

ENVIRONMENTAL STRATEGIES
CONSULTING LLC

**SANITARY SEWER LINE INVESTIGATION
WORK PLAN**

**EMERSON POWER TRANSMISSION FACILITY
ITHACA, NEW YORK
SITE NO. 7-55-010**

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Acronym List

bgs	below ground surface
EPT	Emerson Power Transmission
EPA	U.S. Environmental Protection Agency
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PID	Photoionization Detector
ROD	Record of Decision
STL	Severn Trent Laboratories, Inc.
VOCs	volatile organic compounds
QA/QC	quality assurance/quality control

1.0 Introduction

On behalf of Emerson Electric Co., Environmental Strategies Consulting LLC is submitting this work plan for conducting a focused investigation of the sanitary sewer lines that extend from the Emerson Power Transmission (EPT) site to the north along Turner Place in Ithaca, New York. Engineering drawings provided by the Town of Ithaca, indicate that two sanitary sewer lines (one identified as 1878 Line and a second identified as 1979 Line) extend north from the EPT site down Turner Place to the intersection of Pleasant Street. Based on the results of the Onsite Assessment completed by Emerson in December 2005, and the uncertainty related to historical discharges to the municipal sewers, the sanitary sewer lines located on Turner Place are considered potential areas of concern. The objective of the focused investigation is to determine if historic releases of site related compounds have occurred from the sewer lines.

The proposed scope of work involves drilling and sampling 24 soil borings along the west side of the two sanitary sewer lines that run along Turner Place to the intersection of Pleasant Street. The soil borings will be spaced at 100 foot centers beginning at the north limit of the EPT property to the intersection of Pleasant Street. The proposed work is consistent with requirements outlined in the Consent Order, dated July 13, 1987, entered into by the New York State Department of Environmental Conservation (NYSDEC) and Emerson.

Section 2 of the work plan presents background information on the site. The scope of the proposed soil sampling activities is presented in Section 3. This is followed by a discussion of the project mobilization and demobilization plans in Section 4 and the project schedule and report preparation details in Section 5.

2.0 Site Background

2.1 Facility Description

The EPT facility is located at 620 South Aurora Street in Ithaca, New York (Figure 1). The site consists of three main buildings along the northeast and southwest portion of South Hill, one of many relatively steep hills that overlook the city of Ithaca (Figure 1). The majority of the floor space is in the main plant building, which stretches more than 1,600 feet along the eastern edge of the 110-acre site. The main building is flanked by a number of smaller buildings to the west and a series of access roads and parking lots that terrace the hillside above the plant. Further uphill and to the east are South Aurora Street and the campus of Ithaca College. Undeveloped woodland borders the site to the southwest along the steep embankments of the hill. West Spencer Street, which runs parallel to the EPT property, marks the western edge of the wooded section and the base of South Hill. Beyond Spencer Street to the west and in areas along the steep northern approach to South Hill and the EPT property are residential areas. These neighborhoods are bordered by Six Mile Creek, which flows north along the base of South Hill and eventually empties into Cayuga Lake approximately 2 miles northwest of the site.

Sanitary wastewater, process wastewater, non-contact cooling water, boiler blowdown, and miscellaneous wastewater streams are discharged to the municipal sewer which extends along Turner Place to the north of the EPT facility. According to historic files reviewed as part of the Onsite Assessment work, solvent may have been historically discharged to the municipal sewers lines located on Turner Place.

2.3 Site Geology

The site is located on the northern edge of the Appalachian Plateau Physiographic Province, which is characterized in central New York by deeply dissected hilly uplands and glacially gouged stream valleys. The EPT facility occupies the edge of one of the dissected hills and overlooks the Cayuga Lake basin, which is formed in a former stream valley eroded and enlarged by the advance of glaciers. Underlying the site is a thin, discontinuous veneer of glacially till and man-made fill. The soil, also known as the A-zone, is typically a silty or clayey gravel and ranges in depth from 2.5 to 33 feet thick, though most of the EPT facility property and the western slope of South Hill is covered by less than 15 feet of soil. Soil depths generally

increase with decreasing elevation and eventually merge with glacio-lacustrine silt and clay that lines the bottom of the valley floor below South Hill.

Beneath the overburden lies bedrock of the Ithaca Siltstone, which is a member of the Genesee Formation. The bedrock is typically well-cemented with generally non-fossiliferous beds ranging in thickness from 0.1 inch to 2.5 feet in thickness. Previous interpretations of the site bedrock, based on core logs recovered from borehole drilled for investigation activities, differentiated the rock into three zones based on the frequency of bedding plane fractures: an upper “stress relief zone” (B-zone), a middle “transitional zone” (C-zone), and a lower “lithologically controlled zone” (D-zone). The uppermost B-zone is weathered bedrock and very highly to highly fractured. The B-zone extends to a maximum depth of approximately 22 feet below ground surface (bgs) and has an average thickness of approximately 8 to 10 feet on the west portion of the site where the current remediation system is located (Figure 2).

The transitional zone (C-zone) extends from the base of the B-zone to a maximum depth of approximately 55 feet bgs beneath the site. The lower lithologically controlled zone (D-zone) extends from the bottom of the C-zone to a minimum depth of 145 feet bgs. In this lower zone, fractures are reportedly confined to intervals that are widely spaced, and their occurrence is controlled by lithology. This terminology was developed by Radian Corporation, the previous consultants at the site, and carried forward by Environmental Strategies.

The bedrock in the Ithaca area is cut by at least three sets of nearly vertical fractures or joints. Limited geologic mapping performed by Radian at 16 outcrop locations on and around the EPT facility found three consistent joint orientations: N13W to N21W (north-northwest); N70E to N89E (east-northeast); and N45E to N55E (northeast). Two of the three strike orientations measured by Radian are in reasonably close agreement with regional joint set measurements of N19W and N7E made at outcrops of the Genesee Group in Tompkins County. All of the joints measured by Radian were within 8 degrees of vertical.

2.3 Site Hydrogeology

Groundwater is present within the overburden and bedrock at the EPT site. Overburden water appears to be restricted to limited areas of the site where the discontinuous cover of soil is thickest. Based on short duration pumping events and slug test performed by Radian, the overburden groundwater in the area surrounding the treatment system is in hydraulic

communication with the underlying bedrock of the B-zone. The extent of the communication has not been quantified; however, in the area around the treatment system, the two units appear to act as a single hydraulic entity. Groundwater is also present in the deeper bedrock wells. Limited pumping and slug tests performed by Radian and Environmental Strategies suggest that the deeper wells in the treatment system area are hydraulically isolated from the overlying B-zone.

Groundwater elevation data collected in December 2005 from B-zone wells show a northwesterly flow direction. Groundwater flow in the deeper bedrock intervals likely follows the same flow direction towards the Cayuga Lake basin. However, given the vagaries of groundwater in bedrock wells, which is often dictated by the particular fracture or fractures intercepted by the borehole, flow may vary locally.

3.0 Proposed Scope of Work

This section describes the scope of the proposed investigation to evaluate the soil quality along the sanitary sewer lines on Turner Place north of the EPT site. The investigation activities will be conducted in accordance with the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation, dated December 25, 2002, and Environmental Strategies' Standard Operating Procedures (SOPs), which are included as Appendix A. Additionally, all manufacturer specifications will be adhered to for operation and maintenance of field sampling and monitoring equipment.

3.1 **Soil Borings**

Based on engineering drawings provided by the Town of Ithaca, two parallel sewer lines extend from the EPT site to the north on Turner Place a distance of approximately 700 feet where they join at a manhole near the intersection of Columbia Street. Both lines are currently active. As a first step, the location of the two sanitary sewer lines will be identified and marked by the Ithaca Water and Sewer Department.

Once located and marked, Environmental Strategies will install a total of 24 soil borings along the west limits of the two sanitary sewer lines located on Turner Place. The soil borings will be spaced approximately 100 feet apart. Each soil boring location will be marked with paint using unique sample identification. Soil samples will be collected from each boring at a depth approximately 6 feet bgs, which is anticipated to be just below the base of the sewer line within the backfill materials. Invert piping elevations will be obtained from the Ithaca Water and Sewer Department to aid in determining the appropriate depths for sample collection. Figure 1 show the proposed soil boring locations. If necessary, based on the results of the initial sampling, additional borings may be installed to further define the extent of impacts in areas where releases are identified. Any additional investigation along the sewer lines will be conducted in accordance with the methods outlined in this work plan.

The soil borings will be installed using a Geoprobe® or similar equipment. Soil samples will be collected continuously from the ground surface to a depth of approximately 6.0 feet bgs (assuming the base of the pipe is between 4-5 feet bgs). On retrieval, the soil will be logged and classified according to the Unified Soil Classification System. Following lithologic

characterization of the soil, samples will be screened in the field for volatile organic compounds (VOCs) using a photoionization detector (PID). The samples corresponding to the fill material at the base of the sewer line will be collected for laboratory analysis.

The soil samples will be shipped to Severn Trent Laboratories, Inc (STL), which is certified by the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program, and analyzed for site-related VOCs by U.S. Environmental Protection Agency Method 8260. In accordance with the *Operation, Maintenance, and Monitoring Manual* for the site, dated April 1997, and addendum pages, dated July 11, 1997, the soil samples will be analyzed for the following compounds: 1,2-dichloroethane, cis-1,2-dichloroethene, trans-1,2-dichloroethene, methylene chloride, tetrachloroethene, 1,1,1-trichloroethane, trichloroethene, and vinyl chloride.

Following sampling activities, boreholes will be backfilled with bentonite pellets or coarse bentonite chips, and the bentonite material hydrated with tap water. All down-hole sampling equipment will be decontaminated after each use.

3.2 Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) samples, including equipment blanks, trip blanks, and duplicates, will be collected in accordance with SOPs. All samples will be sealed, labeled, and placed in a cooler with ice for shipment to STL. Appropriate chain-of-custody procedures will be followed.

3.3 Sample Location Survey

The soil sample locations, the sewer lines, and all manholes located on Turner Place north of the EPT facility will be surveyed by a surveyor licensed in the state of New York. Each sample location will be marked by Environmental Strategies with paint so that the sample locations can be accurately identified by the surveyor. Horizontal measurements will be accurate to the nearest 0.1 foot and vertical measurements to the nearest 0.01 foot. The survey information will be used to prepare a sample location diagram for inclusion in the final report.

4.0 Project Mobilization and Demobilization

This section identifies activities that will be conducted to complete the soil sampling investigation field operations.

4.1 Site Facilities

Support facilities are available onsite and include a groundwater treatment system/building, sanitary facilities, electric power, water, a staging area, and a decontamination area. The staging and decontamination areas will be located at the groundwater treatment building on the northwest portion of the site.

4.2 Mobilization of Equipment and Supplies

This task will include all activities required to procure equipment and supplies and mobilize these items to the site for the sampling activities.

4.3 Orientation of Field Personnel

Field personnel orientation will consist of an onsite project briefing for each field team member to review health and safety requirements, QA/QC protocols, and field procedures. Subcontractors involved in field activities will also participate in onsite briefings before beginning fieldwork. Personnel from Emerson will also be informed on health and safety requirements, as appropriate. Routine health and safety and field progress briefings and daily health and safety tailgate meetings will be held for the project team and subcontractor personnel, conducted by the onsite safety coordinator.

Before initiating field activities, field personnel will perform a reconnaissance of the work areas. A PID will be used during the site walkover to assess hazards and determine background concentration of organic vapors within the breathing zone.

4.4 Demobilization and Restoration of Site

Equipment will be demobilized at the completion of each phase of field activities, as necessary. This equipment may include sampling equipment, subcontractor equipment, and decontamination equipment.

4.5 Management of Investigation Derived Waste

Decontamination fluid, disposable sampling equipment, and disposable personal protective equipment will be generated during the sampling activities. The decontamination fluid will be managed at the onsite groundwater treatment building. Disposal of the other material will be as follows:

- Trash and debris will be placed in a trash dumpster and its contents will be disposed of by a local garbage hauler.
- All investigative-derived waste (soil) will be containerized, stored onsite, sampled, and analyzed for disposal characterization. The disposal methods will be contingent on analytical data and will be consistent with state and federal law.
- Used protective clothing and equipment will be appropriately managed and will be consistent with U.S. EPA Guidance Document, Management of Investigative Derived Waste During Site Inspections (May 1991), OERR 9345.3-02.

5.0 Project Schedule and Report Preparation

Environmental Strategies will begin the sampling activities within approximately 2 weeks of receiving work plan approval from the NYSDEC, pending subcontractor availability. The proposed sampling activities will require approximately 3 to 4 days to complete, and the analytical results will be available 4 weeks later. If additional sampling is deemed appropriate, Emerson will notify the NYSDEC. A report detailing the scope of the investigation and the finding will be submitted to the NYSDEC approximately 3 weeks following receipt of the final laboratory data. The report will include a sample location diagram, summary tables, a discussion of the analytical results, and copies of the analytical reports.

References

New York State Department of Environmental Conservation. 1994. Record of Decision for the Morse Industrial Site Inactive Hazardous Waste Site, Ithaca, Tompkins County, New York. December.

Radian Corporation. 1990. Final Report; Remedial Investigation Stages 1 and 2; Emerson Power Transmission (EPT), Ithaca, New York. February.

Figure 1
Sewer Plan and Proposed Direct Push Soil Boring Locations
Emerson Power Transmission
Ithaca, New York

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Legend

- Monitoring Well Location
- Seep
- Existing Sanitary Sewer
- Proposed Direct Push Soil Borings

Note: Where Sanitary Sewer Lines is Less Than 3' bgs it is Likely Encased in Concrete.



