55.5-60.5 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	<1.0 U
Trichloroethene	5	<1.0 U
cis-1,2-Dichloroethene	5	<1.0 U
trans-1,2-Dichloroethene	5	<1.0 U
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	<1.0 U
Methyl Tertiary Butyl Ether	10	<1.0 U

ERM-MW-05 Screen Zone 145-150 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	1.5
Trichloroethene	5	0.76 J
cis-1,2-Dichloroethene	5	[177]
trans-1,2-Dichloroethene	5	[6.6]
Vinyl chloride	2	[7.4]
1,1,1-Trichloroethane	5	0.92 J
Methyl Tertiary Butyl Ether	10	<1.0 U

ERM-MW-06 Screen Zone 95-100 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	0.42 J
Trichloroethene	5	0.58 J
cis-1,2-Dichloroethene	5	0.45 J
trans-1,2-Dichloroethene	5	<1.0 U
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	<1.0 U
Methyl Tertiary Butyl Ether	10	<1.0 U

ERM-MW-09 Screen Zone 165-175 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	[29.5]
Trichloroethene	5	[13.0]
cis-1,2-Dichloroethene	5	[14.0]
trans-1,2-Dichloroethene	5	<1.0 U
Vinyl chloride	2	0.21 J
1,1,1-Trichloroethane	5	0.75 J
Methyl Tertiary Butyl Ether	10	<1.0 U

ERM-MW-07D Screen Zone 280-290 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	3.3
Trichloroethene	5	[5.8]
cis-1,2-Dichloroethene	5	<1.0 U
trans-1,2-Dichloroethene	5	<1.0 U
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	<1.0 U
Methyl Tertiary Butyl Ether	10	<1.0 U

ERM-MW-04 Screen Zone 50-60 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	<1.0 U
Trichloroethene	5	0.67 J
cis-1,2-Dichloroethene	5	<1.0 U
trans-1,2-Dichloroethene	5	<1.0 U
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	<1.0 U
Methyl Tertiary Butyl Ether	10	0.39 J

ERM-MW-08 Screen Zone 285-295 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	2.8
Trichloroethene	5	[158]
cis-1,2-Dichloroethene	5	1.6
trans-1,2-Dichloroethene	5	<1.0 U
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	<1.0 U
Methyl Tertiary Butyl Ether	10	<1.0 U

ERM-MW-10 Screen Zone 225-235 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	<1.0 U
Trichloroethene	5	0.48 J
cis-1,2-Dichloroethene	5	<1.0 U
trans-1,2-Dichloroethene	5	<1.0 U
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	<1.0 U
Methyl Tertiary Butyl Ether	10	<1.0 U

ERM-MW-03 Screen Zone 50-60 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	1.6
Trichloroethene	5	<1.0 U
cis-1,2-Dichloroethene	5	<1.0 U
trans-1,2-Dichloroethene	5	<1.0 U
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	<1.0 U
Methyl Tertiary Butyl Ether	10	<1.0 U

ERM-MW-11D Screen Zone 285-295 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	[125]
Trichloroethene	5	[205]
cis-1,2-Dichloroethene	5	[286]
trans-1,2-Dichloroethene	5	[5.7]
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	[18.4]
Methyl Tertiary Butyl Ether	10	<1.0 U

ERM-MW-11M Screen Zone 235-245 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	[174] J
Trichloroethene	5	[202] J
cis-1,2-Dichloroethene	5	[90.9] J
trans-1,2-Dichloroethene	5	1.7
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	[7.1] J
Methyl Tertiary Butyl Ether	10	<1.0 U

S-58535 Screen Zone 240-270 ft bgs Constituent	NYSDEC TOGS	10/09/12
Tetrachloroethene	5	[120]
Trichloroethene	5	[58]
cis-1,2-Dichloroethene	5	[40]
trans-1,2-Dichloroethene	5	0.71 J
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	3.8
Methyl Tertiary Butyl Ether	10	<1.0 U

ERM-MW-11S Screen Zone 185-195 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	[211]
Trichloroethene	5	[155]
cis-1,2-Dichloroethene	5	[120]
trans-1,2-Dichloroethene	5	2.2
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	[5.5]
Methyl Tertiary Butyl Ether	10	<1.0 U

S-72566 Screen Zone 86-100 ft bgs Constituent	NYSDEC TOGS	10/09/12
Tetrachloroethene	5	[130]
Trichloroethene	5	[56]
cis-1,2-Dichloroethene	5	[29]
trans-1,2-Dichloroethene	5	0.51 J
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	4.4
Methyl Tertiary Butyl Ether	10	<1.0 U

ERM-MW-12S Screen Zone 90-100 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	2.4
Trichloroethene	5	1.6
cis-1,2-Dichloroethene	5	0.90 J
trans-1,2-Dichloroethene	5	<1.0 U
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	<1.0 U
Methyl Tertiary Butyl Ether	10	<1.0 U

ERM-MW-12M Screen Zone 228-238 ft bgs Constituent	NYSDEC TOGS	12/10/12
Tetrachloroethene	5	[23.2]
Trichloroethene	5	[18.0]
cis-1,2-Dichloroethene	5	2.4
trans-1,2-Dichloroethene	5	<1.0 U
Vinyl chloride	2	<1.0 U
1,1,1-Trichloroethane	5	4.2
Methyl Tertiary Butyl Ether	10	<1.0 U

Legend

⌖ Monitoring well location

J The constituent was positively identified the associated numerical value is the approximate concentration of the constituent for the sample.

[ ] Indicates that a compound was detected above it's comparison criteria.

U Non detect

All data reporting is in micrograms per liter (ug/l).

0 350' 700'

GRAPHIC SCALE IN FEET

N

TITLE

REMEDIAL INVESTIGATION GROUNDWATER CONTAMINATION SUMMARY

PREPARED FOR

RESPONDANTS ORDER ON CONSENT
NO. W1-0998-04-04

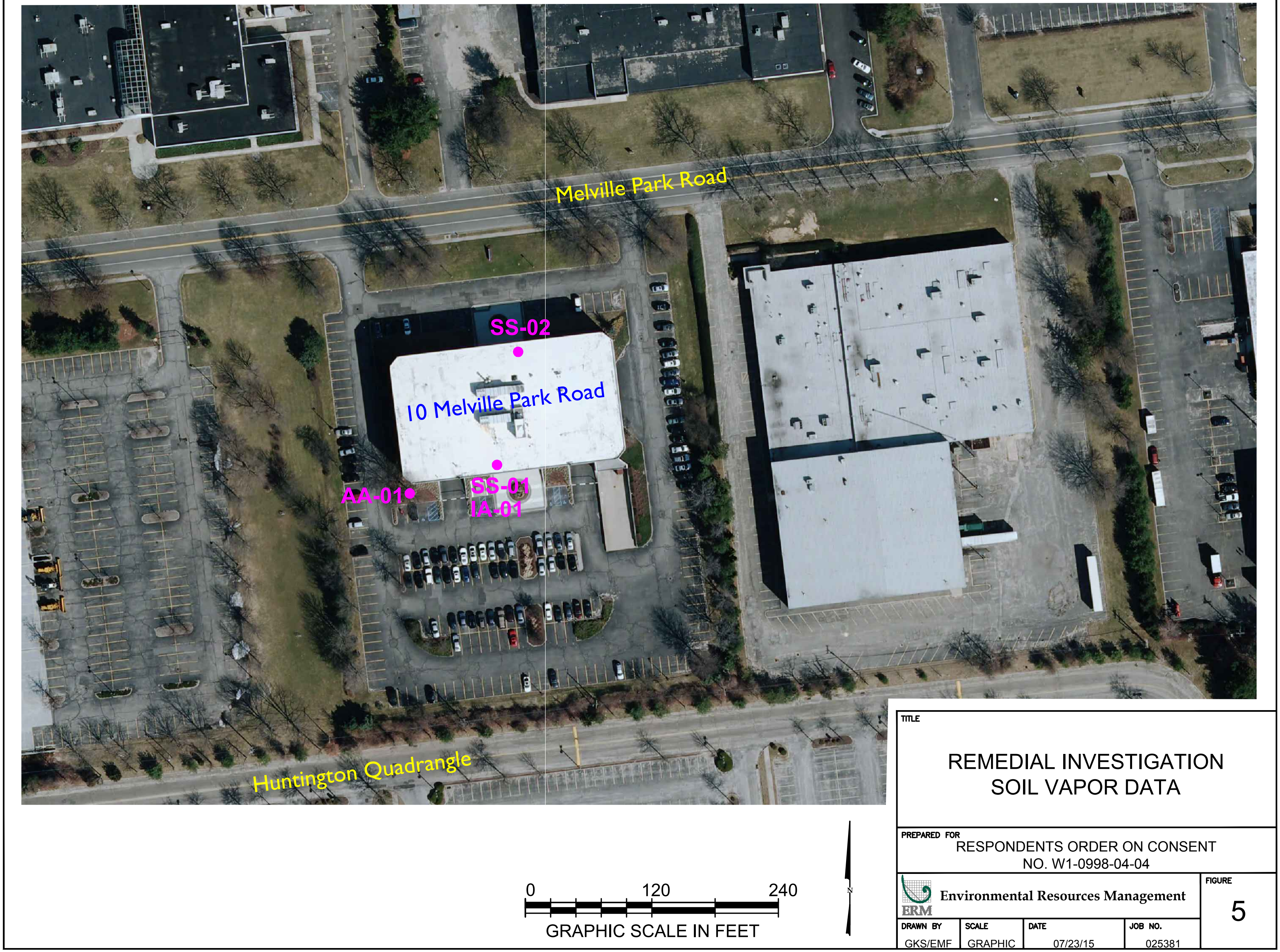
ERM Environmental Resources Management

FIGURE

4

DRAWN BY	SCALE	DATE	JOB NO.
GKS/EMF	AS SHOWN	07/23/15	0025381

R:\Scout\Projects\NY Twist Drill\CAD\2013 FS Report\CAD\2013-02-12 - NY Twist Drill 2012 Chemistry Spider Map.dwg (07/23/2015 - 2:54pm Melville)



TITLE

REMEDIAL INVESTIGATION
SOIL VAPOR DATA

PREPARED FOR

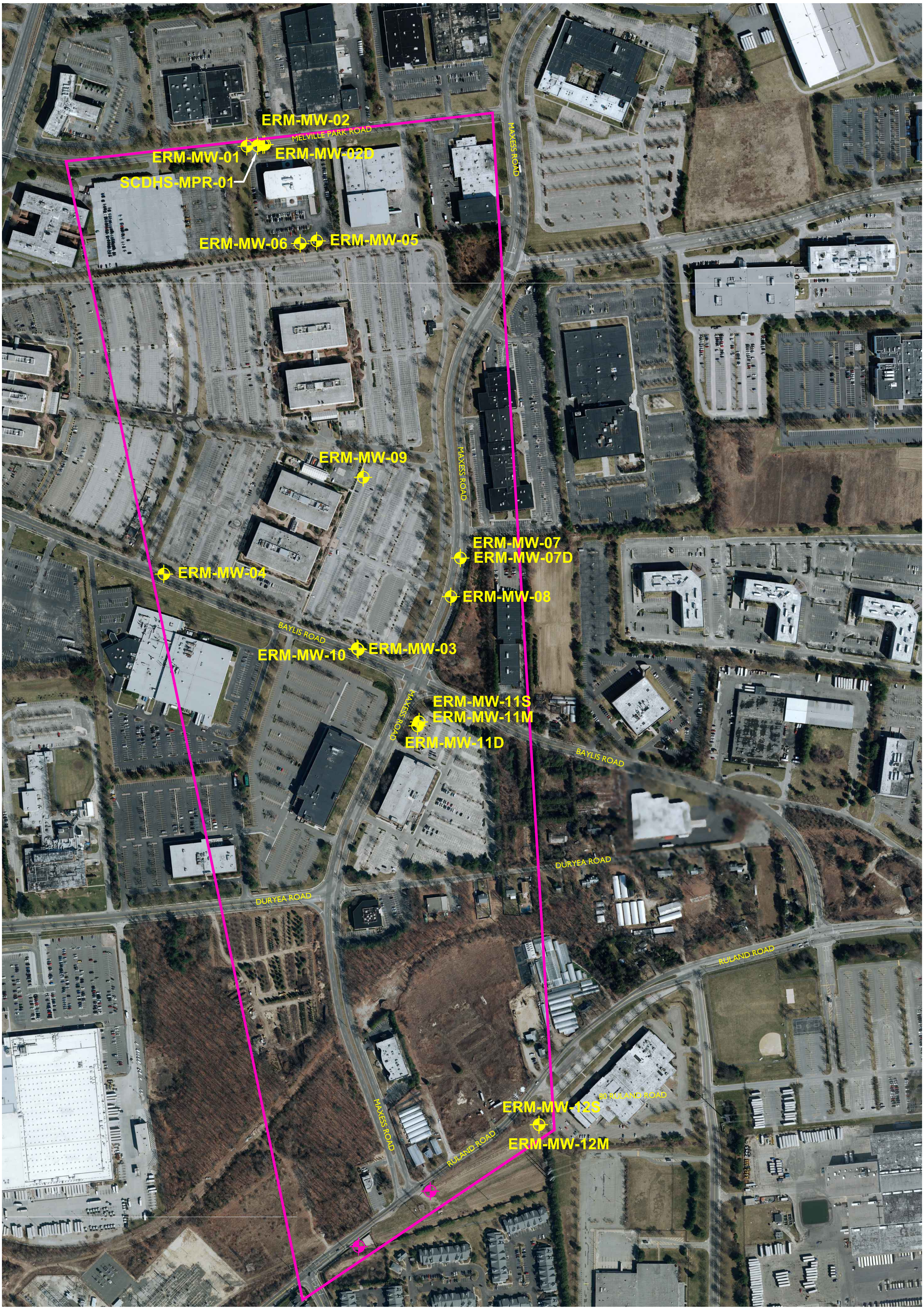
RESPONDENTS ORDER ON CONSENT
NO. W1-0998-04-04

ERM Environmental Resources Management

FIGURE
5

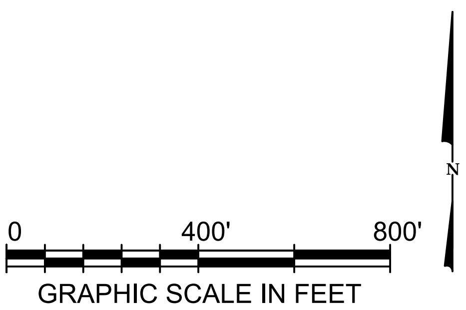
DRAWN BY	SCALE	DATE	JOB NO.
GKS/EMF	GRAPHIC	07/23/15	025381

R:\Scout\Projects\NY Twist Drill\CAD\2013 FS Report\CAD\2013-04-30 - NY Twist Drill - Soil Vapor Samples.dwg (07/23/2015 - 3:21pm Melville)



Legend

●	**Monitoring Well Location**
●	**Proposed Vertical Profile/Monitoring Well Location**



TITLE

GROUNDWATER MONITORING WELL NETWORK

PREPARED FOR
RESPONDANTS ORDER ON CONSENT
NO. W1-0998-04-04

ERM Environmental Resources Management

FIGURE
6

DRAWN BY	SCALE	DATE	JOB NO.
GKS/EMF	AS SHOWN	10/16/15	0300219

R:\Scout\Projects\NY Twist Drill\CAD\2015 October\2015-10 - NY Twist Drill - GW MW Network.dwg (10/16/2015 - 3:38pm Melville)

APPENDIX A
SITE SPECIFIC
HEALTH AND SAFETY PLAN

New York Twist Drill OU2
25 Melville Park Road
Melville, Suffolk County, NY
NYSDEC Site # 1-52-169

October 2015

Prepared for:

Respondents
Order on Consent
Index Number W1-0998-04-04

Prepared by:

Environmental Resources Management
105 Maxess Road, Suite 316
Melville, New York 11747

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ATTACHMENTS

1.0 SITE NAME AND ADDRESS

New York Twist Drill
25 Melville Park Road
Melville, Suffolk County, New York
NYSDEC Site No. 1-52-169

2.0 ERM PROJECT PERSONNEL AND RESPONSIBILITIES

ERM Project Director (PD): Ernie Rossano
Responsible for all work and conducts ultimate Quality Assurance/Quality Control (QA/QC) overview.

ERM Project Manager (PM): Greg Shkuda
Manages day-to-day activities; reports to PD.

ERM Project Health and Safety Coordinator (PHSC): John Mohlin
Directs development of HASP; provides technical advice on health and safety issues.

ERM Site Safety Officer (SSO): Brice Lynch
Responsible for implementation of HASP; reports to PM and PHSC.

ERM Field Team Leader (FTL): Brice Lynch
Responsible for the day-to-day management and coordination with RM field staff and subcontractors; reports to PM and PD.

3.0 SITE DESCRIPTION

New York Twist Drill (NYTD) is located at 25 Melville Park Road in a large industrial/commercial area in Melville, Suffolk County. The six-acre site is located slightly east of Route 110 and is located on the north side of the first east-west street that is south of the south service road for the Long Island Expressway. The IW Industries, Inc. inactive hazardous waste disposal site (Site Number 1-52-102) is adjacent to the site along the eastern property border.

NYTD operated the Site from 1966 (when the building was originally constructed) to 1984. NYTD manufactured carbon steel and other hardened metal twist drills. After NYTD vacated the building in 1985, it was gutted and converted into a two-story office complex. The former manufacturing area for NYTD was an approximately 63 by 103-foot area located in the northeast corner of the building. The process of manufacturing twist drills consisted of modifying steel bars, which ranged from 1/4-inch to 2-inches in diameter. After the bars were cut, they were thermally tempered, degreased with a chlorinated solvent in a vapor degreaser, ground and pointed, finished, packaged and shipped.

Investigations conducted at the site have revealed the presence of onsite soil and groundwater contamination by volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs). The onsite contamination at NYTD is referred to as OU-1. The primary VOC of concern onsite is tetrachloroethene (perchloroethene [PCE]). Other chlorinated hydrocarbon solvents including trichloroethene (TCE) and 1,1,1-trichloroethane (1,1,1-TCA) have also been detected onsite.

Onsite groundwater contamination was documented as extending to the southern property border where 9,800 ppb of PCE, 100 ppb of TCE and 30 ppb of 1,1,1-TCA were detected at 76-feet below land surface (bls) (ERI). Because groundwater flow is dynamic, it is believed that VOC contamination extends offsite. The potential offsite extent of groundwater contamination has been designated as OU-2 for the NYTD Site.

4.0 FIELD ACTIVITIES

The following activities are considered the primary components of the work plan activities for the investigation of the site (not including office activities):

- mobilization;
- offsite geophysical survey;
- utility markout;
- soil gas sampling;
- vertical groundwater profile sampling;
- monitoring well installation and development;
- well location and elevation survey; and
- monitoring well gauging and sampling.

Table 4-1 describes the goals for the investigation for each of the activities listed above.

5.0 HAZARD IDENTIFICATION AND CONTROL

5.1 HAZARD IDENTIFICATION PROCESS

Prior to initiating any new project activity or when there is a change in site conditions, the Site Safety Officer (SSO) will assist project team members in completing a Job Hazard Analysis Form (JHA). A copy of the JHA form is located in Attachment 1.

5.2 CHEMICAL HAZARDS

Chemicals may be introduced into the body by ingestion, inhalation, or absorption through the skin. Since not all chemicals have the same level of toxicity, the length of time for the exposure and the concentration of the chemical are important in determining the risk. Inhalation and skin contact are the most common routes of entry. Chemicals can be introduced into the body by ingestion when chemicals present on the hands are transferred to food or cigarettes.

Based on historical processes that have occurred at the site, tetrachloroethene (PCE) and breakdown products trichloroethene (TCE), *cis*-1,2,dichlrorethene (*cis*-1,2,DCE), vinyl chloride (VC), and 1,1,1-trichloroethane are the chemicals of concern that may be encountered during work activities, in addition, Table 5.1 describes pertinent health and safety information.

5.3 AMBIENT AIR MONITORING

Ambient air and particulate monitoring will be conducted by the SSO when there is a question of employee exposure to hazardous concentrations of substances to assure the proper selection of engineering controls, work practices, and personal protective equipment (PPE). These conditions could possibly exist when performing intrusive activities. Additional monitoring might also be conducted under any of the following circumstances.

- During intrusive activities (drilling).

- When opening existing and newly installed wells.
- Change in weather.
- Change in ambient levels of hazardous constituents as indicated by the sense of smell or changes in the physical appearance of the soil or groundwater.
- Soil vapor sampling.
- During high-risk operations (e.g. drum opening, waste handling, or handling of leaking drums, or when working in areas with obvious liquid contamination).

Ambient air monitoring will be conducted using direct-reading, real-time instruments such as a photoionization detector or a flame ionization detector. Not all work at the site will require ambient air monitoring for all contaminants and particulates. During the mobilization phase or a particular project task or activity, either the Project Manager or the SSO will determine what hazards may be encountered in order to have the appropriate instrumentation on-site. The Project Health and Safety Coordinator is available to assist the Project Manager or the SSO in determining the appropriate instrumentation.

In addition a community air monitoring plan (CAMP) will be implemented during all intrusive activities to protect the community from potential hazardous air-borne emissions.
Client specific requirements that are covered under the CAMP include work related to soil gas monitoring during the IRM and air monitoring within the on-site building. Ambient air monitoring during these activities will be continuous. Should threshold values for contaminants, dust or particulates be breached work will be discontinued until such time as either site conditions return to acceptable levels or engineered controls are properly instituted.

Direct reading instrumentation will be calibrated daily per manufacturer's instructions. Cylinders of the appropriate calibration gas will be required for fieldwork lasting longer than one day. Table 5-1 lists the air monitoring equipment that will be used for the Scope of Work.

Under stable site conditions, ambient air monitoring will be conducted at least once every two hours in the workers' breathing zone and at other locations based on the professional judgment of the SSO or the Project Health and Safety Coordinator. Ambient air monitoring results will be recorded in the Field Notebook.

Table 5-3 outlines the steps to be taken by the SSO when the action levels of the various contaminants are exceeded. Respiratory protection is selected based on occupational exposure limits of the constituents at the site and the potential for exposure to vapors and dust from site activities.

All reasonable efforts will be instituted to minimize exposure, nuisance and inconvenience to the community during any and all activities conducted on-site.

5.4 SITE-SPECIFIC AND TASK-SPECIFIC HAZARDS AND CONTROL STRATEGIES

The hazards and control strategies associated with planned work activities are summarized in Table 5-4. During the mobilization phase of a specific work task, the project team can quickly review the hazards and control strategies by locating the task or activity to be performed on the table. Hazards that are common to all activities performed at the site are listed first. The hazards listed for a particular task or activity includes the common hazards.

However prior to initiating any new project activity or when there is a change in site conditions, an additional JHA will be completed. A copy of the JHA form is located in Attachment 1.

6.0 PERSONAL PROTECTIVE EQUIPMENT

The level of PPE selected for a task is based on the following.

- Type and measured concentration of the chemical substance in the ambient atmosphere and its toxicity.
- Potential for exposure to substances in air, splashes of liquids, or other direct contact with material due to work being done.
- Knowledge of chemicals on-site along with properties such as toxicity, route of exposure, and contaminant matrix.

In situations where the type of chemical, concentration, and possibilities of contact are not known, the appropriate level of protection must be selected based on professional experience and judgment until the hazards can be better identified.

In addition to summarizing the general PPE requirements for tasks performed at the site, Table 6-1 also serves as the written certification that the PPE Hazard Assessment has been conducted.

6.1 RESPIRATORY PROTECTION

The type of respiratory protection required will be based on the results of ambient air monitoring, the results of any models used to predict ambient air concentrations, and the professional judgment of either the SSO or the Project Health and Safety Coordinator.

As required by 29 CFR 1910.134, *Respiratory Protection*, a cartridge change-out schedule will be developed if a conclusion is made to upgrade to Level C, based on either the results of ambient air monitoring, the results of any models used to predict ambient air concentration, or the professional judgment of the Project Health and Safety Coordinator.

At a minimum, new respirator cartridges must be placed on the respirator at the beginning of the shift and after lunch.

7.0 HEAT AND COLD STRESS

7.1 HEAT STRESS

The timing of these activities may be such that heat stress may pose a threat to the health and safety of site personnel. Acclimation periods and work/rest regimens will be implemented as necessary so that personnel do not suffer adverse effects from heat stress. Heat stress, if necessary, will be monitored in accordance with the American Conference of Governmental and Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) for Heat Stress or equivalent when the temperature is greater than 80°F. The following work/rest regimen will be utilized:

Temp °F	*Work-Rest Regimen*
80	Work Break Every 2 hours.
82	75% Work - 25% Rest, each hour.
85	50% Work - 50% Rest, each hour.
88	25% Work - 75% Rest, each hour.
90	Delay work until cooler temperatures prevail.

Special clothing and an appropriate diet and fluid intake will be recommended for all site personnel to further reduce these temperature-related hazards. A good rule of thumb to prevent dehydration from heat stress is that fluid intake should equal fluid loss from the body, which can be accomplished through frequent small intakes of water. Potable water and/or a drink substitute (e.g., Gatorade) will be available for employee consumption.

7.2 COLD STRESS

The timing of remediation activities may be such that cold stress presents a threat to the health and safety of site employees. Work/rest schedules, with rest in a warming shelter, will be implemented as necessary to reduce adverse effects from cold exposure. Cold stress, if necessary, will be monitored in accordance with the ACGIH TLV for Cold Stress or equivalent. The addition of wind speed and the resulting wind chill will be considered when determining an appropriate work/rest schedule and appropriate clothing.

Site personnel will be encouraged to consume water to avoid dehydration. Potable water and/or a drink substitute (e.g., Gatorade) shall be available for employee consumption. Workers will wear adequately insulated clothing to limit exposure to cold.

8.0 SPECIFIC REQUIREMENTS

Community Air Monitoring Plan (CAMP) – Real time monitoring of volatile organic compound (VOC) and particulate emissions (dust) at the downwind perimeter of each designated work area when intrusive activities are in progress.

Soil Gas Monitoring – Monitoring of concentrations of VOC in soil gas will be carried out during the RI.

Prevention of Exposure to Customers and Passers-By - An exclusion zone of sufficient size to prevent exposure to customers and passers-by will established. The CAMP will be used to adjust the size of the exclusion zone to limit exposure.

9.0 SAFE WORK PRACTICES AND STANDARD OPERATING PROCEDURES

9.1 GENERAL SITE PROVISIONS

Smoking and Eating Areas

Smoking will only be allowed in designated areas. Upon mobilization at the site, the SSO will establish smoking areas per site-specific or client-specific requirements. Individuals caught smoking outside the designated smoking areas will be subject to disciplinary action up to and including immediate termination.

Upon mobilization at the site, the SSO will establish eating and break areas per site-specific or client-specific requirements. Eating will only be allowed in the designated areas and the areas will be maintained in a clean and sanitary condition.

Sanitation and Potable Water.

Hand washing facilities may consist of pre-moistened towels such as baby-wipes or moist sanitized towelettes.

Containers used for drinking water will be equipped with a tap and capable of being tightly closed. In addition, the container will be labeled as “Drinking Water” or “Potable Water”. Disposal cups will be stored in a sanitary condition and a receptacle for disposing of the cups will be near-by.

Sanitary facilities are located at the ERM offices, approximately one quarter mile from the site.

9.2 STANDARD OPERATING PROCEDURES

The following standard operating procedures will be adhered to at all times.

- All personnel entering the site must check in with the SSO.
- All individuals entering the site must demonstrate to the SSO that they have been adequately trained as defined in Section 10.

- All individuals must be familiar with emergency communication methods and how to summon emergency assistance.
- Use of alcoholic beverages before, during operations, or immediately after hours is absolutely forbidden. Alcohol can reduce the ability to detoxify compounds absorbed into the body as the result of minor exposures and may have negative effects with exposure to other chemicals. In addition, alcoholic beverages will dehydrate the body and intensify the effects of heat stress.
- Horseplay of any type is forbidden.
- All unsafe conditions will be immediately reported to the SSO, who will document such conditions in the field log. The SSO will be responsible for ensuring that the unsafe condition is corrected as quickly as possible.
- Smoking, matches, and lighters are only allowed in the designated smoking area.
- Avoid contact with potentially contaminated substances. Avoid, whenever possible, kneeling on the ground, or leaning or sitting on trucks, equipment or the ground. Do not place equipment on potentially contaminated surfaces.

9.3 SAFE WORK PRACTICES

Ergonomics

Ergonomic risk factors include repetitive motion, force, awkward posture and vibration. The key to preventing ergonomic injuries is education of personnel relative to the hazards and risk factors and implementation of proper controls and work practices. When completing JHAs the Project Health and Safety Coordinator will assist project team members in identifying ergonomic risk factors and appropriate control methods.

Several tasks associated with this project have the potential to cause back injuries, if proper lifting techniques are not followed. Site workers should not lift objects that are beyond their physical capabilities and the use of mechanical devices such as forklifts is encouraged. In addition, when shoveling site workers should not twist their backs while moving materials with the shovel. The proper technique is to move the feet.

Proper lifting techniques are summarized below:

- Place feet shoulder width apart with toes pointing slightly out.
- Bend at your knees keeping back straight.
- Get a good grip on the object and pull object close to your body.
- Tighten abdominal muscles.
- Keep your head up, looking forward, and lift with your legs while maintaining a straight back.
- Keep load close to your body and ensure your view is not obstructed.
- If one end of the load is heavier than the other, the heavier end should be closest to your body.
- Move your feet to relocate the object as opposed to twisting your back.
- When placing the object down, bend your knees and use your leg muscles while keeping your back straight.

Pre-Drilling/Pre-Excavation and Probing Protocol

Prior to mobilizing to the field, the Project Manger will be responsible for ensuring the following issues have been adequately addressed.

- Contacting One Call or equivalent to identify underground pipelines, utility lines, and fiber optic cable.
- Contacting appropriate municipality to identify underground water and sewer lines.
- Contacting posted pipeline companies.

Fall Protection

This project does not involve working from heights more than six feet above grade.

Weather Related Events

Weather related events that may impact fieldwork include, but are not limited to, rain, snow, thunder, and lightning. The SSO will be responsible for determining what site work can be performed safely in the rain and at what point work will cease due to either quality or safety issues. In the event of thunder and/or lightning, all work will be suspended until 15 minutes have elapsed from the last clap of thunder or flash of lightning.

During rain, lightning and/or thunder events, site workers should seek shelter in either a building or vehicle.

Night Work

This project will not involve activities being performed at night.

Noise

Employees performing any noisy task, such as but not limited to, operating heavy equipment, drilling, using power tools, or employees working within 20 feet of the person performing the task will wear hearing protection consisting of either earplugs or earmuffs. Personnel operating a drilling rig or standing within 20 feet of a drilling rig during operation will also wear hearing protection.

10.0 EMPLOYEE TRAINING

All employees and subcontractors working on-site, who may be exposed to hazardous substances, health hazards, or safety hazards and their supervisors and management responsible for the site will receive training meeting the requirements of 29 CFR 1910.120, *Hazardous Waste Operations and Emergency Response* (HAZWOPER) before they are permitted to engage in any job task. Employees will not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility. All on-site workers will receive training covering at a minimum the following.

- Names of personnel and alternates responsible for site safety and health.
- Safety, health and other hazards present on the site.
- Use of PPE.
- Safe use of engineering controls and equipment on the site.
- Medical surveillance requirements including recognition of symptoms and signs that might indicate overexposure to hazards.

10.1 SUBCONTRACTOR TRAINING

The SSO will verify that subcontractor personnel have received all appropriate training as required by this HASP prior to their arriving on-site. <u>Verification will consist of reviewing written training documentation such as copies of training certificates or cards.</u> Copies of the written training documentation will be retained in the project file. Subcontractor personnel will not be allowed to work at the site unless said training documentation is available.

10.2 DAILY TAILGATE SAFETY MEETING

A tailgate safety meeting will be conducted each morning. The daily safety meeting meetings will include awareness concerns such as special concerns regarding health and safety, pollution prevention or a discussion of recent incidents or safety observations. Issues such as any changes to the HASP will be addressed daily. The meetings will include a discussion of what tasks will be completed that day and how those tasks will be conducted safely. The meetings will be documented on the Daily Safety Meeting form found in Attachment 2.

11.0 MEDICAL SURVEILLANCE

All ERM employees are enrolled in a medical surveillance program. All employees receive an initial medical examination and consultation prior to assignment to any job site. In addition, employees receive an annual medical examination, a medical examination upon termination of employment, and a medical examination when the employee exhibits signs or symptoms relating to possible overexposure to hazardous substances or when an injury or exposure above published exposure limits has occurred in an emergency situation.

Additional medical surveillance should be provided for employees who:

- are or may be exposed to hazardous substances or health hazards at or above published exposure levels for these substances for 30 days or more a year;
- wear a respirator for 30 days or more a year or as required by 29 CFR 1910.134, *Respiratory Protection*; and,
- are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation.

12.0 SITE CONTROL MEASURES

The drilling location and surrounding area will be considered the work zone. Drilling will take place in different areas and new work zones will be delineated by the SSO as the drill rig is moved and during monitoring well sampling. The work area will be delineated using traffic cones and/or “Caution” tape. The SSO will ensure that no one enters the work zone without the proper training and requirements. All personnel entering the Work Zone will sign the Site Safety Meeting Form in Attachment 2. Furthermore, all ERM personnel and subcontractor will sign-in at the start of each workday and sign out at the end of each workday.

13.0 DECONTAMINATION PROCEDURES

Decontamination involves the orderly controlled removal of contaminants from both personnel and equipment. The purpose of decontamination procedures is to prevent the spreading of contaminated materials into uncontaminated areas. All site personnel should limit contact with contaminated soil, ground water or equipment in order to reduce the need for extensive decontamination.

13.1 PERSONNEL DECONTAMINATION

The following decontamination procedures will be utilized.

- Clean rubber boots with water.
- Remove all PPE and dispose of the PPE in the designated drums.
- Wash hands and any skin that may have come in contact with affected soil or ground water with moistened disposable towels, such as baby wipes, or soap and water.

13.2 EQUIPMENT DECONTAMINATION

All drilling equipment and the back of the drilling rig shall be decontaminated by steam cleaning prior to performance of the first boring/well installation and between all subsequent borings/well installations. This shall include all hand tools, casing, augers, drill rods and bits, tremie pipe and other related tools and equipment. The steam cleaning equipment shall be capable of generating live steam with a minimum temperature of 212^{o} degrees Fahrenheit. The equipment shall be cleaned to the satisfaction of ERM's representative.

14.0 CONFINED SPACE ENTRY PROCEDURE

Entry into permit-required confined spaces is not anticipated or permitted.

15.0 SPILL CONTAINMENT PROGRAM

The project activities involve the use of drums or other containers, the drums or containers will meet the appropriate DOT regulations and will be inspected and their integrity assured prior to being moved. Operations will be organized so as to minimize drum or container movement. Drums or containers that cannot be moved without failure will be over packed into an appropriate container.

15.1 HYDRAULIC FLUID/ENGINE OIL/FUEL SPILLS

In the event of an unexpected release of hydraulic fluid, engine oil, gasoline or diesel fuel, the release material will be absorbed with sorbent pads, which will be placed in a designated drum for disposal. Impacted soil will be excavated and placed on plastic sheeting and covered until characterization and/or disposal can be arranged.

16.0 SITE COMMUNICATION

Cell phones will be used for communication between the project team, the client, and the office.

17.0 COMMUNICATION AND REVIEW OF SITE-SPECIFIC HEALTH AND SAFETY PLAN

An initial review of the site-specific HASP will be held either prior to mobilization or after mobilization but prior to commencing work at the site to communicate HASP details and answer questions to individuals working at the site. Daily tailgate safety meetings will be held each morning to review work practices for the day and to discuss safety issues. Any new hazard or safety information will be disseminated at the daily tailgate safety meeting or as needed throughout the day.

18.0 EMERGENCY REPSONSE PLAN

This section describes possible contingencies and emergency procedures to be implemented at the site.

18.1 PERSONNEL ROLES AND LINES OF AUTHORITY

The SSO has primary responsibility for site evacuation and notification in the event of an emergency situation. This includes taking appropriate measures to ensure the safety of site personnel and the public. Possible actions may involve the evacuation of personnel from the site area and ensuring that corrective measures have been implemented, appropriate authorities notified, and follow-up reports completed. If the SSO is not available, the ERM Project Geologist/Engineer will assume these responsibilities. Subcontractors are responsible for assisting the SSO in their mission within the parameters of their scope of work.

18.2 EMERGENCY ALARMS

Because of the small work area and mobility of work areas, an emergency evacuation plan and meeting place will decide on the drilling or sampling locations.

18.3 REPORTING EMERGENCIES

All, including any late developing or aggravated injuries, must receive prompt medical attention. For non-life threatening injuries or illnesses site workers should be transported to the hospital. For life threatening injuries or illnesses, the local emergency responders should be contacted via 911.

The SSO is responsible for reporting all injuries, illnesses, fires, spills/releases, property damage, or near-misses to the following individuals.

- Injured/involved employee's supervisor
- ERM Project Manager

- ERM Project Director
- ERM Office Manager – Ernie Rossano
- ERM Project Health and Safety Coordinator
- Client Contact

18.4 EMERGENCY CONTACTS

In the event of an emergency, the SSO will contact the following as appropriate.

Title/Name	*Phone Numbers*	
ERM Project Director Ernie Rossano	Work: Mobile:	631-756-8900 516-250-1429
Project Manager Greg Shkuda	Work: Mobile:	631-756-8900 516-652-6412
Office Manager Ernie Rossano	Work: Mobile:	631-756-8900 516-250-1429
Site Safety Officer Brice Lynch	Work: Mobile:	631-756-8900 516-967-2515
Project Geologist/Engineer Brice Lynch	Work: Mobile:	631-756-8900 516-967-2515
Project Health and Safety Coordinator John Mohlin	Work: Mobile:	631-756-8900 516-315-6872
Local Emergency Responders	Phone:	911
Hospital: North Shore University Hospital - Plainview	**Phone:**	**516-719-3000**
Fire Department-Town of Huntington	**Phone:**	**911 or (516) 547-4121**
Police Suffolk County 2nd Precinct **1071 Park Ave, Huntington**	**Phone:**	**(516) 573-5275**
Police	**State**	**(631) 728-3000**

18.5 INCIDENT INVESTIGATIONS

An ERM Incident Reporting Form (Attachment 3) will be completed by the Project Manager in conjunction with the PD and Office Manager the day of the incident. The PHSC will approval the final Incident Report and forward the Incident Report to the ERM-Northeast Health and Safety Coordinator, Martin Anderson in the ERM-Boston office within 24 hours of an incident. Only facts will be included on the Incident Report. The purpose of the Incipient Report is to determine root causes of incidents to prevent re-occurrence. The Incident Report is not used to place blame. All incidents will be investigated in a timely manner. The SSO and/or the Project Manager will schedule the investigation and include project supervision (ERM, subcontractors, and client), the injured/involved employee(s) and the Project Health and Safety Coordinator. Root cause analysis will be performed to assess the apparent cause and identify corrective measures to be implemented to prevent re-occurrence. The last page of the Incident Form is used to document the investigation.

18.6 DIRECTIONS TO NEAREST HOSPITAL

The nearest hospital is North Shore University Hospital 888 Old Country Road, Plainview, New York. A map to the medical facility with directions is located in Attachment 4.
Directions: Drive west on Melville Park Road 0.2 miles. Right onto Broad Hollow Road (Route 110) north (0.75 Miles). Take West Bound Long Island Expressway (Route 495) to Exit 48 (1.5 miles). At traffic light, left turn onto Round Swamp Road. Round Swamp Road south , take right fork onto Old Country Road. Old Country Road west to hospital (approximately 2 miles).

18.7 EMERGENCY DRILLS

In accordance with the HAZWOPER Standard, emergency evacuation plans will be addressed regularly during the morning tailgate meeting and documented in the field notebook. Work will take place next to public roads or on residential properties. There is no anticipation of an emergency evacuation being needed. The frequency of this drill (rehearsal) is outlined on Table 18-1. Drills will not need to be elaborate. A table-top scenario during the daily safety meeting is an adequate drill.

19.0 SAFETY EQUIPMENT

A first aid kit containing first aid items for minor incidents **MUST BE** maintained in the ERM vehicle. The driller will have a first aid kit and fire extinguisher.

20.0 CERTIFICATION OF FAMILIARITY WITH PLAN BY SITE PERSONNEL

By signing below, signee certifies that they have read, understand and will abide by the contents of this HASP.

Name	Signature	Company	Date

TABLES

TABLE 4-1
FIELD ACTIVITIES PROJECT GOALS

Field Task	Rationale
Mobilization	Plan and coordinate initial activities to support the field investigation as well as site preparation of equipment and materials.
Site geophysical survey	Identify possible subsurface utilities, obstructions, or features.
Utility Markout	Locate public utilities.
Soil Gas Sampling	Evaluate potential for migration of VOCs emanating from residual on-site sources or other impacted media.
Vertical Groundwater Profile Sampling	Evaluate groundwater conditions.
Monitoring Well Installation	Allow for permanent groundwater monitoring locations.
Monitoring well survey	Obtain coordinates and elevation for monitoring wells.
Groundwater Sampling	Evaluate groundwater quality.

TABLE 5-1: Summary of Chemical Hazards for Chemicals of Concern

Chemical	Published Exposure (8-hour TWA)	Routes of Exposure	Target Organs	Signs/Symptoms of Exposure (Acute versus Chronic Effects)	First Aid &Emergency Response
Chemical Name: **Tetrachloroethene** CAS: 7439-92- Vapor Pressure: 14 mmHg Ionization Potential: 9.32 eV	100 ppm (OSHA PEL)	Inhalation, Skin adsorption, Ingestion, Skin or eye contact	Eyes, skin, respiratory system, liver, kidneys, central nervous system.	Acute: Irritation eyes, skin, nose, throat; respiratory system, nausea, dizziness Chronic: cancer, liver damage	Flush skin/eyes with water Administer artificial respiration if no breathing If ingested see medical attention
Chemical Name: **Trichloroethene** CAS: 79-01-6 Vapor Pressure: 58 mmHg Ionization Potential: 9.45 eV	NIOSH REL Carcinogen: No acceptable exposure. OSHA PEL 100 ppm 300 ppm (15-minute maximum peak) IDLH: 1,000 ppm	Inhalation, Ingestion, Skin Absorption, Skin or eye contact	Eyes, skin, respiratory system, heart, liver, kidneys, CNS.	Dizziness, headache, lassitude, irritation to eyes/skin, visual distortion, vomiting, dermatitis, dizziness, tremors.	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory Support Ingestion: Medical attention immediately
Chemical Name: **Vinyl Chloride** CAS: 75-01-4 Vapor Pressure: 3.3 atm Ionization Potential: 9.99 eV	NIOSH REL Carcinogen: No acceptable exposure. OSHA PEL: 1 ppm (240 mg/m$^{3)}$	Inhalation, Contact	Liver, CNS, blood, respiratory system, lymphatic system, [liver cancer].	Lassitude, abdominal pain, GI bleeding, enlarged liver, frostbite [liquid].	Eye: Treat frostbite Skin: Treat frostbite Breathing: Respiratory support
Chemical Name: **1,1,1-Trichloroethane** CAS: 71-55-6	350 ppm (OSHA PEL)	Inhalation Skin adsorption Ingestion Skin or eye	Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system.	Acute: Irritation eyes, skin, nose, throat, headache, weakness, exhaustion, CNS depression, poor equilibrium, dermatitis, cardiac arrhythmias.	Flush skin/eyes with water Administer artificial respiration if no breathing

Chemical	Published Exposure (8-hour TWA)	Routes of Exposure	Target Organs	Signs/Symptoms of Exposure (Acute versus Chronic Effects)	First Aid &Emergency Response
Vapor Pressure: 100 mmHg Ionization Potential:		contact		Chronic: liver damage	If ingested see medical attention
Chemical Name: **1,2-Dichloroethene** CAS: 540-59-0	NIOSH REL: 200 ppm (790 mg/m^3) OSHA PEL: 200ppm (790 mg/m^3)	Inhalation, Ingestion, Skin and/or eye contact	Eyes, respiratory system, central nervous system	Irritation eyes, respiratory system; central nervous system depression	Eye: Irrigate immediately; skin: soap wash promptly; Breathing: Respiratory Support; Swallow: Mediacal attention immediately

NOTES:

1. The most conservative published occupational exposure limit is listed. Sources for occupational exposure limits were OSHA and ACGIH.
2. TWA = time weighted average.
3. ppm – parts of contaminant per million parts of air.

Sources of information include published exposure limits in 29 CFR 1910.1000 or the 2002 TLV Booklet published by ACGIH, NIOSH pocket guide, Chemical/Physical Properties from Texas Risk Reduction Program, International Chemical Safety Cards, MSDSs, and the HNU listing of Photoionization Characteristics of Selected Compounds.

TABLE 5.2

AMBIENT AIR MONITORING INSTRUMENTS

Contaminant	*Instrument*
Organics	OVM (PID) or FID

TABLE 5-3

ACTION LEVELS AND RESPONSE ACTIONS REQUIREMENTS

Chemical	***Action Level***	***Response Actions***
Organics	PID reads 5 ppm sustained in the breathing zone for 1 minute	Stop work and workers leave immediate area. After allowing vapors to dissipate, If readings are less than 5 ppm, resume work Otherwise, if readings are 5 ppm or greater, stop work and workers leave immediate area. Notify Project Manager and Project Health and Safety Coordinator (PHSC)
	/PID reads 10 ppm sustained in the breathing zone for 1 minute	Stop work and workers leave immediate area. After allowing vapors to dissipate, If readings are less than 5 ppm, resume work If readings are 10 ppm or greater, notify Project Manager and Project Health and Safety Coordinator. Upgrade to Level C.

TABLE 5-4

SITE SPECIFIC AND TASK-SPECIFIC HAZARDS AND CONTROL STRATEGIES

Task/Activity	***Hazards***	***Control Strategy***
All activities at Site Level D PPE	Thunder/Lightning	• If drilling, cease work following first indication of thunder/lightning • Shelter in buildings or vehicles not underneath trees or near drilling equipment • Begin work after 15 minutes has • elapsed from last thunder/lightning
	Heat Stress	• Awareness training –signs/symptoms • of heat stress disorders • Scheduling of work/rest periods • Replacement fluids • Shaded area for rest breaks • Buddy system
	Cold Stress	• Awareness training – signs/symptoms • Warm area to recover • Warm drinks • Possible medial attention
All activities at site, continued Level D PPE	Walking working surfaces – uneven terrain, steep grades, slippery surfaces, ditches	• Awareness of terrain and footing
	Vehicular traffic when working on public streets	• <u>High visibility traffic vest</u> • <u>Orange traffic cones</u> • <u>Flag person required</u>.
Drilling	Heavy Equipment movement	• Personnel maintain eye contact with operators when near the rig.
	Dropped equipment, slip, trip or fall.	• Hard hats, steel-toe safety shoes and safety glasses worn during equipment operation.
	Noise	• Hearing protectors with proper noise reduction rating.
Completion and development of ground water	Splashing of chemical in groundwater	• Safety glasses; chemical-resistant suits (as determined necessary by SSO)

Task/Activity	***Hazards***	***Control Strategy***
well		
High pressure hoses		• Safety glasses • Awareness training
Lockout/tagout		• Awareness training

TABLE 6-1

PERSONAL PROTECTION EQUIPMENT REQUIREMENTS

PPE Level	**Ensemble Components**	**Anticipated Use**
Level D Should be worn only as a work uniform and not in any area with respiratory or skin hazards. It provides minimal protection against chemical hazards.	• Long pants and shirt with sleeves • Steel-toed footwear • Safety glasses with molded side shields • Hard hat if potential for head injury or falling debris is possible/or client requirement • General purpose work gloves if task does not involve water or wet materials • Hearing protection • **High visibility traffic vest**	All field activities
Modified Level D	• Level D and the following: • Disposable Tyvek™ coveralls • Steel-toed rubber boots or disposal boot covers over shoes • Thin nitrile gloves • Green nitrile gloves over thin nitrile gloves when primary gloves may tear or puncture	Any of the above-referenced tasks in which there is moderate potential for skin contact
Level C Should be worn when the criteria for using air-purifying respirators are met, and a lesser level of skin protection is needed.	• Level D or Modified Level D and the following: • Half-face air purifying respirator with combination organic vapor/high efficiency particular air (HEPA) cartridges	Any of the above-referenced tasks in which there is moderate potential for skin contact with constituents and data indicating need for respiratory protection
Level B Should be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection is needed.	Not anticipated to be required	Tasks requiring Level B PPE are not anticipated during this project. If Level B PPE is needed, as determined by the SSO and/or the Project Health and Safety Coordinator, the HASP will be revised.

TABLE 6-1 (CONTINUED)

PERSONAL PROTECTION EQUIPMENT REQUIREMENTS

PPE Level	**Ensemble Components**	**Anticipated Use**
Level A Should be worn when the highest level of respiratory, skin, and eye protection is needed.	Not anticipated to be required	Tasks requiring Level A PPE are not anticipated during this project. If Level A PPE is needed, as determined by the SSO and/or the Project Health and Safety Coordinator, the HASP will be revised

TABLE 18-1

EMERGENCY DRILL FREQUENCY

Project Duration	*Drill Frequency*
Less than 30 days	None, cover during review/sign-off of HASP
Greater than one month but less than one year	Once
Greater than one year	Annually

Job Hazard Analysis Form

Attachment 1

Environmental Resources Management

ERM

JHA
Job Hazard Analysis

S1-ERM-002-FM4 - JHA Template
Version: 1.2

Project Number:	add	Project / Client Name:	add
Project Manager:	add	Location:	add
Partner-in-Charge:	add	Date and Revision Number:	add

SPECIFIC TASK:	**add**

Minimum Required PPE for Entire Task:	☐ Hard Hat ☐ Safety-Toe Shoes ☐ Hearing Protection ☐ Goggles ☐ Face Shield ☐ Respirator <enter type and cartridge type> ☐ Other (specify): ☐ Safety Glasses ☐ Reflective Vest ☐ Gloves <enter type here> ☐ PPE clothing <enter type here (eg, Tyvek, FRC, long sleeves)> <enter additional PPE here>		
Additional Task-Step Specific PPE: (as indicated below under Controls)	add	Equipment / Tools Required:	Include monitoring equipment, hand tools, powered equipment, etc.
Training Required for this Task:	Include regulatory, client, ERM training requirements	Permits Required for this Task:	Include both safety permits (e.g., Hot Work) and environmental permits (eg, drilling permit)
Forms Associated with This Task:	add		

JHA Developed / Reviewed By:			JHA Review In Field
Name / Job Title:	Name / Job Title:	Name / Job Title:	Field supervisor to ensure all personnel performing this task have reviewed JHA and agree to follow it. Site-specific changes to this JHA have been made as warranted based on this review. **Signature/Date:**

Task Steps[1]		**Potential Hazards & Consequences[2]**		select ⇩	**Probability**	**Consequence**	**RISK**	**Controls to Eliminate or Reduce Risks[3]**	
1		1a						1a	
		1b						1b	

Task Steps[1]		Potential Hazards & Consequences[2]		select	Probability	Consequence	RISK	Controls to Eliminate or Reduce Risks[3]	

ONE JHA PER TASK. CONTRACTORS MUST PROVIDE THEIR OWN JHAS. JHAS SHOULD BE WRITTEN IN PLAIN LANGUAGE AND SHOULD BE NO MORE THAN 2-3 PAGES IN LENGTH.
INSERT ADDITIONAL ROWS AS NEEDED ABOVE (MUST MANUALLY COPY AND PASTE FORMULA IN COLUMN H). ROW HEIGHTS MAY NEED TO BE MANUALLY EXPANDED TO VIEW ALL TEXT.
LEAVE SEVERAL BLANK OVERSIZED ROWS TO ALLOW HANDWRITTEN FIELD ADDITIONS. CAN ALSO DELETE UNNEEDED ROWS TO FIT PAGE(S).

1. Each task consists of a set of steps. List and number all the steps in the sequence they are performed. Specify the equipment or other details.

2. List potential health & safety hazards and consequences - ONE PER ROW - and select "H&S" from the drop-down list. Then list any potential security, environmental, and/or property loss impacts - ONE PER ROW - and select the corresponding code(s) from the drop-down list. Use numbers and letters for each hazard/impact listed (1a, 1b, etc). Hazards should be described in terms of their specific origin and negative consequences (e.g., instead of “moving equipment”, write “injury from getting struck by forklift”).

3. Describe the specific actions or procedures that will be implemented to eliminate or reduce each hazard. Be clear, concise, and specific. Use objective, observable, and quantified terms (e.g., instead of “use good body positioning,” write “don’t bend at waist or reach above head”). Use numbers and letters corresponding to listed hazards.

4. Select the probability of occurrence and consequence of each hazard, AFTER implementation of the planned control measures (use the Risk Matrix as a guide). The corresponding risk rating will then be automatically calculated [RISK = Likelihood x Severity].

A risk rating shaded red indicates that work cannot continue without additional control measures and approval of Partner-in-Charge.

WAYS TO ELIMINATE OR REDUCE RISKS (IN ORDER OF PREFERENCE):

ELIMINATE / AVOID --> SUBSTITUTE / MODIFY --> ISOLATE --> ENGINEER / SAFEGUARD --> TRAINING AND PROCEDURES --> WARNING AND ALERT MECHANISMS --> PPE

Daily Safety Meeting Form

Attachment 2

Environmental Resources Management

ERM	**Applicability:** North America	**Form**	**Document Number:** S3-NAM-029-FM5	**Version:** 2
	Title:	**Site Safety Meeting Form**	**Last Revision Date:**	6/24/15

Project Name/ Location:				**Phone:**	
Project Number:		**Date:**		**Time:**	
Meeting Leader:					

Today's Work Tasks(s)	**Conducted By:**

1. **Review relevant sections of the Health and Safety Plan (HASP), Job Hazard Analyses (JHAs) for planned tasks, and any other applicable procedures. Discuss potential hazards of planned work and control measures to be used to eliminate or reduce risks (including PPE). Pay specific attention to overlapping/ simultaneous operations.**
2. **Review emergency response procedures including emergency phone numbers, location of emergency equipment (fire extinguishers, first aid kit, AED, eyewashes, safety showers, etc.), exit routes, muster points, methods of conducting head count at muster point, and identity of first responders trained in first aid/CPR.**
3. **Does everyone fully understand the task(s)? Are there any changes that need to be assessed? Use SNAP cards to assess risks associated with changed or unplanned tasks.**
4. **Remind the team that everyone on the job site is empowered to stop work if something is unsafe or if there are any questions or concerns regarding safety.**

What tools and equipment are required for today's tasks? Have they been inspected and are they in good condition?

What training/qualifications/experience is necessary for today's assigned tasks?

List any new or Short Service personnel on site today:

Discuss any recent incidents, near misses, field inspection findings, or other safety observations (or observations from similar tasks performed at other sites):

ERM	**Applicability:**	**Form**	**Document Number:**	**Version:**
	North America		S3-NAM-029-FM5	2
	Title:	**Site Safety Meeting Form**	**Last Revision Date:**	6/24/15

Additional Safety Meeting Topics (check those discussed)
☐ What client safety rules or procedures are applicable to today’s activities?
☐ How will you communicate with others on site? How will you communicate with the PIC and PM?
☐ What are the potential impacts of planned activities to visitors, nearby workers, or the public?
☐ Who do you contact if you have questions or before deviating from written procedures?
☐ What happens and who do you contact if there is an injury or other emergency? If working at an active facility, how will you be alerted of an emergency and what will you do?
☐ Where is nearest medical facility and how would we get an injured employee there? If medical help is more than five minutes away, is at least one person on site trained in first aid/CPR? How do you contact them?
☐ Do you have any medical condition or allergy that the project team needs to be aware of? Write this down and keep it in your pocket for reference in the event of an emergency.
☐ Are any work permits required?
☐ Has anything unexpected or out-of-the-ordinary occurred on this job recently to share?
☐ Is there anything different about today’s operations as compared to yesterday or previous days?
☐ What is the worst that could happen if something goes wrong today?
☐ What activities occurring today could result in hand injuries? Is everyone aware that the use of fixed open-blade knives is not permitted?
☐ What natural hazards are present (including plants, animals, and insects)?
☐ What areas of the site have slip/trip/fall hazards? Can these be avoided? Are everyone’s work boots in good shape?
☐ Other items:

Meeting Attendees (including employees, contractors, and visitors)

Name	**Company**	**Sign-In***	**Sign-Out****

* Signature/initials in this space verify that the employee is fit for performing work.

** Signature/initials in this space verify that the employee was uninjured during the workday.

ERM Incident Reporting Form

Attachment 3

Environmental Resources Management

ERM	**Applicability:**	**Procedure**	**Document Number:**	**Version:**
	United States		S3-USA-016-PR	1
	Title:	**Incident Reporting and Investigation**	**Last Revision Date:**	10/17/14

1. Purpose and Scope

This document supports the Management System and establishes the procedures to ensure that safety events are being properly reported and investigated within ERM operations. This document applies to all ERM field and office locations.

2. Roles and Responsibilities

Partner in Charge (PIC): Responsible for the following elements:

- Ensuring this procedure is implemented, understood, and followed by employees under their charge and working on their projects; and
- Correcting any deficiencies in the implementation of this procedure as identified by the Division Health, Safety Security, and Environment (HSSE) Leader.

Project Manager (PM)/Supervisor/Branch Manager (BM): Responsible for the following elements:

- Performing observations of ERM work processes to assess whether or not employees are operating in accordance with this procedure; and
- Correcting, in conjunction with the PIC and the Division HSSE Leader, any observed deficiencies in the implementation of this procedure.

Division HSSE Leader: Responsible for the following elements:

- Evaluating implementation of this procedure by Division personnel during ECS reviews; and
- Communicating identified deficiencies to the PIC and Divisional management teams.

Employee: Responsible for the following elements:

- Completing ECS entries within 24 hours of a safety event; and
- Participating in the investigation of the event as directed by the ERM management and health and safety (H&S) teams.

3. Definitions

Event Communication System (ECS): The primary tool utilized at ERM for communicating the occurrence of safety events.

Event Principals: People who may be involved in safety events, including ERM employees, subcontractors, and third parties (including clients).

5 Why: A question-asking technique used to explore the cause and effect relationship underlying a problem or event.

Incident: One of the following:

- An employee becomes injured or is made ill;
- Useful property is damaged in some fashion;
- A hazardous material is spilled or released to air, water, or ground;
- Operational security is breached;
- A regulatory citation is issued; or
- A loss of reputation to clients or the general public is sustained.

Near Miss: An unplanned event that did not result in an incident, but had the potential to do so.

Reporting Person: The ERM employee entering the Safety Event into the ECS.

Root Cause Analysis: A method of problem solving that tries to identify the root causes of an issue. A root cause is one that, once removed, would have prevented the final undesirable event from occurring.

Safe Behavior: A positive action or attitude toward safety or that promoted safety within the workplace.

Safety Event: An incident, near miss, unsafe act/condition, or safe behavior occurring within or due to the working environment experienced by ERM personnel.

Unsafe Act: A task or activity conducted in a manner that may threaten the health and safety of co-workers.

Unsafe Condition: A condition in the work environment likely to lead an incident if not corrected.

Workcare: The occupational health consulting firm which assists ERM in management of its medical surveillance programs.

Working Environment: Anywhere ERM, its employees, and its subcontractors are engaged in work activity, including ERM offices, client sites (visits, meetings, field work, etc.), or during travel.

4. Procedure

4.1 Safety Event Initial Response

4.1.1 Injuries or Illnesses

The general steps for responding to an injury or illness incident include the following:

- For emergency situations, employees shall call 911. This would include chest pains, stroke, severe shortness of breath, sudden and severe pain, major injury (including potential fractures and trauma), uncontrolled bleeding, electrocution, second or third degree burns, or unconsciousness. If transport to an urgent care center or hospital is required, a second ERM employee must accompany or follow the injured or ill employee to the medical treatment center.
- For non-emergency situations, employees shall give necessary first aid care for the employee (if qualified to do so) and secure the scene.
- After stabilizing the scene and ensuring appropriate initial treatment is provided to the employee, contact the PM/Supervisor, who will then contact the BM and/or PIC, as well as the local and/or Division H&S team, to report the event.
- Immediately after contacting the ERM management and H&S personnel, an ERM representative shall call ERM's medical service provider (Workcare) to initiate the Incident Intervention process if follow-up medical treatment is deemed necessary by the management or health and safety team. The phone number is 888-449-7787.
- Within 24 hour, ERM employees shall enter the basic details of the event into the ECS.

Note that the above direction may change based on site-specific circumstances or client-specific requirements. Emergency response elements, including contact information and directions to urgent care facilities, will be included in the project health and safety plan (HASP) as well as the Emergency Action Plan (EAP) within each office.

In the event of a fatality or the hospitalization of three or more ERM employees from a single incident, ERM's management team with the assistance of the Regional H&S Director is responsible for notifying the Occupational Safety and Health Administration (OSHA) within eight hours of the incident.

4.1.2 Non-injury Incidents and Near Misses

After the occurrence of a work related non-injury incident (property damage, environmental release, etc.), work will be halted, the scene will be secured, and initial facts gathered regarding the event. Work should not continue until the causes of the incident or near miss are understood and corrected. Within 24 hours, ERM employees must enter the basic details of the event into the ECS.

4.1.3 Unsafe Acts and Conditions/Safe Behaviors

When a work related unsafe act or condition is identified, work will be halted until the act or condition is addressed and corrected. Similarly, when safe behaviors are identified, the employee(s) involved should be commended for their safe performance. Within 24 hours of the observation, ERM employees must enter the basic details of these events into the ECS.

4.2 Safety Event Follow-up

4.2.1 ECS Information Routing

After the basic details of a safety event are entered into the ECS by the employee or designated reporting person, the system will automatically notify appropriate parties. All individuals receiving automatic notification are included on the communication chain for the safety event's ECS record. Automatic notifications per Event Type are summarized in Appendix 1.

Any ERM employee may be added to the communication chain for an ECS record as an additional affected party.

4.2.2 Initiating and Conducting Follow-up

ERM assigns and tracks corrective actions for all safety events. The required detail of the follow-up and the personnel involved is based on the Event Type and its actual or potential severity, as judged by the project and/or safety team. The ECS record created by entering the Safety Event is meant to both guide follow-up and document the findings of the investigation.

At the option of ERM's safety and/or management team, or as required by actual or potential severity of the event, a more robust follow-up may be required, including root cause analysis.

Within 24 hours of the initial communication of the Safety Event into ECS, a member of the BU safety team will contact the Reporting Person to gather initial facts and begin the investigation. The safety team will be responsible for:

- Stewarding the completion of the investigation with the persons involved in the Safety Event; and
- Verifying that all assigned corrective actions have been completed.

4.2.3 Determining Recordability

If the Safety Event is an occupational illness or injury, then the Regional H&S Director will confer with ERM's Global H&S Director to determine recordability of the Safety Event. This will include a calculation of lost work days and/or restricted duty/job transfer time. These determinations will be made based on the established facts of the Safety Event and according to US recordkeeping criteria established by the OSHA. Collected data on events meeting OSHA's recordability definition will be summarized on OSHA Forms 300 and 300A and will be maintained as required by OSHA recordkeeping and reporting requirements.

4.2.4 Root Cause Analysis

A root cause analysis (RCA) will be performed for all recordable incidents and high value learning events as determined by the client, ERM management and/or the Regional H&S Director.

The RCA process should begin no less than two business days after all immediate response measures have been taken and the situation is under control. The default ERM RCA methodology in the "5 Why" technique, but ERM reserves the right to substitute other valid methods as deemed appropriate by management or the Regional H&S Director.

The first step in the process is to assemble the RCA team. The team shall be led by the PIC and facilitated by a member of the ERM safety team or another ERM employee trained in RCA methods. Other team members may include:

- The PM of the project;
- The BM (if the Safety Event was based in the office);
- The person directly involved in the event;
- Other employees familiar with the activities during which the event occurred;
- Subcontractor representatives (if a subcontractor was involved); and
- A senior ERM Partner not involved in the event (e.g., Practice Leader or BU Managing Partner).

The RCA team leader will facilitate the implementation of the process, which may include:

- Interviews and fact gathering;
- Casual factor determination;
- Root cause identification using the "5 Why" method; and
- Corrective action recommendation.

Target deadlines for completing an RCA are as follows:

- Conduct interviews within five working days after the event;
- Distribute draft RCA report to the RCA team for review within 10 working days after the event; and
- Issue the final RCA report, including photos and an RCA flowchart, within 15 working days after the event.

The final RCA report will be uploaded to the ECS record after the event. Adopted corrective actions will be tracked to completion in the ECS. All corrective actions must be completed within 30 days of the issuance of the RCA report. If additional time is needed to complete a corrective action, the Regional H&S Director must be notified.

4.2.5 Approval and Record Finalization

When the corrective actions are verified as complete, the following individuals will indicate their approval of the event:

- For incidents, the applicable Business Unit (BU) H&S Leader, the BU Managing Partner (MP), and the Regional H&S Director.
- For all other safety events, the BU H&S Leader.

After all approvals are made, the BU H&S Leader will initiate the finalization check within ECS to save and close the record. Future changes are locked out are event finalization.

4.3 Additional Procedures for Mine-Related Safety Events

For ERM projects covered by the regulatory statues of the Mine Safety and Health Administration (MSHA), additional recordkeeping is required when specific safety events occur. Safety events meeting one or more of the following criteria must be reported to both the mine operator and MSHA immediately (i.e., no later than 15 minutes after occurrence):

- Death of an ERM employee;
- Injury to an ERM employee at the mine that had the reasonable potential to cause death;
- Entrapment of an ERM employee for more than 30 minutes or which had the reasonable potential to cause death;
- An unplanned inundation of a mine by liquid or gas;
- An unplanned ignition or explosion of gas or dust;
- In underground mines, an unplanned fire not extinguished within 10 minutes of discovery;
- In surface mines, an unplanned fire not extinguished within 30 minutes of discovery;
- An unplanned ignition or explosion of a blasting agent or explosive;
- An unplanned roof fall at or above the anchorage zone in active workings that impair ventilation or impede passage;
- A coal or rock outburst that causes withdrawal of miners or which disrupts regular mining activity for more than one hour;
- An unstable condition at an impoundment, refusal pile, or culm bank which requires emergency action to prevent failure, or which cause individuals to evacuate an area, or failure of an impoundment, refuse pile, or culm bank;
- Damage to hoisting equipment in a shaft or slope which endangers an individual or which interferes with use of the equipment for more than 30 minutes, and
- An event at a mine which causes death or bodily injury to an ERM employee not at the mine when the event occurs.

Within 10 days of occurrence, ERM must submit a report of any work-related incidents to MSHA using MSHA Form 7000-1. Additionally, each calendar quarter, ERM must submit employment information to MSHA utilizing MSHA Form 7000-2. The form must be completed and submitted to MSHA no later than 15 days after the end of each calendar quarter.

5. References

- Occupational Safety and Health Administration (OSHA) 29 CFR 1904, *"Recording and Reporting Occupational Injuries and Illnesses"*
- Mine Safety and Health Administration (MSHA) 30 CFR 50, *"Notification, Investigation, Reports, and Records of Accidents, Injuries, Illnesses, Employment, and Coal Production in Mines"*

Document Control Information

Original Effective Date: 10/17/14

Policy Approval by: Mark Hickey

Approval Signature: ______________________________

Appendix 1: ECS E-mail Notification Matrix

Appendix 2: Event Severity Matrix

Revision History

Section	Reason for Revision	Date
All	Revised and edited to meet new Global SMS requirements and update procedures	10/17/14

Map and Directions To Hospital

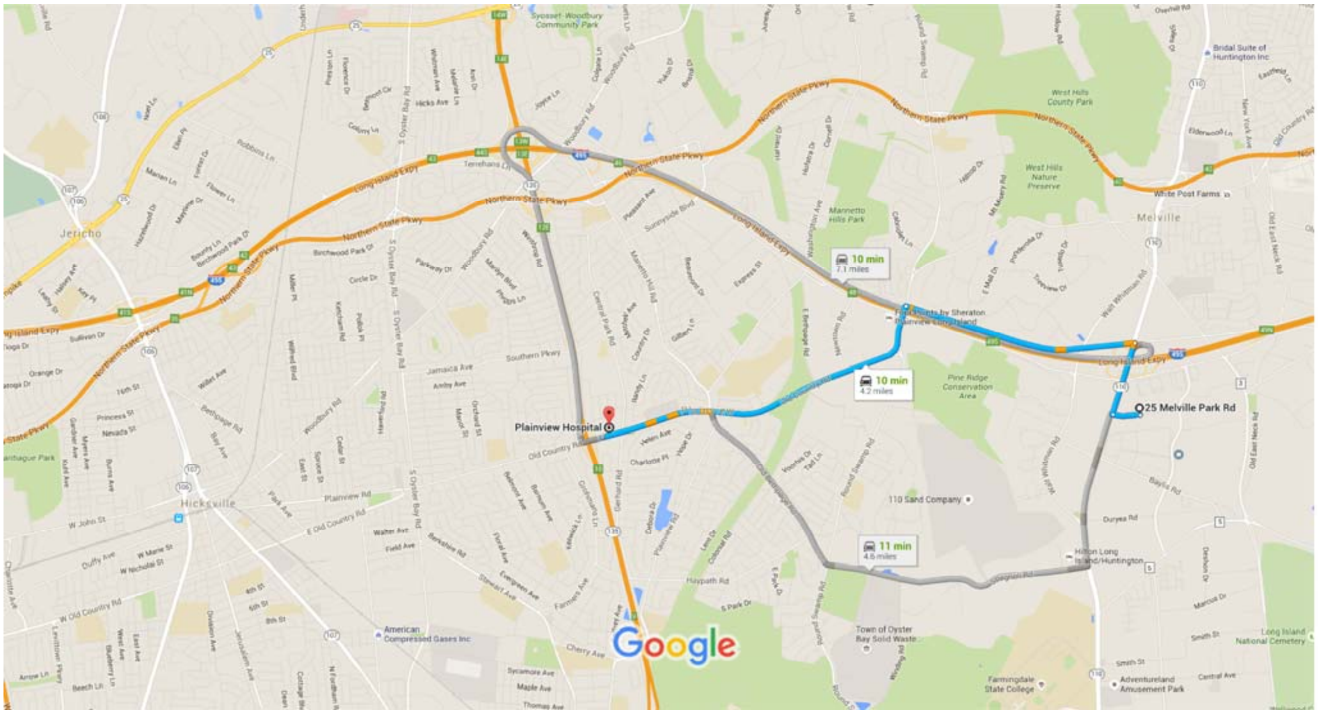
Attachment 4

Environmental Resources Management

Google Maps

25 Melville Park Road, Melville, NY to Plainview Hospital

Drive 4.2 miles, 10 min



Map data ©2015 Google 2000 ft

25 Melville Park Rd

Melville, NY 11747

1. Head north toward Melville Park Rd	10 ft
2. Turn left onto Melville Park Rd	0.2 mi
3. Turn right onto Broad Hollow Rd	0.5 mi
4. Use the 2nd from the left lane to turn left onto N Service Rd	1.4 mi
5. Use the left 2 lanes to turn left onto Old Country Rd/Round Swamp Rd ⓘ Continue to follow Old Country Rd ⓘ Destination will be on the right	2.2 mi

Plainview Hospital

888 Old Country Road, Plainview, NY 11803

APPENDIX B
QUALITY ASSURANCE PROJECT PLAN (QAPP)

New York Twist Drill OU2
25 Melville Park Road
Melville, Suffolk County, NY
NYSDEC Site # 1-52-169

January 2016

Prepared for:

Respondents
Order on Consent
Index Number W1-0998-04-04

Prepared by:

Environmental Resources Management
105 Maxess Road, Suite 316
Melville, New York 11747

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B.1 PURPOSE AND OBJECTIVES

B.1.1 Purpose

This QAPP was prepared for Site Management (SM) activities to set guidelines for the generation of reliable data measurement activities such that data generated are scientifically valid, defensible, comparable and of known precision and accuracy.

This QAPP is an extension of the WP containing a detailed discussion of the quality assurance protocols to be used by ERM and laboratory personnel.

B.1.2 Definitions

The parameters that will be used to specify data quality objectives, and to evaluate the analytical system performance for all analytical samples are precision, accuracy, representativeness, completeness and comparability (PARCC). Definitions of these and other key terms used in this QAPP are provided below.

- ***Accuracy*** - the degree of agreement of a measurement with an accepted reference value. Accuracy is generally reported as a percent recovery, and calculated as:

$$\frac{\text{Measured Value}}{\text{Accepted Value}} \times 100$$

- ***Analyte*** - the chemical or property for which a sample is analyzed.
- ***Comparability*** - the expression of information in units and terms consistent with reporting conventions; the collection of data by equivalent means; or the generation of data by the same analytical method. Aqueous samples will be reported as µg/l and solid samples will be reported in units of mg/kg, dry weight.
- ***Completeness*** - the percentage of valid data obtained relative to that which would be expected under normal conditions. Data are judged valid if they meet the stated precision and accuracy goals.
- ***Duplicate*** - two separate samples taken from the same source by the same person at essentially the same time and under the same conditions that are placed into separate containers for independent analysis. Duplicate samples are intended to assess the effectiveness of equipment decontamination, the precision of sampling efforts, the impacts of ambient environmental conditions on sensitive analyses (e.g., volatile organics analysis (VOA), and the potential for contaminants attributable to reagents or decontamination fluids. Identifying such potential sources of error is essential to the success of

the sampling program and the validity of the environmental data. Each QC sample is described below. As a minimum, each set of ten or fewer field samples will include a trip blank, a duplicate and one sample collected in a sufficient volume to allow the laboratory to perform a matrix spike.

- ***Episode*** - a continuous period of time during which sampling activities are undertaken. Cessation of activities for more than 48 hours terminates the episode.

- ***Field Blanks*** - field blanks (sometimes referred to as "equipment blanks" or "sampler blanks") are the final analyte-free water rinse from equipment decontamination in the field and are collected at least one during a sampling episode. If analytes pertinent to the project are found in the field blank, the results from the blanks will be used to qualify the levels of analytes in the samples. This qualification is made during data validation. The field blank is analyzed for the same analytes as the sample that has been collected with that equipment.

- ***Precision*** - a measure of the agreement among individual measurements of the sample property under prescribed similar conditions. Precision is generally reported as Relative Standard Deviation (RSD) or Relative Percent Difference (RPD). Relative standard deviation is used when three or more measurements are available and is calculated as:

  $$\text{RSD} = \frac{\text{Standard Deviation}}{\text{Arithmetic Mean}} \times 100$$

  Relative percent difference is used for duplicate measurements and is calculated as:

  $$\text{RPD} = \frac{\text{Value 1 - Value 2}}{\text{Arithmetic Mean}} \times 100$$

- ***Quality Assurance (QA)*** - all means taken in the field and inside the laboratory to make certain that all procedures and protocols use the same calibration and standardization procedures for reporting results; also, a program which integrates the quality planning, quality assessment, and quality improvements activities within an organization.

- ***Quality Control (QC)*** - all the means taken by an analyst to ensure that the total measurement system is calibrated correctly. It is achieved by using reference standards, duplicates, replicates, and sample spikes. Also, the routine application of procedures designed to ensure that the data produced achieve known limits of precision and accuracy.

- ***Representativeness –*** degree to which data represents a characteristic of a set of samples. The representativeness of the data is a function of the procedures and caution utilized in collecting and analyzing the samples. The representativeness can be documented by he relative percent difference between separately collected but otherwise identical samples.
- ***Replicate*** - two aliquots taken from the same sample container and analyzed separately. Where replicates are impossible, as with volatile organics, duplicates must be taken.
- ***Trip Blanks*** - trip blanks are samples that originate from analyte-free water taken from the laboratory to the sampling site and returned to the laboratory with the volatile organic samples. One trip blank should accompany each cooler containing volatile organics; it will be stored at the laboratory with the samples, and analyzed with the sample set. Trip blanks are only analyzed for VOCs.

B.1.3 Data Quality Objectives

B.1.3.1 Overall Data Quality Objectives

Data Quality Objectives (DQO) are quantitative and qualitative statements specifying the quality of the environmental data necessary to support the decision-making process to guide the SM and any subsequent corrective actions. DQO define the total uncertainty in the data that is acceptable for each specific activity during the SM. This uncertainty includes both sampling error and analytical error. Ideally, the prospect of zero uncertainty is the objective; however, the very processes by which data are collected in the field and analyzed in the laboratory contribute to the uncertainty of the data. It is the overall objective to keep the total uncertainty to a minimal level such that it will not hinder the intended use of the data.

To achieve the project DQO, specific data quality parameters such as detection limits, criteria for accuracy and precision, sample representativeness, data comparability and data completeness must be specified. The overall objectives are established such that there is a high degree of confidence in the measurements.

The parameters that will be used to specify data quality objectives and to evaluate the analytical system performance for groundwater samples are PARCC.

B.1.3.2 Field Investigation Quality Objectives

The field investigation will will llinclude collection of three types of samples of the media monitoring program: screening samples that will be collected during installation of the Vertical Profile Borings, groundwater monitoring well samples and VI samples. These VPBs will complete the fourth transect and define the lateral plume extent at the downgradient plume boundary.. Groundwater monitoring will be performed in the OU-2 Off-Site Area on an annual basis to assess the performance of the OU-1 remedy. Vapor Intrusion Sampling will be carried out annually at 10 Melville Park Road (assuming access is granted) to ensure that: soil vapor VOC concentrations are decreasing as a result of the continuing On-Site clean up at 25 Melville Park Road and that Indoor VOC concentrations are below New York Department of Health (NYSDOH) Guidance Values.

In the media monitoring program, groundwater screening samples and monitoring well samples will be analyzed by an analytical laboratory using standard USEPA Methods. Specifically, USEPA Method SW-846 Method 8260C for VOCs will be used for analysis of the screening samples. DQO for the screening sample data are data of quality sufficient to allow to define the vertical extent of the offsite plume and to allow identification of the screen zone of a permanent monitoring well. Screening samples for VOC analysis will be obtained using a hydro punch. QA/QC samples will also be sent for analysis during collection of screening samples.

After the installation of the two VPBs/monitoring wells, the two new wells (ERM-MW-13 and ERM-MW-14) and existing monitoring wells ERM-MW-01, ERM-MW-02D, ERM-MW-05, ERM-MW-09, ERM-MW-11A, ERM-MW-11B, ERM-MW-11C, ERM-MW-12S and ERM-MW-12M will be sampled on a yearly basis to assess the effectiveness of the remedy at the Former NYTD Site on the off-site groundwater (OU-2) including any changes in the plume configuration. All groundwater monitoring well samples will be analyzed for VOCs using USEPA Method SW-846 Method 8260C. Collection of QA/QC samples including duplicates and trip and field blanks will permit calculation of precision and accuracy for these samples. Through the submission of field QC samples, distinctions can be made between laboratory problems, sampling technique considerations, sample matrix effects, and laboratory artifacts. To assure groundwater representativeness, all sample collection will be performed in strict accordance with the procedures set forth in this WP.
Vapor Intrusion Sampling will be carried out annually at 10 Melville Park Road (assuming access is granted) to ensure that: soil vapor VOC concentrations are decreasing as a result of the continuing On-Site clean up at 25 Melville Park Road and that Indoor VOC concentrations are below New York Department of Health (NYSDOH) Guidance Values. Two sub-slab soil vapor, one outdoor and a ground floor indoor air sample, will be collected from 10 Melville Park Road (Marcum, LLP), an office building located on the south side of Melville Park Road from the former NYTD Site. Sub-slab soil gas, indoor air and ambient air samples will be collected over a 24-hour period using a 6 liter laboratory certified SUMMA® canister. All samples will be analyzed by an ELAP certified

laboratory for VOCs using USEPA Method TO-15. A summary of the samples to be collected is presented in Tables B-1 and B-2.

Precision will be calculated as RPD if there are only two analytical points and percent relative standard deviation (% RSD) if there are more than two analytical points. Blind field duplicate and MS/MSD sample analyses will provide the means to assess precision. The submission of field and trip blanks will provide a check with respect to accuracy and will monitor chemicals that may be introduced during sampling, preservation, handling, shipping and/or the analytical process. In the event that the blanks are contaminated and/or poor precision is obtained, the associated data will be appropriately qualified.

Representativeness will be assured through the implementation of the structured and coherent WP of which this QAPP is a part. This WP has been designed so that the appropriate numbers of samples of each matrix and of each location of interest are obtained for analysis.

Ideally, 100% completeness is the goal of this SM. However, it must be recognized that unforeseen issues may result in the generation of some data that may not be acceptable for use. Therefore, a completeness target of 90%, as determined by the total number of usable data points versus the total number of data points measured, will be the realistic goal of this program.

Comparability is defined as the extent to which data from one data set can be compared to similar data sets. Comparability between data sets is often questionable due to issues such as different analytical methods used or inter-laboratory differences. In order that the data generated as part of this project remain comparable to any previously generated data or data to be generated in the future, currently published analytical methods have been identified for the analysis of the collected samples. These methods will be performed by an analytical laboratory with a demonstrated proficiency in the analysis of similar samples by the referenced methods. In addition, samples will be collected using documented procedures to ensure consistency of effort and reproducibility if necessary.

B.1.3.3 Laboratory Data Quality Objectives

As indicated above, samples collected from the Vertical Profile Borings and permanent monitoring wells will be sent for standard fixed analytical laboratory analysis. Typical QA/QC samples will be collected during collection of these samples including duplicates, blanks, etc. The analytical laboratory will demonstrate analytical precision and accuracy by the analysis of various QC samples (i.e., laboratory duplicates, spike samples, matrix spike duplicates and laboratory control samples). Precision, as well as instrument stability, will also be demonstrated by comparison of calibration response factors from the initial calibration to that of the continuing calibrations. Laboratory accuracy will be evaluated by the addition of surrogate and matrix spike compounds, and will be presented as percent recovery. Precision will be presented as RPD, % RSD, or percent difference (%D), whichever is appropriate for the number and type of QC samples analyzed. Laboratory blanks can also be used to demonstrate the accuracy of the analyses and possible effects from laboratory artifact contamination.

B.2 FIELD QUALITY ASSURANCE/QUALITY CONTROL

B.2.1 Equipment Maintenance

In addition to the laboratory analyses carried out during the course of this RI, field measurements will be collected for total volatile organics (air monitoring), pH, conductivity, oxidation/reduction potential (ORP), dissolved oxygen (DO) and turbidity in groundwater. A maintenance, calibration, and operation program will be implemented to ensure that routine calibration and maintenance is performed on all field instruments. The program will be administered by the Quality Assurance Officer (QAO) and the field team members. The equipment rental company will perform the scheduled monthly and annual calibration and maintenance. Monthly and annual maintenance, calibration and equipment operation will follow the procedures outlined in the manufacturer's Operation and Field Manuals accompanying the respective instruments. Daily calibration will be performed by ERM.

B.2.2 Equipment Calibration

Trained field team members will be familiar with the field calibration, operation, and maintenance of the equipment. They will perform field calibrations, checks, and instrument maintenance daily. The PID will be calibrated on a periodic basis with isobutylene. A trained team member will perform daily field checks and instrument maintenance prior to use. The pH, conductivity, ORP, DO and turbidity meters will be calibrated by a trained team member using standard calibration solutions. Field maintenance, calibration and equipment operation will follow the procedures outlined in the manufacturer's Operation and Field Manuals accompanying the respective instruments. All maintenance and calibration will be documented on an instrument-specific master calibration/ maintenance form.

The Field Team Leader (FTL) will be responsible for keeping a master instrument calibration/maintenance form for each measuring device. Each form will include at least the following relevant information:

- Name of device and/or instrument calibrated;

- Device/instrument serial and/or identification (I.D.) number;
- Frequency of calibration;
- Date of calibration;
- Results of calibration;
- Name of person performing the calibration;
- Identification of the calibration standards; and
- Buffer solutions (pH meter only).

B.2.3 *Equipment Decontamination*

To minimize the potential for cross-contamination, all drilling and sampling equipment will be properly decontaminated prior to and after each use.

B.2.3.1 *General Procedures*

All heavy equipment will be decontaminated in a designated clean area. Sampling equipment and probes will be decontaminated in an area covered by plastic near the sampling location. All solvents and wash water used in the decontamination process will be collected and drummed for off-site disposal. All disposable sampling equipment will be properly disposed of in dry containers.

All well casing and screen will be steam cleaned, wrapped in clean polyethylene sheeting and stored until the time of well construction.

Extraneous contamination and cross-contamination will be controlled by wrapping the sampling equipment with aluminum foil when not in use and changing and disposing of the sampler's gloves between samples. Decontamination of sampling equipment will be kept to a minimum in the field, and wherever possible, dedicated sampling equipment will be used. Personnel directly involved in equipment decontamination will wear appropriate protective equipment.

B.2.3.2 *Heavy Equipment (drill rigs, etc.)*

All drilling equipment and the back of the drilling rig will be decontaminated by steam cleaning prior to performance of the first boring/well installation and between all subsequent borings/well installations. This will include all hand tools, casing, augers, drill rods and bits, tremie pipe and other related tools and equipment. The steam cleaning equipment will be capable of generating live-steam with a minimum temperature of 212 °F.

All water used during drilling and/or steam cleaning operations will be from a potable source and so designated in writing. The drilling contractor is responsible for obtaining all permits from the local potable water purveyor and any other concerned authorities, and provision of any requested back-flow prevention devices. The equipment will be cleaned to the satisfaction of the ERM Hydrogeologist or FTL.

B.2.3.3 *Aqueous Sampling Equipment*

Factory pre-cleaned disposable bailers will be used during the RI. In the event that field decontamination of reusable sampling equipment is necessary, decontamination procedures will be as follows:

- Laboratory-grade glassware detergent and tap water scrub to remove visual contamination;
- Generous tap water rinse; and
- Distilled and deionized (ASTM Type II) water rinse;
- 10% nitric acid rinse, followed by a distilled and deionized water rinse (metals only), or
- Methanol (pesticide grade) rinse (volatiles only);
- Air dry; and
- Distilled and deionized water rinse.

The submersible sampling pumps that are placed in the borehole will be decontaminated with an Alconox detergent rinse and by pumping approximately 5 gallons of potable water through the pump. Since dedicated new lengths of polyethylene tubing will be used for sampling each well, the tubing will not be decontaminated. Unless otherwise specified, the submersible pumps will be decontaminated prior to the sampling the first well and between each subsequent well as follows:

- Potable water rinse.
- Alconox detergent and potable water scrub.
- Potable water rinse.
- Distilled/deionized water rinse.
- Wrap in aluminum foil, shiny side facing out.

B.2.3.4 *Meters and Probes*

All meters and probes that are used in the field (other than those used solely for air monitoring purposes, e.g., oxygen meters, explosimeters, etc.) will be decontaminated between use as follows:

- phosphate-free laboratory detergent solution;
- tap water;
- methanol rinse (at the FTL's discretion);
- deionized water (triple rinse).

A methanol rinse will be used if deemed necessary by the FTL.

B.2.4 Quality Assurance/Quality Control Sampling

Specific guidance regarding the collection of field and laboratory QA/QC samples is presented separately below. The summary of samples to be collected is presented in Tables B-1 and B-2.

B.2.4.1 Field QA/QC Samples

Trip Blanks

The trip blank will be used to determine if any cross-contamination occurs between aqueous samples during shipment. The analytical laboratory will supply trip blanks as aliquots of distilled, deionized water that will be sealed in a sample bottle prior to initiation of each day of fieldwork. Glass vials (40 ml) with Teflon®-lined lids will be used for trip blanks. The sealed trip blank bottles will be placed in a cooler with the empty sample bottles and will be shipped to the site by the laboratory personnel. If multiple coolers are necessary to store and transport aqueous VOC samples, then each cooler must contain an individual trip blank. Trip blanks are analyzed for VOCs only. Trip blanks will only be used with aqueous samples.

Field Blanks

Field blanks will be collected to evaluate the cleanliness of aqueous sampling equipment, sample bottles and the potential for cross-contamination of samples due to handling of equipment, sample bottles and contaminants present in the air. Field blanks will collected at a frequency of one per decontamination event for each type of sampling equipment, and each media being sampled (e.g., a groundwater bailer for groundwater), at a minimum of one per equipment type and/or media per day.

Field blanks will be collected prior to the occurrence of any analytical field sampling event by pouring deionized or potable water over a particular piece of sampling equipment and into a sample container. The analytical laboratory will provide field blank water and sample jars with preservatives for the collection of all field blanks. Glass jars will be used for organic blanks. The field blanks as well as the trip blanks will accompany field personnel to the sampling location. The field blanks will be analyzed for the same analytes as the environmental samples being collected that day and will be shipped with the samples taken.

Field blanks will be taken in accordance with the procedure described below:

- Decontaminate sampler using the procedures specified in the QAPP;
- Pour distilled/deionized water over the sampling equipment and collect the rinseate water in the appropriate sample bottles;
- The sample will be immediately placed in a sample cooler and maintained at a temperature of 4°C until receipt by the laboratory; and
- Fill out sample log, labels and COC forms, and record in field notebook.

Temperature Blanks

The temperature blank will be used to determine the temperature of the samples within the cooler upon arrival at the analytical laboratory. A laboratory-supplied temperature blank will be an aliquot of distilled, deionized water that will be sealed in a sample bottle. The sealed temperature blank bottles will be placed in a cooler with the empty sample bottles and will be shipped to the site by the laboratory personnel. If multiple coolers are necessary to store and transport samples, then each cooler must contain an individual temperature blank.

B.2.4.2 Laboratory QA/QC

Duplicate Samples

Duplicate aqueous samples will be collected analyzed to check laboratory reproducibility of analytical data. Duplicate samples will be collected at a frequency of at least 5% (one out of every 20 samples) of the total number of samples collected to evaluate the precision and reproducibility of the analytical methods. All duplicate samples will be submitted to the analytical laboratory as a "blind duplicate", having a fictitious sample identification name and time of sample collection. Each blind duplicate will be cross-referenced to document which real sample it is a duplicate of in the field notes and on the master sample log. Duplicates will not be collected as part of the Vertical Profile Boring Installations.

Matrix Spike/Matrix Spike Duplicate

Additional environmental sample volume will be collected for use as MS/MSD samples at a frequency of at least 5% (one out of every 20 samples) of the total number of samples collected to evaluate the precision and reproducibility of the analytical methods. To ensure the laboratory has sufficient volume for MS/MSD analysis, triple sample volume must be submitted for aqueous organic extractable and volatile samples once per every 20 samples in a sample delivery group (SDG). MS/MSD will not be collected as part of the Vertical Profile Boring Installations.

B.2.5 Field Records

Proper management and documentation of field activities is essential to ensure that all necessary work is conducted in accordance with the WP, and QAPP in an efficient and high quality manner. Field management procedures include following proper chain of custody procedures to track a sample from collection through analysis, noting when and how samples are split (if necessary), making regular and complete entries in the field logbook, and the consistent use and completion of field management forms. Field management forms and field logbook will be used to document all field activities, as this documentation will support that the samples were collected and handled properly, making the resultant data complete, comparable and defensible. Field logbook procedures and field management forms are identified in the following sections.

B.2.5.1 Field Logbook

The sample team or individual performing a particular sampling activity will keep a weatherproof field notebook. Field notebooks are intended to provide sufficient data and observations to enable participants to reconstruct events that occurred during projects and to refresh the memory of the field personnel. The field notebook entries should be factual, detailed, and objective. All entries are to be signed and dated. All members of the field investigation team are to use this notebook, which will be kept as a permanent record. The field notebook will be filled out at the location of sample collection immediately after sampling. It will contain sample descriptions including: sample number, sample collection time, sample location, sample description, sampling method used, daily weather conditions, field measurements, name of sampler, and other site-specific observations. The field notebook will contain any deviations from protocol and why, visitor's names, or community contacts made during sampling, geologic and other site-specific information which may be noteworthy.

B.2.5.2 Field Management Forms

In addition to maintenance of a field logbook, the use of field management forms will supplement field logbook entries for all field activities associated with this project. Field management forms provide a regular format to record the relevant information for a particular field activity. Use of these forms will ensure that the field team consistently and completely records all pertinent data relative to a particular field activity on a regular basis. All forms, sample labels, custody seals and other sample documents will be filled out completely.

A list of forms and the associated activities for which each form could be potentially be completed is presented below.

Form	***Activity***
Daily Field Report	Every day of field activity
Daily Instrument Calibration Log	Every day a field instrument is used
Monitoring Well Construction Logs	All permanent well installations
Well Development Data Sheet	All well development efforts
Sampling Equipment Checklist	All field sampling efforts
Laboratory Sample Bottle Request	All field sampling efforts
Groundwater Sampling Record	All permanent well sampling
Well Inspection Log	All permanent well sampling
Chain of Custody (COC) Form	All field sampling efforts
Status of Laboratory Sample Data	All field sampling efforts (Master Log)

B.2.6 Sample Preparation And Custody

B.2.6.1 Sample Identification

To provide for proper identification in the field, and proper tracking in the laboratory, all samples must be labeled in a clear and consistent fashion using the procedures and protocols described below and within the following subsections.

- Sample labels will be waterproof and have a pre-assigned, unique number that is indelible.
- Field personnel must maintain a field notebook. This notebook must be water resistant with sequentially numbered pages. Field activities will be sequentially recorded in the notebook.
- The notebook, along with the COC form, must contain sufficient information to allow reconstruction of the sample collection and handling procedure at a later time.
- Each sample will have a corresponding notebook entry which includes:
    - Sample ID number;
    - Well or other sample location and number;
    - Date and time;
    - Analysis for which sample was collected;

  - Additional comments as necessary; and
  - Samplers' name.
- Each sample must have a corresponding entry on a COC manifest.
- The manifest entry for sampling at any one well is to be completed before sampling is initiated at any other well by the same sampling team.
- In cases where the samples leave the immediate control of the sampling team (i.e., shipment via common carrier) the shipping container must be sealed.

Each sample collected will be designated by an alpha-numeric code that will identify the type of sampling location and a specific sample designation (identifier). Location types will be identified by a two-letter code. Groundwater from the Vertical Profile Borings will begin with "VP". Groundwater samples collected from the monitoring wells will begin with "MW." The depth will also be added to the Vertical Profile Boring samples as XXXYYY where XXX denotes the starting depth and YYY denotes the ending depth for each sample. As an example, a sample collected at the first vertical profile at a depth of 90 to 100 feet will be noted on all documentation as VP-01-090100. Sub slab soil vapor samples will be designated SS-10MPR-mmddyy. The corresponding indoor and ambient air samples will be designated, respectively IA-10MPR-mmddyy and AA-10MPR-mmddyy. Where "mmddyy" is month, is month, day, year.

In the case of QC samples such as field blanks, trip blanks and blind field duplicate samples; six digits will follow FB, TB and DUP respectively to represent the date (e.g., FB040105 would represent a field blank collected on 1 April 2005). For matrix spike/matrix spike duplicate samples, MS/MSD will be added following the applicable sample identification.

B.2.6.2 Sample Containers

A summary of sample containers is presented on Table B-3 for aqueous samples.

- The analytical laboratory will provide all sample containers.
  - If glass bottles are used, extra glass bottles will be obtained from the laboratory to allow for accidental breakage that may occur.
  - If sample preservation is specified, the necessary preservatives will be placed in the sample bottles by the laboratory.
- The sample bottles will be handled carefully so that any preservatives are not inadvertently spilled.

B.2.6.3 Sample Preservation

A summary of sample preservation and holding times is presented on Table B-3 for aqueous samples. Table B-4 present a summary of sample preservation and holding times for soil vapor and air samples.

Sample Preservation

Groundwater for VOC analysis will be preserved by acidification to a pH of <2 using hydrochloric acid (HCl), cooled to 4°C, and maintained at this temperature until time of analysis.

- Immediately following collection of the samples, they will be placed in a cooler with "freezer-pacs" in order to maintain sample integrity. All volatile sample bottles to be filled to capacity with no headspace for volatilization. If necessary to meet a maximum recommended holding time, the samples are to be shipped by overnight courier to the laboratory.
- The shipping container used will be designed to prevent breakage, spills and contamination of the samples. Tight packing material is to be provided around each sample container and any void around the "freezer-pacs". The container is to be securely sealed, clearly labeled, and accompanied by a COC record. Separate shipping containers should be used for "clean" samples and samples suspected of being heavily contaminated. During winter months, care should be taken to prevent samples from freezing. Sample bottles will not be placed directly on "freezer-pacs".

Sample Holding Time

- All screenng samples will be shipped the same day they are obtained to the analytical laboratory for VOC analysis.
- The samples must be stored at or near 4ºC and analyzed within specified holding times.
- The analytical laboratory will be a NYSDOH ELAP-certified laboratory, and conform to meeting specifications for documentation, data reduction and reporting. The laboratory will follow all method specifications pertaining to sample holding times contained in the specific analytical method. Screening analysis will be carried out using USEPA SW 846 Method 8260C and the analytical laboratory will adhere to required QA/QC procedures.

Sample Custody

Chain of Custody - The primary objective of the sample custody procedures is to create an accurate written record that can be used to trace the possession and handling of all samples from the moment of their collection, through analysis, until their final disposition. All field sampling personnel will adhere to proper sample custody procedures because samples collected during an investigation could be used as evidence in litigation. Therefore, possession of the samples must be traceable from the time each sample is collected until it is analyzed at the laboratory.

Custody Transfer to Field Personnel - The on-site hydrogeologist or the field personnel will maintain custody of samples collected during this investigation. All field personnel are responsible for documenting each sample transfer and maintaining custody of all samples until they are shipped to the laboratory. COC records will be completed at the time of sample collection and will accompany the samples inside the cooler for shipment to the selected laboratory.

Each individual who has the samples in their possession will sign the COC record. Preparation of the COC record is as follows:

- For every sample, the person collecting the sample will initiate the COC record in the field. Every sample will be assigned a unique identification number that is entered on the COC Record.
- The record will be completed in the field to indicate project, sampling team, etc.
- If the person collecting the sample does not transport the samples to the laboratory or deliver the sample containers for shipment, the first block for Relinquished By __________, Received By __________ will be completed in the field.
- The person transporting the samples to the laboratory or delivering them for shipment will sign the record form as Relinquished By ____________.
- If a commercial carrier ships the samples to the laboratory, the original COC record will be sealed in a watertight container and placed in the shipping container, which will be sealed prior to being given to the carrier. The carbonless copy of the COC record will be maintained in the field file.
- If the samples are directly transported to the laboratory, the COC will be kept in possession of the person delivering the samples.
- For samples shipped by commercial carrier, the waybill will serve as an extension of the COC record between the final field custodian and the laboratory.
- Upon receipt in the laboratory, the Sample Custodian or designated representative, will open the shipping containers, compare the contents

with the COC record, and sign and date the record. Any discrepancies will be noted on the COC record.

- If discrepancies occur, the samples in question will be segregated from normal sample storage and the field personnel immediately notified.
- COC records will be maintained with the records for a specific project, becoming part of the data package.

Custody Transfer to Laboratory - All groundwater samples collected during the Offsite RI will be submitted to a NYSDOH ELAP-certified laboratory meeting specifications for documentation, sample login, internal chain of custody procedures, sample/analysis tracking, data reduction and reporting. The laboratory will follow all specifications pertaining to laboratory sample custody procedures contained in the NYSDEC ASP (revised 2000).

In general, the following procedures will be followed upon sample receipt. The laboratory will not accept samples collected by project personnel for analysis without a correctly prepared COC record.

The first steps in the laboratory receipt of samples are completing the COC records and project sample log-in form. The laboratory Sample Custodian, or designee, will note that the shipment is accepted and notify the Laboratory Manager or the designated representative of the incoming samples.

Upon sample receipt, the laboratory Sample Custodian, or designee, will:

- Examine all samples and determine if proper temperature has been maintained during shipment. If samples have been damaged during shipment, the remaining samples will be carefully examined to determine whether they were affected. Any samples affected will also be considered damaged. It will be noted on the COC record that specific samples were damaged and that the samples were removed from the sampling program. Field personnel will be notified as soon as possible that samples were damaged and that they must be resampled, or the testing program changed, and provide an explanation of the cause of damage.
- Compare samples received against those listed on the COC record.
- Verify that sample holding times have not been exceeded.
- Sign and date the COC record and attach the waybill to the COC record.
- Denote the samples in the laboratory sample log-in book which contains the following information:

  - Project identification number
  - Sample numbers
  - Type of samples
  - Date received in laboratory
  - Record of the verified time of sample receipt (VTSR)
  - Date put into storage after analysis is completed
  - Date of disposal.

The last two items will be added to the log when the action is taken.

- Notify the Laboratory Manager of sample arrival.
- Place the completed COC records in the project file.

The VTSR is the time of sample receipt at the laboratory. The date and time the Sample Custodian logs in the samples or designee will agree with the date and time recorded by the person relinquishing the samples.

B.2.6.4 Sampling Packaging And Shipping

Sample bottles and samples will either be delivered/picked up at the site daily by the analytical laboratory, or delivered/shipped via overnight courier. Once the samples have been collected, proper procedures for packaging and shipping will be followed as described below.

Packaging

Prior to shipment, samples must be packaged in accordance with current United States Department of Transportation (USDOT) regulations. All necessary government and commercial carrier shipping papers must be filled out. The procedure below should be followed regardless of transport method:

- Samples will be transported in metal ice chests or sturdy plastic coolers (cardboard or styrofoam containers are unacceptable).
- Remove previously used labels, tape and postage from cooler.
- Ship filled sample bottles in same cooler in which empty bottles were received.
- Affix a return address label to the cooler.
- Check that all sample bottles are tightly capped.
- Check that all bottle labels are complete.

- Be sure COC forms are complete.
- Wrap sample bottles in bubble pack and place in cooler.
- Pack bottles with extra bubble pack, vermiculite, or styrofoam "peanuts". Be sure to pack the trip blank, if one is being submitted with the samples.
- Keep samples refrigerated in cooler with bagged ice or frozen cold packs. Do not use ice for packing material; melting will cause bottle contact and possible breakage.
- Separate and retain the sampler's copy of COC and keep with field notes.
- Tape paperwork (COC, manifest, return address) in zipper bag to inside cooler lid.
- Close cooler and apply signed and dated custody seal in such a way that the seal must be broken to open cooler.
- Securely close cooler lid with packing or duct tape. Be sure to tape latches and drain plugs in closed position.

Shipping

Samples should arrive at the lab as soon as possible following sample collection to ensure holding times are not exceeded. All samples must be hand delivered on the same day as sampling or sent via overnight courier. When using a commercial carrier, follow the steps below.

- Securely package samples and complete paperwork.
- Weigh coolers for air transport.
- Complete air bill for commercial carrier (air bills can be partially completed in office prior to sampling to avoid omissions in field). If necessary, insure packages.
- Keep customer copy of air bill with field notes and COC form.
- When coolers have been released to transporter, call receiving laboratory and give information regarding samplers' names, method of arrival.
- Call the lab on day following shipment to be sure all samples arrived intact. If bottles are broken, locations can be determined from COC and resampled.

B.2.7 *Analytical Laboratory*

The data collected during the course of the RI activities will be used to determine the presence and concentration of VOCs in groundwater samples. These locations were described in preceding sections.

Groundwater collected from the Vertical Profile Boring will be submitted to STL-Inc. of Shelton, CT. STL is an ELAP certified laboratory meeting specifications for documentation, data reduction and reporting. Soil vapor and air samples will be analyzed by Air Toxics of Folsom, California and is also an ELAP certified laboratory meeting specifications for documentation, data reduction and reporting.

B.2.8 *Analytical Test Parameters*

The specific analyses and analytical methodologies employed for investigation of these media are:

Sample Type	**Reporting List/Deliverable**	**Analytical Method**
Vertical Profile Boring		
Groundwater	TCL VOCs, Category B Deliverable	SW 846 Method 8260C
Confirmatory Groundwater Monitoring Wells		
Groundwater	TCL VOCs, Category B Deliverable	SW 846 Method 8260C
Subslab Soil Vapor, Indoor and Outdoor Air	Volatile Organics, Category B Deliverable	USEPA TO-15

B.2.9 *Instrument Calibration*

The frequency of laboratory instrument calibration and associated procedures for the specific analytical methods to be followed by the selected laboratory are specified in the individual ASP analytical method procedures. The selected laboratory's calibration schedule will adhere to all analytical method specifications.

B.2.10 *Data Management and Reporting Plan*

B.2.10.1 *Data Use and Management Objectives*

Data Use Objectives

The typical data use objectives for this RI are:

- Ascertaining if there is a threat to public health or the environment.
- Delineation of horizontal and vertical constituent concentrations, identifying clean areas, estimating the extent and/or volume of impacted groundwater.
- Determining treatment and disposal options.
- Formulating remediation strategies, and estimating remediation costs.

Data Management Objectives

The primary objective of proper data management is to ensure and document that all necessary work is conducted in accordance with the WP and QAPP in an efficient and high quality manner thereby maximizing the confidence in the data in terms of PARCC. Data management procedures not only include field and laboratory documentation, but also include how the information is handled after the conclusion of field investigation and laboratory analyses area completed. Data handling procedures include project file management, reporting, usability analysis (review and validation) and use of consistent formats for the final presentation of the data. DQOs for VOC parameters are presented in Tables B-7 and B-8.

Project File Specifications

All project information will be kept in a central Project File maintained by the ERM Project Manager in ERM's Melville, New York office location. The Project File will be assigned a unique project number that will be clearly displayed on all project file folders (including electronic files). Electronic files will be maintained in a similarly organized Project File located on the ERM Central Network system that is backed up on a weekly basis. Both hard copy and electronic Project Files will contain, at a minimum copies or originals of the following key project information:

- All correspondence including letters, transmittals, telephone logs, memoranda, and emails;
- Meeting notes;
- Technical information such as analytical data; field survey results, field notes, field logbooks and field management forms;
- Project calculations;

- Subcontractor agreements/contracts, and insurance certificates;
- Project-specific health and safety information/records;
- Access agreements;
- Project document output review/approval documentation; and
- Reports: Monthly Progress, Interim Technical and Draft/Final Technical.

B.2.10.2 *Reporting*

Field Data

Field data will be recorded and reported by field personnel using appropriate field data documentation materials such as the field logbook, field management forms and COC forms.

Good field management procedures include following proper chain of custody procedures to track a sample from collection through analysis, noting when and how samples are split (if necessary), making regular and complete entries in the field logbook, and the consistent use and completion of field management forms. Proper completion of these forms and the field logbook are necessary to support the consequent actions that may result from the sample analysis. This documentation will support that the samples were collected and handled properly making the resultant data complete, comparable and defensible.

Laboratory Data

The analytical results of all confirmatory samples collected as part of the RI will be reported following 1995 NYSDEC ASP Rev-00 specifications. All laboratory analytical data will be reported as NYSDEC Category B deliverables. The Category B data deliverables include all backup QA/QC documentation necessary to facilitate a complete validation of the data.

In addition, NYSDEC "Sample Identification and Analytical Requirement Summary" and "Sample Preparation and Analysis Summary" forms (for VOC Analysis) will be completed and included with each data package. The sample tracking forms are specified and supplied by the 2000 NYSDEC ASP.

The laboratory will also transmit the analytical data in an electronic format to minimize the chances of transposition errors in summarizing the data. The data will be transmitted in an electronic data deliverable (EDD) in Equis (most recent version) format and a PDF copy of each ASP deliverable. Analytical data will be submitted to the NYSDEC in accordance with NYSDEC electronic data deliverable standards.

B.2.10.3 *Data Validation*

All field and laboratory data will be reviewed, validated and qualified as necessary to assess data usability by direct comparison to the specified data quality objectives and/or procedures set forth in this QAPP. Information that can be obtained includes comparison of results obtained from samples taken at the same location, and the identification of missing data points. Examination of the data at the end of the process allows for the assessment of data quality with respect to PARCC.

Field Data Validation Protocol

Field data generated in accordance with the project-specific WP will primarily consist of field temperature, pH, ORP and specific conductance data and monitoring well installation and development. This data will be validated by review of the project documentation to check that all forms specified in the Field Sampling Plan and this QAPP have been completely and correctly filled out and that documentation exists for the specified instrument calibrations. This documentation will be considered sufficient to provide that proper procedures have been followed during the field investigation.

Laboratory Data Validation Protocol

Data validation is the assessment of data quality with respect to method specifications and technical performance of the analytical laboratory. Analytical data packages will be examined to ensure that all specified lab components are included, all QA/QC specifications were performed or met, and the data use restrictions are well defined.

Summary documentation regarding QA/QC results will be completed by the laboratory using NYSDEC ASP forms and will be submitted with the raw analytical data packages (NYSDEC ASP Category B deliverables). A Data Usability Summary Report will be prepared in accordance with DER-10 when a Category B deliverable is obtained. Data validation will be performed to assess and document analytical data quality in accordance with the project data quality objectives. The data review will evaluate data for its quality and usability. This process will qualify results so that the end user of the analytical results can make decisions with consideration of the potential accuracy and precision of the data. For example, the results are acceptable as presented, qualified as estimated and qualified with a "J", or rejected and not useable and therefore qualified "R".

Investigative Derived Waste (IDW) samples will not be validated.

The validation of the analytical data will be performed according to the protocols and QC requirements of the analytical methods, the NYSDEC ASP, the USEPA CLP National Functional Guidelines for Low Concentration Organic Data Review (June 2001), the National Functional Guidelines for Organic Data Review (October 1999), the USEPA Region II Data Review Standard Operating Procedure (SOP) HW-13, Revision 2, October 1996: Organic Data Review for Low Concentration Water, EPA SOW OLC02.1, the USEPA Region II Data Review SOP HW-6, Revision 12, March 2001: CLP Organics Data Review and Preliminary Review, and the reviewer's professional judgment.

The order in which the aforementioned guidance documents and/or criteria are listed does not imply a hierarchy of reliance on a particular document for validation. ERM will utilize all guidance documents and/or criteria relying on the most comprehensive reference sources to perform the most complete validation possible.

The data validation process will provide an informed assessment of the laboratory's performance based upon contractual obligations and specific analytical criteria. The report generated as a result of the data validation process will provide a base upon which the usefulness of the data can be evaluated by the end user of the analytical results.

During the review process, it will be determined whether sufficient back-up data and QA/QC results are available so the reviewer may conclusively determine the quality of data support laboratory submittals for sample results. Each data package will be checked for completeness and technical adequacy of the data. Upon completion of the review, the reviewers will develop a QA/QC data validation report for each SDG.

For the organic parameter analyses, the following items or criteria will be reviewed:

- Quantitation, detection limits;
- Holding times;
- Gas Chromatogram/ Mass Spectrometer (GC/MS) tuning and performance;
- Initial and continuing calibration data;
- Procedural method blank data;
- Field and trip blank data;
- Field duplicate results;
- Internal standard areas, and retention times;
- Surrogate compound recoveries;
- MS/MSD duplicate recoveries;
- Data system printouts;
- Chromatograms and mass spectra;
- Qualitative and quantitative compound identification; and

- Case narrative and deliverables compliance.

B.2.10.4 Data Presentation Formats

Project data will be presented in consistent formats for all letters, Monthly Progress Reports (if required), Interim Technical Reports, and Draft/Final Technical Reports. Specific formats will be tailored to best fit the needs of the data being presented but general specifications are described below.

Data Records

The data record will generally include one or more of the following:

- Unique sample or field measurement code;
- Sampling or field measurement location and sample or measurement type;
- Sampling or field measurement raw data;
- Laboratory analysis ID number;
- Property or component measured; and
- Result of analysis (e.g., concentration).

Tabular Displays

The following data will generally be presented in tabular displays:

- Unsorted (raw) data;
- Results for constituent monitored;
- Data reduction for statistical analysis;
- Sorting of data by potential stratification factors (e.g., location, depth, topography, etc.); and
- Summary data.

Graphical Displays

The following data will be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

- Sample locations and sampling grid;
- Boundaries of sampling area;

- Constituent concentrations at each sample location;
- Geographical extent of impacts;
- Constituent concentration levels, averages, minima and maxima;
- Changes in concentration in relation to distance from the source, time, depth or other parameters;
- Features affecting intramedia transport; and
- Potential receptors.

B.3 PERFORMANCE AUDITS

B.3.1 Field Audits

During field activities, the QAO will accompany sampling personnel into the field to verify that the sampling program is being properly implemented and to detect and define problems so that corrective action can be taken. All findings will be documented and provided to the ERM Project Manager and FTL.

B.3.2 Laboratory Audits

The NYSDOH ELAP CLP certified laboratory that has satisfactorily completed performance audits and performance evaluation samples will be used for all sample analysis. The results of the most recent performance audits and performance evaluations will be made available upon request.

B.3.3 Corrective Actions

The NYSDOH ELAP CLP certified laboratory utilized for this project will meet the specifications for corrective action protocols typical for performing contract laboratory services. Laboratory corrective action may include instrumentation maintenance, methods modification, cross contamination/carry over issues, sample tracking practices, laboratory information management (LIMs), etc.

Prior to mobilization for the field investigation, a meeting may be scheduled among representatives of ERM and the laboratory to discuss general corrective action approach and establish procedures to ensure good and timely communications among all parties during the investigation. New procedures will be put into effect as appropriate.

TABLES

TABLE B-1

SUMMARY OF SAMPLING PROGRAM

Location	*Matrix*	*Locations to be Sampled*	*Frequency*	*Analysis*
VPB Screening Samples	Aqueous	ERM-VPB-13 ERM-VPB-14	Once	Volatile Organic Compounds (VOCs) by SW-846 Method 8260C
Monitoring Wells	Aqueous	ERM-MW-01 ERM-MW-02D ERM-MW-05 ERM-MW-09 ERM-MW-11S ERM-MW-11M ERM-MW-11D ERM-MW-12S ERM-MW-12M ERM-MW-13 ERM-MW-14	Annually	Volatile Organic Compounds (VOCs) by SW-846 Method 8260C
10 Melville Park Road	Air	10MPR-SS-01 10MPR-SS-02 10MPR-IA-01 10MPR-OA-01	Annually	Volatile Organic Compounds (VOCs) by Method TO-15

TABLE B-2

SAMPLE TOTAL SUMMARY

Analytical Parameters	***Matrix***	***Number of Samples***	***Blind Field Duplicates*** [1]	***MS/MSD Pairs*** [2]	***Field Blanks*** [3]	***Trip Blanks*** [4]
Volatile Organic Compounds (VOCs)	Air[5]	4	0	0	0	0
	Aqueous[5]	11	1	1	1	1

Notes:

1. Duplicates are generally collected at a minimum frequency of five percent (1 per 20 field samples). More frequent collection may be warranted based on field conditions/observations and/or at the discretion of the Field Team Leader.
2. MS/MSD Pairs (two samples) will be collected at a minimum frequency of five percent (1 per 20 field samples). More frequent collection may be warranted based on field conditions/observations and/or at the discretion of the Field Team Leader.
3. Field Blanks will be collected at a minimum frequency of one per day. More frequent collection may be warranted based on field conditions/observations and/or at the discretion of the Field Team Leader.
4. Trip Blanks will be collected at the rate of one per sample shipment when VOCs are collected.
5. Number of samples is shown for each annual sampling event.

TABLE B-3
DETAILED SUMMARY OF AQUEOUS SAMPLING PROGRAM

SAMPLE TOTALS, ANALYTICAL METHODS, PRESERVATIVES, HOLDING TIMES AND CONTAINERS

Analytical Parameters	*Number of Samples* [1]	*Analytical Method Reference*	*Sample Preservation*	*Holding Time* [2]	*Container* [3]
VOCs	11+5 (1+1+1+1+1)	SW-846 Method 8260C	Cool 4°C, pH<2 (HCl)	10 days	3 – 40 ml glass Teflon-lined cap

Notes:

1. Total analytical samples + QA/QC samples (Blind Field Duplicate (5%), Field Blank one per day, Matrix Spike (5%), Matrix Spike Duplicate (5%), Trip Blank one per VOC shipment cooler). Total number of samples is for each sampling event.
2. Holding times are in accordance with Exhibit I of the June 2005 ASP. VOC holding times are days from the VTSR until analysis.
3. As specified by Accutest Laboratories, Dayton, New Jersey.

TABLE B-4
DETAILED SUMMARY OF AIR SAMPLING PROGRAM

SAMPLE TOTALS, ANALYTICAL METHODS, PRESERVATIVES, HOLDING TIMES AND CONTAINERS

Analytical Parameters	*Number of Samples*	*Analytical Method Reference*	*Sample Preservation*	*Holding Time* [1]	*Container* [1]
VOCs	4	TO-15	None	30 days	6 Liter Summa Canister

Notes:

1. As specified by Accutest Laboratories, Dayton, New Jersey.

TABLE B-5
VOLATILE ORGANIC COMPOUNDS (VOCs) COMPOUND LIST, REPORTING LEVELS, AND METHOD DETECTION LIMITS - AQUEOUS

Compound List	*CAS Number* [1]	*Reporting Levels Water (μg/L)*	*Method Detection Limit (μg/L)* [2, 3]
Acetone	67-64-1	10	3.3
Benzene	71-43-2	0.5	0.24
Bromochloromethane	74-97-5	1	0.37
Bromodichloromethane	75-27-4	1	0.23
Bromoform	75-25-2	1	0.23
Bromomethane	74-83-9	2	0.42
2-Butanone (MEK)	78-93-3	10	5.6
Carbon disulfide	75-15-0	2	0.25
Carbon tetrachloride	56-23-5	1	0.22
Chlorobenzene	108-90-7	1	0.19
Chloroethane	75-00-3	1	0.34
Chloroform	67-66-3	1	0.19
Chloromethane	74-87-3	1	0.41
Cyclohexane	110-82-7	5	0.28
1,2-Dibromo-3-chloropropane	96-12-8	2	0.99
Dibromochloromethane	124-48-1	1	0.15
1,2-Dibromoethane	106-93-4	1	0.23
1,2-Dichlorobenzene	95-50-1	1	0.19
1,3-Dichlorobenzene	541-73-1	1	0.23
1,4-Dichlorobenzene	106-46-7	1	0.27
Dichlorodifluoromethane	75-71-8	2	0.9
1,1-Dichloroethane	75-34-3	1	0.17
1,2-Dichloroethane	107-06-2	1	0.18
1,1-Dichloroethene	75-35-4	1	0.51
cis-1,2-Dichloroethene	156-59-2	1	0.27
trans-1,2-Dichloroethene	156-60-5	1	0.65
1,2-Dichloropropane	78-87-5	1	0.39
cis-1,3-Dichloropropene	10061-01-5	1	0.21
trans-1,3-Dichloropropene	10061-02-6	1	0.19
Ethylbenzene	100-41-4	1	0.27
Freon 113	76-13-1	5	0.52
2-Hexanone	591-78-6	5	1.7
Isopropylbenzene	98-82-8	1	0.23
Methyl Acetate	79-20-9	5	1.9
Methylcyclohexane	108-87-2	5	0.22
Methyl Tert Butyl Ether	1634-04-4	1	0.24
4-Methyl-2-pentanone(MIBK)	108-10-1	5	1
Methylene chloride	75-09-2	2	0.73
Styrene	100-42-5	1	0.27
1,1,2,2-Tetrachloroethane	79-34-5	1	0.21
Tetrachloroethene	127-18-4	1	0.4
Toluene	108-88-3	1	0.16

TABLE B-5(continued)
VOLATILE ORGANIC COMPOUNDS (VOCs) COMPOUND LIST, REPORTING LEVELS, AND METHOD DETECTION LIMITS - AQUEOUS

Compound List	*CAS Number* [1]	*Reporting Levels Water (µg/L)*	*Method Detection Limit (µg/L)* [2, 3]
1,2,3-Trichlorobenzene	87-61-6	1	0.23
1,2,4-Trichlorobenzene	120-82-1	1	0.21
1,1,1-Trichloroethane	71-55-6	1	0.25
1,1,2-Trichloroethane	79-00-5	1	0.21
Trichloroethene	79-01-6	1	0.22
Trichlorofluoromethane	75-69-4	2	0.43
Vinyl chloride	75-01-4	1	0.15
m,p-Xylene		1	0.38
o-Xylene	95-47-6	1	0.17
Xylene (total)	1330-20-7	1	0.17

Notes:

1. Chemical Abstracts Service (CAS) Registry Number.
2. MDLs as per Accutest Laboratories, Dayton, New Jersey (08/2015).
3. Subject to change throughout the course of the project if the laboratory is required to update the MDLs. New MDLs must be approved by NYSDEC before being implemented.

TABLE B-6
VOLATILE ORGANIC COMPOUNDS (VOCs) COMPOUND LIST, REPORTING LEVELS, AND METHOD DETECTION LIMITS - AIR

Compound List	*CAS Number*[1]	*Reporting Levels Soil Vapor (ppbv)*	*Method Detection Limit Soil Vapor (ppbv)*[2, 3]	*Reporting Levels Indoor/Ambient Air (ppbv)*	*Method Detection Limit Indoor/Ambient Air (ppbv)*[2, 3]
Acetone	67-64-1	1	0.16	0.2	0.032
1,3-Butadiene	106-99-0	1	0.16	0.2	0.031
Benzene	71-43-2	1	0.15	0.2	0.03
Bromodichloromethane	75-27-4	1	0.16	0.2	0.032
Bromoform	75-25-2	1	0.1	0.2	0.02
Bromomethane	74-83-9	1	0.11	0.2	0.022
Bromoethene	593-60-2	1	0.1	0.2	0.02
Benzyl Chloride	100-44-7	1	0.13	0.2	0.026
Carbon disulfide	75-15-0	1	0.14	0.2	0.029
Chlorobenzene	108-90-7	1	0.16	0.2	0.032
Chloroethane	75-00-3	1	0.11	0.2	0.022
Chloroform	67-66-3	1	0.16	0.2	0.031
Chloromethane	74-87-3	1	0.14	0.2	0.029
3-Chloropropene	107-05-1	1	0.14	0.2	0.028
2-Chlorotoluene	95-49-8	1	0.16	0.2	0.033
Carbon tetrachloride	56-23-5	1	0.12	0.2	0.025
Cyclohexane	110-82-7	1	0.16	0.2	0.032
1,1-Dichloroethane	75-34-3	1	0.15	0.2	0.031
1,1-Dichloroethylene	75-35-4	1	0.14	0.2	0.028
1,2-Dibromoethane	106-93-4	1	0.18	0.2	0.035
1,2-Dichloroethane	107-06-2	1	0.13	0.2	0.026
1,2-Dichloropropane	78-87-5	1	0.25	0.2	0.05
1,4-Dioxane	123-91-1	1	0.32	0.2	0.063
Dichlorodifluoromethane	75-71-8	1	0.18	0.2	0.037
Dibromochloromethane	124-48-1	1	0.21	0.2	0.041
trans-1,2-Dichloroethylene	156-60-5	1	0.1	0.2	0.02
cis-1,2-Dichloroethylene	156-59-2	1	0.12	0.2	0.025
cis-1,3-Dichloropropene	10061-01-5	1	0.18	0.2	0.035
m-Dichlorobenzene	541-73-1	1	0.14	0.2	0.028
o-Dichlorobenzene	95-50-1	1	0.15	0.2	0.03
p-Dichlorobenzene	106-46-7	1	0.096	0.2	0.019
trans-1,3-Dichloropropene	10061-02-6	1	0.1	0.2	0.02
Ethanol	64-17-5	2.5	0.83	0.5	0.17
Ethylbenzene	100-41-4	1	0.24	0.2	0.048
Ethyl Acetate	141-78-6	1	0.32	0.2	0.064
4-Ethyltoluene	622-96-8	1	0.11	0.2	0.022
Freon 113	76-13-1	1	0.14	0.2	0.027

TABLE B-6(continued)
VOLATILE ORGANIC COMPOUNDS (VOCs) COMPOUND LIST, REPORTING LEVELS, AND METHOD DETECTION LIMITS - AIR

Compound List	*CAS Number*[1]	*Reporting Levels Soil Vapor (ppbv)*	*Method Detection Limit Soil Vapor (ppbv)*[2, 3]	*Reporting Levels Indoor/Ambient Air (ppbv)*	*Method Detection Limit Indoor/Ambient Air (ppbv)*[2, 3]
Freon 114	76-14-2	1	0.13	0.2	0.025
Heptane	142-82-5	1	0.15	0.2	0.029
Hexachlorobutadiene	87-68-3	1	0.16	0.2	0.033
Hexane	110-54-3	1	0.14	0.2	0.028
2-Hexanone	591-78-6	1	0.22	0.2	0.044
Isopropyl Alcohol	67-63-0	1	0.6	0.2	0.12
Methylene chloride	75-09-2	1	0.67	0.2	0.13
Methyl ethyl ketone	78-93-3	1	0.24	0.2	0.049
Methyl Isobutyl Ketone	108-10-1	1	0.14	0.2	0.027
Methyl Tert Butyl Ether	1634-04-4	1	0.13	0.2	0.026
Methylmethacrylate	80-62-6	1	0.15	0.2	0.03
Propylene	115-07-1	2.5	0.4	0.5	0.081
Styrene	100-42-5	1	0.13	0.2	0.026
1,1,1-Trichloroethane	71-55-6	1	0.16	0.2	0.032
1,1,2,2-Tetrachloroethane	79-34-5	1	0.15	0.2	0.03
1,1,2-Trichloroethane	79-00-5	1	0.18	0.2	0.036
1,2,4-Trichlorobenzene	120-82-1	1	0.22	0.2	0.044
1,2,4-Trimethylbenzene	95-63-6	1	0.12	0.2	0.023
1,3,5-Trimethylbenzene	108-67-8	1	0.15	0.2	0.03
2,2,4-Trimethylpentane	540-84-1	1	0.11	0.2	0.021
Tertiary Butyl Alcohol	75-65-0	1	0.25	0.2	0.05
Tetrachloroethylene	127-18-4	0.2	0.12	0.04	0.024
Tetrahydrofuran	109-99-9	1	0.22	0.2	0.043
Toluene	108-88-3	1	0.1	0.2	0.02
Trichloroethylene	79-01-6	0.2	0.13	0.04	0.025
Trichlorofluoromethane	75-69-4	1	0.1	0.2	0.02
Vinyl chloride	75-01-4	1	0.16	0.2	0.032
Vinyl Acetate	108-05-4	1	0.28	0.2	0.055
m,p-Xylene		1	0.22	0.2	0.043
o-Xylene	95-47-6	1	0.13	0.2	0.026
Xylenes (total)	1330-20-7	1	0.13	0.2	0.026

Notes:

4. Chemical Abstracts Service (CAS) Registry Number.
5. MDLs as per Accutest Laboratories, Dayton, New Jersey (08/2015).
6. Subject to change throughout the course of the project if the laboratory is required to update the MDLs. New MDLs must be approved by NYSDEC before being implemented.

TABLE B-7
ANALYTICAL LABORATORY DATA QUALITY OBJECTIVES (DQOs) FOR PRECISION AND ACCURACY – AQUEOUS

QC Compounds	*Surrogate Accuracy (% Rec.)* [1]	*Blind Field Duplicate Precision (RPD)*	*Method Blanks*	*MS/MSD Accuracy (% Rec.)* [1]	*MS/MSD Precision (% RPD)* [1]	*Blank Spike Accuracy (% Rec.)* [1]
All Compounds		< 50	≤ 5 x RL for methylene chloride, acetone, 2-butanone, ≤ RL for other compounds			
Acetone				33-158	19	47-144
Benzene				43-138	12	81-119
Bromochloromethane				75-127	12	84-120
Bromodichloromethane				72-128	13	81-125
Bromoform				70-131	12	74-128
Bromomethane				47-142	16	52-146
2-Butanone (MEK)				56-146	12	68-130
Carbon disulfide				38-136	17	71-129
Carbon tetrachloride				45-149	17	77-140
Chlorobenzene				70-124	12	84-116
Chloroethane				47-139	15	70-148
Chloroform				66-126	13	81-120
Chloromethane				41-140	15	50-143
Cyclohexane				30-148	17	77-125
1,2-Dibromo-3-chloropropane				64-136	14	66-132
Dibromochloromethane				75-126	12	81-122
1,2-Dibromoethane				77-124	11	81-120
1,2-Dichlorobenzene				71-124	12	80-117
1,3-Dichlorobenzene				69-125	12	81-116
1,4-Dichlorobenzene				69-122	12	80-115
Dichlorodifluoromethane				24-161	20	36-169
1,1-Dichloroethane				60-129	13	80-125
1,2-Dichloroethane				72-133	12	78-131
1,1-Dichloroethene				40-137	17	73-127
cis-1,2-Dichloroethene				57-128	13	77-118
trans-1,2-Dichloroethene				53-128	15	75-118
1,2-Dichloropropane				69-127	12	80-124
cis-1,3-Dichloropropene				67-129	14	72-121
trans-1,3-Dichloropropene				68-130	14	73-122
Ethylbenzene				38-139	12	80-118
Freon 113				34-154	18	76-140
2-Hexanone				55-148	15	66-128
Isopropylbenzene				54-137	15	78-125
Methyl Acetate				60-137	13	63-120

TABLE B-7 (continued)
ANALYTICAL LABORATORY DATA QUALITY OBJECTIVES (DQOs) FOR PRECISION AND ACCURACY - AQUEOUS

QC Compounds	*Surrogate Accuracy (% Rec.)* [1]	*Blind Field Duplicate Precision (RPD)*	*Method Blanks*	*MS/MSD Accuracy (% Rec.)* [1]	*MS/MSD Precision (% RPD)* [1]	*Blank Spike Accuracy (% Rec.)* [1]
Methylcyclohexane				30-152	17	69-132
Methyl Tert Butyl Ether				64-132	13	73-122
4-Methyl-2-pentanone(MIBK)				68-139	12	73-129
Methylene chloride				63-128	13	75-122
Styrene				61-134	13	81-121
1,1,2,2-Tetrachloroethane				67-126	13	69-116
Tetrachloroethene				43-145	15	69-138
Toluene				51-136	13	80-122
1,2,3-Trichlorobenzene				66-140	14	74-137
1,2,4-Trichlorobenzene				65-138	15	75-135
1,1,1-Trichloroethane				51-141	16	80-131
1,1,2-Trichloroethane				71-127	12	78-122
Trichloroethene				55-136	14	83-122
Trichlorofluoromethane				33-157	21	66-143
Vinyl chloride				34-147	17	57-138
m,p-Xylene				42-139	13	82-119
o-Xylene				56-134	13	82-119
Xylene (total)				46-137	12	82-119
Dibromofluoromethane	76-120					
1,2-Dichloroethane-D4	73-122					
Toluene-D8	84-119					
4-Bromofluorobenzene	78-117					

Notes:

In-house QC limits established by Accutest Labs, Dayton, New Jersey for USEPA Method SW-846 8260C. Subject to change.

QC = Quality Control; % Rec. = Percent Recovery; RPD = Relative Percent Difference; MS = Matrix Spike; MSD = Matrix Spike Duplicate; RL = Reporting Limit.

TABLE B-8
ANALYTICAL LABORATORY DATA QUALITY OBJECTIVES (DQOs) FOR PRECISION AND ACCURACY – AIR

QC Compounds	*Surrogate Accuracy (% Rec.)*[1]	*Blind Field Duplicate Precision (RPD)*	*Method Blanks*	*MS/MSD Accuracy (% Rec.)*[1]	*MS/MSD Precision (% RPD)*[1]	*Blank Spike Accuracy (% Rec.)*[1]
All Compounds		< 50	≤ 5 x RL for methylene chloride, acetone, 2-butanone, ≤ RL for other compounds			
Acetone				60-140	70-130	27
1,3-Butadiene				60-140	70-130	20
Benzene				60-140	70-130	17
Bromodichloromethane				60-140	70-130	20
Bromoform				60-140	70-130	20
Bromomethane				60-140	70-130	20
Bromoethene				70-114	70-130	30
Benzyl Chloride				60-140	70-130	20
Carbon disulfide				60-140	70-130	11
Chlorobenzene				60-140	70-130	20
Chloroethane				60-140	70-130	20
Chloroform				10-140	70-130	12
Chloromethane				60-140	70-130	22
3-Chloropropene				70-130	70-130	10
2-Chlorotoluene				74-119	70-130	20
Carbon tetrachloride				60-140	70-130	10
Cyclohexane				60-140	70-130	12
1,1-Dichloroethane				60-140	70-130	20
1,1-Dichloroethylene				60-140	70-130	20
1,2-Dibromoethane				60-140	70-130	20
1,2-Dichloroethane				60-140	70-130	20
1,2-Dichloropropane				60-140	70-130	20
1,4-Dioxane				60-140	70-130	20
Dichlorodifluoromethane				60-140	70-130	22
Dibromochloromethane				60-140	70-130	20
trans-1,2-Dichloroethylene				60-140	70-130	10
cis-1,2-Dichloroethylene				60-140	70-130	10
cis-1,3-Dichloropropene				60-140	70-130	20
m-Dichlorobenzene				60-140	70-130	20
o-Dichlorobenzene				60-140	70-130	10
p-Dichlorobenzene				60-140	70-130	20
trans-1,3-Dichloropropene				60-140	70-130	20
Ethanol				60-140	70-130	33
Ethylbenzene				60-140	70-130	15
Ethyl Acetate				60-140	70-130	20
4-Ethyltoluene				60-140	70-130	13

TABLE B-8 (continued)
ANALYTICAL LABORATORY DATA QUALITY OBJECTIVES (DQOs) FOR PRECISION AND ACCURACY - AIR

QC Compounds	*Surrogate Accuracy (% Rec.) [1]*	*Blind Field Duplicate Precision (RPD)*	*Method Blanks*	*MS/MSD Accuracy (% Rec.) [1]*	*MS/MSD Precision (% RPD) [1]*	*Blank Spike Accuracy (% Rec.) [1]*
Freon 113				60-140	70-130	10
Freon 114				60-140	70-130	20
Heptane				60-140	70-130	20
Hexachlorobutadiene				60-140	70-130	20
Hexane				60-140	70-130	17
2-Hexanone				60-140	70-130	20
Isopropyl Alcohol				60-140	70-130	26
Methylene chloride				60-140	70-130	26
Methyl ethyl ketone				60-140	70-130	21
Methyl Isobutyl Ketone				60-140	70-130	20
Methyl Tert Butyl Ether				60-140	70-130	20
Methylmethacrylate				70-130	70-130	20
Propylene				60-140	70-130	16
Styrene				60-140	70-130	11
1,1,1-Trichloroethane				60-140	70-130	20
1,1,2,2-Tetrachloroethane				60-140	70-130	20
1,1,2-Trichloroethane				60-140	70-130	20
1,2,4-Trichlorobenzene				60-140	70-130	20
1,2,4-Trimethylbenzene				60-140	70-130	19
1,3,5-Trimethylbenzene				60-140	70-130	13
2,2,4-Trimethylpentane				69-119	70-130	18
Tertiary Butyl Alcohol				60-140	70-130	21
Tetrachloroethylene				60-140	70-130	17
Tetrahydrofuran				60-140	70-130	20
Toluene				60-140	70-130	20
Trichloroethylene				60-140	70-130	13
Trichlorofluoromethane				60-140	70-130	21
Vinyl chloride				60-140	70-130	20
Vinyl Acetate				60-140	70-130	20
m,p-Xylene				60-140	70-130	26
o-Xylene				60-140	70-130	20
Xylenes (total)				60-140	70-130	26
4-Bromofluorobenzene	65-128					

Notes:

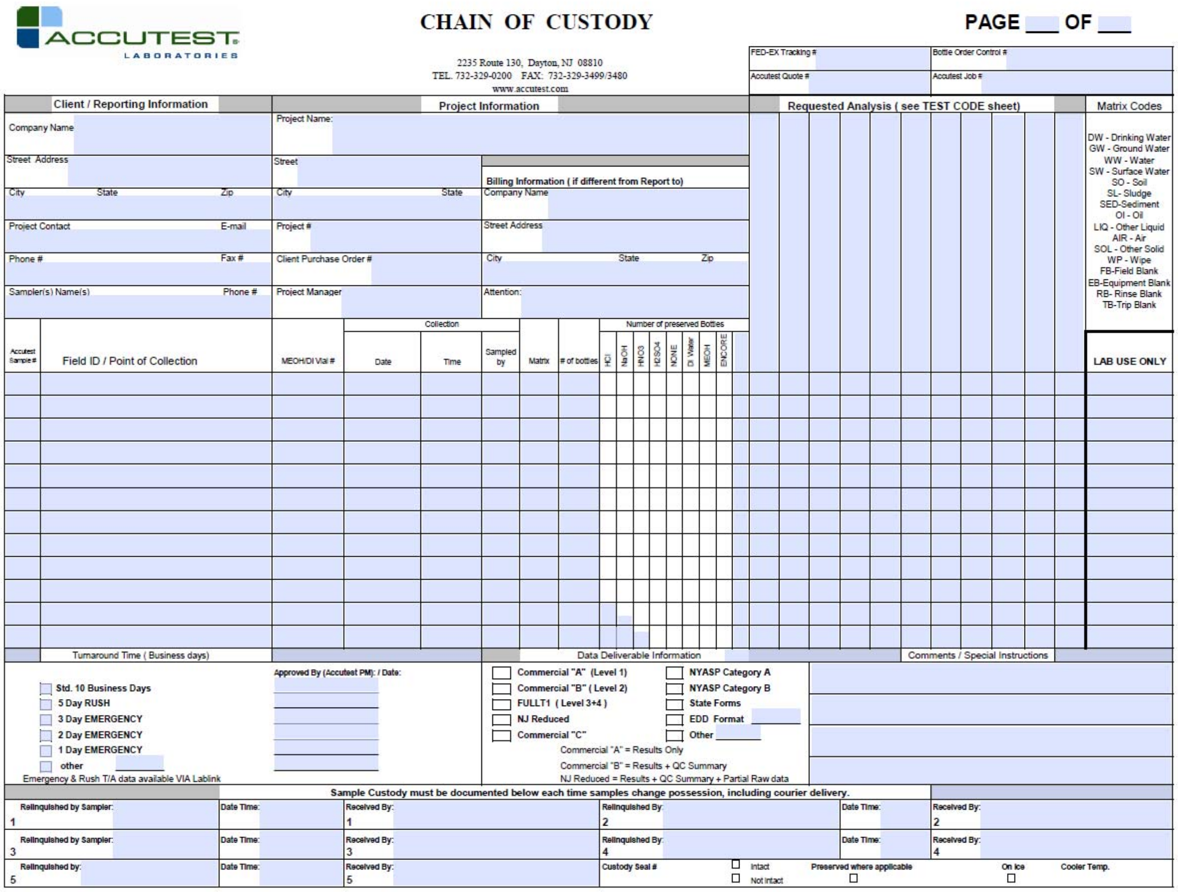
1. In-house QC limits established by Accutest Labs, Dayton, New Jersey for USEPA Method TO-15. Subject to change.

QC = Quality Control; % Rec. = Percent Recovery; RPD = Relative Percent Difference; MS = Matrix Spike; MSD = Matrix Spike Duplicate; RL = Reporting Limit.

FIGURES

FIGURE B-1

EXAMPLE CHAIN-OF-CUSTODY



ACCUTEST
LABORATORIES

CHAIN OF CUSTODY

PAGE ___ OF ___

2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.accutest.com

FED-EX Tracking #	Bottle Order Control #
Accutest Quote #	Accutest Job #

Client / Reporting Information

Company Name
Street Address
City State Zip
Project Contact E-mail
Phone # Fax #
Sampler(s) Name(s) Phone #

Project Information

Project Name:
Street
City State
Project #
Client Purchase Order #
Project Manager

Billing Information (if different from Report to)

Company Name
Street Address
City State Zip
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
SED-Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB-Field Blank
EB-Equipment Blank
RB- Rinse Blank
TB-Trip Blank

			Collection					Number of preserved Bottles																				
Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE													LAB USE ONLY

Turnaround Time (Business days)

☐ **Std. 10 Business Days**
☐ **5 Day RUSH**
☐ **3 Day EMERGENCY**
☐ **2 Day EMERGENCY**
☐ **1 Day EMERGENCY**
☐ **other**

Emergency & Rush T/A data available VIA Lablink

Approved By (Accutest PM): / Date:

Data Deliverable Information

☐ **Commercial "A" (Level 1)**
☐ **Commercial "B" (Level 2)**
☐ **FULLT1 (Level 3+4)**
☐ **NJ Reduced**
☐ **Commercial "C"**
☐ **NYASP Category A**
☐ **NYASP Category B**
☐ **State Forms**
☐ **EDD Format** ______
☐ **Other** ______

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler: 1	**Date Time:**	**Received By:** 1	**Relinquished By:** 2	**Date Time:**	**Received By:** 2
Relinquished by Sampler: 3	**Date Time:**	**Received By:** 3	**Relinquished By:** 4	**Date Time:**	**Received By:** 4
Relinquished by: 5	**Date Time:**	**Received By:** 5	**Custody Seal #**	☐ Intact ☐ Not intact	**Preserved where applicable** ☐ **On Ice** ☐ **Cooler Temp.**

FIGURE B-2

EXAMPLE CUSTODY SEAL

ERM®

CHAIN OF CUSTODY SEAL