IRM Modifications and Enhancements Completion Report

March 11, 2016

Client

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Engineering Certification

ENGINEER'S CERTIFICATION
INTERIM REMEDIAL MEASURE
CONSTRUCTION COMPLETION REPORT
EMERSON POWER TRANSMISSION
620 SOUTH AURORA STREET
ITHACA, NEW YORK
SITE NO. 7-55-010

I, Todd M. Musterait, P.E., hereby certify, as a Professional Engineer registered in the State of New York, that based on WSP's observation of the remedial construction activities conducted by the remedial contractor, Remediation Services, Inc., the remedial construction activities were completed in substantial conformance with the requirements presented in the following documents and/or approved field changes detailed in this Construction Completion Report:

- Record of Decision for the Morse Industrial Corporation Inactive Hazardous Waste Site, Ithaca, Tompkins County, New York (NYSDEC, December 1994).
- IRM Modifications and Enhancements Work Plan (WSP, July 18, 2014)

Todd M. Musterait, P.E.
New York State P.E. No. 076923

3/11/16
Date

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1 Introduction

On behalf of Emerson and its subsidiary, Emerson Power Transmission Corp. (EPT), WSP has prepared this Completion Report for the Interim Remedial Measure (IRM) modifications and enhancements incorporated into the pre-existing dual phase extraction (DPE) system installed in the area of the fire water reservoir (FWR) at the EPT site in Ithaca, New York (Figure 1). The DPE system and this completed supplement are intended to meet the requirements of the Record of Decision Amendment (ROD Amendment, June 2009) and the Administrative Order on Consent (Index #A7-0125-87-09) entered into by the New York State Department of Environmental Conservation (NYSDEC) and EPT on July 13, 1988.

The IRM DPE system was upgraded in 2009 and has been operating effectively since then. Several investigations were conducted between October 2009 and April 2011 to gather additional information on the geology, groundwater flow pathways, and groundwater quality in the vicinity of the FWR for purposes of assessing potential supplemental remedies. The investigations focused on identifying the presence or absence of dense non-aqueous phase liquid (DNAPL) or residual source material in groundwater immediately south and east of the FWR. The results of the investigations showed no evidence of DNAPL or residual source material in groundwater at these locations. The results also showed that the base of the reservoir was completed in competent bedrock that is not in direct hydraulic communication with the surrounding aquifer. The highest volatile organic compound (VOC) concentrations detected in groundwater were found to occur approximately 18 feet below the base of the reservoir within two bedding plane fractures identified at 550 and 544 feet above mean sea level (amsl). These bedding plane fractures, as well as a deeper bedding plane fracture at 515 feet amsl, have been identified as the primary migration pathways for affected groundwater at the FWR, and are directly targeted by the existing IRM system and the modifications and system enhancements described in this completion report.

This completion report presents a description of the existing IRM DPE system and the components of the implemented modifications and enhancements that will serve to provide greater hydraulic control and increase the removal rate of VOCs from groundwater. The IRM Modifications and Enhancements Work Plan, dated July 18, 2014, provide additional pre-design investigation results and updated conceptual site model information.

2 Description of Pre-existing System

The pre-existing IRM DPE system (as upgraded in 2009) consists of 10 wells, 9 of which are aligned in a north-south direction downgradient of the FWR, and one well located to the south of the FWR (EW-9-86C) (Figure 2). Four DPE wells are screened in the highly fractured groundwater B-zone (EW-4-25B, EW-5-25B, EW-7-25B, and EW-10-25B), and were located to intercept and contain impacted groundwater from the B-zone as well as the upper C-zone groundwater bedding plane fractures where these fractures discharge to the B-zone. Six DPE wells are screened in the lower C-zone (EW-1- 62C, EW-2-62C, EW-3-60C, EW-6-60C, EW-8-62C, and EW-9-86C) and are located to intercept and contain impacted groundwater from the lower C-zone groundwater. The DPE wells are connected by a piping network including compressed air, soil vapor extraction (SVE), and groundwater conveyance which extend to a building housing the treatment equipment. The treatment system equipment consists of an air compressor, tankage, filtration units, air stripper, SVE blower, liquid- and vapor-phase carbon units, and a programmable logic controller (PLC). A brief discussion of the treatment system is presented below.

Groundwater is pumped from the extraction wells and transferred to a 1,000-gallon aluminum equalization tank, which is intended to equalize the influent flows and minimize downstream cycling of system components. The bag filter feed pump, controlled by the equalization tank level, discharges water from the equalization tank through the bag filter system, and into the air stripper. Under the current operations, the bag filter feed pumps processes water in approximate 600 gallon batches, at a flow rate of approximately 10 to 12 gallons per minute.

A low-profile, shallow-tray air stripper unit, is used to remove dissolved-phase VOCs from the groundwater stream as it passes through the trays to the sump below (integral to the unit). The air stripper is equipped with a sump pump which discharges water from the air stripper sump, through the liquid-phase granular activated carbon (GAC) units, and ultimately to the outfall (Outfall 001). The air stream from the stripper is discharged to the vapor-phase GAC units, which eventually discharges through the building stack to the atmosphere.

Soil vapor is drawn from the DPE wells through a 120-gallon air/water separator, using a positive displacement rotary lobe blower. The blower is equipped with a discharge silencer which reduces the noise coming from the discharge stack. Separated liquids that accumulate in the air/water separator are batch-pumped back to the equalization tank for aqueous treatment. The combined vapor stream (from the vacuum blower and the air stripper) is treated by two 1,000-pound vapor-phase GAC vessels in series before discharge to the atmosphere through the discharge stack to the atmosphere.

3 Modifications/Enhancements to DPE System

The objectives of the modifications/enhancements to the DPE system are: (1) to intercept impacted groundwater within the horizontal bedding plane fractures in the C-zone between 550 feet, 544 feet, and 515 feet amsl to the south and east of the FWR; and (2) to extract both aqueous and vapor-phases for treatment. The drilling and well installation work was performed in accordance with the IRM Modifications and Enhancements Work Plan, dated July 18, 2014, WSP Standard Operating Procedures (SOPs) and New York State regulations. The work was conducted between June 17, 2015 and July 9, 2015. The as-built drawings are provided in Appendix A.

3.1 Well Abandonment

WSP abandoned extraction well EW-9-86C and exploratory boring EXB-1, which were both constructed as open boreholes that intersect the shallow and deep bedding plane fractures. EW-9-86C and EXB-1 were constructed by grouting a steel casing approximately 2 feet into the siltstone bedrock; then, the borehole was drilled into the siltstone to the designed depth. EW-9-86C was drilled at an approximate 30-degree angle from vertical, to a bottom elevation of approximately 500.37 feet amsl (length of approximately 100 feet). EXB-1 was drilled to a bottom elevation of 506.45 feet amsl (length of approximately 81 feet).

Decommissioning was conducted in accordance with NYSDEC CP-43: Groundwater Monitoring Well Decommissioning Policy. Based on a review of the boring logs and well construction logs, the overburden seal was believed to be competent, thus both steel outer casings were left in place and the wells were abandoned by grouting in place.

At EXB-1, grouting involved filling the open bedrock borehole with cement-bentonite grout to a final depth of 5-feet below the ground surface (bgs). A very thick grout mix was used to minimize grout loss into the geologic units. Grout loss was monitored at 10-foot (maximum) intervals. Following grout placement, the steel casing was cut at 5 feet bgs and removed.

Multiple attempts to remove the submersible pump from EW-9-86C were unsuccessful. At the recommendation of the NYSDEC, the pump was abandoned in place; however, all equipment associated with the former extraction well (i.e., well vaults and piping at EW-9-86C) was removed. During abandonment, WSP determined that a section of the steel casing installed at new extraction well EW-9R-72C was installed through the open borehole section of EW-9-86C. The volume of grout injected into EW-9-86C was sufficient to abandon this extraction well in accordance with the Work Plan.

Following decommissioning, the surface around these wells was restored to match the existing surface (Section 3.5). Well abandonment procedures were documented as specified in CP-43.

3.2 Installation of New Extraction Wells

Three new DPE wells (EW-9R-72C, EW-11-42C, and EW-12-45C) were constructed at the locations shown on the drawings provided in Appendix A. Specific well installations are discussed below and boring logs, including well construction information, are provided in Appendix B.

- EW-9R-72C – This new vertical, open-hole bedrock well was constructed to replace former extraction well EW-9-86C and is located in close proximity to the southwest corner of the FWR. EW-9R-72C was drilled through the overburden using a hollow stem auger, and into bedrock using 6-inch air rotary equipment. A 4-inch conductor casing was installed and grouted in place to 55 feet bgs. Subsequently, a 4-inch core bit combined with circulated water was used to ream the borehole to the overall desired depth of 79.3 feet bgs, intersecting the horizontal bedding plane at 515 amsl. The well was completed as an open-hole bedrock well. The well was equipped with an extraction pump and associated equipment and connected to the existing piping network.

- EW-11-43C – Existing open-hole bedrock monitoring well MW-14C was converted to an extraction well designated as EW-11-43C. The well is located immediately south of the FWR south tank in an area of higher VOC concentrations in groundwater and intersects the horizontal bedding plane fractures at approximately 550 and 544 feet amsl. The converted well was equipped with an extraction pump and associated equipment and connected to the existing piping network.
- EW-12-45C – Existing open-hole well EXB-2 was converted to an extraction well designated as EW-12-45C. Former well EXB-2 is located in an area of higher VOC concentrations in groundwater. The well was partially grouted from the current depth of 80 feet bgs up to a final depth of 45 feet bgs. The upper portion of the borehole (25 to 45 feet bgs) was left open to intersect the 550 ft amsl and 544 ft amsl bedding plane fractures. The converted well was equipped with an extraction pump and associated equipment and connected to the existing piping network.

3.3 Well Vaults, Piping, and Pumping Equipment

Each new well was fitted with a pre-fabricated incidental H20 highway loading, traffic-rated vault box with bottom slabs cast-in-place concrete to allow flexibility during installation of the piping. A 3-foot by 3-foot by 2-foot vault box was installed at EW-9R-72C and EW- 12-45C, a 4-foot by 4-foot by 2-foot vault box was installed at EW-11-43C and a 3-foot by 2-foot by 2-foot vault box was installed as a junction to tie the new extraction well piping into the pre-existing system's conveyance piping. Piping for conveying water and compressed air was run through a 6-inch diameter PVC containment pipe installed underground running between the vaults. The existing containment pipe was cut in the vicinity of the former EW-9-86C (at the new junction box) and extended to the new well locations. The piping enters the bottom of the vaults using a vertical 90-degree elbow. The existing groundwater force main, compressed air conveyance lines, and the 220V electric conduit (heat trace) extending from EW-8-62C were pulled into the junction box in the vicinity of EW-9-86C. The replacement water conveyance piping between the junction box and EW-11-43C was matched to the size and materials of construction used in the existing systems (1.25-inch diameter nylon-12 tubing for groundwater and 1-inch diameter Duratec® aluminum composite for compressed air piping). The containment pipe was run independently to EW-9R-72C and to EW-12-45C from EW-11-43C. Pipe dimensions and trench locations were constructed as shown in Appendix A.

Conveyance piping was installed within trenches excavated to approximately 52 inches bgs in all areas except an approximate 20-foot section of trench leading to the EW-12-45C vault (Appendix A) to accommodate crossing the natural gas line in the area. To avoid any contact or disturbance of this gas line, the trench was sloped from 52 inches bgs to 48 inches bgs along the 20-foot section of trench and into the EW-12-45C vault. The trenches were backfilled with a minimum of 2 inches of pipe bedding material surrounding the pipes on all sides. The remainder of the trench was then backfilled with excavated materials as shown on the drawings (Appendix A, Sheet 3). All conveyance piping (groundwater force main and compressed air tubing) was pressure tested in accordance with manufacturer's instructions following installation. The 6-inch diameter containment pipe was carefully inspected during installation and was not subject to pressure testing.

Existing underground vapor conveyance piping to the former EW-9-86C is comprised of 2-inch diameter HDPE piping. This HDPE pipe was extended to each of the new wells (using butt fused joints), and transitions to PVC once entering each vault. The extended HDPE piping enters the bottom of each well vault via a branch tee off of the main header running underneath the vaults. Inside the vault the SVE pipe transitions to PVC and connects directly to the well casing. Valves, fittings, and saddle connections were installed on the SVE piping as shown on the drawings (Appendix A).

The water conveyance header transitions from 1 ¼ -inch diameter nylon-12 to 1/2-inch galvanized steel pipe once inside EW-11-43C. A manifold was constructed inside this well vault, with 5/8-inch diameter polypropylene tubing branching off and running independently to EW-9R-72C and EW-12-45C, as well as to EW-11-43C. Within each vault, a check valve, ball valve, sample port, pressure gauge, and reducer with quick connect fittings were installed on the groundwater force main.

Once inside the EW-11-43C vault, the compressed air line header transitions from 1-inch to 3/4-inch Duratec® compressed air tubing. A manifold was constructed as shown on the drawings, with ½-inch Duratec® tubing

branches extending independently to each well (similar to the groundwater force main). An isolation valve, pressure indicator with regulator, and cycle counter was installed within each vault for isolation, control, and monitoring purposes. All of the vault equipment and branch piping was fastened to the concrete wall of the vaults.

Stainless steel 2-inch diameter, bottom inlet, long and short pneumatic pumps manufactured by QED Environmental Systems (Model Long AP2 Bottom Inlet Pump for EW-9R-72C and EW-11-43C and Model Short AP2 Bottom Inlet Pump for EW-12-45C) and stainless steel fittings were installed in each of the new DPE wells. The down-well water discharge tubing was 5/8-inch diameter nylon-12, the air supply tubing was 3/8-inch diameter nylon-12, and the air exhaust line was 1/2-inch diameter nylon-12 tubing. The exhaust line was vented inside the casing at each location. All of the down well equipment was provided by the pump manufacturer (QED) and completely compatible with the pump operation. The bottom of each pump was positioned approximately 1 foot off the base of each well to minimize suspended solids and sediments from entering the pump intake.

Stainless steel, vacuum-rated well caps were provided by the pump manufacturer to fit the well casing and adapt to the 5/8-inch diameter groundwater tube, the 3/8-inch diameter compressed air tube, and a third 1-inch port for instrumentation and monitoring.

A historical well (HISTWELL-1) was uncovered during trenching activities associated with the expansion of the interim remedial measure (IRM) near the former firewater reservoir west of the main building. The investigation and evaluation of this historic well was included in the scope of the Phase II Supplemental Remedial Investigation Work Plan, dated May 11th 2015, and the finding will be included in the Supplemental Investigation Report, as requested by NYSDEC.

3.4 Waste Material Management

All drilling activities were conducted using clean equipment. The drilling equipment (augers and rods) were decontaminated using a portable steam cleaner prior to demobilizing from the Site (only EW-9R-72C required drilling). Decontamination water, drill cuttings and other investigation derived wastes (IDW) associated with extraction well installation and well decommissioning's were properly labeled and disposed of along with other waste materials associated with other on-site activities.

Excess soil excavated from the IRM modifications/enhancements work area that could not be used as backfill were stockpiled at the site and characterized for disposal. In addition, sections of concrete with rebar tie wire were removed as part of trenching for underground conveyance piping. These sections of concrete were demolished into pieces appropriate for disposal and also stockpiled at the site and characterized for disposal. On June 27, 2015, discrete grab samples were collected from various locations of the stockpiled soil and used to form a composite sample which was submitted to ALS Environmental Laboratory in Middletown, Pennsylvania for VOCs, semi-volatile organic compounds (SVOCs), metals by Toxicity Characteristic Leaching Procedure (TCLP), and polychlorinated biphenyls (PCBs) analyses. On July 9, 2015, discrete grab samples were collected from various locations of the stockpiled concrete and used to form a composite sample which was submitted to ALS Environmental Laboratory in Middletown, Pennsylvania for VOCs, SVOCs, metals by TCLP, and PCBs analyses. The characterization data for the soil and concrete are provided in Appendix C and Appendix D, respectively.

Due to the presence of trichloroethene (TCE) identified by the soil waste characterization sample, the excavated soil was designated as a listed hazardous waste, F001. Three roll-off containers containing approximately 46 tons of hazardous soil material were removed from the site on August 10, 2015 and disposed of at CWM Chemical Services, LLC in Model City, New York. Additionally, a roll-off containing 22.33 tons of non-hazardous concrete debris was removed from the site on July 30, 2015 and disposed of at Seneca Meadows, Inc. in Waterloo, New York. Corresponding hazardous and non-hazardous waste profiles and manifests can be found in Appendix E.

3.5 Site Restoration

Concrete removed during the trenching activities for EW-11-43C and EW-12-45C was replaced. Other areas of disturbance due to trenching activities were finished with crushed stone.

3.6 Site Survey

Following installation, the elevation and location of the ground surface at each corner of the new well vaults, as well as the top of the well casing at each location was surveyed to the nearest 0.01 foot by a New York State-licensed land surveyor. The horizontal locations were determined to the nearest 0.1 foot. All survey data was referenced to the state plane coordinate system and tied into the existing base map for the site. The surveyed locations of the new extraction wells and well vaults are shown on the drawings in Appendix A.

4 System Startup and Operation

4.1 System Startup

The treatment system was restarted in accordance with the operations and maintenance instructions on July 9, 2015. Each of the new DPE wells was brought on line individually by applying compressed air until full drawdown was achieved. Full groundwater drawdown was followed by application of system vacuum to the well casing.

The pressure regulator within each of the new well vaults was set to provide pressure to each pump according to the manufacturer's specifications. Pressure indicators within the newly installed well vaults were monitored continuously for several minutes to ensure proper air delivery and water discharge. Groundwater flow was confirmed by observing the air line's cycle counter over a 6 hour period.

Once the wells had reached full drawdown, vacuum was applied by opening the isolation valves (one in each well vault). Operation of vacuum gauges was verified as functional during this process, and initial vacuum readings were recorded. The isolation valves were used to balance flow and vacuum throughout the system between the existing DPE wells and the newly installed DPE wells. Each DPE well head was set to a maximum vacuum of 10 inches of mercury using the control valve.

With both the groundwater and vapor extraction systems operating, the total groundwater extraction rate was estimated by monitoring the flow totalizer on the treatment system, downstream of the aqueous phase carbon units. This flow rate was compared to previous monitoring events to determine the increase flow provided by the three new DPE wells. The system flow rate increased approximately 1 to 2 gallons per minute by the addition of the new wells.

4.2 Operation, Maintenance, and Monitoring (OMM)

After completing the start-up activities, routine operations of the DPE system with the modifications and enhancements began on July 9, 2015. Operation, maintenance and monitoring activities for the new extraction wells will be conducted as presented in the pre-existing OMM Plan, dated March 31, 2009.

5 Acronyms

amsl – above mean sea level

bgs – below ground surface

DNAPL – dense non-aqueous phase liquid

DPE – dual phase extraction

EPT – Emerson Power Transmission Corp.

EXB – exploratory boring

EW – extraction well

FWR – fire water reservoir

GAC – granular activated carbon

HDPE – high-density polyethylene

IDW – investigation derived wastes

IRM – Interim Remedial Measure

in. Hg – inches of mercury

NYSDEC – New York State Department of Environmental Conservation

MW – monitoring well

OMM – Operation, Maintenance, and Monitoring

PCB – polychlorinated biphenyls

PLC – programmable logic controller

PVC – polyvinyl chloride

ROD – record of decision

SOPs – Standard Operating Procedures

SVE – soil vapor extraction

TCE - trichloroethene

TCLP – Toxicity Characteristic Leaching Procedure

SVOC – semi-volatile organic compound

Figures

DWG Name:	4507/34
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Approved:	
Drawn By:	FMC 2/4/2014
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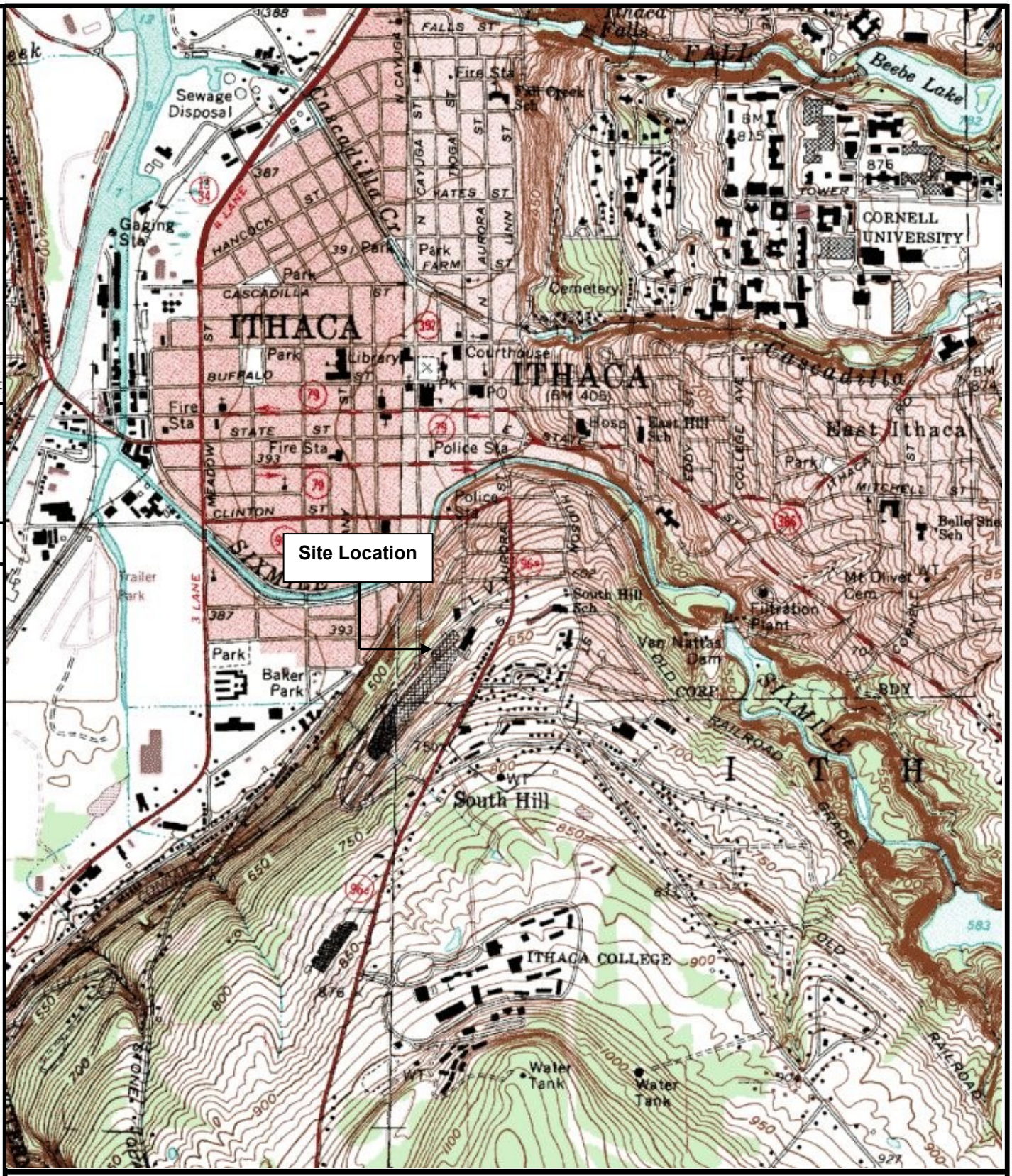

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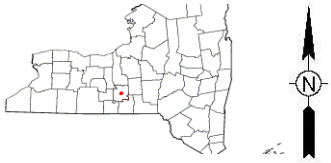

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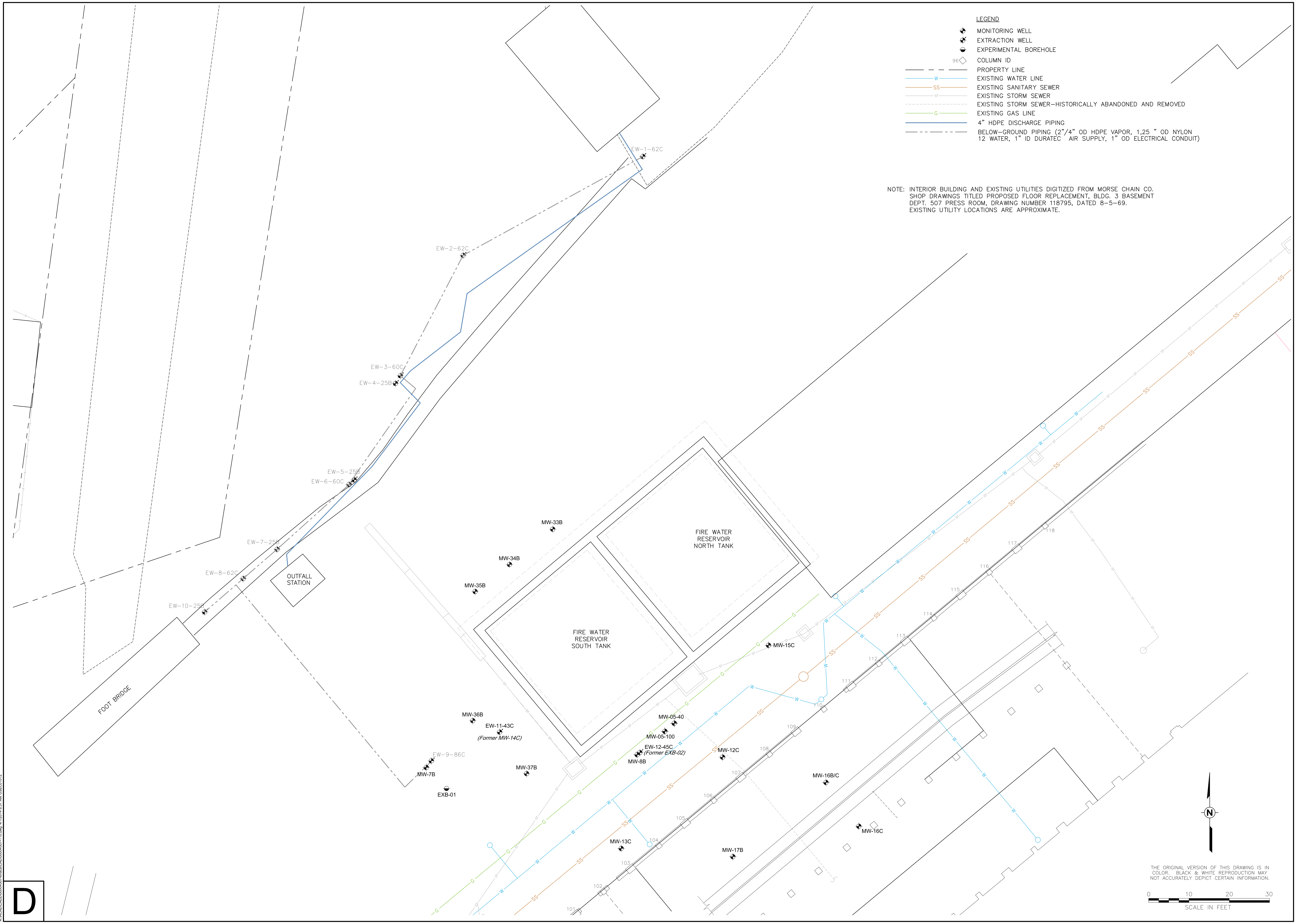
FIGURE 1

SITE LOCATION MAP

Emerson Power Transmission
Ithaca, New York

PREPARED FOR

Emerson
Saint Louis, Missouri


LEGEND
MONITORING WELL
EXTRACTION WELL
EXPERIMENTAL BOREHOLE
COLUMN ID
PROPERTY LINE
EXISTING WATER LINE
EXISTING SANITARY SEWER
EXISTING STORM SEWER
EXISTING STORM SEWER–HISTORICALLY ABANDONED AND REMOVED
EXISTING GAS LINE
4" HDPE DISCHARGE PIPING
BELOW–GROUND PIPING (2"/4" OD HDPE VAPOR, 1.25 " OD NYLON 12 WATER, 1" ID DURATEC AIR SUPPLY, 1" OD ELECTRICAL CONDUIT)
NOTE: INTERIOR BUILDING AND EXISTING UTILITIES DIGITIZED FROM MORSE CHAIN CO. SHOP DRAWINGS TITLED PROPOSED FLOOR REPLACEMENT, BLDG. 3 BASEMENT DEPT. 507 PRESS ROOM, DRAWING NUMBER 118795, DATED 8–5–69. EXISTING UTILITY LOCATIONS ARE APPROXIMATE.
EW–1–62C
EW–2–62C
EW–3–60C
EW–4–25B
EW–5–25B
EW–6–60C
EW–7–25B
EW–8–62C
EW–10–25B
OUTFALL STATION
FOOT BRIDGE
MW-33B
MW-34B
MW-35B
FIRE WATER RESERVOIR NORTH TANK
FIRE WATER RESERVOIR SOUTH TANK
MW-15C
MW-36B
EW-11-43C
(Former MW-14C)
MW-05-40
MW-05-100
EW-12-45C
(Former EXB-02)
MW-8B
MW-12C
EW–9–86C
MW-7B
EXB-01
MW-37B
MW-16B/C
MW-16C
MW-13C
MW-17B
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REVISIONS

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DATE

DRAWN BY	EGC
CHECKED	KDS 1/7/2014
APPROVED	

EXISTING CONDITIONS

IRM MODIFICATIONS AND ENHANCEMENTS
EMERSON POWER TRANSMISSION
ITHACA, NEW YORK

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

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SHEET 2

Drawing Number
00004507–110

Appendix A – As-Built Drawing Package

INDEX OF DRAWINGS

TITLE SHEET

IRM MODIFICATIONS AND ENHANCEMENTS AS-BUILT DRAWINGS

EMERSON POWER TRANSMISSION ITHACA , NEW YORK

PREPARED FOR

EMERSON
ST. LOUIS, MISSOURI

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DRAWN BY RK 09/18/2015
CHECKED PCC 02/17/2016
APPROVED GER 02/17/2016

TITLE SHEET
IRM MODIFICATIONS AND ENHANCEMENTS
EMERSON POWER TRANSMISSION
ITHACA, NEW YORK
PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

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SHEET 1

Drawing Number
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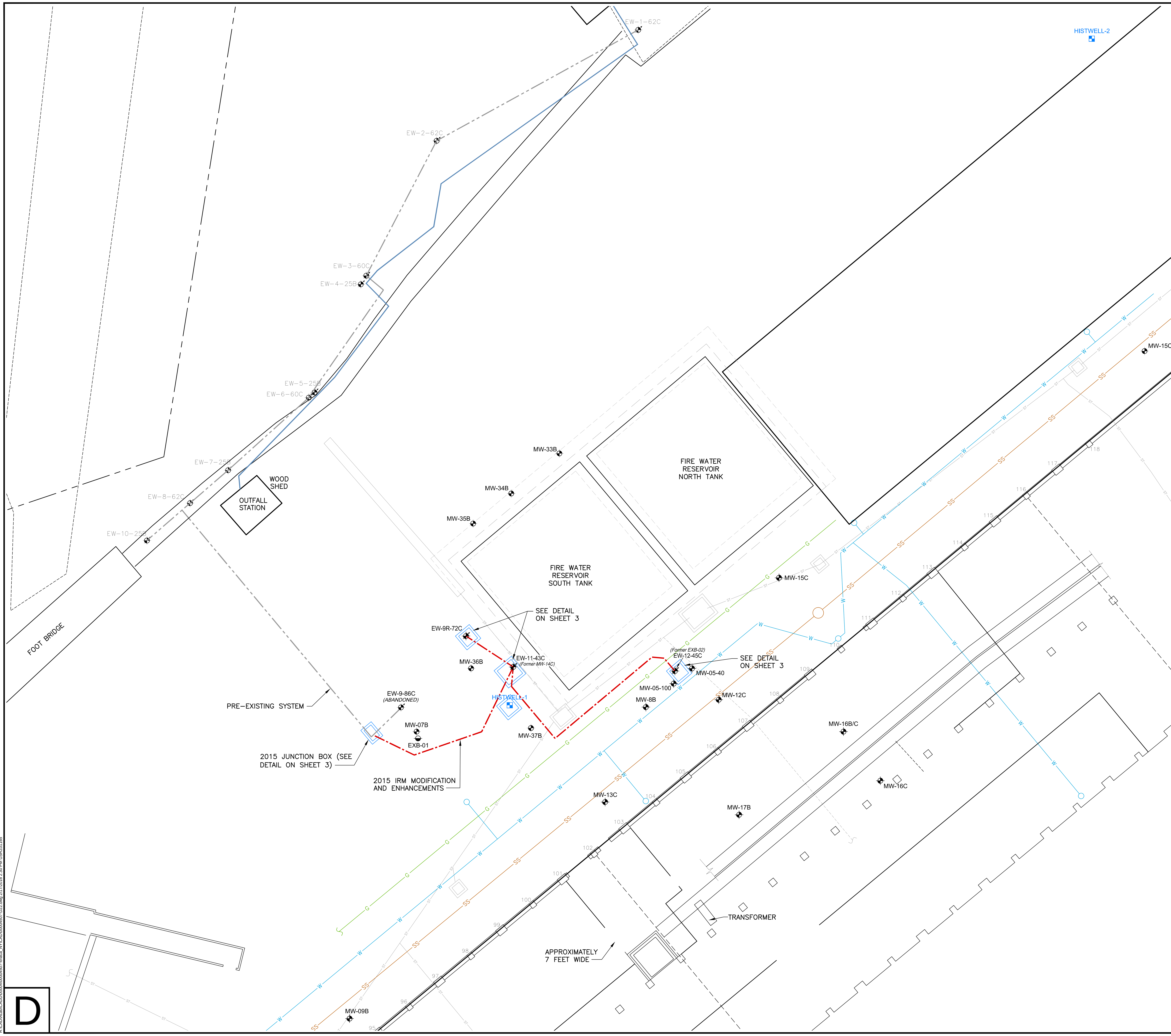

LEGEND

- MONITORING WELL
- EXTRACTION WELL
- EXPERIMENTAL BOREHOLE
- 96 COLUMN ID
- PROPERTY LINE
- W — EXISTING WATER LINE
- SS — EXISTING SANITARY SEWER
- ST — EXISTING STORM SEWER
- EXISTING STORM SEWER—HISTORICALLY ABANDONED AND REMOVED
- G — EXISTING GAS LINE
- 4" HDPE DISCHARGE PIPING
- PRE—EXISTING SYSTEM BELOW—GROUND PIPING (2"/4" OD HDPE VAPOR, 1,25 " OD NYLON 12 WATER, 1" ID DURATEC AIR SUPPLY, 1" OD ELECTRICAL CONDUIT)
- 2015 IRM MODIFICATION AND ENHANCEMENTS BELOW—GROUND PIPING (2"/4" OD HDPE VAPOR, 1,25 " OD NYLON 12 WATER, 1" ID DURATEC AIR SUPPLY, 1" OD ELECTRICAL CONDUIT)

NOTE:

INTERIOR BUILDING AND EXISTING UTILITIES DIGITIZED FROM MORSE CHAIN CO. SHOP DRAWINGS TITLED PROPOSED FLOOR REPLACEMENT, BLDG. 3 BASEMENT DEPT. 507 PRESS ROOM, DRAWING NUMBER 118795, DATED 8—5—69. EXISTING UTILITY LOCATIONS ARE APPROXIMATE.

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK & WHITE REPRODUCTION MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

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REVISIONS

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DATE

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APPROVED	GER 02172016

PLAN

IRM MODIFICATIONS AND ENHANCEMENTS
EMERSON POWER TRANSMISSION
ITHACA, NEW YORK

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

WSP | PARSONS BRINCKERHOFF
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SHEET 2

Drawing Number
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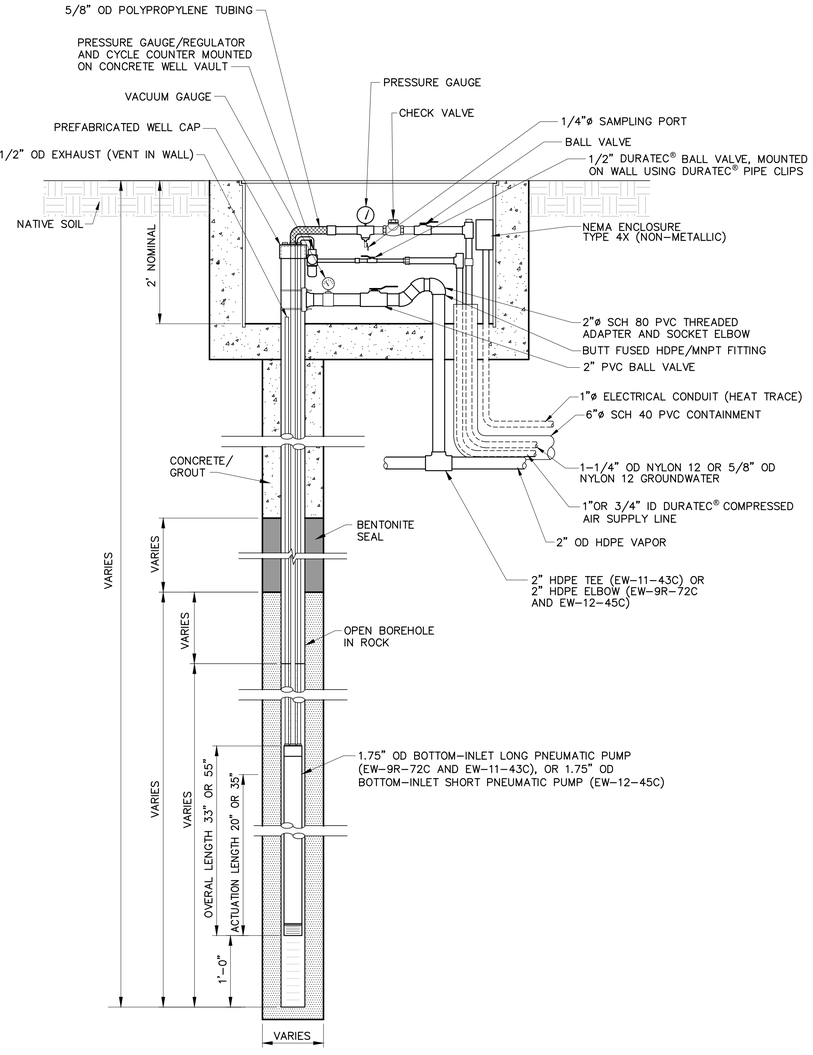

SECTION

WELL VAULT COMPLETION AND
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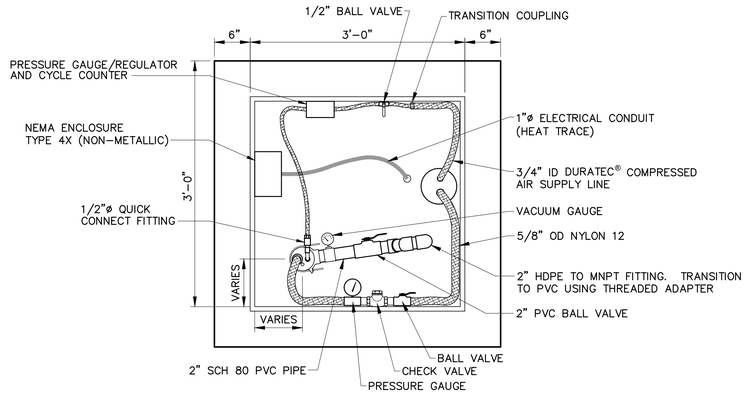

EXTRACTION WELL VAULT COMPLETION (EW-9R-72C AND EW-12-45C)

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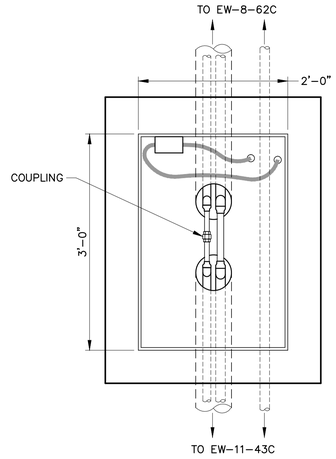
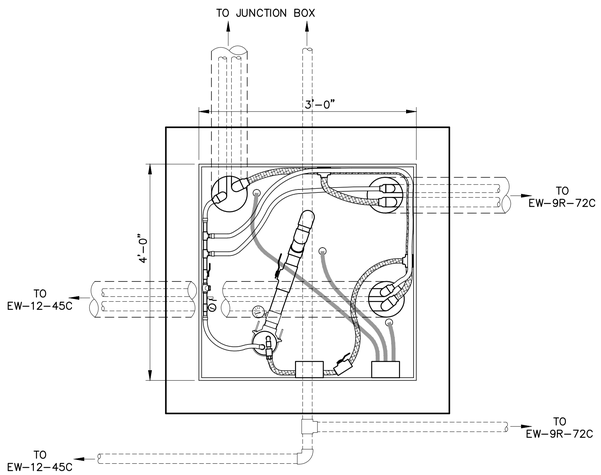


JUNCTION BOX VAULT COMPLETION

NOT TO SCALE

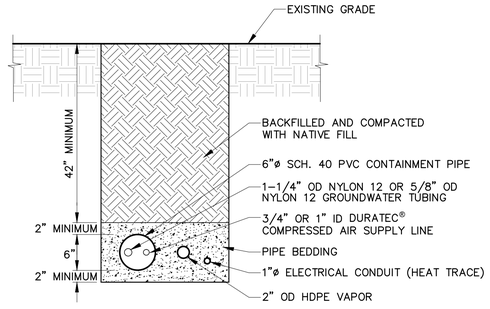


EXTRACTION WELL VAULT COMPLETION (EW-11-43C)

NOT TO SCALE

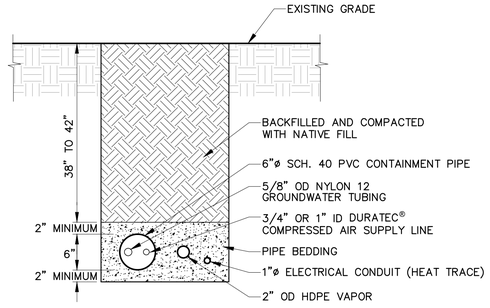
NOTE:

SEE EXTRACTION WELL VAULT COMPLETION (EW-9R-72C AND EW-12-45C) ABOVE FOR SIMILAR VAULT BOX COMPONENTS.



GROUNDWATER, COMPRESSED AIR, AND
VAPOR EXTRACTION PIPE TRENCH DETAIL (TYPICAL)

NOT TO SCALE



GROUNDWATER, COMPRESSED AIR, AND VAPOR EXTRACTION
PIPE TRENCH DETAIL (AT GAS LINE CROSSING)

NOT TO SCALE

D

R:\CAD\Aug\dwg\CADD\00004600\00004507-ithaca_NY\CAD\00004507-D23.dwg 2/17/2016 2:29 PM LUSD20165

REVISIONS

REV	DESCRIPTION		
1	Revised	Chkd:	Appr.:
2	Revised	Chkd:	Appr.:
3	Revised	Chkd:	Appr.:

SEAL

DATE

DRAWN BY: PAE 02/17/2016
CHECKED: DCC 02/17/2016
APPROVED: CFK 02/17/2016

WELL VAULT AND EXTRACTION WELL DETAILS

IRM MODIFICATIONS AND ENHANCEMENTS
EMERSON POWER TRANSMISSION
ITHACA, NEW YORK

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

PARSONS BRINCKERHOFF
WSP USA Corp.
750 Holiday Drive, Suite 410
Pittsburgh, Pennsylvania 15220
(412) 604-1040
www.wspgroup.com/usa

SHEET 3

Drawing Number
00004507-D23

Appendix B – Boring Logs

Boring Log: EW-11-43C (Formerly MW-14C)

Project: Fmr Emerson Power Transmissio **Surface Elevation (feet AMSL*):** 586.61

Project No.: 4255/4507/Legacy 127491 **TOC Elevation (feet AMSL*):** 588.31

Location: Ithaca, New York **Total Depth (feet):** 45

Completion Date: March 15, 2011 **Borehole Diameter (inches):** 4

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
2	1	0.0				***Silty Clay*** Dark brown, moist, silty clay overburden	
4							
6	2	0.0					
8							
10							
12						***Ithaca siltstone*** Light gray siltstone; weak to moderate field strength; thinly bedded; fresh to slightly decomposed; slightly disintegrated; intensely to moderately fractured with near vertical joints with iron staining at 14.5 to 15 feet and 19 feet, all other fractures are thin and horizontal.	
14							
16							
18	3	2.3		31			
20	4	12.0		75			

Geologist(s): Rob Wallace

Subcontractor: Parratt Wolff, Inc.

Driller/Operator:

Method: Hollow Stem Auger/Mud Rotary

WSP USA Corp.
5 Sullivan Street
Cazenovia, NY 13035
(315) 655-3900

Boring Log: EW-11-43C (Formerly MW-14C)

Project: Fmr Emerson Power Transmission **Surface Elevation (feet AMSL*):** 586.61

Project No.: 4255/4507/Legacy 127491 **TOC Elevation (feet AMSL*):** 588.31

Location: Ithaca, New York **Total Depth (feet):** 45

Completion Date: March 15, 2011 **Borehole Diameter (inches):** 4

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
	5	14.3		75		***Ithaca siltstone*** Light gray siltstone; weak to moderate field strength; thinly bedded; fresh to slightly decomposed; slightly disintegrated; intensely to moderately fractured with near vertical joints with iron staining at 14.5 to 15 feet and 19 feet, all other fractures are thin and horizontal. *(continued)*	
22	6	6.1		75			
24							
26							
28							
30							
32							
34							
36							
38							
40							

Geologist(s): Rob Wallace

Subcontractor: Parratt Wolff, Inc.

Driller/Operator:

Method: Hollow Stem Auger/Mud Rotary

WSP USA Corp.
5 Sullivan Street
Cazenovia, NY 13035
(315) 655-3900

Boring Log: EW-11-43C (Formerly MW-14C)

Project: Fmr Emerson Power Transmissio **Surface Elevation (feet AMSL*):** 586.61

Project No.: 4255/4507/Legacy 127491 **TOC Elevation (feet AMSL*):** 588.31

Location: Ithaca, New York **Total Depth (feet):** 45

Completion Date: March 15, 2011 **Borehole Diameter (inches):** 4

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
42						***Ithaca siltstone*** Light gray siltstone; weak to moderate field strength; thinly bedded; fresh to slightly decomposed; slightly disintegrated; intensely to moderately fractured with near vertical joints with iron staining at 14.5 to 15 feet and 19 feet, all other fractures are thin and horizontal. *(continued)*	
44							
46						Bottom of Boring at 45 feet	
48							
50							
52							
54							
56							
58							
60							

Geologist(s): Rob Wallace

Subcontractor: Parratt Wolff, Inc.

Driller/Operator:

Method: Hollow Stem Auger/Mud Rotary

WSP USA Corp.
5 Sullivan Street
Cazenovia, NY 13035
(315) 655-3900

Boring Log: EW-12-45C (Formerly EXB-02)

Project: Fmr Emerson Power Transmission **Surface Elevation (feet AMSL*):** 587.05

Project No.: 4255/4507/Legacy 127491 **TOC Elevation (feet AMSL*):** 586.47

Location: Ithaca, New York **Total Depth (feet):** 80

Completion Date: August 16, 2007 **Borehole Diameter (inches):** 10/4

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
		0		100		***Silt (ML)*** Dark brown clayey silt, moist.	
5		0		100			
10		0		100		***Lean Clay with Sand (CL)*** Brownish gray silty clay; sand; petroleum odor.	
						Soil sample EXB-2 collected from 10 to 12 feet bgs for VOCs.	
15						***Siltstone*** Ithaca Siltstone (Description based on cuttings)	
						Rock cuttings sample EXB-2 collected from 19 to 19.5 feet bgs for VOCs. Water sample EXB-2 collected from 75 feet bgs for VOCs.	
20							
25							

Geologist(s): Scott P. Haitz

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Lee Penrod

Method: Hollow Stem Auger/Air Hammer

WSP USA Corp.
5 Sullivan Street
Cazenovia, NY 13035
(315) 655-3900

Boring Log: EW-12-45C (Formerly EXB-02)

Project: Fmr Emerson Power Transmissio **Surface Elevation (feet AMSL*):** 587.05

Project No.: 4255/4507/Legacy 127491 **TOC Elevation (feet AMSL*):** 586.47

Location: Ithaca, New York **Total Depth (feet):** 80

Completion Date: August 16, 2007 **Borehole Diameter (inches):** 10/4

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
30						***Siltstone*** Ithaca Siltstone (Description based on cuttings) Rock cuttings sample EXB-2 collected from 19 to 19.5 feet bgs for VOCs. Water sample EXB-2 collected from 75 feet bgs for VOCs. *(continued)*	
35							
40							
45							
50							

Geologist(s): Scott P. Haitz
Subcontractor: Parratt Wolff, Inc.
Driller/Operator: Lee Penrod
Method: Hollow Stem Auger/Air Hammer

WSP USA Corp.
5 Sullivan Street
Cazenovia, NY 13035
(315) 655-3900

Boring Log: EW-12-45C (Formerly EXB-02)

Project: Fmr Emerson Power Transmissio **Surface Elevation (feet AMSL*):** 587.05

Project No.: 4255/4507/Legacy 127491 **TOC Elevation (feet AMSL*):** 586.47

Location: Ithaca, New York **Total Depth (feet):** 80

Completion Date: August 16, 2007 **Borehole Diameter (inches):** 10/4

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
55						***Siltstone*** Ithaca Siltstone (Description based on cuttings) Rock cuttings sample EXB-2 collected from 19 to 19.5 feet bgs for VOCs. Water sample EXB-2 collected from 75 feet bgs for VOCs. *(continued)*	
60							
65							
70							
75							

Geologist(s): Scott P. Haitz

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Lee Penrod

Method: Hollow Stem Auger/Air Hammer

WSP USA Corp.
5 Sullivan Street
Cazenovia, NY 13035
(315) 655-3900

Boring Log: EW-12-45C (Formerly EXB-02)

Project: Fmr Emerson Power Transmissio **Surface Elevation (feet AMSL*):** 587.05

Project No.: 4255/4507/Legacy 127491 **TOC Elevation (feet AMSL*):** 586.47

Location: Ithaca, New York **Total Depth (feet):** 80

Completion Date: August 16, 2007 **Borehole Diameter (inches):** 10/4

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Siltstone Ithaca Siltstone (Description based on cuttings) Rock cuttings sample EXB-2 collected from 19 to 19.5 feet bgs for VOCs. Water sample EXB-2 collected from 75 feet bgs for VOCs. *(continued)*	
80						Bottom of Boring at 80 feet EXB-02 converted to extraction well EW12-45C by grouting up open portion to 45 feet on 6/3/15	
85							
90							
95							
100							

Geologist(s): Scott P. Haitz

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Lee Penrod

Method: Hollow Stem Auger/Air Hammer

WSP USA Corp.
5 Sullivan Street
Cazenovia, NY 13035
(315) 655-3900

Boring Log: EW-9R-72C

Project: Fmr Emerson Power Transmissio **Surface Elevation (feet AMSL*):** ND

Project No.: 4255/4507/Legacy 127491 **TOC Elevation (feet AMSL*):** ND

Location: Ithaca, New York **Total Depth (feet):** 79.3

Completion Date: June 2, 2015 **Borehole Diameter (inches):** 10.25/6/2/3.8

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
2			- - - -	0		***Well-Graded Gravel with Silt (GW-GM)*** Angular rock fragments to 1 foot in diameter, some sand and gravel, little black silt.	
4							
6	1	1.8	- - - -	67		***Silt with Gravel (ML)*** Brownish-yellow (10YR 6/6) silt, little sub-angular gravel to 0.5-inch in diameter, trace organics and wood debris; medium soft to stiff; dry.	
8						***Well-Graded Gravel (GW)*** Dark gray (10YR 4/1) angular siltstone gravel to 1-inch in diameter; loose; dry.	
10	2	8.6	- - - -	50		***Silt with Gravel (ML)*** Dark grayish-brown (10YR 5/2) to dark gray (10YR 4/1) silt, some angular gravel to 2-inches in diameter, few clay, medium soft to stiff; dry, becoming wet between 11 and 11.2 feet bgs, faint petroleum-like odor.	
12	3	4	- - -	100		***Well-Graded Gravel (GW)*** Dark gray (10YR 4/1) siltstone fragments; loose; dry.	
14						***Silt with Gravel (ML)*** Very dark gray (10YR 3/1) silt, some gravel and coarse-grained sand; medium soft; moist, faint petroleum-like odor.	
16						***Well-Graded Gravel (GW)*** Grayish-brown (10YR 5/2) siltstone fragments greater than 2 inches in diameter with shaly partings, few sand and gravel; dense; dry.	
18							
20							

Geologist(s): Erik S. Reinert

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Layne Pesch

Method: HSA/Downhole Air Hammer/HQ Core Barrel

WSP USA Corp.
5 Sullivan Street
Cazenovia, NY 13035
(315) 655-3900

Boring Log: EW-9R-72C

Project: Fmr Emerson Power Transmissio **Surface Elevation (feet AMSL*):** ND

Project No.: 4255/4507/Legacy 127491 **TOC Elevation (feet AMSL*):** ND

Location: Ithaca, New York **Total Depth (feet):** 79.3

Completion Date: June 2, 2015 **Borehole Diameter (inches):** 10.25/6/2/3.8

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
22						***Bedrock*** Gray siltstone, recovery is small chips (less than 1/2-inch diameter) and rock dust; dry. *(continued)*	
24							
26							
28							
30							
32							
34							
36							
38							
40							

Geologist(s): Erik S. Reinert

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Layne Pesch

Method: HSA/Downhole Air Hammer/HQ Core Barrel

WSP USA Corp.
5 Sullivan Street
Cazenovia, NY 13035
(315) 655-3900

Boring Log: EW-9R-72C

Project: Fmr Emerson Power Transmissio **Surface Elevation (feet AMSL*):** ND

Project No.: 4255/4507/Legacy 127491 **TOC Elevation (feet AMSL*):** ND

Location: Ithaca, New York **Total Depth (feet):** 79.3

Completion Date: June 2, 2015 **Borehole Diameter (inches):** 10.25/6/2/3.8

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
42						***Bedrock*** Gray siltstone, recovery is small chips (less than 1/2-inch diameter) and rock dust; dry. *(continued)*	
44							
46							
48							
50							
52							
54							
56	4	-	- - - -	100			
58							
60							

Geologist(s): Erik S. Reinert

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Layne Pesch

Method: HSA/Downhole Air Hammer/HQ Core Barrel

WSP USA Corp.
5 Sullivan Street
Cazenovia, NY 13035
(315) 655-3900

Boring Log: EW-9R-72C

Project: Fmr Emerson Power Transmissio **Surface Elevation (feet AMSL*):** ND

Project No.: 4255/4507/Legacy 127491 **TOC Elevation (feet AMSL*):** ND

Location: Ithaca, New York **Total Depth (feet):** 79.3

Completion Date: June 2, 2015 **Borehole Diameter (inches):** 10.25/6/2/3.8

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
62	5	-	- - - -	98		***Bedrock*** Siltstone; moderate to strong field strength; gray (10YR 5/1); fine grained; massive with some laminations; fresh; competent; slightly fractured. 54.5'- mechanical break 54.8'- 70 degree angle fracture; medium narrow; not healed; wet; clean; rough; some sediment. 55.0'- bedding plane fracture 56.0'- mechanical break 59.2'-60.6' 90 degree joint; very to extremely narrow; not healed; non-cohesive sediment; moderately smooth; wet with minor seepage. 61.6'- mechanical break 62.5'- mechanical break 63.4'- mechanical break 65.5'- mechanical break 66.2'- mechanical break 67.1'- mechanical break 68.1'- mechanical break 68.5'- bedding plane fracture; healed; smooth; restricted. 72.3'-72.5' 70 degree angle joint; extremely narrow; not healed; non plastic sediment; tight; medium smooth; wet with minor seepage. 73.3'-74.1; 70 degree angle joint; extremely narrow; not healed; non plastic sediment; tight; medium smooth; wet with minor seepage. 75.0'-75.4'- 70 degree angle joint; extremely narrow; not healed; clean; tight; moderately smooth; wet with minor seepage. 77.3'-77.6'- Multiple intersecting joint sets with discrete 70 degree angle plane of fracture; highly pulverized. *(continued)*	
64							
66	6	-	- - - -	98			
68							
70	7	-	- - - -	87			
72							
74							
76	8	-	- - - -	80			
78							
80						Bottom of Boring at 79.3 feet ~~Macro-core refusal at 13.5 feet. Augered to 14.5. Downhole Air Hammer to 54 feet.~~	

Geologist(s): Erik S. Reinert

Subcontractor: Parratt Wolff, Inc.

Driller/Operator: Layne Pesch

Method: HSA/Downhole Air Hammer/HQ Core Barrel

WSP USA Corp.
5 Sullivan Street
Cazenovia, NY 13035
(315) 655-3900

Appendix C – Analytical Data: Waste Characterization (Soil)

ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

July 16, 2015

Mr. Dan Roth
Remediation Services, Inc.
2735 S. 10th St.
Independence, KS 67301

Certificate of Analysis

Revised Report - 7/16/2015 10:10:55 AM - See workorder comment section for explanation

Project Name:	**Soil Testing Q#06182015-01**	Workorder:	**2079627**
Purchase Order:		Workorder ID:	**WSP Ithica**

Dear Mr. Roth:

Enclosed are the analytical results for samples received by the laboratory on Monday, June 29, 2015.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Debra J. Musser (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Debbie Steinbauer

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Debra J Musser

Ms. Debra J. Musser
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

SAMPLE SUMMARY

Workorder: 2079627 WSP Ithica

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2079627001	21524-SOIL	Solid	6/27/2015 13:00	6/29/2015 08:26	Collected by Client

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

PROJECT SUMMARY

Workorder: 2079627 WSP Ithica

Workorder Comments

This report was updated to report the TCL VOC list per client request. DJM

This report was modified to add two volatiles per client request. VLF 7/16/15

Sample Comments

Lab ID: 2079627001 **Sample ID:** 21524-SOIL **Sample Type:** SAMPLE

The analysis for ignitability is performed using a modified method 1010A that provides a flashpoint temperature for a solid sample.

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2079627 WSP Ithica

Lab ID: **2079627001** Date Collected: 6/27/2015 13:00 Matrix: Solid

Sample ID: **21524-SOIL** Date Received: 6/29/2015 08:26

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
TCLP VOLATILE ORGANICS										
Benzene	ND		ug/L	20.0	SW846 8260B			7/1/15 12:27	TMP	A
2-Butanone	ND		ug/L	200	SW846 8260B			7/1/15 12:27	TMP	A
Carbon Tetrachloride	ND		ug/L	20.0	SW846 8260B			7/1/15 12:27	TMP	A
Chlorobenzene	ND		ug/L	20.0	SW846 8260B			7/1/15 12:27	TMP	A
Chloroform	ND		ug/L	20.0	SW846 8260B			7/1/15 12:27	TMP	A
1,2-Dichloroethane	ND		ug/L	20.0	SW846 8260B			7/1/15 12:27	TMP	A
1,1-Dichloroethene	ND		ug/L	20.0	SW846 8260B			7/1/15 12:27	TMP	A
Tetrachloroethene	ND		ug/L	20.0	SW846 8260B			7/1/15 12:27	TMP	A
Trichloroethene	27.3		ug/L	20.0	SW846 8260B			7/1/15 12:27	TMP	A
Vinyl Chloride	ND		ug/L	20.0	SW846 8260B			7/1/15 12:27	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	91.2		%	62 - 133	SW846 8260B			7/1/15 12:27	TMP	A
4-Bromofluorobenzene (S)	92.3		%	79 - 114	SW846 8260B			7/1/15 12:27	TMP	A
Dibromofluoromethane (S)	77.9		%	78 - 116	SW846 8260B			7/1/15 12:27	TMP	A
Toluene-d8 (S)	91.6		%	76 - 127	SW846 8260B			7/1/15 12:27	TMP	A
VOLATILE ORGANICS										
Acetone	ND		ug/kg	12.7	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Benzene	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Bromochloromethane	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Bromodichloromethane	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Bromoform	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Bromomethane	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
2-Butanone	ND		ug/kg	12.7	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Carbon Disulfide	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Carbon Tetrachloride	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Chlorobenzene	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Chlorodibromomethane	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Chloroethane	ND		ug/kg	6.3	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Chloroform	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Chloromethane	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
1,2-Dibromo-3-chloropropane	ND		ug/kg	6.3	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
1,2-Dibromoethane	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
1,1-Dichloroethane	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
1,2-Dichloroethane	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
1,1-Dichloroethene	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2

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State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2079627 WSP Ithica

Lab ID: **2079627001** Date Collected: 6/27/2015 13:00 Matrix: Solid

Sample ID: **21524-SOIL** Date Received: 6/29/2015 08:26

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
cis-1,2-Dichloroethene	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
trans-1,2-Dichloroethene	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
1,2-Dichloropropane	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
cis-1,3-Dichloropropene	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
trans-1,3-Dichloropropene	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Ethylbenzene	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Freon 113	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
2-Hexanone	ND		ug/kg	12.7	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
4-Methyl-2-Pentanone(MIBK)	ND		ug/kg	12.7	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Methylene Chloride	17.5		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Styrene	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
1,1,2,2-Tetrachloroethane	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Tetrachloroethene	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Toluene	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Total Xylenes	ND		ug/kg	7.6	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
1,1,1-Trichloroethane	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
1,1,2-Trichloroethane	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Trichloroethene	20.4		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Trichlorofluoromethane	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Vinyl Chloride	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
o-Xylene	ND		ug/kg	2.5	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
mp-Xylene	ND		ug/kg	5.1	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	98.6		%	56 - 124	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
4-Bromofluorobenzene (S)	116		%	51 - 128	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Dibromofluoromethane (S)	96.7		%	62 - 123	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
Toluene-d8 (S)	95.2		%	59 - 131	SW846 8260C	6/29/15	JAH	6/29/15 14:51	TMP	D2
PCBs										
Total Polychlorinated Biphenyl	0.94		mg/kg	0.037	SW846 8082A	6/30/15	KAC	7/1/15 12:26	EGO	A
Aroclor-1016	ND		mg/kg	0.037	SW846 8082A	6/30/15	KAC	7/1/15 12:26	EGO	A
Aroclor-1221	ND		mg/kg	0.037	SW846 8082A	6/30/15	KAC	7/1/15 12:26	EGO	A
Aroclor-1232	ND		mg/kg	0.037	SW846 8082A	6/30/15	KAC	7/1/15 12:26	EGO	A
Aroclor-1242	ND		mg/kg	0.037	SW846 8082A	6/30/15	KAC	7/1/15 12:26	EGO	A
Aroclor-1248	ND		mg/kg	0.037	SW846 8082A	6/30/15	KAC	7/1/15 12:26	EGO	A
Aroclor-1254	0.94		mg/kg	0.037	SW846 8082A	6/30/15	KAC	7/1/15 12:26	EGO	A
Aroclor-1260	ND		mg/kg	0.037	SW846 8082A	6/30/15	KAC	7/1/15 12:26	EGO	A

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State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2079627 WSP Ithica

Lab ID: **2079627001** Date Collected: 6/27/2015 13:00 Matrix: Solid

Sample ID: **21524-SOIL** Date Received: 6/29/2015 08:26

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
Decachlorobiphenyls (S)	78.6		%	46 - 120	SW846 8082A	6/30/15	KAC	7/1/15 12:26	EGO	A
Tetrachloro-m-xylene (S)	64		%	52 - 115	SW846 8082A	6/30/15	KAC	7/1/15 12:26	EGO	A
WET CHEMISTRY										
Cyanide, Reactive	ND		ppm	10	SW-846 7.3CN	6/30/15	THB	7/1/15 11:18	LJF	A
Ignitability	See comment	12	Deg. F		SW-846 1010AM			7/1/15 07:00	SDL	A
Moisture	13.1		%	0.1	S2540G-11			6/29/15 15:40	REA	A
Sulfide, Reactive	ND		ppm	6.2	SW846 7.3	6/30/15	THB	6/30/15 15:15	THB	A
Total Solids	86.9		%	0.1	S2540G-11			6/29/15 15:40	REA	A
TCLP METALS										
Arsenic, Total	ND		mg/L	0.14	SW846 6010C	6/30/15	JPS	6/30/15 16:21	SRT	A
Barium, Total	ND		mg/L	2.8	SW846 6010C	6/30/15	JPS	6/30/15 16:21	SRT	A
Cadmium, Total	ND		mg/L	0.011	SW846 6010C	6/30/15	JPS	6/30/15 16:21	SRT	A
Chromium, Total	ND		mg/L	0.028	SW846 6010C	6/30/15	JPS	6/30/15 16:21	SRT	A
Lead, Total	ND		mg/L	0.033	SW846 6010C	6/30/15	JPS	6/30/15 16:21	SRT	A
Mercury, Total	ND		mg/L	0.0020	SW846 7470A	6/30/15	MNP	6/30/15 12:25	MNP	A1
Selenium, Total	ND		mg/L	0.11	SW846 6010C	6/30/15	JPS	6/30/15 16:21	SRT	A
Silver, Total	ND		mg/L	0.022	SW846 6010C	6/30/15	JPS	6/30/15 16:21	SRT	A
TCLP SEMI-VOLATILES										
mp-Cresol	ND		ug/L	160	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
o-Cresol	ND		ug/L	160	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
1,4-Dichlorobenzene	ND		ug/L	60.0	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
2,4-Dinitrotoluene	ND		ug/L	60.0	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
Hexachlorobenzene	ND		ug/L	60.0	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
Hexachlorobutadiene	ND		ug/L	60.0	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
Hexachloroethane	ND		ug/L	60.0	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
Nitrobenzene	ND		ug/L	60.0	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
Pentachlorophenol	ND		ug/L	320	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
Pyridine	ND		ug/L	160	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
2,4,5-Trichlorophenol	ND		ug/L	160	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
2,4,6-Trichlorophenol	ND		ug/L	160	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2,4,6-Tribromophenol (S)	95.8		%	40 - 125	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
2-Fluorobiphenyl (S)	81.6		%	50 - 110	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
2-Fluorophenol (S)	54.5		%	20 - 75	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A

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State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2079627 WSP Ithica

Lab ID: **2079627001** Date Collected: 6/27/2015 13:00 Matrix: Solid

Sample ID: **21524-SOIL** Date Received: 6/29/2015 08:26

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Nitrobenzene-d5 (S)	92.6		%	40 - 110	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
Phenol-d5 (S)	36.6		%	13 - 49	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A
Terphenyl-d14 (S)	99.2		%	50 - 122	SW846 8270D	6/30/15	LEH	6/30/15 18:35	CGS	A

Debra J Musser

Ms. Debra J. Musser
Project Coordinator

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PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2079627001	1	21524-SOIL	SW-846 1010AM	Ignitability
According to Pa/USEPA regulations, this sample is not considered to be ignitable. (Ref 40 CFR 261.21)				
2079627001	2	21524-SOIL	SW-846 1010AM	Ignitability
Sample did not flash up to 200 degrees F				

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

ALS Environmental

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE __

* 2 0 7 9 6 2 7 *

Project Name: WSP Ithica	Project Number:
Project Manager: Grant Sherwood	Report CC:
Company/Address: RSI P.O. Box 587 Independence, Ks 67301	
Phone #: 620-331-1200	Email: gsherwood@RSI-Ks.com
Sampler's Signature: CD Silicco	Sampler's Printed Name: CD Silicco

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

PRESERVATIVE

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOAs ○ 8260 ○ 624 ○ CLP	GC/MS SVOAs ○ 8270 ○ 625	GC VOAs ○ 8021 ○ 601/602	PESTICIDES ○ 8081 ○ 608	PCBs ○ 8082 ○ 608	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	TCLP VOC	TCLP SVOC	TCLP 8 RCRA	Total TCE.	
21524-Soil		6-27-15	1:00	Soil	11								X	X	X	X	

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

REMARKS/ ALTERNATE DESCRIPTION

Rec'd
(1) A 2oz
(1) A 2oz
(2) 40 mL DI
(2) 40 mL MeOH
(2) 4 oz
(4) 8 oz

AS 6/29/15
AS 6/29/15

	Y	N	Initials
Custody Seals Present?		✓	
(if present) Seals Intact?			
Received on Ice?	✓		
COC/Lbls Complete	✓		
Cont in Good Cond?	✓		
Correct Containers?	✓		
Correct Samp Vol?	✓		
Correct Preservation?	✓		
Headspace/Volatiles?			

Cooler Temp: ____ C
Cooler #:
Therm ID: IR-291
Ship Carrier: FedEx UPS DHL
Tracking #: 8079 7283 9761

SPECIAL INSTRUCTIONS/COMMENTS
Metals
TCLP, RCRA Metals

See QAPP ☐

TURNAROUND REQUIREMENTS
RUSH (SURCHARGES APPLY)
____ 1 day ____ 2 day X 3 day
____ 4 day ____ 5 day

REQUESTED REPORT DATE
7-1-2015

REPORT REQUIREMENTS
____ I. Results Only
____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data
Edata ____ Yes ____ No

INVOICE INFORMATION
21524
PO #
BILL TO: RSI

STATE WHERE SAMPLES WERE COLLECTED

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature: Chuck Silicco	Signature: JESSICA SMITH ALS	Signature	Signature	Signature	Signature
Printed Name: Charles Silicco	Printed Name: ALS	Printed Name	Printed Name	Printed Name	Printed Name
Firm: RSI	Firm: 6/29/15 CR826	Firm	Firm	Firm	Firm
Date/Time: 6-27-15 3:18pm	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

Distribution: White - Lab Copy; Yellow - Return to Originator

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Appendix D – Analytical Data: Waste Characterization (Concrete)

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July 15, 2015

Mr. Dan Roth
Remediation Services, Inc.
2735 S. 10th St.
Independence, KS 67301

Certificate of Analysis

Project Name:	**Soil Testing Q#06182015-01**	Workorder:	**2082186**
Purchase Order:	**15070716**	Workorder ID:	**Ithica 21524 Concrete samples**

Dear Mr. Roth:

Enclosed are the analytical results for samples received by the laboratory on Friday, July 10, 2015.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Debra J. Musser (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Debbie Steinbauer

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Debra J Musser

Ms. Debra J. Musser
Project Coordinator

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SAMPLE SUMMARY

Workorder: 2082186 Ithica 21524 Concrete samples

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2082186001	Ithica 21524-Concrete	Solid	7/9/2015 07:45	7/10/2015 08:51	Collected by Client

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)

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ANALYTICAL RESULTS

Workorder: 2082186 Ithica 21524 Concrete samples

Lab ID: **2082186001** Date Collected: 7/9/2015 07:45 Matrix: Solid

Sample ID: **Ithica 21524-Concrete** Date Received: 7/10/2015 08:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
TCLP VOLATILE ORGANICS										
Benzene	ND		ug/L	20.0	SW846 8260B			7/14/15 12:30	JPA	A
2-Butanone	ND		ug/L	200	SW846 8260B			7/14/15 12:30	JPA	A
Carbon Tetrachloride	ND		ug/L	20.0	SW846 8260B			7/14/15 12:30	JPA	A
Chlorobenzene	ND		ug/L	20.0	SW846 8260B			7/14/15 12:30	JPA	A
Chloroform	ND		ug/L	20.0	SW846 8260B			7/14/15 12:30	JPA	A
1,2-Dichloroethane	ND		ug/L	20.0	SW846 8260B			7/14/15 12:30	JPA	A
1,1-Dichloroethene	ND		ug/L	20.0	SW846 8260B			7/14/15 12:30	JPA	A
Tetrachloroethene	ND		ug/L	20.0	SW846 8260B			7/14/15 12:30	JPA	A
Trichloroethene	ND		ug/L	20.0	SW846 8260B			7/14/15 12:30	JPA	A
Vinyl Chloride	ND		ug/L	20.0	SW846 8260B			7/14/15 12:30	JPA	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	93.6		%	62 - 133	SW846 8260B			7/14/15 12:30	JPA	A
4-Bromofluorobenzene (S)	96.5		%	79 - 114	SW846 8260B			7/14/15 12:30	JPA	A
Dibromofluoromethane (S)	83.9		%	78 - 116	SW846 8260B			7/14/15 12:30	JPA	A
Toluene-d8 (S)	95.6		%	76 - 127	SW846 8260B			7/14/15 12:30	JPA	A
VOLATILE ORGANICS										
Acetone	121		ug/kg	13.5	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Acetonitrile	ND		ug/kg	13.5	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Acrolein	ND		ug/kg	67.6	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Acrylonitrile	ND		ug/kg	13.5	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
tert-Amyl methyl ether	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
tert-Amyl Alcohol	ND		ug/kg	13.5	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
tert-Amyl Ethylether	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Benzene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Benzyl Chloride	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Bromobenzene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Bromochloromethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Bromodichloromethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Bromoform	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Bromomethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
2-Butanone	ND		ug/kg	13.5	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
tert-Butyl Alcohol	ND		ug/kg	13.5	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
n-Butylbenzene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
tert-Butylbenzene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
sec-Butylbenzene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Carbon Disulfide	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D

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State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2082186 Ithica 21524 Concrete samples

Lab ID: **2082186001** Date Collected: 7/9/2015 07:45 Matrix: Solid

Sample ID: **Ithica 21524-Concrete** Date Received: 7/10/2015 08:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Carbon Tetrachloride	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Chloroacetonitrile	ND		ug/kg	33.8	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Chlorobenzene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1-Chlorobutane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Chlorodibromomethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Chloroethane	ND		ug/kg	6.8	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
2-Chloroethylvinyl ether	ND		ug/kg	203	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Chloroform	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1-Chlorohexane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Chloromethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Chloroprene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
3-Chloro-1-propene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
o-Chlorotoluene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Cyclohexane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,2-Dibromo-3-chloropropane	ND		ug/kg	6.8	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,2-Dibromoethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Dibromomethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
trans-1,4-Dichloro-2-butene	ND		ug/kg	6.8	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,1-Dichloro-2-Propanone	ND		ug/kg	33.8	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,2-Dichlorobenzene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,3-Dichlorobenzene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,4-Dichlorobenzene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Dichlorodifluoromethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,1-Dichloroethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,2-Dichloroethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,1-Dichloroethene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,2-Dichloroethene, Total	ND		ug/kg	5.4	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
cis-1,2-Dichloroethene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
trans-1,2-Dichloroethene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Dichlorofluoromethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,3-Dichloropropane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
2,2-Dichloropropane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,2-Dichloropropane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,1-Dichloropropene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
cis-1,3-Dichloropropene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
trans-1,3-Dichloropropene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,3-Dichloropropene, Total	ND		ug/kg	5.4	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Diisobutylene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D

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State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2082186 Ithica 21524 Concrete samples

Lab ID: **2082186001** Date Collected: 7/9/2015 07:45 Matrix: Solid

Sample ID: **Ithica 21524-Concrete** Date Received: 7/10/2015 08:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Diisopropyl ether	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,4-Dioxane	ND		ug/kg	101	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Ethyl Ether	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Ethyl Methacrylate	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Ethyl Acetate	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Ethyl tert-butyl ether	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Ethylbenzene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Freon 113	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Heptane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Hexachlorobutadiene	ND		ug/kg	6.8	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Hexachloroethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Hexane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
2-Hexanone	ND		ug/kg	13.5	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Iodomethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Isobutyl alcohol	ND		ug/kg	67.6	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Isopropyl Alcohol	ND		ug/kg	135	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Isopropylbenzene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
p-Isopropyltoluene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Methacrylonitrile	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Methyl methacrylate	ND		ug/kg	6.8	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Methyl acetate	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Methyl acrylate	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Methyl cyclohexane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Methyl t-Butyl Ether	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
4-Methyl-2-Pentanone(MIBK)	ND		ug/kg	13.5	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Methylene Chloride	6.6		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Naphthalene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Nitrobenzene	ND		ug/kg	27.1	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
2-Nitropropane	ND		ug/kg	13.5	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Octane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Pentachloroethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Pentane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
n-Propanol	ND		ug/kg	135	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Propionitrile	ND		ug/kg	13.5	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
n-Propylbenzene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Styrene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,1,1,2-Tetrachloroethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,1,2,2-Tetrachloroethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D

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State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2082186 Ithica 21524 Concrete samples

Lab ID: **2082186001** Date Collected: 7/9/2015 07:45 Matrix: Solid

Sample ID: **Ithica 21524-Concrete** Date Received: 7/10/2015 08:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Tetrachloroethene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Tetrahydrofuran	ND		ug/kg	13.5	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Toluene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Total Xylenes	ND		ug/kg	8.1	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,2,3-Trichlorobenzene	ND		ug/kg	6.8	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,2,4-Trichlorobenzene	ND		ug/kg	6.8	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,1,1-Trichloroethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,1,2-Trichloroethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Trichloroethene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Trichlorofluoromethane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,2,3-Trichloropropane	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,2,4-Trimethylbenzene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
1,3,5-Trimethylbenzene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Vinyl Acetate	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Vinyl Chloride	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
o-Xylene	ND		ug/kg	2.7	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
mp-Xylene	ND		ug/kg	5.4	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	112		%	56 - 124	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
4-Bromofluorobenzene (S)	111		%	51 - 128	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Dibromofluoromethane (S)	65.8		%	62 - 123	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
Toluene-d8 (S)	98.6		%	59 - 131	SW846 8260C	7/9/15	DD	7/13/15 11:47	JPA	D
PCBs										
Total Polychlorinated Biphenyl	0.32		mg/kg	0.033	SW846 8082A	7/13/15	KAC	7/13/15 13:10	EGO	A
Aroclor-1016	ND		mg/kg	0.033	SW846 8082A	7/13/15	KAC	7/13/15 13:10	EGO	A
Aroclor-1221	ND		mg/kg	0.033	SW846 8082A	7/13/15	KAC	7/13/15 13:10	EGO	A
Aroclor-1232	ND		mg/kg	0.033	SW846 8082A	7/13/15	KAC	7/13/15 13:10	EGO	A
Aroclor-1242	ND		mg/kg	0.033	SW846 8082A	7/13/15	KAC	7/13/15 13:10	EGO	A
Aroclor-1248	ND		mg/kg	0.033	SW846 8082A	7/13/15	KAC	7/13/15 13:10	EGO	A
Aroclor-1254	0.32		mg/kg	0.033	SW846 8082A	7/13/15	KAC	7/13/15 13:10	EGO	A
Aroclor-1260	ND		mg/kg	0.033	SW846 8082A	7/13/15	KAC	7/13/15 13:10	EGO	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
Decachlorobiphenyls (S)	74.3		%	46 - 120	SW846 8082A	7/13/15	KAC	7/13/15 13:10	EGO	A
Tetrachloro-m-xylene (S)	75.6		%	52 - 115	SW846 8082A	7/13/15	KAC	7/13/15 13:10	EGO	A
WET CHEMISTRY										
Cyanide, Reactive	ND		ppm	10	SW-846 7.3CN	7/13/15	THB	7/14/15 11:11	SYB	A

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ANALYTICAL RESULTS

Workorder: 2082186 Ithica 21524 Concrete samples

Lab ID: **2082186001** Date Collected: 7/9/2015 07:45 Matrix: Solid

Sample ID: **Ithica 21524-Concrete** Date Received: 7/10/2015 08:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Ignitability	Not ignitable	1			SW846 1030			7/13/15 12:00	SDL	
Moisture	3.7		%	0.1	S2540G-11			7/14/15 05:31	JP	A
Sulfide, Reactive	ND		ppm	6.2	SW846 7.3	7/13/15	THB	7/13/15 19:15	THB	A
Total Solids	96.3		%	0.1	S2540G-11			7/14/15 05:31	JP	A
TCLP METALS										
Arsenic, Total	ND		mg/L	0.14	SW846 6010C	7/14/15	JPS	7/14/15 14:05	SRT	A1
Barium, Total	ND		mg/L	2.8	SW846 6010C	7/14/15	JPS	7/14/15 14:05	SRT	A1
Cadmium, Total	ND		mg/L	0.011	SW846 6010C	7/14/15	JPS	7/14/15 14:05	SRT	A1
Chromium, Total	0.072		mg/L	0.028	SW846 6010C	7/14/15	JPS	7/14/15 14:05	SRT	A1
Lead, Total	ND		mg/L	0.033	SW846 6010C	7/14/15	JPS	7/14/15 14:05	SRT	A1
Mercury, Total	ND		mg/L	0.0020	SW846 7470A	7/15/15	MNP	7/15/15 15:13	MNP	A2
Selenium, Total	ND		mg/L	0.11	SW846 6010C	7/14/15	JPS	7/14/15 14:05	SRT	A1
Silver, Total	ND		mg/L	0.022	SW846 6010C	7/14/15	JPS	7/14/15 14:05	SRT	A1
TCLP SEMI-VOLATILES										
mp-Cresol	ND		ug/L	160	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
o-Cresol	ND		ug/L	160	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
1,4-Dichlorobenzene	ND		ug/L	60.0	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
2,4-Dinitrotoluene	ND		ug/L	60.0	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
Hexachlorobenzene	ND		ug/L	60.0	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
Hexachlorobutadiene	ND		ug/L	60.0	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
Hexachloroethane	ND		ug/L	60.0	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
Nitrobenzene	ND		ug/L	60.0	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
Pentachlorophenol	ND		ug/L	320	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
Pyridine	ND		ug/L	160	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
2,4,5-Trichlorophenol	ND		ug/L	160	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
2,4,6-Trichlorophenol	ND		ug/L	160	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2,4,6-Tribromophenol (S)	91.5		%	40 - 125	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
2-Fluorobiphenyl (S)	90.7		%	50 - 110	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
2-Fluorophenol (S)	49.7		%	20 - 75	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
Nitrobenzene-d5 (S)	101		%	40 - 110	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
Phenol-d5 (S)	34.6		%	13 - 49	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A
Terphenyl-d14 (S)	94.9		%	50 - 122	SW846 8270D	7/14/15	LEH	7/14/15 20:42	CGS	A

ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2082186 Ithica 21524 Concrete samples

Lab ID: **2082186001** Date Collected: 7/9/2015 07:45 Matrix: Solid

Sample ID: **Ithica 21524-Concrete** Date Received: 7/10/2015 08:51

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed	By	*Cntr*

Debra J Musser

Ms. Debra J. Musser
Project Coordinator

ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2082186001	1	Ithica 21524-Concrete	SW846 1030	Ignitability

According to Pa/USEPA regulations, this sample is not considered to be ignitable. (Ref 40 CFR 261.21)

ALS Environmental

34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F.717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1

Courier: FedEx

Tracking #: 8070728 2072

2082186

Co. Name: RSI

Contact (Report to): Dan Roth

Phone: 620-331-1200

Address: P.O. Box 587, Independence, KS 67301

Bill to (if different than Report to):

PO#: 15070701 6

Project Name/#: Ithica 21524 (Concrete Samples)

ALS Quote #:

TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.

Date Required:

Approved By:

Email? [X] Y droth@rsi-ks.com

Fax? [X] Y No.: 620-331-6216

	***Container Type	TCK	CG
	***Container Size	40ml	32oz
	***Preservative	NE	—

ANALYSES/METHOD REQUESTED: TCL Volatiles; Various Testing*

Enter Number of Containers Per Analysis

	Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	TCL Volatiles	Various Testing*
1	Ithica 21524-concrete	* see task order for analyses	07/09/15	745	G	SO		2
2	TC-concrete		07/09/15	745	G	SO	1	
3								
4								
5								
6								
7								
8								

AG 7/10/15

(completed by Sample Receiving)

Performed by: AF

Cooler Temp: 6

Therm. ID: 14891

No. of Coolers:

Notes:

Circle appropriate Y or N.

	Y/N
Correct containers?	Y
Correct sample volume?	Y
Correct preservation?	Y
Headspace/Volatiles?	
Custody seals Present?	N
(if present) Seals intact?	
Received on ice?	Y
COC/Labels complete/accurate?	Y
Container in good condition?	Y

SAMPLED BY (Please Print): CD Siliceo

Project Comments: Matrix - solids*, concrete

	Relinquished By / Company Name	Date	Time		Received By / Company Name	Date	Time
1				2	[signature]	7/10/15	0950
3				4			
5				6			
7				8			
9				10			

Data Deliverables: [X] Standard; [ ] CLP-like; [ ] NJ-Reduced; [ ] NJ-Full; [ ] (other)

EDDs Required? [ ] If yes, format type:

SDWA Forms? yes [ ] yes [ ] yes [ ] yes [ ] Other

State Samples Collected In? MD [ ] NJ [ ] NY [✓] PA [ ]

DOD Criteria Required?

ALS FIELD SERVICES: [ ] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

* G=Grab; C=Composite

**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

Rev 01-2013

Appendix E – Waste Profiles and Manifests

Seneca Meadows, Inc.
1786 Salcman Road
Waterloo, NY 13165
NYS DEC Facility #50S08
Telephone: 315-539-5624
Industrial Waste Fax: 315-539-0557
E-mail: dpannucci@iesi.com

File Number: _____

Generators Industrial Waste Profile
Non Hazardous Waste Only

This form is for disposal of Non Hazardous Waste at the Seneca Meadows Landfill only
NYSDEC Permit #8-4532-00023/00001-0

This form must be completed by the generator only

Generator's Name: Emersub 15, LLC c/o WSP Group			
Mailing Address: 11190 Sunrise Valley Drive	City: Reston	State: VA	Zip: 20191
Contact Person: Scott Haitz	Title: Senior Vice President		
Phone: 703-709-6500	Fax/E-mail: Scott.Haitz@wspgroup.com		
EPA ID#: NYD-002-228-625	State ID#: NA		

Facility Generating Waste:

Mailing Address: 620 S. Aurora Street	City: Ithaca	State: NY	Zip: 14853
Contact Person: Scott Haitz	Title: Senior Vice President		
Phone: 703-709-6500	Fax/E-mail: Scott.Haitz@wspgroup.com		

Authorized Hauler (Primary):

Name: Page ETC Inc	NYS Permit #:		
Mailing Address: 2758 Tombley Road	City: Weedsport	State: NY	Zip: 13166
Contact Person: Donna Keysor	Title: Terminal Manager		
Phone: 315-294-1647	Fax/E-mail:		

Authorized Hauler (Secondary):

Name:	NYS Permit #:		
Mailing Address:	City:	State:	Zip:
Contact Person:	Title:		
Phone:	Fax/E-mail:		

Waste Characterization:

Name of waste: Concrete Debris	Description of waste: Concrete Debris
Process that generated waste: Removal of concrete to excavate a utility trench	

Does this facility generate any hazardous waste? ☒ YES ☐ NO

If hazardous wastes are generated, does management feel that adequate controls are in place to control/separate waste streams? (if answer is no, a detailed explanation must be attached) ☒ YES ☐ NO

Certification of Representative Sample

Seneca Meadows File Number: _____

Generator's name: Emersub 15, LLC	
Waste name: Concrete Debris	
Sampler's name: Charles (CD) Siliceo	
Sample date: 7/10/2015	Sample time: 0745

NOTE: This sample must be received by the lab within 24 hours

It is critical that the testing laboratory receive a representative sample of the waste stream that you intend to dispose of at Seneca Meadows Landfill. Please follow the instructions very carefully.

Sample Collection Process:

- Must be done by your consultant or selected laboratory representative
- Sample must be kept cold (placed in ice pack)
- Amount of samples required is one (1) container. However, we may require a semi-annual testing of the waste stream sample if the quantity exceeds 5,000 (thousand) tons per year

Samples required – One time only approvals:

1 – 200 tons	One (1) sample required
201 – 500 tons	Two (2) samples required
501 – 1,000 tons	Three (3) samples required
1,001 – 2,000 tons	Four (4) samples required
Over 2,000 tons	Determined by Seneca Meadows

Lab Selection:

We will have our waste stream analysis completed by:

Laboratory Name: ALS Environmental			
Mailing Address: 34 Dogwood Lane	City: Middletown	State: PA	Zip: 17057
Contact Person: Scott Brunk	Title: Operations Manager		
Phone: 717-944-5541	Fax/E-mail: Scott.Brunk@ALSGlobal.com		

Sample Certification:

I hereby certify that I personally collected a representative sample of waste stream at the location, time and date as listed above.

Signature: Charles Siliceo Date: 07-15-15

~~Laboratory~~: Remediation Services Inc.

Generator Witness: Daniel B. Roth

General Information

Seneca Meadows File Number: _____

Physical Characteristic:

☒ Solid ☐ Sludge Minimum % of solids _____ for waste stream

NOTE: Acceptable level of solids must exceed 20% and have no free liquids

Odor:

☒ None ☐ Mild ☐ Strong

Transportation:

☐ Roll Off ☒ Trailer ☐ Packer
☐ Other _____

NOTE: No drums are acceptable

☒ One time only ☐ On going

Approximate amount: 30 tons Amount of monthly _____ tons

What is the maximum tonnage for any given day: 30 tons

Briefly describe any special handling that could be required for this waste item:
(dust, protective clothing...)

Generators certification to Seneca Meadows landfill

(Please Initial)

I / we hereby certify that all of the information that we have presented to Seneca Meadows, Inc. on this form or any attachments is an accurate representation of our waste stream. GER

I / we hereby certify that the laboratory can contact Seneca Meadows, Inc. directly to discuss this waste stream. GER

I / we hereby certify that the waste stream that we are applying for disposal at Seneca Meadows, Inc. is not a listed or known hazardous waste. In addition, none of the components of the process, or any residue generated are known to be a hazardous, radioactive, or contain regulated concentrate of polychlorinated biphenyles (PCBs) waste streams. GER

I / we hereby agree that any charges in this waste stream, either in process method, changes of any of the components, or laboratory data received, that we will notify Seneca Meadows, Inc. in writing within 24 hours of our findings (*Fax is the preferred method of notification*). GEK

Name: Glen Rieger - WSP Signature: Glen Rieger
on behalf of Emersub 15, LLC

Title: General Manager Date: 7/16/15

Industrial Waste Characterization Information

Section One - General project information (please complete in full)
If not applicable, denote with "NA"

Site / Project Engineering Company: WSP Group			
Mailing Address: 11190 Sunrise Valley Drive	City: Reston	State: VA	Zip: 20191
Contact Person: Scott Haitz	Title: Senior Vice President		
Phone: 703-709-6500	Fax/E-mail: Scott.Haitz@WSPGroup.com		

General Contractor: Remediation Services, Inc			
Mailing Address: PO Box 587	City: Independence	State: KS	Zip: 67301
Contact Person: Daniel Roth	Title: Project Manager		
Phone: 620-331-1200	Fax/E-mail: droth@rsi-ks.com		

Seneca Meadows Customer to be Billed: Capitol Environmental Services, Inc			
Mailing Address: 200 Biddle Avenue, Suite 205	City: Newark	State: DE	Zip: 19702
Contact Person: Bruce Hillman	Title: Senior Business Manager		
Phone: 860-601-0387	Fax/E-mail: bhillman@capitolenv.com		

Site Owner: Emersub 15, LLC C/O WSP Group			
Mailing Address: 11190 Sunrise Valley Drive, Suite 300	City: Reston	State: VA	Zip: 20191
Contact Person: Scott Haitz	Title: Senior Vice-President		
Phone: 703-709-6500	Fax/E-mail: Scott.Haitz@WSPGroup.com		

Is the material a listed hazardous waste? ☐ YES ☒ NO

Description of the waste: Concrete and steel pipe

NYSDEC Waste Type Code: N - _____ Comments: _____

Section Two - Site information (please complete in full)
If not applicable, denote with "NA"

Was the site ever suspected of having hazardous materials? ☒ YES ☐ NO

If so, what was the source of the potential hazardous materials? F001 - Solvent

Which compounds were suspected? Trichloroethylene

Has testing been performed to quantify these compounds? ☒ YES ☐ NO

Who prepared the sampling and analysis program?

Company Name: NA			
Mailing Address:	City:	State:	Zip:
Contact Person:	Title:		
Phone:	Fax/E-mail:		

Was the program reviewed by the NYSDEC and NYDOH officials prior to installation? ☐ YES ☒ NO

Was the program approved? NA ☐ YES ☐ NO

Please attach any available analytical data (*including Chain of Custody Record*)

What conclusions were made regarding the laboratory data?

Is the site a registered Superfund Site? ☐ YES ☒ NO

If so, place Site Registration Number here: _____

Will copies of the scale manifest / tickets be required? ☒ YES ☐ NO

NOTE: Seneca Meadows, Inc. may have to charge a nominal administrative fee for providing this information at a later date, if not notified appropriately herein

Additional comments, handling precautions or supplemental information:

WASTE MANAGEMENT

EZ Profile™

Requested Facility: _____ ☐ Unsure Profile Number: _____

☐ Multiple Generator Locations (Attach Locations) ☑ Request Certificate of Disposal ☐ Renewal? Original Profile Number: _____

A. GENERATOR INFORMATION (MATERIAL ORIGIN)

1. Generator Name: Emersub 15, LLC
2. Site Address: 620 S. Aurora Street
   (City, State, ZIP) Ithaca, NY 14853
3. County: Tompkins
4. Contact Name: Scott Haitz - Senior Vice President, WSP Group
5. Email: Scott.Haitz@wspgroup.com
6. Phone: 703-709-6500 7. Fax: 703-709-8505
8. Generator EPA ID: NYD-002-228-625 ☐ N/A
9. State ID: _____ ☑ N/A

B. BILLING INFORMATION ☐ SAME AS GENERATOR

1. Billing Name: Remediation Services, Inc
2. Billing Address: PO Box 587
   (City, State, ZIP) Independence, KS 67301
3. Contact Name: Michelle Norton
4. Email: mnorton@rsi-ks.com
5. Phone: 620-331-1200 6. Fax: 620-331-6216
7. WM Hauled? ☑ Yes ☐ No
8. P.O. Number: 21524
9. Payment Method: ☑ Credit Account ☐ Cash ☐ Credit Card

C. MATERIAL INFORMATION

1. Common Name: Trench Spoils

   Describe Process Generating Material: ☐ See Attached

   Excavation of soils for installation of underground piping

2. Material Composition and Contaminants: ☑ See Attached

1. Soil	80-100
2. Gravel	0-10
3. Concrete	0-10
4. Steel	0-2
Total composition must be equal to or greater than 100%	≥100%

3. State Waste Codes: _____ ☑ N/A
4. Color: Brown
5. Physical State at 70°F: ☑ Solid ☐ Liquid ☐ Other: _____
6. Free Liquid Range Percentage: _____ to _____ ☑ N/A
7. pH: _____ to _____ ☑ N/A
8. Strong Odor: ☐ Yes ☑ No Describe: _____
9. Flash Point: ☐ <140°F ☐ 140°–199°F ☑ ≥200° ☐ N/A

D. REGULATORY INFORMATION

1. EPA Hazardous Waste? ☑ Yes* ☐ No
   Code: F001
2. State Hazardous Waste? ☐ Yes ☑ No
   Code: _____
3. Is this material non-hazardous due to Treatment, Delisting, or an Exclusion? ☐ Yes* ☑ No
4. Contains Underlying Hazardous Constituents? ☐ Yes* ☑ No
5. From an industry regulated under Benzene NESHAP? ☐ Yes* ☑ No
6. Facility remediation subject to 40 CFR 63 GGGGG? ☐ Yes* ☑ No
7. CERCLA or State-mandated clean-up? ☑ Yes* ☐ No
8. NRC or State-regulated radioactive or NORM waste? ☐ Yes* ☑ No

***If Yes, see Addendum (page 2) for additional questions and space.**

9. Contains PCBs? → If Yes, answer a, b and c. ☑ Yes ☐ No
   a. Regulated by 40 CFR 761? ☐ Yes ☑ No
   b. Remediation under 40 CFR 761.61 (a)? ☐ Yes ☑ No
   c. Were PCB imported into the US? ☐ Yes ☑ No
10. Regulated and/or Untreated Medical/Infectious Waste? ☐ Yes ☑ No
11. Contains Asbestos? ☐ Yes ☑ No
    → If Yes: ☐ Non-Friable ☐ Non-Friable – Regulated ☐ Friable

E. ANALYTICAL AND OTHER REPRESENTATIVE INFORMATION

1. Analytical attached ☐ Yes

   Please identify applicable samples and/or lab reports:

   Sample analysis dated July 2, from ALS laboratories.
   Sample No. 21524-Soil

2. Other information attached (such as MSDS)? ☐ Yes

F. SHIPPING AND DOT INFORMATION

1. ☑ One-Time Event ☐ Repeat Event/Ongoing Business
2. Estimated Quantity/Unit of Measure: 30
   ☑ Tons ☐ Yards ☐ Drums ☐ Gallons ☐ Other: _____
3. Container Type and Size: End Dump Trailers
4. USDOT Proper Shipping Name: ☐ N/A

   NA3077, Hazardous Waste Solid, N.O.S. (F001, Trichloroethylene),9,III

G. GENERATOR CERTIFICATION (PLEASE READ AND CERTIFY BY SIGNATURE)

By signing this EZ Profile™ form, I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this material, and that all relevant information necessary for proper material characterization and to identify known and suspected hazards has been provided. Any analytical data attached was derived from a sample that is representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. All changes occurring in the character of the material (i.e., changes in the process or new analytical) will be identified by the Generator and be disclosed to Waste Management prior to providing the material to Waste Management.

If I am an agent signing on behalf of the Generator, I have confirmed with the Generator that information contained in this Profile is accurate and complete.

Name (Print): Glen Rieger Date: 7/14/15

Title: General Manager

Company: WSP USA Corp.

Certification Signature

Glen Rieger
on behalf of Emersub 15, LLC

WASTE MANAGEMENT

EZ Profile™ Addendum

Only complete this Addendum if prompted by responses on EZ Profile™ (page 1) or to provide additional information. Sections and question numbers correspond to EZ Profile™.

Profile Number: _____

C. MATERIAL INFORMATION

Describe Process Generating Material (Continued from page 1): If more space is needed, please attach additional pages.

Material Composition and Contaminants (Continued from page 1): If more space is needed, please attach additional pages.

5. Trichloroethylene	20.4 ppb
6. Methylene Chloride	17.5 ppb
7. Polychlorinated Biphenyls	0.94 ppm
8.	
9.	
Total composition must be equal to or greater than 100%	≥100%

D. REGULATORY INFORMATION

Only questions with a "Yes" response in Section D on the EZ Profile™ form (page 1) need to be answered here.

1. EPA Hazardous Waste
   a. Please list all USEPA listed and characteristic waste code numbers:

   F001

   b. Is the material subject to the Alternative Debris standards (40 CFR 268.45)? ☐ Yes ☑ No
   c. Is the material subject to the Alternative Soil standards (40 CFR 268.49)? → If Yes, complete question 4. ☐ Yes ☑ No
   d. Is the material exempt from Subpart CC Controls (40 CFR 264.1083)? ☑ Yes ☐ No
      → If Yes, please check **one** of the following:
      ☑ Waste meets LDR or treatment exemptions for organics (40 CFR 264.1082(c)(2) or (c)(4))
      ☐ Waste contains VOCs that average <500 ppmw (CFR 264.1082(c)(1)) – will require annual update.
2. State Hazardous Waste → Please list all state waste codes: _____
3. For material that is Treated, Delisted, or Excluded → Please indicate the category, below:
   ☐ Delisted Hazardous Waste ☐ Excluded Waste under 40 CFR 261.4 → Specify Exclusion: _____
   ☐ Treated Hazardous Waste Debris ☐ Treated Characteristic Hazardous Waste → If checked, complete question 4.
4. Underlying Hazardous Constituents → Please list all Underlying Hazardous Constituents:

5. Industries regulated under Benzene NESHAP include petroleum refineries, chemical manufacturing plants, coke by-product recovery plants, and TSDFs.
   a. Are you a TSDF? → If yes, please complete Benzene NESHAP questionnaire. If not, continue. ☐ Yes ☐ No
   b. Does this material contain benzene? ☐ Yes ☐ No
      1. If yes, what is the flow weighted average concentration? _____ ppmw
   c. What is your facility's current total annual benzene quantity in Megagrams? ☐ <1 Mg ☐ 1–9.99 Mg ☐ ≥10 Mg
   d. Is this waste soil from a remediation? ☐ Yes ☐ No
      1. If yes, what is the benzene concentration in remediation waste? _____ ppmw
   e. Does the waste contain >10% water/moisture? ☐ Yes ☐ No
   f. Has material been treated to remove 99% of the benzene or to achieve <10 ppmw? ☐ Yes ☐ No
   g. Is material exempt from controls in accordance with 40 CFR 61.342? ☐ Yes ☐ No
      → If yes, specify exemption: _____
   h. Based on your knowledge of your waste and the BWON regulations, do you believe that this waste stream is subject to treatment and control requirements at an off-site TSDF? ☐ Yes ☐ No
6. 40 CFR 63 GGGGG → Does the material contain <500 ppmw VOHAPs at the point of determination? ☐ Yes ☐ No
7. CERCLA or State-Mandated clean up → Please submit the Record of Decision or other documentation with process information to assist others in the evaluation for proper disposal. A "Determination of Acceptability" may be needed for CERCLA wastes not going to a CERCLA approved facility.
8. NRC or state regulated radioactive or NORM Waste → Please identify Isotopes and pCi/g: _____

WASTE MANAGEMENT

Additional Profile Information

Profile Number: _____

C. MATERIAL INFORMATION

Material Composition and Contaminants (Continued from page 2): If more space is needed, please attach additional pages.

10.	
11.	
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35.	
36.	
37.	
38.	
39.	
40.	
Total composition must be equal to or greater than 100%	≥100%

D. REGULATORY INFORMATION

1. EPA Hazardous Waste
   a. Please list all USEPA listed and characteristic waste code numbers (Continued from page 2):

Revised September 12, 2014

704224

CAPK2

Seneca Meadows, Inc.
1786 Salcman Rd.
Waterloo, NY 13165
Ph: (315) 539-5624 Fax: (315) 539-3097

Ticket: 2687467
Date: 07/30/2015
Time: 12:51:09 - 13:51:25

Customer: 15CAP / CAPITOL ENVIROMEN
Carrier: 0621 / PAGE E T C INC
Profile: 2015-075-15CAP / 15CAP-2015-07
Cust Ref: TRL D-5293
Gross: 81580LBS Manual
Tare: 36920LBS
Net: 44660LBS

Origin: 132 / TOMPKINS
Truck: PAGE3056
Comment:

Wastes & Services	Quantity
SWCD1 / CONSTRUCT DEBRI	22.3300 Tons

Driver:

3056 704224

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	NYD 002 228 625	1		

GENERATOR

5. Generator's Name and Mailing Address
Emersub 15, LLC C/O WSP Group
11190 Sunrise Valley Dr., Reston, VA 20191
Generator's Phone: (703) 709-6500 Attn: Scott Haitz

Generator's Site Address (if different than mailing address)
620 S. Aurora St. Ithaca, NY 14853

6. Transporter 1 Company Name: Page ETC, Inc.
U.S. EPA ID Number: NYD 986 969 947

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
Seneca Meadows, Inc.
1786 Salcman Rd., Waterloo, NY 13165
Facility's Phone: (315)539-5624
U.S. EPA ID Number: NOT REQUIRED

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Non RCRA, Non DOT Regulated Waste Concrete, None, None	001	DT	est 23	T	
2.						
3.						
4.						

13. Special Handling Instructions and Additional Information
App # 15-075
Job# CAN-BHIL

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: ON BEHALF OF EMERSUB 15 LLC NATHANIEL WINSTON
Signature: ON BEHALF OF EMERSUB 15 LLC
Month: 7 Day: 30 Year: 15

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Mike Clark
Signature: Mike Clark
Month: 7 Day: 30 Year: 15

Transporter 2 Printed/Typed Name
Signature
Month Day Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

17c. Signature of Alternate Facility (or Generator)
Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name
Signature
Month Day Year 7 30 15

169-BLC-O 6 10498 (Rev. 9/09) DESIGNATED FACILITY TO GENERATOR

CWMI

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: NYD002228625
2. Page 1 of: 1
3. Emergency Response Phone: (800)424-9300
4. Manifest Tracking Number: 002733342 GBF

GENERATOR

5. Generator's Name and Mailing Address
EMERSUB 15, LLC c/o WSP
5 SULLIVAN ST
CAZENOVIA NY 13035
Generator's Phone: (607)274-6170

Generator's Site Address (if different than mailing address)
EMERSUB 15, LLC
620 S AURORA ST
ITHACA, NY 14850-5797

6. Transporter 1 Company Name: PAGE ETC INC
U.S. EPA ID Number: NYD986969947

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, L.L.C.
1550 BALMER RD.
MODEL CITY NY 14107
Facility's Phone: (716)286-1550
U.S. EPA ID Number: NYD049836679

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. RQ, NA3077, HAZARDOUS WASTE, SOLID, N.O.S., 9, III, (F001) NY301858	001	DT	15 TON	P	F001
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
CHEMTREC Emergency Response Number (800)424-9300 WMI Contract CCN24117 ERG #171
NY 301858 TCE Contaminated Soil
SR # _____ Weight in section 11 is estimated 15
8166732

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: ON BEHALF OF EMERSUB 15 LLC
Signature: Daniel Lisicki
Month: 8 Day: 10 Year: 15

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Michael Trzaski
Signature:
Month: 8 Day: 10 Year: 15

Transporter 2 Printed/Typed Name
Signature
Month Day Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☒ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Qty est. Actual Rec'd 26120P
Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H132			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: Lynn Piechowski
Signature:
Month: 08 Day: 11 Year: 15

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Transporter Log

CWM Chemical Services, Inc.
Model City, NY

206871 SCALE 1

_____ Cubic Yards

81668732 Receipt #

37853 PC Trailer License Plate # and State

GROSS 60920 LB

_____ Service Req. #

NY3018558 Profile # Permit #

Pace Transporter Name

0462/2020 Tractor/Trailer/Roll-off #

09:19 AM 08/11/15

Michael Townsend Driver's Name

_____ Generator

GROSS 34800 LB

261207

Scheduled Arrival: 8/11/15 Date 6:00 Time

Actual Arrival: _____ Date 538 Time In 925 Time Out 09:21 AM 08/11/15

Arrived during Blackout? Y (N) Notified DEC? Y / N

Receiving: _____ Initials _____ Comments

☐ Leaker ☐ Permit Violation ☐ Placarding/Veh. I.D. Violation

☐ Other (specify _____

☐ Bulk to Landfill ☐ No wet line ☐ Flatbed ☐ Stabilization ☐ Drums ☐ Tanker ☐ Transformers

Laboratory

Time In	Time Out	Initials	Comments
		JW	

Stabilization

Time In	Time Out	Initials	Gross Wt.	Comments

Landfill

Time In	Time Out	Initials	Comments

Other

Time In	Time Out	Initials	Comments

Aqueous Treatment

Time In	Time Out	Signature (NO Initials)	Comments

Facility Personnel (please initial)

_____ Smoking or eating in prohibited areas

_____ Failure to obey instructions of facility personnel

_____ Failure to wear appropriate PPE

_____ Unsafe driving practices

_____ Other (specify) _____

_____ Leaving truck unattended

_____ Failure to display overweight flag

_____ Improper tarping or detarpin

_____ Overweight upon arrival

Security Guard Initials: _____
(Indicating receipt of Wash Bay pass, if necessary)

Driver's Comments

WASTE MANAGEMENT
1550 Balmer Road
Model City, NY 14107
716 286 1550
716 286 0211 Fax

EMERSUB 15, LLC
ATTN: C/O WSP , ANDREW MADDEN
NYD002228625
5 SULLIVAN STREET
CAZENOVIA NY 13035

CERTIFICATE OF DISPOSAL

CWM CHEMICAL SERVICES, L.L.C., EPA ID: NYD049836679, has received waste material from EMERSUB 15, LLC on 08/11/15 as described on Shipping Document number 002733342GBF Sequence number 01.

Profile Number: NY301858
CWM Tracking ID: 8166873201
CWM Unit #: 1*0
Disposal Date: 08/11/15

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

MICHAEL D MAHAR
DISTRICT MANAGER
Certificate # 376249
08/11/15

For questions please call our Customer Service Dept. at (800) 843-3604

CWMI

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: NYD002226625
2. Page 1 of: 1
3. Emergency Response Phone: (800)424-9300
4. Manifest Tracking Number: 002733343 GBF

GENERATOR

5. Generator's Name and Mailing Address
EMERSUB 15, LLC c/o WSP
5 SULLIVAN ST
CAZENOVIA NY 13035
Generator's Phone: (607)274-6170

Generator's Site Address (if different than mailing address)
EMERSUB 15, LLC
620 S AURORA ST
ITHACA, NY 14850-5797

6. Transporter 1 Company Name: PAGE ETC INC. 8/12/15
U.S. EPA ID Number: NYD986969947

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, L.L.C.
1550 BALMER RD.
MODEL CITY NY 14107
Facility's Phone: (716)286-1550
U.S. EPA ID Number: NYD049836679

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. RQ, NA3077, HAZARDOUS WASTE, SOLID, N.O.S., 9, III, (F001) NY301858	001	DT	15 Tons	T	F001
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
CHEMTREC Transportation Response Number (800)424-9300 WMI Contract CCN24117 ERG #171
NY 301858 TCE Contaminated Soil
SR #_____ Weight in section 11 is estimated 81668752
Recd 30320P

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: ON BEHALF OF EMERSUB 15 LLC DANIEL LEWICKI
Signature: [signature]
Month 8 Day 10 Year 15

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Michael Tremblay
Signature: [signature]
Month 8 Day 10 Year 15
Transporter 2 Printed/Typed Name:
Signature:
Month Day Year

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H132			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Lynn Rechowski
Signature: [signature]
Month 08 Day 12 Year 15

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

Transporter Log

CWM Chemical Services, Inc.
Model City, NY

206892

Cubic Yards

SCALE 1

81608752 — Receipt #
37393 PC N.Y. — Trailer License Plate # and State

Service Req. # — NY3018558 — Profile # — Permit #

GROSS SCALE 2 65480 LB

PAGE — Transporter Name
0460/2531 — Tractor/Trailer/Roll-off #

MIKE TROSDALE — Driver's Name
EMERSUB — Generator

06:48 AM 08/12/15 GROSS 35160 LB

30320 P

Scheduled Arrival: 8/12/15 — Date; 6:00 — Time

Actual Arrival: Date; Time In: 540; Time Out: 730

07:26 AM 08/12/15

Arrived during Blackout? Y / N Notified DEC? Y / N

Receiving: Initials; Comments

☐ Leaker ☐ Permit Violation ☐ Placarding/Veh. I.D. Violation

☐ Other (specify)

☐ Bulk to Landfill ☐ No wet line ☐ Flatbed ☐ Stabilization ☐ Drums ☐ Tanker ☐ Transformers

Laboratory — Time In | Time Out | Initials: AC | Comments

Stabilization — Time In | Time Out | Initials | Gross Wt. | Comments

Landfill — Time In | Time Out | Initials | Comments

Other — Time In | Time Out | Initials | Comments

Aqueous Treatment — Time In | Time Out | Signature (NO Initials) | Comments

Facility Personnel (please initial)

____	Smoking or eating in prohibited areas	____	Leaving truck unattended
____	Failure to obey instructions of facility personnel	____	Failure to display overweight flag
____	Failure to wear appropriate PPE	____	Improper tarping or detarpin
____	Unsafe driving practices	____	Overweight upon arrival
____	Other (specify) ____		

Security Guard Initials: ____
(Indicating receipt of Wash Bay pass, if necessary)

Driver's Comments

WASTE MANAGEMENT
1550 Balmer Road
Model City, NY 14107
716 286 1550
716 286 0211 Fax

EMERSUB 15, LLC
ATTN: C/O WSP , ANDREW MADDEN
NYD002228625
5 SULLIVAN STREET
CAZENOVIA NY 13035

CERTIFICATE OF DISPOSAL

CWM CHEMICAL SERVICES, L.L.C., EPA ID: NYD049836679, has received waste material from EMERSUB 15, LLC on 08/12/15 as described on Shipping Document number 002733343GBF Sequence number 01.

Profile Number: NY301858
CWM Tracking ID: 8166875201
CWM Unit #: 1*0
Disposal Date: 08/12/15

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

MICHAEL D MAHAR
DISTRICT MANAGER
Certificate # 376269
08/13/15

For questions please call
our Customer Service Dept.
at (800) 843-3604

CWMI

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
N Y D 0 0 2 2 2 8 6 2 5	1	(800) 424-9300	002733344 GBF

GENERATOR

5. Generator's Name and Mailing Address
EMERSUB 15, LLC c/o WSP
5 SULLIVAN ST
CAZENOVIA NY 13035

Generator's Site Address (if different than mailing address)
EMERSUB 15, LLC
620 S AURORA ST
ITHACA, NY 14850-5797

Generator's Phone: (607) 274-6170

6. Transporter 1 Company Name: Page ETC. — U.S. EPA ID Number:

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, L.L.C.
1550 BALMER RD.
MODEL CITY NY 14107

U.S. EPA ID Number: N Y D 0 4 9 8 3 6 6 7 9

Facility's Phone: (716) 286-1550

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. RQ, NA3077, HAZARDOUS WASTE, SOLID, N.O.S., 9, III, (F001) NY301858	001	~~DT~~ CM	EST 32000	P	F001
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
CHEMTREC Emergency Response Number (800)424-9300 WMI Contract CCN24117 ERG #171 81668767
NY 301858 TCE Contaminated Soil
SR #_____ Weight in section 11 is estimated 15 recd 31360P

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: ON BEHALF OF EMERSUB 15, LLC NATE WINSTON — Signature: ON behalf of Emersub 15 LLC — Month 8 Day 10 Year 15

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Michael Tansdale — Signature — Month 8 Day 10 Year 15

Transporter 2 Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H132			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: Jody Parfinski — Signature: Jody Parfinski — Month 8 Day 13 Year 15

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO PROVIDE COPY TO GENERATOR (IF REQUIRED)

Transporter Log

CWM Chemical Services, Inc.
Model City, NY

206909 — Cubic Yards

SCALE 1

81668767 — Receipt #

31893 PC N.Y. — Trailer License Plate # and State

GROSS 67060 LB

Service Req. # | Profile # | Permit #

Page — Transporter Name

0460 / NA / 3008 — Tractor/Trailer/Roll-off #

96ABE BM 08/13/15

Michael Truesdale — Driver's Name

Emerson — Generator

31360P

Scheduled Arrival: 8/13/15 (Date) 6:00 (Time)

GROSS 35700 LB

Actual Arrival: (Date) 5:36 (Time In) (Time Out) 08:11 AM 08/13/15

Arrived during Blackout? Y / N Notified DEC? Y / N

Receiving: (Initials) (Comments)

☐ Leaker ☐ Permit Violation ☐ Placarding/Veh. I.D. Violation

☐ Other (specify)

☐ Bulk to Landfill ☐ No wet line ☐ Flatbed ☐ Stabilization ☐ Drums ☐ Tanker ☐ Transformers

Laboratory

Time In	Time Out	Initials	Comments
		JLG	

Stabilization

Time In	Time Out	Initials	Gross Wt.	Comments

Landfill

Time In	Time Out	Initials	Comments

Other

Time In	Time Out	Initials	Comments

Aqueous Treatment

Time In	Time Out	Signature (NO Initials)	Comments

Facility Personnel (please initial)

____	Smoking or eating in prohibited areas	____	Leaving truck unattended
____	Failure to obey instructions of facility personnel	____	Failure to display overweight flag
____	Failure to wear appropriate PPE	____	Improper tarping or detarpin
____	Unsafe driving practices	____	Overweight upon arrival
____	Other (specify) ____		

Security Guard Initials: ____
(Indicating receipt of Wash Bay pass, if necessary)

Driver's Comments

WASTE MANAGEMENT

WASTE MANAGEMENT
1550 Balmer Road
Model City, NY 14107
716 286 1550
716 286 0211 Fax

EMERSUB 15, LLC
ATTN: C/O WSP , ANDREW MADDEN
NYD002228625
5 SULLIVAN STREET
CAZENOVIA NY 13035

CERTIFICATE OF DISPOSAL

CWM CHEMICAL SERVICES, L.L.C., EPA ID: NYD049836679, has received waste material from EMERSUB 15, LLC on 08/13/15 as described on Shipping Document number 002733344GBF Sequence number 01.

Profile Number: NY301858
CWM Tracking ID: 8166876701
CWM Unit #: 1*0
Disposal Date: 08/13/15

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

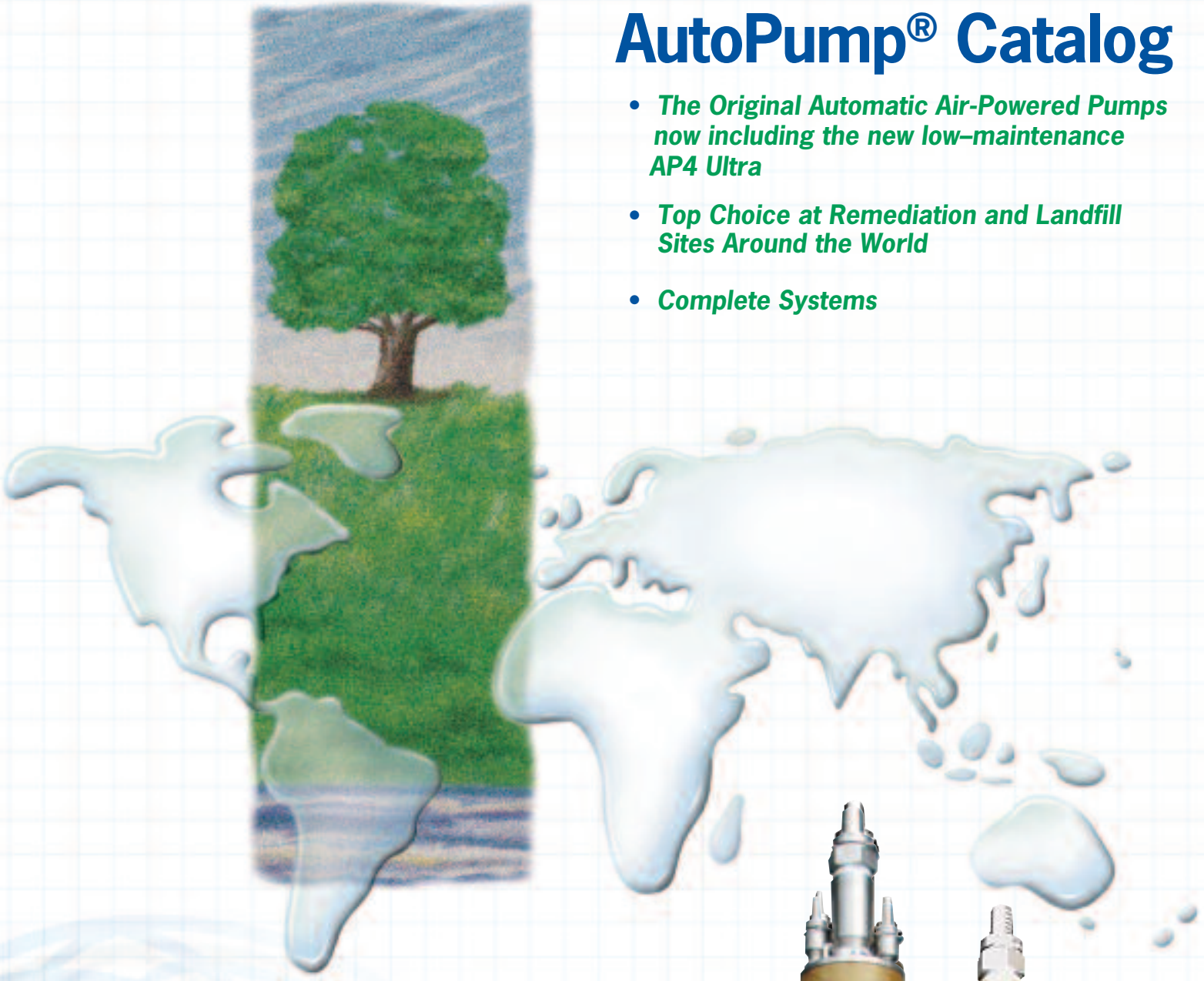
MICHAEL D MAHAR
DISTRICT MANAGER
Certificate # 376288
08/18/15

For questions please call our Customer Service Dept. at (800) 843-3604

Appendix F – QED Autopump Literature

AutoPump® Catalog

- *The Original Automatic Air-Powered Pumps now including the new low–maintenance AP4 Ultra*
- *Top Choice at Remediation and Landfill Sites Around the World*
- *Complete Systems*



QED™
Innovative Environmental Products

Featuring the AP4+ Series and the new low - maintenance AP4 Ultra

AutoPump Automatic Air-Powered Pumps

Automatic air-powered pumps offer exceptional capabilities in the severe pumping conditions found at many landfill and remediation sites. QED's AutoPump® (patent pending) pumps originated the automatic air-powered pump concept in 1986 and have lead the industry ever since. AutoPumps were designed specifically to handle difficult conditions reliably and safely, including hydrocarbons, landfill lechates and condensates, solvents, suspended solids, silts, corrosives, and high viscosities, along with high temperatures and frequent starts and stops. Air-powered AutoPumps are proven worldwide at thousands of sites, which is why AutoPumps are the No. 1 choice of professionals based on reliability, durability, performance range, and technical support.

The superiority of the AutoPump design is based on four key strengths:

- high clearance fluid pathways
- using air as the motive force
- materials of construction matched to site conditions
- a simple yet rugged operating mechanism

Unlike electric pumps, air-powered AutoPumps use no high-speed motors, bearings or impellers, so AutoPumps don't heat up, sieze up, or get ground up. Liquid shearing is typical of electric pumps, creating oil-water emulsions that reduce the performance of downstream treatment equipment. AutoPumps cause far less liquid shearing than electric submersible pumps so downstream treatment systems can perform better. Air-powered also means eliminating the dangers and costs of electricity at and in the well. Finally, AutoPumps actually have a built-in control system – they pump when there is liquid present and shut down when the level is drawn down, without the need for any sensors in the well or controls at the surface.

Application Excellence

Remediation applications and landfill fluids pumping are very challenging. QED is dedicated to providing a comprehensive approach to meeting the specific needs of each site and well, taking into account many factors beyond just flow rate and depth, such as:

- Preferred inlet position number – top or bottom
- Pump length to match water column and meet drawdown requirements
- A broad range of materials of construction to match fluid properties and temperature
- Jacketed tubing sets, bundled hose and quick-connect options to ease installation and service
- A wide variety of standard and custom wellhead completions to fit site needs

Experience and Expertise

The AutoPump specialists at QED have unsurpassed experience in both typical and special applications, providing the quality and care that makes a difference. Call us at 1-800-624-2026 for prompt, professional assistance, or visit our web site at www.qedenv.com to access product and application information.

QED
Environmental Systems

Table of Contents

QED

2355 Bishop Circle West
Dexter, MI 48130
USA

1.800.624.2026
T: 734:995.2547
F: 734.995.1170
info@qedenv.com
www.qedenv.com

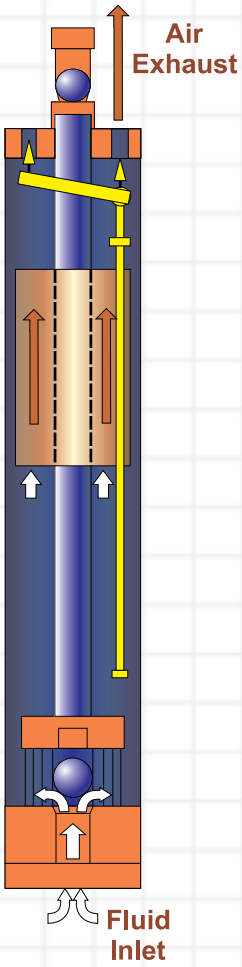
How AutoPumps Work

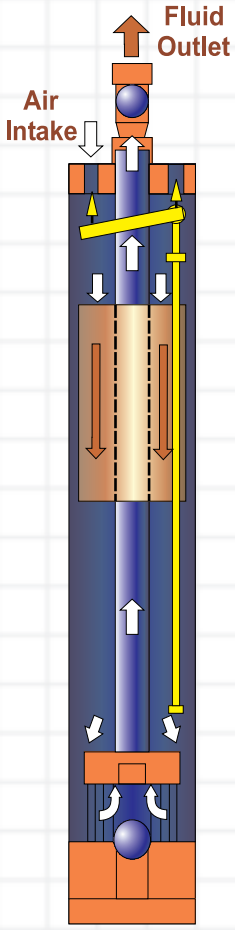
Fill Cycle

The fluid pushes the inlet check valve open and fluid enters the pump.

As the fluid level rises, air is expelled through the exhaust air valve and the internal float rises to the top of its stroke.

In this upper position, the float triggers a lever assembly, which closes the air exhaust valve and opens the air inlet allowing air to enter and pressurize the pump.





Discharge Cycle

With the air inlet open, air pressure builds up within the pump body. This causes the fluid inlet check valve to close and forces the fluid to be displaced up and out of the fluid outlet.

As the fluid level falls, the float moves downward to the bottom of its stroke.

In this lower position, the float triggers the lever assembly to close the air supply and open the air exhaust valve, and a new cycle begins.

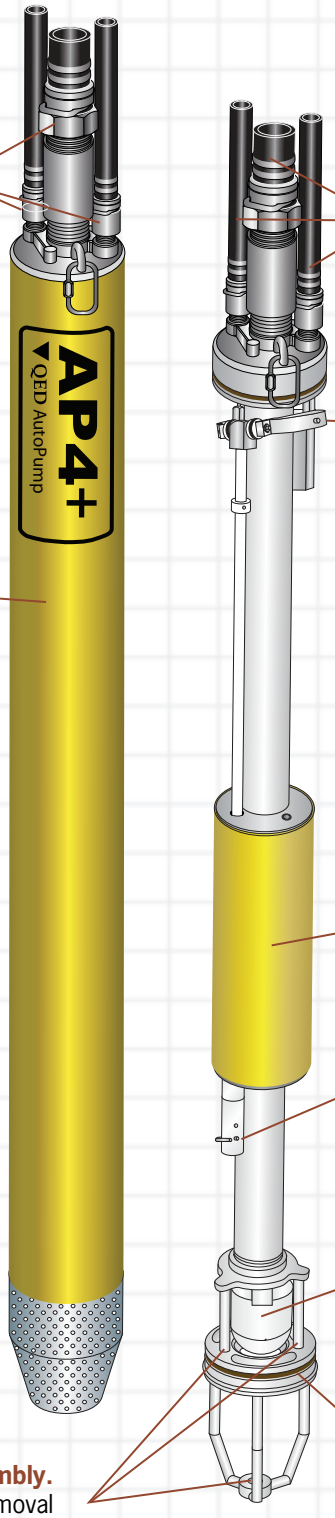
Note: This illustration is for a bottom filling format. A top loader is also available with both the inlet and discharge at the top of the pump.

AutoPump Reliability

The AutoPump® air-powered pump operating cycle diagrams and explanation above tell just part of the story of AutoPump technology. Engineering an automatic pump to function in clear water is just the start. The real secrets of AutoPump durability and reliability are based on over 18 years of site experience in difficult pumping applications. AutoPumps are designed to resist chemical attack, abrasive wear, mechanical wear, solids deposits, viscous fluids and elevated temperatures. The entire air valve control mechanism has been refined in many subtle ways to survive these severe pumping conditions, using special materials, tolerances, and safety factors to provide years of trouble-free cycling. And, now there is the new AutoPump AP4 Ultra, which uses proprietary non-stick finishes on the float and discharge tube to help reduce solid buildups, extending the time between cleaning and making it much faster and easier to clean the pump. AutoPumps are the first of their tolerances, and safety factors to provide years of trouble-free cycling. AutoPumps are the first of their kind, first in design experience, and first in reliability and durability.

QED Environmental Systems

Why AutoPumps Are Better



QED-developed unique Easy Fittings™ Quick–Release Connectors
For quick disconnect/reconnect without the need to shorten pump tubing or remove/replace tubing clamps.

Superior body. Light weight, won't corrode, won't dent.

Same standard 5-year warranty.
No other pneumatic pump manufacturer even comes close.

Maximum flow rate over 14 gpm.

Easy pump disassembly.
Removing four bolts allows removal of the pump casing.

QED originated the concept of **jacketed tubing** to make pump installation/removal easier.

The same **time-proven, reliable, air valve assembly** that has made the AP4+ the industry's preferred choice since 1986.

Air efficiency saves up to $300/year in energy costs compared to other pneumatic pumps.

Superior materials choice.
Most of the AutoPump's internal components are available in a variety of materials to fit site–specific conditions.

Superior float.

Easily removable float retainer.

Inlet check plug design durability has been proven at thousands of sites in over 40 countries.

Easy O-ring fit due to precision tolerance casing ID.

2355 Bishop Circle West Dexter, MI 48130 USA **1.800.624.2026** **F 1.734.995.1170** info@qedenv.com www.qedenv.com

Guide to AutoPump Selection

Quick Guide to AutoPump Selection

An important advantage of an AutoPump® (patent pending) air-powered Pump system is the wide range of choices to truly match site needs. Below is a quick guide to the major configurations and options offered in the AutoPump line, to help you determine which models are best for your project. Of course, you can just call us at 1-800-624-2026, or email us at info@qedenv.com, for fast, personal service by our application specialists.

As a general guideline, pump model selection is usually based on the following primary application criteria.They are presented in the common sequence of consideration, but special site needs may alter the priority.

- **Maximum Flow and Depth** – pump model, depth, submergence, and drive pressure determine the maximum flow rate that can be achieved; see specific pump curves for detailed flow information
- **Pump Diameter** – to fit the well ID; also, larger diameter pumps deliver higher flow rates, all other factors being equal
- **Inlet Position** – top or bottom inlet; a top inlet enhances removal of LNAPLs, while bottom inlets provide the highest flow rates and greatest solids-handling capacity for DNAPL, and landfill fluids
- **Actuation Level** – minimum height of liquid needed to actuate the pump, also equal to the minimum drawdown level; low-drawdown models are optimized for maximum drawdown
- **Materials of Construction** – many models are available in upgraded materials for special applications, such as extremes of pH, suspended solids, high temperatures, and aggressive solvents. The new low-maintenance AutoPump AP4 Ultra uses special non-stick finishes on the float and discharge tube. All metallic parts are 316-grade stainless steel, allowing for greater corrosion resistance. Some models have temperature ratings up to 250º F, making them ideal for your high tempurature applications.

AutoPumps	Model	Pg#	Inlet Position	Out. Diameter in./cm	Overall Length in./cm	Max. Flow[1] gpm/Lpm	Max. Depth ft./cm	Act. Level in./cm
4" Bottom Inlet AP Pumps								
Long AP4.0 Ultra Bottom Inlet	Long AP4.0B	**07**	Bottom	3.6 / 9.1	51.4 / 131	14 / 53	250 / 76	38.4 / 98
Short AP4.0 Ultra Bottom Inlet	Short AP4.0B	**10**	Bottom	3.6 / 9.1	39.3 / 100	13 / 49	425 / 130	26.7 / 68
Long AP4+ Bottom Inllet	Long AP4+B	**22**	Bottom	3.6 / 9.1	51.4 / 131	14 / 53	250 / 76[2]	38.4 / 98
Short AP4+ Bottom Inlet	Short AP4+B	**26**	Bottom	3.6 / 9.1	39.3 / 100	13 / 49	250 / 76[2]	26.7 / 68
Low-Drawdown AP4+ Bottom Inlet	LD AP4+B	**30**	Bottom	3.6 / 9.1	27.5 / 70	7 / 26.5	250 / 76	15.3 / 39
4" Top Inlet AP Pumps								
Long AP4.0 Ultra Top Inlet	Long AP4.0T	**16**	Top	3.6 / 9.1	56.7 / 144	10 / 38	250 / 76	53.3 / 135
Short AP4.0 Ultra Top Inlet	Short AP4.0T	**18**	Top	3.6 / 9.1	45 / 110	9 / 34	250 / 76	41.6 / 106
Long AP4+ Top Inlet	Long AP4+T	**34**	Top	3.6 / 9.1	56.7 / 144	10 / 38	250 / 76[2]	53.3 / 135
Short AP4+ Top Inlet	Short AP4+T	**38**	Top	3.6 / 9.1	45 / 110	9 / 34	250 / 76[2]	41.6 / 106
Low-Drawdown AP4+ Top Inlet	LD AP4+T	**42**	Top	3.6 / 9.1	30.75 / 78	6.4 / 24	250 / 76	27.4 / 70
3" Bottom Inlet AP Pumps								
Long AP3 Bottom Inlet	Long AP3B	**46**	Bottom	2.63 / 6.68	52 / 132	7.3 / 27.6	220 / 67	31 / 79
Short AP3-Bottom Inlet	Short AP3B	**50**	Bottom	2.63 / 6.68	42 / 107	6 / 22.7	175 / 53.3	22 / 56
3" Top Inlet AP Pumps								
Long AP3-Top Inlet	Long AP3T	**54**	Top	3.4 / 8.64[3]	57 / 145	5.4 / 20	220 / 67	53 / 135
Short AP3 Top Inlet	Short AP3T	**58**	Top	3.4 / 8.64[3]	47 / 119	4.8 / 18.1	175 / 53.3	42 / 107
2" Bottom Inlet AP Pumps								
Long AP2 Bottom Inlet	Long AP2B	**62**	Bottom	1.75 / 4.45	55 / 139	2.3 / 8.82	300 / 91.4	35 / 89
Short AP2 Bottom Inlet	Short AP2B	**66**	Bottom	1.75 / 4.45	33 / 85	2 / 7.57	300 / 91.4	20 / 51
2" Top Inlet AP Pumps								
Long AP2-Top Inlet	Long AP2T	**70**	Top	1.75 / 4.45	57 / 144	1.9 / 7.2	300 / 91.4	52 / 132
Short AP2-Top Inlet	Short AP2T	**74**	Top	1.75 / 4.45	35 / 89	1.6 / 6.0	300 / 91.4	31 / 78

[1] **Consult QED for higher flow requirements**
[2] **High Pressure Option for 4" AP pumps**
[3] **Optional 2.63" (6.68cm) OD available**

Complete Systems

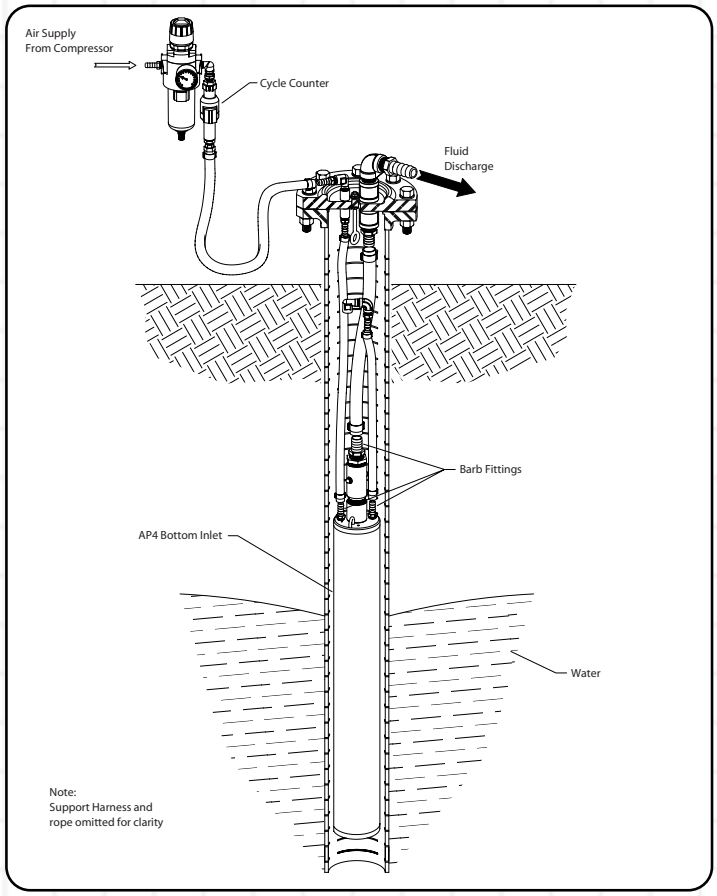
Complete AutoPump® systems offer the greatest assurance of a smooth installation, dependable performance and easy maintenance. Common system components include:

- In-well hose and tubing – see page 78
- Wellhead completion caps and flanges – see page 79
- Cycle counters – see page 80
- Air system filter/regulators – see page 81

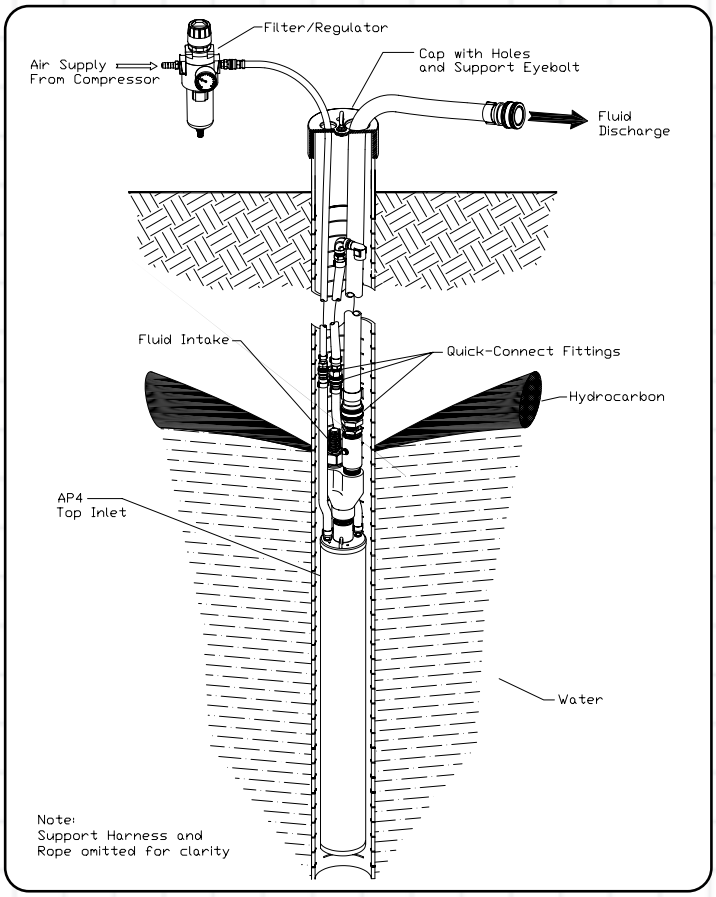
Call 1-800-624-2026 or visit www.qedenv.com for prompt assistance with all of the above.

Basic Pump Systems

Basic System Bottom Inlet Pump



Basic System Top Inlet Pump



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AP2B

AutoPump®

Bottom Inlet, Long

Max. Flow	**2.3 gpm (8.8 lpm)**
O.D.	**1.75 in. (4.45 cm)**
Length	**55 in. (139 cm)**

Description

The AP2 Bottom Inlet Long AutoPump provides maximum capabilities and flow in a bottom inlet pump for 2" (50 mm) diameter wells. It is offered in optional versions to handle even severe remediation and landfill pumping applications, and delivers flow rates up to 2.3 gpm (8.8 lpm). The AP2 Long Bottom Inlet AutoPump is complemented by the most comprehensive selection of accessories to provide a complete system to meet site-specific requirements. Call QED for prompt, no-obligation assistance on your pumping project needs.

The AutoPump Heritage

The AP2 Bottom Inlet Long AutoPump is part of the famous AutoPump family of original automatic air-powered pumps, developed in the mid 1980s specifically to handle unique pumping needs at remediation and landfill sites. Over the years they've proven their durability at thousands of sites worldwide. AutoPumps are designed to handle difficult pumping challenges that other pumps can't, such as solvents, suspended solids, corrosives, temperature extremes, viscous fluids and frequent start/stop cycles. Beyond just the pump, AutoPump systems offer the most complete range of tubing, hose, connectors, caps and accessories to help your installation go smoothly. This superior pumping heritage, application experience and support back up every AutoPump you put to work on your project.

Advantages

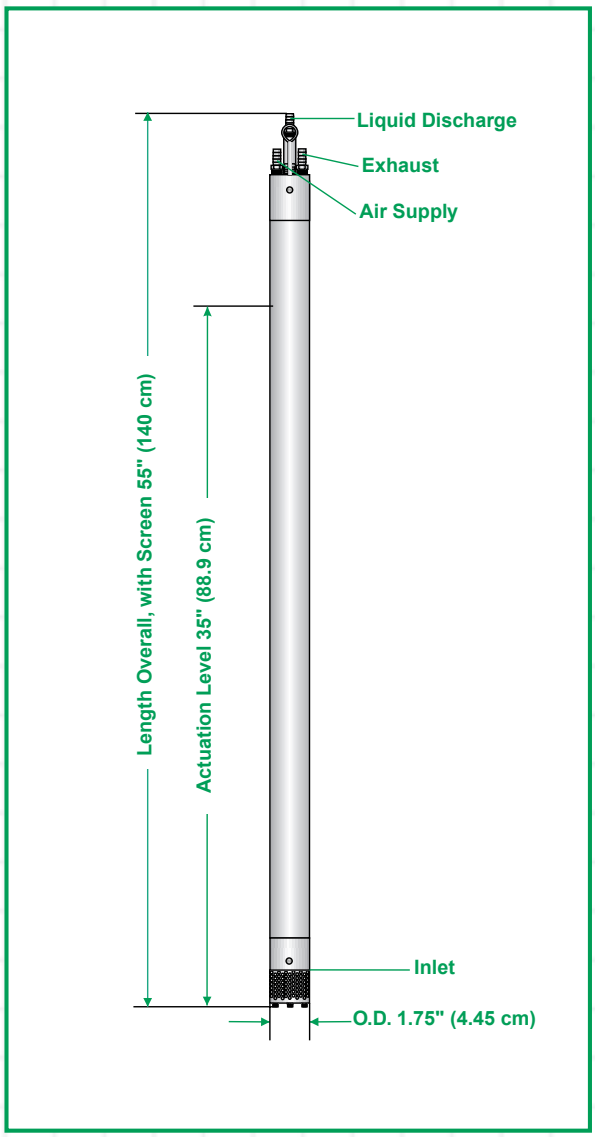
1. **The original 2" automatic air-powered well pump, proven worldwide over 15 years**
2. **The industry leader in reliability, durability, flow rate and depth capability in an automatic pump for 2-inch wells**
3. **Handles solids, hyrocarbons, solvents, corrosive conditions, viscous fluids and landfill liquids**
4. **One-year warranty**

QED Environmental Systems

AutoPump®

Bottom Inlet, Long AP2B

Pump Dimensions



Specifications & Operating Requirements

Model	**2" - Long AP2 Bottom Inlet**
Liquid Inlet Location	Bottom
OD	1.75 in. (4.45 cm)
Length Overall (pump & fittings)	55 in. (139 cm)
Length Overall, w / Extended Screen	57 in. (144 cm)
Weight	7.8 lb (3.6 Kg)
Max. Flow Rate	2.3 gpm (8.8 lpm) - See Flow Rate Chart
Pump Volume / Cycle	0.14 - 0.17gal (0.53 - 0.64 L)
Max. Depth	300 ft (91.4 m)
Air Pressure Range	5 - 130 psi (0.4 - 9.2 kg/cm2)
Min. Actuation Level	35 in. (88.9 cm)
Air Usage	0.38-1.45 scf / gal. (2.8 - 10.8 liters of air / fluid liter)
	See Air Usage Chart
Min. Liquid Density	0.7 SpG (0.7 g/cm3)
Standard Construction Materials[1]	
Pump Body	Stainless Steel
Pump Ends	Stainless Steel
Internal Components	Stainless Steel, Viton, PVDF[3]
Tube & Hose Fittings	Brass or Stainless Steel
Fitting Type	Barbs or Quick Connects
Tube & Hose Options	
Tubing Material	Nylon
Sizes[2] - Liquid Discharge	5/8 in. (16 mm) OD
Pump Air Supply	3/8 in. (9.5 mm) OD
Air Exhaust	1/2 in. (13 mm) OD
Hose Material	Nitrile
Sizes - Liquid Discharge	1/2 in. (13 mm) ID
Pump Air Supply	1/4 in (6.4 mm) ID
Air Exhaust	3/8 in. (9.5 mm) ID

[1] Material upgrades available
[2] Applies to QED supplied tubing; other tubing sources may not conform to QED fittings.
[3] PVDF - Polyvinylidene Fluoride

Application Limits (base model)

Base model AP2 AutoPumps are designed to handle the application ranges described below. For applications outside this range, consult QED about AP2 upgrades.

Maximum Temperature: 150˚F (65˚C)
pH Range: 4-9
Solvents and Fuels: diesel, gasoline, JP1-JP6, #2 heating oils, BTEX, MTBE, landfill liquids

AP2 AutoPumps are warranted for one (1) year: 100% materials and workmanship.

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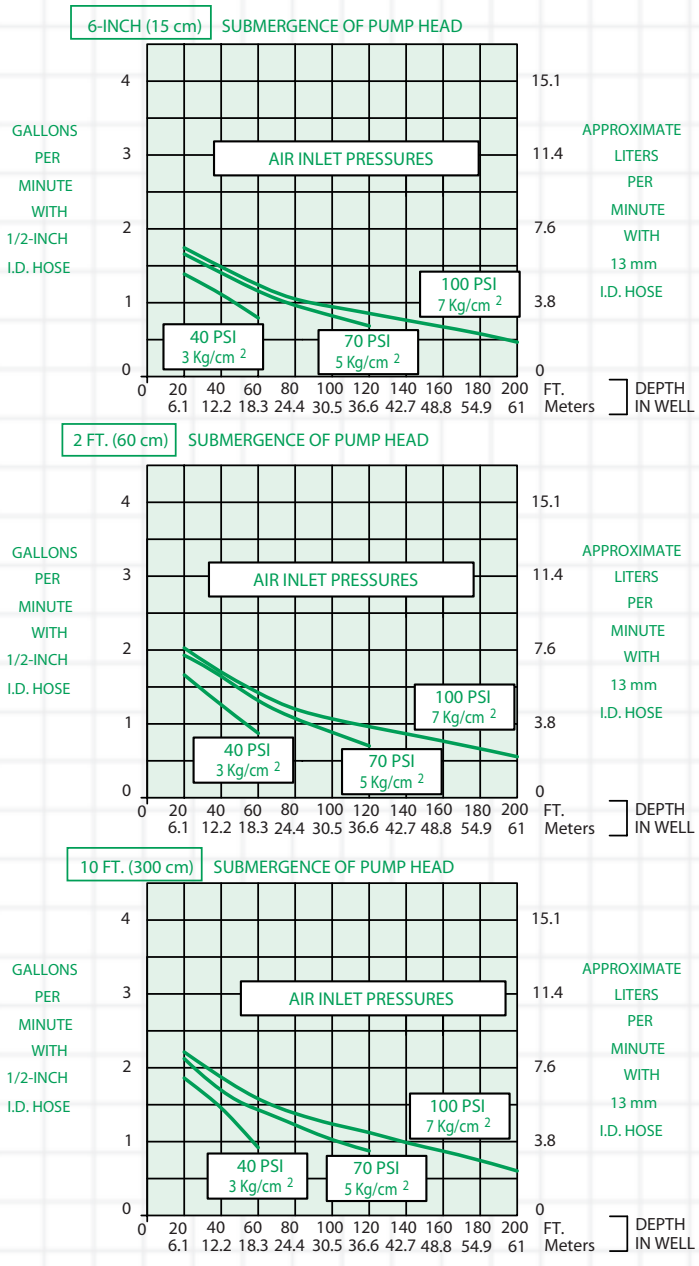
AP2B

AutoPump®

Bottom Inlet, Long

Flow Rates[1]

1/2 inch (13 mm)
Inside Diameter Discharge Hose
(Equivalent to 5/8-Inch O.D. Tubing)



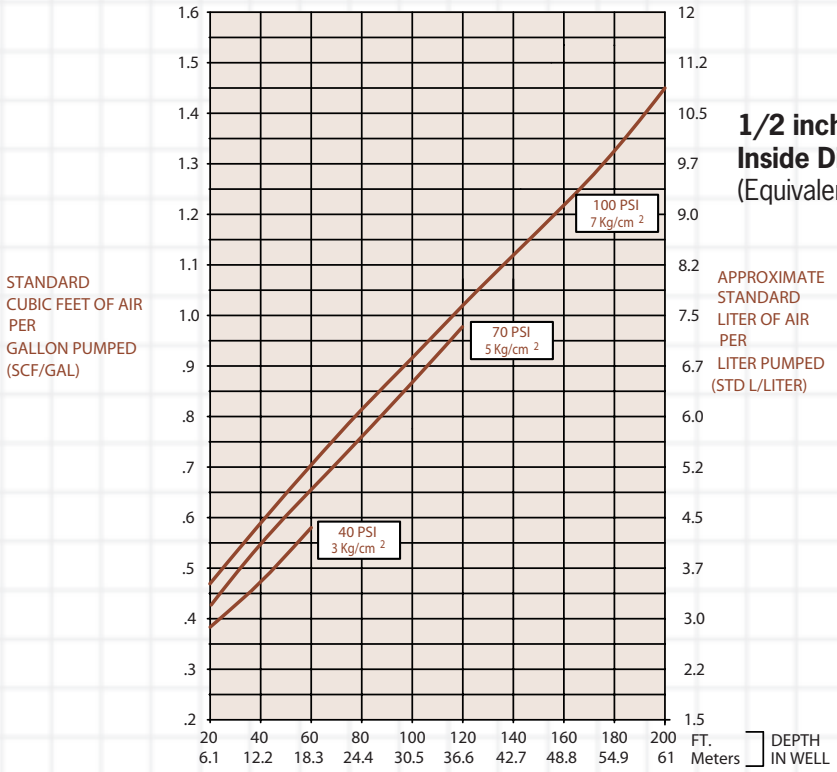
[1] FLOW RATES MAY VARY WITH SITE CONDITIONS. CALL QED FOR TECHNICAL ASSISTANCE.

AutoPump®

Bottom Inlet, Long

AP2B

Air Consumption



1/2 inch (13 mm)
Inside Diameter Discharge Hose
(Equivalent to 5/8-Inch O.D. Tubing)

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AP2B

AutoPump®

Bottom Inlet, Short

Max. Flow	**2.0 gpm (7.6 lpm)**
O.D.	**1.75 in. (4.45 cm)**
Length	**33 in. (85 cm)**

Description

The AP2 Bottom Inlet Short AutoPump provides maximum capabilities and flow in a bottom inlet pump for 2" (50 mm) diameter wells. It is offered in optional versions to handle even severe remediation and landfill pumping applications, and delivers flow rates up to 2.0 gpm (7.6 lpm). The AP2 Short Bottom Inlet AutoPump is complemented by the most comprehensive selection of accessories to provide a complete system to meet site-specific requirements. Call QED for prompt, no-obligation assistance on your pumping project needs.

The AutoPump Heritage

The AP2 Bottom Inlet Short AutoPump is part of the famous AutoPump family of original automatic air-powered pumps, developed in the mid 1980s specifically to handle unique pumping needs at remediation and landfill sites. Over the years they've proven their durability at thousands of sites worldwide. AutoPumps are designed to handle difficult pumping challenges that other pumps can't, such as solvents, suspended solids, corrosives, temperature extremes, viscous fluids and frequent start/stop cycles. Beyond just the pump, AutoPump systems offer the most complete range of tubing, hose, connectors, caps and accessories to help your installation go smoothly. This superior pumping heritage, application experience and support back up every AutoPump you put to work on your project.

Advantages

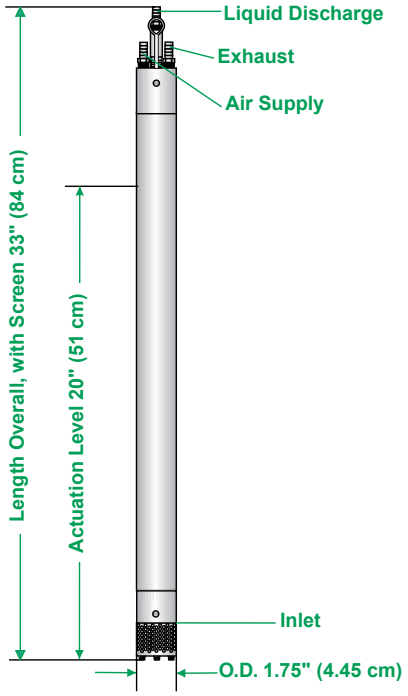
1. **The original 2" automatic air-powered well pump, proven worldwide over 15 years**
2. **The industry leader in reliability, durability, flow rate and depth capability in an automatic pump for 2-inch wells**
3. **Handles solids, hyrocarbons, solvents, corrosive conditions, viscous fluids and landfill liquids**
4. **One-year warranty**

QED Environmental Systems

AutoPump®

Bottom Inlet, Short AP2B

Pump Dimensions



Specifications & Operating Requirements

Model	**2" - Short AP2 Bottom Inlet**
Liquid Inlet Location	Bottom
OD	1.75 in. (4.45 cm)
Length Overall (pump & fittings)	33 in (85 cm)
Length Overall, w / Extended Screen	35. in (89cm)
Weight	5.4 lb (3.6 Kg)
Max. Flow Rate	2.0 gpm (7.6 lpm)
Pump Volume / Cycle	0.05 - 0.08 gal (0.19 - 0.30 L)
Max. Depth	300 ft (91.4 m)
Air Pressure Range	5 - 130 psi (0.4 - 9.2 kg/cm2)
Min. Actuation Level	20 in. (51 cm)
Air Usage	.39-2.58 scf/gal (2.9-19.3 liters of air/fluid liter see Air Usage Chart
Min. Liquid Density	0.7 SpG (0.7 g/cm3)
Standard Construction Materials[1]	
Pump Body	Stainless Steel
Pump Ends	Stainless Steel
Internal Components	Stainless Steel, Viton, PVDF[3]
Tube & Hose Fittings	Brass or Stainless Steel
Fitting Type	Barbs or Quick Connects
Tube & Hose Options	
Tubing Material	Nylon
Sizes[2] - Liquid Discharge	5/8 in. (16 mm) OD
Pump Air Supply	3/8 in. (9.5 mm) OD
Air Exhaust	1/2 in. (13 mm) OD
Hose Material	Nitrile
Sizes - Liquid Discharge	1/2 in. (13 mm) ID
Pump Air Supply	1/4 in (6.4 mm) ID
Air Exhaust	3/8 in. (9.5 mm) ID

[1] Material upgrades available
[2] Applies to QED supplied tubing; other tubing sources may not conform to QED fittings.
[3] PVDF - Polyvinylidene Fluoride

Application Limits (base model)

Base model AP2 AutoPumps are designed to handle the application ranges described below. For applications outside this range, consult QED about AP2 upgrades.

Maximum Temperature: 150˚F (65˚C)
pH Range: 4-9
Solvents and Fuels: diesel, gasoline, JP1-JP6, #2 heating oils, BTEX, MTBE, landfill liquids

AP2 AutoPumps are warranted for one (1) year: 100% materials and workmanship.

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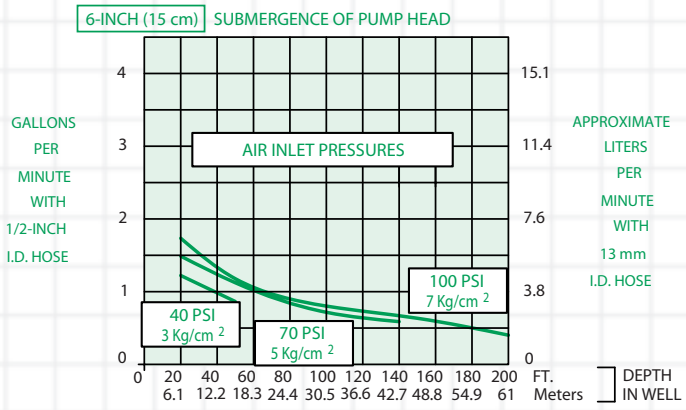
AP2B

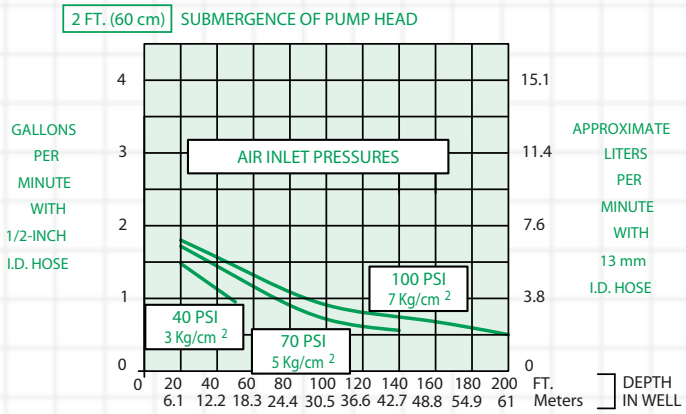
AutoPump®

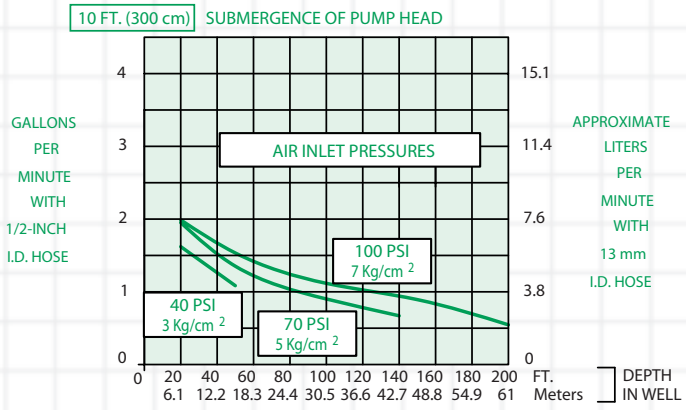
Bottom Inlet, Short

Flow Rates[1]

1/2 inch (13 mm)
Inside Diameter Discharge Hose
(Equivalent to 5/8-Inch O.D. Tubing)



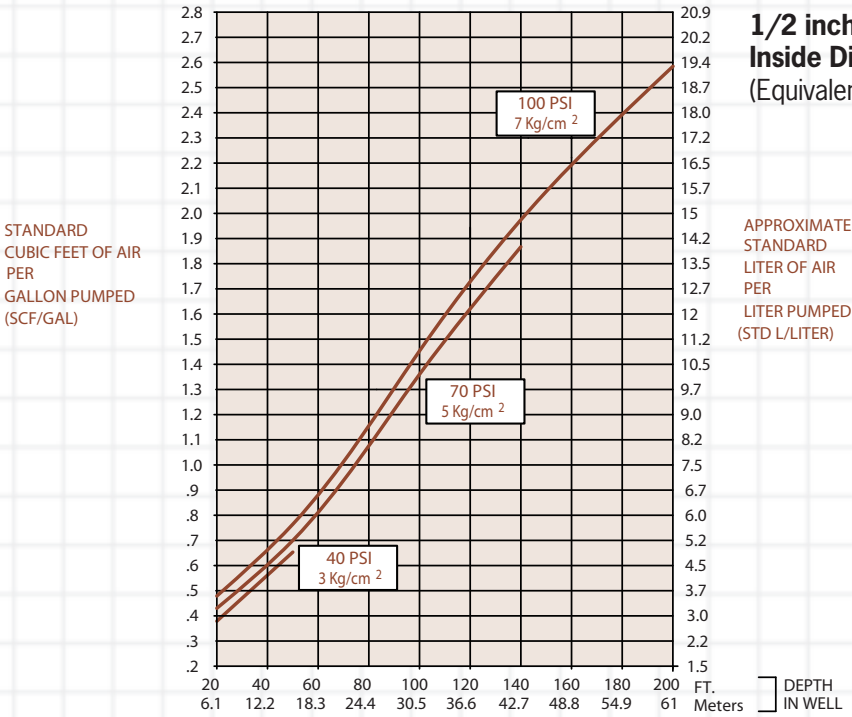




[1] FLOW RATES MAY VARY WITH SITE CONDITIONS. CALL QED FOR TECHNICAL ASSISTANCE.

Bottom Inlet, Short AP2B

Air Consumption



1/2 inch (13 mm)
Inside Diameter Discharge Hose
(Equivalent to 5/8-Inch O.D. Tubing)

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AutoPump Well Caps

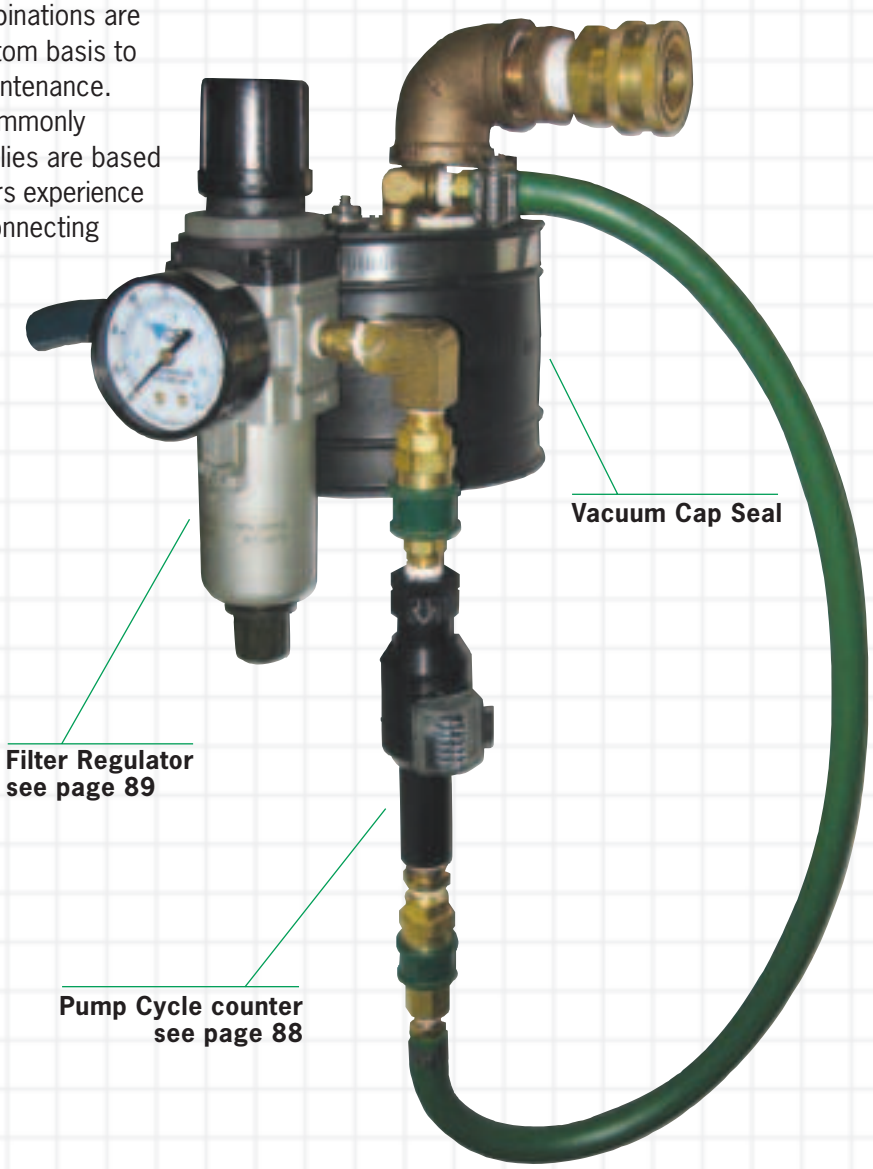
Vacuum seal well cap with brass quick connects, filter regulator and pump cycle counter

Hundreds of wellhead cap and flange combinations are available from QED on a standard and custom basis to fit site needs and ease installation and maintenance. The table below lists some of our most commonly chosen wellhead assemblies. Our assemblies are based on the know-how gained through our 20 years experience and thousands of installations. Besides connecting to the pump tubing or hose, wellhead assemblies have to be designed for safety, equipment support strength, pump level adjustment, access for data and sample collection, and durability. Call us for more detailed information.

Quick connect fitting available in brass or stainless steel

Custom flange

Compression fitting for pass-through hose or tubing. Available in nylon



Wellhead Assembly	Description	Fitting Types (hose & tubing)	Fitting Materials	Well Diameters
Open-hole cap	Non-sealing cap with open pass-through holes for hoses; allows easy pump height adjustment with support rope/cable	No fittings		2", 4", 6", custom (50, 100, 150 mm)
Slip	Non-sealing cap with fittings for connection to air supply and liquid discharge lines	quick-connects, compression fittings	Brass, SS, poly	2", 4", 6", custom (50, 100, 150 mm)
Vacuum Seal	Sealing cap with fittings for connection to air supply and liquid discharge lines	quick-connects, compression fittings	Brass, SS, poly	2", 4", 6", custom (50, 100, 150 mm)
Flange	Sealing flange with fittings for connection to air supply and liquid discharge lines	quick-connects, compression fittings	Brass, SS, poly	Custom

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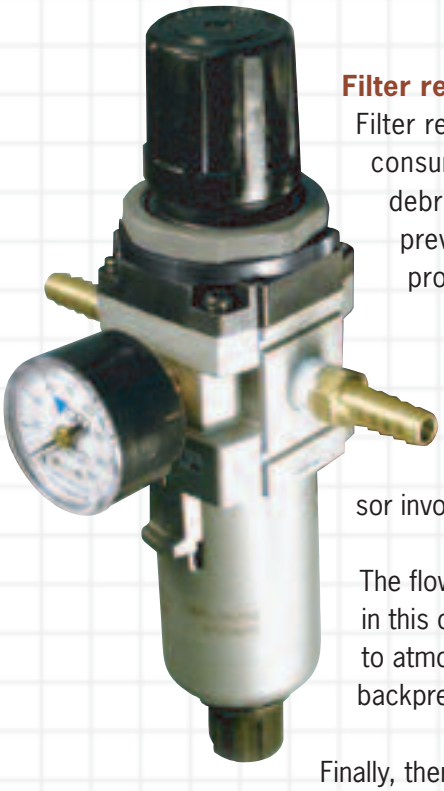
Flow Counters

Cycle Counter

The Cycle Counter detects and displays each AutoPump cycle via the pulse of air that occurs in the supply line. Since the liquid volume delivered by each pump cycle is relatively consistent for a given well condition, the total liquid volume delivered can be monitored with these cycle counts. An important advantage of the Cycle Counter method is its long-term reliability and low maintenance, since it requires no contact with the pumped fluid and no extra components in the liquid flow path. Cycle Counters can also be ordered with an electronic pulse output to support automated flow data collection.

Cycle Counter Specifications
Type: Magnetic piston/spring
Readout: Direct digital (remote option), non-resettable
Maximum Pressure: 200 psi (14 kg/cm^2)
End options: NPT, barb, quick connect

Air Supply



Filter regulators

Filter regulators are recommended for each pump at the wellhead to economize on system air consumption, allow control of pump flow rate, and reduce service needs caused by air system debris and contaminants. These high quality filter regulators are coated on the inside to prevent corrosion from condensed moisture. All QED well caps and flanges include mounting provisions for these filter regulators, and other mounting options are available.

Compressor Sizing

A compressed air supply is required to power AutoPumps. Estimation of the fluid flow rates and air consumption of the AutoPumps and sizing the fluid lines, air lines, and air compressor involves a number of factors. Our application specialists are ready to assist you.

The flow rates and air consumption for the AutoPumps can be compared by using the charts provided in this catalog for each model. The flow rate and air use curves in this catalog are based on pumping to atmospheric pressure at the wellhead, and do not take into account any liquid piping system backpressures due to elevation changes or fluid friction.

Finally, there are some initial guidelines for air compressors. Most importantly, follow all application guidelines of the compressor manufacturer. A piston compressor may be a start / stop type or a constant run type. The tank (receiver) must be large enough, particularly for the start / stop type. The motor should not turn on more times an hour than recommended by the manufacturer. And start/stop compressors are typically assigned a 50% maximum duty cycle, meaning that the compressor is sized to provide twice the maximum air demand of the entire AutoPump system.

Rotary screw compressors are designed for constant operation, and so are sized to just slightly exceed the maximum air supply requirement; it is recommended that rotary screw compressors not be grossly oversized because some types may be damaged by continued operation at low partial capacity.

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Warranty

QED AutoPump Warranty Period Summary

Following is a summary of the warranty periods only for QED AutoPumps and accessories; ***this IS NOT the complete warranty****. Contact QED for a copy of the complete warranty*

1. **AP4+ AutoPumps (Long and Short lengths; Top and Bottom Inlets)**
   warranted for five (5) years: 100% materials and workmanship.
   Low-Drawdown AutoPumps are warranted for one (1) year: 100% materials and workmanship.
2. **AP3 AutoPumps (Long and Short lengths; Top and Bottom Inlets)**
   warranted for two (2) years: 100% materials and workmanship.
3. **AP2 AutoPumps (Long and Short lengths; Top and Bottom Inlets)**
   warranted for one (1) year: 100% materials and workmanship.
4. **Hoses, Tubing, Fittings, Well Caps and Flanges**
   warranted for one (1) year: 100% materials and workmanship.
   There will be no warranty for application or material compatibility.
5. **Pneumatic Data Modules / Logic Control Panels**
   warranted for one (1) year: 100% materials and workmanship.
6. **Parts and Repairs**
   warranted for ninety (90) days: 100% materials and workmanship; when repairs are performed by QED or its appointed agent; from date of repair or for the full term of the original warranty, whichever is longer. Separately sold parts are warranted for ninety (90) days: 100% materials and workmanship.

Beyond the Pumps...

Success with a pumping system involves more than just the pumps. Over 20 years of specialized air-powered pumping experience on thousands of sites with a broad range of applications and groundwater issues has allowed us to develop unequalled expertise and problem solving capabilities.

QED technical experts will work with you on identifing the relevant site information to assure meeting your remediation and landfill pumping objectives. The equipment will be selected to meet your site-specific application.

Accessories

- Downwell hose and tubing
- An array of connectors and fittings for ease of installation and service
- Mix of wellhead assemblies to meet site-specific needs
- Fluid discharge and air supply piping layouts and components
- Tank-full shut-off and other safety items and features
- Pump cycle counters
- Custom requirements

Call us at ***1-800-624-2026***
for prompt, expert assistance on your pumping project needs.

The World Leader in Air-Powered Pumps

For Remediation, Landfills and Groundwater Sampling

QED
Environmental Systems

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