SITE MANAGEMENT PLAN

QUANTA RESOURCES SITE
2802-2810 Lodi Street
City of Syracuse, Onondaga County, New York

NYSDEC Site Number: 7-34-013

Prepared for:

QUANTA RESOURCES / SYRACUSE PRP GROUP

Prepared by:

PLUMLEY ENGINEERING

8232 Loop Road
Baldwinsville, New York 13027
(315) 638-8587
Project No. 2010131

Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date

September 2013

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 INTRODUCTION

This document is required as an element of the remedial program at the Quanta Resources Site located at 2802-2810 Lodi Street, Syracuse, New York (hereinafter referred to as the "Site") under the New York State (NYS) under the New York State (NYS) administered by New York State Department of Environmental Conservation (NYSDEC). The site was remediated in accordance with Order on Consent Index # D7-0001-07-07, Site # 7-34-013, which was last amended on October 25, 2007.

1.1.1 General

Quanta Resources / Syracuse PRP Group (Remedial Party) entered into a consent order with the NYSDEC to remediate a 0.75 acre property located in City of Syracuse, New York. This consent order required the Remedial Party to investigate and remediate contaminated media at the site. The site location and boundaries of this 0.75-acre "site" are provided in Figure 1. The boundaries of the site are more fully described in the metes and bounds site description (Appendix A) that is part of the Environmental Easement.

After completion of the remedial work described in the Remedial Action Work Plan, some contamination was left in the subsurface at this site, which is hereafter referred to as 'remaining contamination." This Site Management Plan (SMP) was prepared to manage remaining contamination at the site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by Plumley Engineering, P.C., on behalf of Quanta Resources / Syracuse PRP Group, in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, dated May 2010, and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the Institutional Controls (ICs) and Engineering Controls (ECs) that are required by the Environmental Easement for the site.

1.1.2 Purpose

The site contains contamination left after completion of the remedial action. Engineering Controls have been incorporated into the site remedy to control exposure to remaining contamination during the use of the site to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the Onondaga County Clerk, will require compliance with this SMP and all ECs and ICs placed on the site. The ICs place restrictions on site use, and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. This SMP specifies the methods necessary to ensure compliance with all ECs and ICs required by the Environmental Easement for contamination that remains at the site. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

This SMP provides a detailed description of all procedures required to manage remaining contamination at the site after completion of the Remedial Action, including: (1) implementation and management of all Engineering and Institutional Controls; (2) media monitoring; (3) operation and maintenance of all treatment, collection, containment, or recovery systems; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (5) defining criteria for termination of treatment system operations.

To address these needs, this SMP includes three plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual for complex systems).

This plan also includes a description of Periodic Review Reports for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the environmental easement, which is grounds for revocation of the Certificate of Completion (COC);

- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the Order on Consent (Index # D7-0001-07-078; Site #7-34-013) for the site, and thereby subject to applicable penalties.

1.1.3 Revisions

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

1.2 SITE BACKGROUND

1.2.1 Site Location and Description

The site is located in the City of Syracuse, County of Onondaga, New York and is identified as Block 01 and Lot 08 on the City of Syracuse Tax Map. The site is an approximately 0.75 acre area bounded by adjacent commercial property (Classic Auto Sales and body shop owned by Awad Realty, LLC) to the north, Lodi Street to the south, an abandoned railroad spur on a linear parcel currently owned by Awad Realty, LLC and a vacant, triangular lot that is also owned by Quanta Resources, Inc. to the east, and Oswego Boulevard to the west (see Figure 1). The boundaries of the site are more fully described in Appendix A.

The Site is currently a vacant lot except for a small building housing the remediation equipment currently in operation. The property is zoned Industrial District Class A. The Site is relatively flat, with a slight slope from east to west. Further to the west, across Oswego Boulevard, the land slopes steeply down to Interstate Route 81. The area is served by public utilities, including

City of Syracuse water and sewer and National Grid natural gas and electric. There are no live sewer or water services currently to the Site. No public/private drinking water supply wells are known to exist within at least ½ mile of the Site. A topographic site location map is provided as Figure 2.

1.2.2 Site History

Sanborn Insurance Maps show that in 1892 and 1911, the Site was occupied by a single dwelling and outbuilding, and the Oswego Canal ran along the west side of the Site where Oswego Boulevard is currently located. The canal was closed in the early 1900's, after the Barge Canal was completed in 1915, and filled sometime thereafter. The 1950 and later maps show the Seitz Lubricating Oil facilities, including the aboveground tanks known to be in place while the facility was operating as Quanta Resources. The tanks and structures appear unchanged from 1950 to 1990 on the maps.

Oil-processing was conducted onsite from the 1920's until 1981. Production of lubricating oils ceased in the mid-1960's, although waste oils continued to be processed for use as heating oil. All facility operations ceased in 1981. Refer to Figure 3 for the former facility layout.

In May 1990, the United States Environmental Protection Agency (EPA) Region II Removal Action Branch began an emergency removal action at the Site. The removal action, which involved testing and removing stored wastes, aboveground tanks, sumps and drums, was performed in two phases. Phase I of the removal action involved inventorying and sampling of all drums and containers of unknown waste material at the Site. The contents of the storage containers were determined to include waste oils, oil/water mixtures, caustics and acids.

Phase II of the removal action provided for removal and disposal of hazardous materials stored in drums, sumps and tanks; dismantling, decontamination and removal of tanks and buildings; removal and disposal of asbestos insulation found at the Site; and disposal of affected soils. Fifty-two aboveground storage tanks (ASTs) and one UST were emptied and removed or disabled. Three USTs (Tanks 57, 58 and 59) were left onsite. The wastes were separated into twenty-three different waste streams and disposed of by various hazardous waste disposal firms.

In 1999, Earth Tech, Inc. removed three 20,000-gallon USTs (Tanks 57, 58 and 59). The liquid content and sludge from the three USTs, containing petroleum and solvents, were removed and disposed. Soil surrounding Tanks 58 and 59 was removed and confirmation soil samples collected from this excavation.

1.2.3 Geologic Conditions

The Site geology and overall sequence of units (prior to the completion of the remediation) at the site consists of a surface layer of non-native fill materials consisting of sand and gravel with bricks, concrete chunks, glass and wood debris. This fill unit is typically 3 to 4 feet thick. Underlying the fill unit is a dense, gray-green silt unit. This unit varies in thickness from 0 to 11 feet. The underlying bedrock is Vernon Shale, which varies in color from green to gray to red. Drilling logs for the Site wells note the top surface of the Vernon shale is fragmented and weathered. The "silt unit" is likely a weathered, residual soil developed on the Vernon Shale. A geologic section is shown in Figure 3. Groundwater at the Site and surrounding wells is 22 to 34 feet below ground surface (bgs), which places the groundwater table within the bedrock unit in all wells. A groundwater contour map is shown in Figure 4, indicating flow directions to the south and west.

1.3 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

A Remedial Investigation (RI) was performed in 2008 and 2009 to characterize the nature and extent of contamination at the site. The results of the RI are described in detail in: *Remedial Investigation Report for the Quanta Resources Site, Lodi Street, Syracuse, New York,* prepared for the Quanta Resources / Syracuse PRP Group, by Plumley Engineering, P.C., dated August 2009, revised December 2009.

Generally, the RI determined the presence of free-phase oil in subsurface soils, including the fill and silt units. In addition, a light non-aqueous phase liquid (LNAPL) with detected levels of PCBs in excess of the hazardous waste threshold (i.e., >50 parts per million) was present on the water table within the shale. The migration of the LNAPL is limited to the Site area, as evidenced by the lack of LNAPL in off-site monitoring wells. A UST filled with groundwater

was also discovered during the RI. Impacted soils contain a few constituents at concentrations that exceeded the DEC Soil Cleanup Objective (SCO)[1] thresholds, but not by large margins. The primary groundwater contaminants are VOCs and PCBs. However, there is a relatively minor presence of these compounds in the groundwater at the Site and none of the off-site wells had any significant impacts.

Below is a summary of site conditions when the RI was performed in 2008 and 2009:

1.3.1 Soil

The RI identified an area where free-phase oil is present in the soil. Within this area, the surficial fill unit, and in some locations the underlying silt unit, has free-phase oil in the soils. In general, the fill unit is 2 to 4 feet thick on the eastern side of the impacted zone, but the fill reaches up to 11 feet on the western side. The approximate areal extent of oil-impacted soils is shown on Figure 6.

The northwestern portion of the Site that lies outside the free-phase oil affected soils contains stained soils, generally within 2 to 5 feet of the ground surface. These soils contain a few constituents at concentrations that exceed the DEC Soil Cleanup Objective (SCO) thresholds, but not by large margins. Refer to Figure 6 for a summary of results.

1.3.2 Site-Related Groundwater

Groundwater is impacted with LNAPL, which is present in MW-1S, MW-2, MW-7 and MW-10. The LNAPL contains PCBs in concentrations of 66 parts per million (ppm) in MW-1S and 173 ppm in MW-2. In July 2009, the liquid surface in wells with LNAPL was between 31 and 34 feet below the ground surface.

[1]New York State Codes, Rules and Regulations, Title 6 (6 NYCRR), Part 375-6, *Remedial Program Soil Cleanup Objectives*, December 2006.

Dissolved impacts to groundwater onsite are most pronounced in MW-10 on the west side of the Site, with a total VOC content of less than 500 micrograms per liter (µg/L). This well subsequently developed an LNAPL layer. Well MW-1D is impacted by a single constituent, 2-butanone, at 7,800 µg/L.

Groundwater at the Site and surrounding wells is 22 to 34 feet below ground surface (bgs), which places the groundwater table below the bedrock surface in all wells.

Refer to Figure 7 for additional information.

1.3.3 Site-Related Soil Vapor Intrusion

The potential for soil vapor intrusion resulting from site-related soil or groundwater contamination was evaluated by sampling soil vapor at the site. VOCs were detected at low concentrations in the soil vapor samples.

Only one location yielded a concentration that is above a NYSDOH guideline; trichloroethylene (TCE) was detected at a concentration of 420 micrograms per cubic meter of air (µg/m³). This vapor point is located approximately 10 feet south of the adjacent auto body shop and 20 feet east of MW-8.

Based on the results of the soil vapor sampling and the presence of petroleum contaminants in areas beneath the Site, there is a potential for on-site soil vapor intrusion if new buildings are constructed on the Site. Therefore, the assessment for on-site soil vapor intrusion was addressed by the remedy selection process and within this SMP.

1.3.4 Underground Storage Tanks

The remedial investigation activities indicated the presence of one remaining UST (Figure 7). All the other tanks were removed by earlier Site remedial activities, as described in Section 1.2.2. The remaining UST was a steel, 12,000-gallon tank found to contain groundwater, with minor residual oil.

1.4 SUMMARY OF REMEDIAL ACTIONS

The site was remediated in accordance with the NYSDEC-approved Remedial Action Work Plan, dated July 2011, following issuance of a Record of Decision (ROD), dated March 2011. The following is a summary of the Remedial Actions performed at the site:

1. Excavation of soil exceeding industrial SCOs listed in Tables 1, 2 and 3 and impacted by free-phase oil to a maximum depth of 16 feet or bedrock;

2. Construction and maintenance of a 12-inch soil cover system consisting of demarcation fabric layer, 9-inch layer of clean fill soil and a 3-inch layer of topsoil to prevent human exposure to remaining contaminated soil/fill remaining at the site;

3. Execution and recording of an Environmental Easement to restrict land use and prevent future exposure to any contamination remaining at the site.

4. Installation of a vacuum-enhanced LNAPL recovery system to enhance oil recovery from the bedrock water table.

5. Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

Remedial activities were completed at the site in May 2012.

1.4.1 Removal of Contaminated Materials from the Site

A list of the soil cleanup objectives (SCOs) for the primary contaminants of concern (COCs) and applicable land use for this site are provided in the sample analytical summary Tables 1, 2 and 3. Project SCOs used for compliance monitoring are the industrial use values in 6 NYCRR Part 375-6, *Remedial Program Soil Cleanup Objectives*, dated December 2006. Commercial and

unrestricted use criteria are also provided on the Tables for comparative information. Figure 7 shows the areas where excavation was performed.

The following activities were completed as part of the remedial excavation program:

- A 12,000-gallon UST constructed of steel, was removed from the subsurface at the start of the remedial excavation program. A steel vault was also discovered during the excavation work. Refer to Figure 7 for locations. The tank contained groundwater. The tank and vault were decontaminated and removed from the site for recycling. The groundwater was transported to a oil reclamation facility for treatment and disposal.

- Soil impacted with visible oil or staining was excavated and disposed of in the project landfill. This involved removal depths of approximately 6 to a maximum of 16 feet below grade. The deepest excavation depths were completed in the vicinity of the former UST. Most of the excavated area averaged a removal depth of approximately 10 feet. A total of 8,709 tons of soil was transported to the Seneca Meadows landfill.

- Clean fill material was imported to the Site to backfill and cover the remedial excavation. This consisted of 9,243 tons of native run-a-bank gravel material from a DEC-permitted mine located on Brickyard Road in the Town of Van Buren. All imported fill brought to the Site was characterized as clean involving sieve test data, documentation of approved mining sources and analytical testing for required materials. Supporting documentation has been provided in the Final Engineering Report (FER).

- Prior to backfilling, representative soil samples were collected from the excavation sidewalls and bottom for analysis of site contaminants. The results are summarized in Tables 1, 2 and 3. A total of 34 samples were collected and analyzed for VOCs, SVOCs, metals and PCBs. None of the results exceeded the Restricted Industrial Use SCOs.

- After completing the remedial excavation and backfilling, a 12-inch thick cap was installed over the entire area of the property. A minimum 9-inch lift of clean sand and gravel run-a-bank fill was imported from a DEC-permitted mine and placed on a black

soil separation drainage fabric. A minimum 3-inch lift of topsoil was then placed, completing the cover. The cover layer was hydro-seeded and mulched [work to be completed this spring].

- All materials transported off-site for disposal were properly characterized and shipped. Disposal documentation has been provided in the FER.

- New fencing was installed around the remediation building and a driveway for access to the building was constructed (Figure 8).

1.4.2 Site-Related Treatment Systems

The remedial work at the Site involved the installation of a free product recovery system. The system was installed to facilitate the recovery of LNAPL found present in the on-site groundwater. The main elements of the system included (refer to Figures 8, 9 and 10 for system installation details):

- Drilling and installation of four 4-inch diameter recovery wells.

- Installation of a 8' x 12' on-site building containing the vacuum pump equipment for inducing vacuum in the remedial wells.

- Buried, connective piping from the remediation wells, along with four existing 2-inch diameter wells, piped into the building and plumbed into a common manifold.

- Installation of a regenerative blower and accessories for inducing the vacuum in the wells. A particulate filter, air stream separator and granular activated carbon drum filtration on the air discharge were included in the installation (Figure 10).

- Manhole vaults for all wells.

- Installation of new electrical service for the remediation equipment.

- System control panel, allowing automated 24-hour on/off cycling of the blower system.

A low vacuum will be applied to the wells and the accumulation of product will be monitored. Periodic manual removal of the free product and proper off-site disposal will be undertaken, as appropriate.

1.4.3 Remaining Contamination

Tables 1, 2 and 3 and Figure 7 summarize the analytical results of samples of remaining soil at the Site after completion of the Remedial Action. The tables compare and indicate results that exceed the Track 1 (unrestricted) SCOs. Figure 11 summarizes the results of all soil samples analyzed of remaining soil at the Site after completion of Remedial Action that exceed the SCOs for Unrestricted Use of the Site.

The remedial excavation was successful in removing the bulk of impacted soils from the Site. All of the soil confirmation samples collected from the bottom and sidewalls of the excavation met the targeted SCOs (Part 375 Restricted-Industrial Use) except for arsenic in two samples (S-1 and S-2, 14 and 12 feet deep respectively) and lead in one sample (S-32, 6 feet deep). These samples were all located along the property line/right-of-way adjacent to Oswego Boulevard where excavation was limited by the property line.

Most of the soil confirmation samples also indicated that Unrestricted Use SCOs were met for most compounds. Specifically, no exceedances of the Unrestricted Use SCOs were reported for SVOCs and PCBs. Twelve of the 34 samples had exceedances of the Unrestricted Use SCOs for VOCs and metals. Twenty six of the samples had exceedances for metals (mainly nickel in 26 samples ranging from 32 to 61 mg/kg compared to the SCO of 30 mg/kg). All exceedances were by relatively small factors, except for lead in sample S-32 at 84,000 mg/kg at 6 feet below grade.

The location of remaining contamination at the Site is summarized as follows:

- All soil beneath the 12-inch soil cap and geotextile fabric demarcation layer that was not excavated as part of the remedial action should be considered potentially impacted with

site contaminants (VOCs, SVOCs, PCBs and metals). This includes shallow soils outside the lateral limits of the remedial excavation area at the north and south ends of the property. It also includes soil beneath the bottom of the excavation (Figure 7). Figure 7 provides contours of the expected depths of the remaining soil within the excavation area. The depth to potentially impacted soil can be expected to be from 6 to 7 feet to 14 to 16 feet within the limits of the excavation.

- In the areas outside the remedial excavation limits, all soil immediately beneath the 12-inch cover cap and geotextile fabric demarcation layer should be considered potentially contaminated.

There are no live utilities at the site except for the new remediation piping from the remedial wells to the shed (Figure 8). These are buried in the clean backfill beneath the cover cap at depths of 1.5 to 2.5 feet. No other buried utilities are within the excavation limits and none are known in the area outside the excavation. No subsurface structures are know to exist on the site.

2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

2.1 INTRODUCTION

2.1.1 General

Since remaining contaminated soil, groundwater and possibly soil vapor exists beneath the Site, Engineering Controls and Institutional Controls (EC/ICs) are required to protect human health and the environment. This Engineering and Institutional Control Plan describes the procedures for the implementation and management of all EC/ICs at the site. The EC/IC Plan is one component of the SMP and is subject to revision by NYSDEC.

2.1.2 Purpose

This plan provides:

- A description of all EC/ICs on the site;
- The basic implementation and intended role of each EC/IC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the features to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of EC/ICs, such as the implementation of the Excavation Work Plan for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the site remedy, as determined by the NYSDEC.

2.2 ENGINEERING CONTROLS

2.2.1 Engineering Control Systems

2.2.1.1 Cover System

Exposure to remaining contamination in soils at the site is prevented by a soil cover system placed over the site. The cover system is comprised of a minimum of 12 inches of clean soil placed on a black, demarcation soil separation fabric. The Excavation Work Plan in Appendix B outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection and maintenance of this cover are provided in the Monitoring Plan included in Section 4 of this SMP.

2.2.1.2 Vacuum-Enhanced Oil Recovery System (ORS)

Free product occurs as a LNAPL on the bedrock water table. The system is comprised of eight recovery wells installed with well screens that transect the bedrock water table. The wells are installed at depths of 35 to 40 feet with well screens that are 15 to 20 feet long. The water table is at an average depth of 27 feet below grade. The regenerative blower system, installed in the building, is used to apply a small vacuum in the wells to enhance the potential flow of free product from the low permeability shale bedrock. The air discharge from the blower is being treated with a granular activated carbon drum. Future monitoring may indicate this element of the system can be removed. Free product is monitored in the wells and manually removed when appropriate. The manifold piping and control system provides flexibility of applying cyclic vacuum versus full time application and controlling the number of wells on line and the distribution of vacuum among the wells. Figures 8, 9 and 10 show the locations of the free product recovery system components and equipment design details.

The operational objectives of the system are to:

- Determine how best to operate the system maximizing recovery

- Recover as much of the oil as possible

- Track the volume of recovery over time to evaluate the progress and feasibility of oil recovery

Procedures for operating and maintaining the ORS are documented in the Operation and Maintenance Plan (Section 4 of this SMP). Procedures for monitoring the system are included in the Monitoring Plan (Section 3 of this SMP). The Monitoring Plan also addresses severe condition inspections in the event that a severe condition, which may affect controls at the site, occurs.

2.2.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC DER-10.

2.2.2.1 Composite Cover System

The composite cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity.

2.2.2.2 Vacuum Enhanced Oil Recovery System (ORS)

The ORS will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the ORS system is no longer required, a proposal to discontinue the system will be submitted. Conditions that warrant discontinuing the ORS system will include documenting the recovery of free product has reached an asymptotic low level after all modes of operation have been tried and that the NYSDEC has determined that the ORS system has reached the limit of its effectiveness. The ORS will remain in place and operational until permission to discontinue its use is granted in writing by the NYSDEC.

2.3 INSTITUTIONAL CONTROLS

A series of Institutional Controls is required by the ROD to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (3) limit the use and development of the site to industrial uses only. Adherence to these Institutional Controls on the site is required by the Environmental Easement and will be implemented under this Site Management Plan. These Institutional Controls are:

- Compliance with the Environmental Easement and this SMP by the Grantor and the Grantor's successors and assigns;
- All Engineering Controls must be operated and maintained as specified in this SMP.
- All Engineering Controls on the Controlled Property must be inspected at a frequency and in a manner defined in the SMP.
- Soil vapor intrusion evaluation or monitoring associated with any future development of buildings at the Site must be performed as defined in this SMP.
- Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in this SMP.

Institutional Controls identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement.

The site has a series of Institutional Controls in the form of site restrictions. Adherence to these Institutional Controls is required by the Environmental Easement. Site restrictions that apply to the Controlled Property are:

- The property may only be used for industrial use subject to local zoning and provided that the long-term Engineering and Institutional Controls included in this SMP are employed.

- The property may not be used for a higher level of use, such as unrestricted residential or commercial use without additional remediation and amendment of the Environmental Easement, as approved by the NYSDEC. The post-remedial confirmation soil sampling indicated the remaining soils meet both industrial and commercial cleanup objectives. Commercial uses of the site may be possible, pending submission and approval of the request to the DEC, completion of any additional investigation and remediation tasks, if any, that may be required and modification of the Environmental Easement.

- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with this SMP.

- The use of the groundwater underlying the property is prohibited without treatment rendering it safe for intended use.

- The potential for vapor intrusion must be evaluated for any buildings developed anywhere on the Site and any potential impacts that are identified must be monitored or mitigated.

- Vegetable gardens and farming on the property are prohibited.

- The Site owner or remedial party will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

2.3.1 Excavation Work Plan

The Site has been remediated for restricted industrial use. Any future intrusive work that will penetrate the soil cover system or disturbing any of the remaining underlying soils, including any modifications or repairs to the existing soil cap will be performed in compliance with the Excavation Work Plan (EWP) that is attached as Appendix B to this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) prepared for the Site. A sample HASP is attached as Appendix C and a CAMP is attached as Appendix D to this SMP that are in current compliance with DER-10, 29 CFR 1910, 29 CFR 1926, and all other applicable Federal, State and local regulations. Based on future changes to State and Federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP will be updated and re-submitted with the notification provided in Section A-1 of the EWP. Any intrusive construction work will be performed in compliance with the EWP, HASP and CAMP, and will be included in the periodic inspection and certification reports submitted under the Site Management Reporting Plan (refer to Section 5).

The Site owner and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all intrusive work, the structural integrity of excavations, proper disposal of excavation de-water, control of runoff from open excavations into remaining contamination, and for structures that may be affected by excavations (such as building foundations and bridge footings). The Site owner will ensure that site development activities will not interfere with, or otherwise impair or compromise, the engineering controls described in this SMP.

2.3.2 Soil Vapor Intrusion Evaluation

Prior to the construction of any enclosed structures anywhere on the Site, a soil vapor intrusion (SVI) evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first

conducting an investigation. This mitigation system will include a vapor barrier and passive sub-slab depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York". Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed and maintained based on the SVI evaluation, the NYSDOH guidance and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation.

SVI sampling results, evaluations and follow-up actions will also be summarized in the next Periodic Review Report.

2.4 INSPECTIONS AND NOTIFICATIONS

2.4.1 Inspections

Inspections of all remedial components installed at the site will be conducted at the frequency specified in the SMP Monitoring Plan schedule. A comprehensive site-wide inspection will be conducted annually, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether Engineering Controls continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;

- Achievement of remedial performance criteria;
- Sampling and analysis of appropriate media during monitoring events;
- If site records are complete and up to date; and
- Changes, or needed changes, to the remedial or monitoring system.

Inspections will be conducted in accordance with the procedures set forth in the Monitoring Plan of this SMP (Section 3). The reporting requirements are outlined in the Periodic Review Reporting section of this plan (Section 5).

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the EC/ICs implemented at the site by a qualified environmental professional as determined by NYSDEC.

2.4.2 Notifications

Notifications will be submitted by the remedial party to the NYSDEC as needed for the following reasons:

- 60-day advance notice of any proposed changes in Site use that are required under the terms of the Order on Consent, 6NYCRR Part 375 and/or Environmental Conservation Law.
- 7-day advance notice of any proposed ground-intrusive activities pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundations structures that reduces or has the potential to reduce the effectiveness of other Engineering Controls and likewise any action to be taken to mitigate the damage or defect.

- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of Engineering Controls in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the Site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with a copy of the Order on Consent and all approved work plans and reports, including this SMP.

- Within 15 days after the transfer of all or part of the Site, the new owner's name, contact representative and contact information will be confirmed in writing.

2.5 CONTINGENCY PLAN

Emergencies may include injury to personnel, fire or explosion, environmental release or serious weather conditions.

2.5.1 Emergency Telephone Numbers

In the event of any environmentally-related situation or unplanned occurrence requiring assistance, the Owner or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be

contacted. These emergency contact lists must be maintained in an easily accessible location at the site.

Table A: Emergency Contact Numbers

Medical, Fire, and Police:	911
One Call Center [Dig Safely New York]:	(800) 272-4480 (3 day notice required for utility markout)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362
NYSDEC Region Office (Spills)	(315) 426-7519
Facility Contact: Plumley Engineering, P.C.	(315) 638-8587 Office Hours 24-hours (315) 264-5137 or 372-3472 or 345-9535
Spill Response Contractors: Op-Tech Environmental Services, Inc. or Paragon Environmental Construction, Inc.	 (315) 437-2065 (315) 699-0840

Note: Contacts and numbers are subject to change and shall be updated as necessary

2.5.2 Map and Directions to Nearest Health Facility

Site Location: 2802 Lodi Street, Syracuse, New York

Nearest Hospital Name: St. Joseph's Hospital Health Center

Hospital Location: 301 Prospect Avenue, Syracuse, New York 13203

Hospital Telephone: (315) 448-5101 (Emergency Room)

Directions to the Hospital:	Head southeast on Lodi Street
	Turn right on North Salina Street
	Bear left onto Prospect Avenue to Emergency Department
Total Distance:	Approximately 1.5 miles from Site
Total Estimated Time:	Approximately 3 minutes

Map Showing Route from the site to the Hospital: Refer to HASP

2.5.3 Response Procedures

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (Table A). The list will also posted prominently at the site and made readily available to all personnel at all times.

This section describes the response and cleanup procedures in the event of an oil discharge. State and Federal laws prohibit the uncontrolled discharge of oil to groundwater, surface water or soil. The most likely spill scenario at the Site would be a leak from a single 55-gallon drum used to store oil recovered from the on site wells.

In general, the following steps are taken:

- Contact the DEC Spill Hotline at **(800) 457-7362 within 2 hours of discovery.**
- If possible and safe to do so, identify and shut down the source of the discharge to stop the flow. Otherwise, contact one of the spill response contractors.
- Contain the discharge with absorbent material or absorbent materials.

- Contact the Facility Contact.
- Contact regulatory authorities and the response organization.
- Collect and dispose of recovered products according to regulation.
- If soil is impacted, remove all impacted soils, collect soil confirmation samples for laboratory analysis to document post-cleanup conditions.
- Repair the soil cover system in accordance with this plan.

The following spill response equipment and materials shall be kept in the shed at the site:

- Fire Extinguisher
- Empty 55-gallon drum
- Loose absorbent material (e.g. 1 bag Speedi-Dri)
- Absorbent pads (1-bale)

Should future development of the site include occupied building facilities, amendment to this Contingency Plan should be considered to include procedures for evacuation.

3.0 SITE MONITORING PLAN

3.1 INTRODUCTION

3.1.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the site, the soil cover system, and all affected site media identified below. Monitoring of other Engineering Controls is described in Chapter 4, Operation, Monitoring and Maintenance Plan. This Monitoring Plan may only be revised with the approval of NYSDEC.

3.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Assessing achievement of the remedial performance criteria.
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

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

- Information on all designed monitoring systems (e.g., well logs);
- Reporting requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and

- Annual inspection and periodic certification.

Monthly monitoring of the performance of the vacuum enhanced oil recovery system will be conducted for the first year. The frequency thereafter will be determined by NYSDEC. Trends in the amount of free product recovered will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring requirements are summarized in Table B and outlined in detail in Sections 3.2 and 3.3 below.

Table B: Monitoring/Inspection Schedule

Monitoring Program	Frequency*	Matrix	Analysis
Oil Recovery System	Once per week for three months, then once per month	Floating oil layers in site monitoring and recovery wells	• Gauging thickness of oil layers • Depth to well water level
Groundwater Monitoring	Quarterly for one year after completion of the free product recovery program, then twice per year	Groundwater	• VOCs and PCBs

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

3.2 SOIL COVER SYSTEM MONITORING

The 12-inch thick soil cover system shall be inspected periodically for evidence of disturbance or erosion. Any excavations of the soil cap to depths greater than 12 inches below the soil cap demarcation fabric are to be recorded by the property owner and repaired in accordance with the requirements of this SMP. The inspection of the condition and integrity of the soil cap will be an item of the annual inspection and certification in the Periodic Review Report.

3.3 MEDIA MONITORING PROGRAM

3.3.1 Free Product Monitoring

Free product monitoring will be performed on a periodic basis to assess the performance of the remedy.

The network of monitoring and remediation wells has been installed to recover and monitor free product on the groundwater table at the Site. The network of wells is described as follows:

- A total of eight remediation wells and nine monitoring wells are present at the site. Refer to Figure 8 for well locations. All wellheads are enclosed within protective risers or manhole vaults.

- All wells are approximately 35 to 40 feet deep, with well screens intercepting the bedrock water table.

Monitoring well construction logs are included in Appendix E.

The well inspection frequency may be modified with the approval of NYSDEC. The SMP will be modified to reflect changes in the inspection plan approved by NYSDEC. Deliverables for the monitoring program are specified below.

3.3.1.1 Inspection Protocol

All monitoring well inspection activities will be recorded on a well inspection log, provided in Appendix F. Other observations (e.g., well integrity, etc.) will be noted on the well inspection log. The following routine information shall be recorded for each well inspected:

- Measure the depth to water.

- Complete a free product check, including noting the absence or presence of floating product on the water and the thickness of floating product layer, if present.

- Condition of the well and wellhead.

- Amount of oil removed from the well, if any.

Procedures for completing a free product check are included in the Appendix G.

3.3.2 Groundwater Monitoring

Groundwater monitoring will be performed on a periodic basis specified in Table B to assess the performance of the remedy following completion of the free product recovery program. Groundwater samples will be analyzed for VOCs and PCBs. Initially, all wells will be sampled, then based on the results, a reduced list of key wells will developed for the remainder of the monitoring program, subject to approval of NYSDEC.

3.3.2.1 Sampling Protocol

All monitoring groundwater sampling activities will be conducted in accordance with the groundwater sampling procedures presented in Appendix H.

3.3.1.2 Monitoring Well Repairs, Replacement and Decommissioning

If biofouling or silt accumulation occurs in the wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (as per the Monitoring Plan), if an event renders the wells unusable. Repairs and/or replacement of wells in the well network will be performed based on assessments of structural integrity and overall performance and need.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be

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

3.3.3 Indoor Air Quality

Future construction of buildings on the Site will be subject to indoor air quality testing and possible monitoring unless prior mitigation measures are incorporated into the construction of the building(s). Refer to Section 2.3.2 for requirements concerning soil vapor intrusion.

3.4 SITE-WIDE INSPECTION

Site-wide inspections will be performed on a regular schedule at a minimum of once a year. Site-wide inspections will also be performed after all severe weather conditions that may affect Engineering Controls or monitoring devices. During these inspections, an inspection form will be completed (Appendix I), compiling sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;
- Compliance with permits and schedules included in the Operation and Maintenance Plan; and
- Confirm that site records are up to date.

3.5 MONITORING QUALITY ASSURANCE/QUALITY CONTROL

All sampling and analyses will be performed in accordance with the following requirements:

- Sampling Program
    - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
    - Sample holding times will be in accordance with the NYSDEC ASP requirements.
    - Field QC samples (e.g., trip blanks, coded field duplicates and matrix spike/ matrix spike duplicates) will be collected, as necessary.
- Sample Tracking and Custody
- Calibration Procedures
    - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
    - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures
    - VOCs: EPA Method 8260B (Full List)
    - PCBs: EPA Method 8082

- Laboratory Deliverables: Category A

- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.

3.6 MONITORING REPORTING REQUIREMENTS

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

All monitoring results for the oil recovery system and the subsequent groundwater monitoring program will be reported to NYSDEC on a periodic basis agreed to by the DEC in the Periodic Review Report. A letter report will also be prepared, if required by NYSDEC, subsequent to each sampling event. The report will include, at a minimum:

- Date of event;

- Personnel conducting sampling;

- Description of the activities performed;

- Copies of the well inspection logs or groundwater sampling logs, as appropriate;

- A summary table and graphing of the results (free product thickness and recovery);

- Sampling results in comparison to appropriate standards/criteria;

- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);

- A *Site Plan* illustrating well locations;

- Waste disposal documentation of oil recovered from the wells that was disposed of over the time period; and

- Any observations, conclusions, or recommendations.

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

4.0 OPERATION AND MAINTENANCE PLAN

4.1 INTRODUCTION

This Operation and Maintenance Plan describes the measures necessary to operate, monitor and maintain the mechanical components of the vacuum enhanced oil recovery system installed at the Site. This Operation and Maintenance Plan:

- Includes the steps necessary to allow individuals unfamiliar with the site to operate and maintain the ORS;
- Includes an operation and maintenance contingency plan; and
- Will be updated periodically if needed to reflect changes in Site conditions or the manner in which the system is operated and maintained.

Information on non-mechanical Engineering Controls (i.e. soil cover system) is provided in Section 3. A copy of this Operation and Maintenance Plan, along with the complete SMP, will be kept at the Site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of the SMP.

4.2 ENGINEERING CONTROL SYSTEM OPERATION AND MAINTENANCE

4.2.1 Scope

This section describes the operation and maintenance procedures for the enhanced vacuum oil recovery system (ORS) installed at the Site. The system was put into operation in October 2012.

4.2.2 System Startup and Testing

The system component locations and as-built information are detailed on Figures 8, 9 and 10. Equipment cut sheets and manuals for the system are included in Appendix J. The regenerative

blower is the only electrical motor in the system. Its operation extracts air from the 4-inch diameter manifold producing a vacuum in the wells. The air is pulled through a water separator and particulate air filter installed on the suction side of the pump and is discharged through a drum of granular activated carbon for treatment and out the discharge stack. Each of the eight wells is individually piped to the interior 4-inch diameter manifold. Flow control and shutoff valves are installed on each of the well lines to allow flexibility in activating or isolating any number of the wells. Shutoff valves are installed both inside the building on the manifold and also in each wellhead vault. Vacuum and pressure gauges are installed to allow monitoring the blower operating parameters.

Prior to starting the system, the following should be done:

- The manufacturer's operational manual and troubleshooting guide for the blower is included in Appendix J. Proper motor rotation and connections with appropriate inlet (suction) and outlet (discharge) piping connections are to be verified prior to operating (e.g., if the blower is installed after a repair).

- All valves on the suction and discharge side of the blower are to be fully open.

- Check that the particulate filter element is in place.

- Check that all piping connections are properly secured.

- Check that the water separation tank is empty and drain valve closed and that the air relief valve is free to activate.

- The 2-inch air bleeder valve on the suction side of the blower should be fully opened initially.

- Activate the blower using the Hand-OFF-Auto switch on the control panel.

- Once the blower is activated, shut the air bleeder valve off and check the blower vacuum. This condition produces the highest vacuum in the eight-well network achievable with the system. The blower should not be allowed to operate at a vacuum greater than 50-inch water column (wc) for any significant length of time.

- The target vacuum to maintain in the wells is ~0.15 to 0.2-inch wc. Adjust (open) the air relief value until a reading of 0.2-inch wc is obtained on the manifold vacuum gauge.

- Check the vacuums using the petcock valve and hose barb fitting in each well head vault (Figure 9) using a magnehelic gauge. Adjust the air relief valve at the blower as needed to achieve the ~0.15 to 0.2-inch wc well head vacuum. Check the well vacuums for each well at the manifold and compare with those at the wellhead.

- Confirm that none of the wells are short circuiting (drawing excessive amounts of air and therefore reducing vacuum in the other wells). Isolate using the well line valve, if needed.

- Check for any leaks in the piping connections.

- Check that air flow is freely discharging through the carbon drum and roof stack. Any blockage will result in pressure buildup and loss of vacuum.

- Confirm that no water is being pulled from the wells in the separation tank A sight level tube is provided on the tank for determining the presence and level of water in the tank.

The system testing described above is a checklist to complete whenever the system is restarted after a sustained period of shutdown.

4.2.3 System Operation: Routine Operation Procedures

The following routine operational procedures are recommended:

- Check that the blower motor has been cycling on and off as per the settings on the motor 24-hour cycle timer or if set to run full-time without the cycle timer. This can be accomplished by logging the motor run time using the mechanical run-time meter.

- Check that no water is being withdrawn from the wells into the separation tank. Empty as needed.

- Check for generation of excessive vacuum across the particulate filter (10 inches). Clean or replace the filter element if needed.

- There are no maintenance procedures for the regenerative blower (greasing, oil level, etc). However, the sound of the unit should be monitored for unusual noise (and vibration) that will be present if problems with the unit (bearings, for example) are being encountered. A troubleshooting guide for the blower is provided in the manufacturer's manual (Appendix J).

- Check and record the photoionization detection (PID) meter readings of the influent (before carbon drum) and effluent air (after carbon drum) using the two sample taps provided. Note that the carbon drum may not be installed on the system (due to prior operation confirming that drum treatment was no longer needed), in which case only a single reading would be obtained. PID readings of less than 5 ppm should be obtained. If readings are higher than this, carbon treatment may be needed. Turn off the system and consult the NYSDEC or an environmental professional in this case.

- If carbon treatment of the air stream remains a requirement, replacement of the drum would be needed if the effluent air discharge PID reading is greater than 5 ppm. Contact an environmental contractor to arrange a replacement of the drum. Union fittings are provided on the piping system to allow easy change-out of the drums. Proper disposal of the spent carbon drum will need to be arranged by the environmental contractor. Transport manifests and disposal receipts are to be retained by the owner and provided in the periodic report.

- If water is withdrawn from the well lines, the system may automatically turn off via the high level switch in the separator tank. The system should be shut off using the Hand-Off-Auto switch, the water drained from the tank using the manual bottom valve, then restarted and set to operate on the auto mode.

- If the blower is not running and thermal overloads have tripped, this is probably an indication the blower unit requires repair. Consult a specialist to diagnosis and repair, as needed.

- It is recommended that the above checks be completed once per week.

- The system should remain on and operating every day of the week (full time).

4.3 ENGINEERING CONTROL SYSTEM PERFORMANCE MONITORING

A vacuum enhanced oil recovery system (ORS) has been installed at the site to recover oil floating on the water table. Figures 9 and 10 show the locations and equipment layout of the recovery system. Performance monitoring will involve routine inspections for the presence and thickness (volume) of free product in the eight recovery wells and nine monitoring wells. Boring and well as-built logs are provided in Appendix E and a summary of the well construction in Table 4.

4.3.1 Monitoring Schedule

Table 4 summarizes the baseline (pre-remediation) data available regarding the presence of free product in the on-site wells. Wells MW-1S and MW-2 have shown the presence of 1.5 to 4.5-foot thick oil layer over the historical monitoring period. Thinner layers (less than 1 inch to 0.9-feet) have been present in wells MW-7 and MW-10.

Inspection of the wells for free product in the remediation and monitoring wells is to be conducted once per week during the first three months of operation, followed by once per month thereafter. Inspection frequency is subject to change with the approval of the NYSDEC.

Unscheduled inspections and/or sampling may take place when a suspected failure of the system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. Monitoring deliverables for the oil recovery system are specified later in this Plan.

4.3.2 General Equipment Monitoring

A visual inspection of the complete system will be conducted during the monitoring event. ORS components to be inspected include, but are not limited to, the following:

Indoor Inspection Items:

- Blower operating vacuum and pressure readings.
- Hand-Off-Auto switch setting (should be on Auto).
- Blower noise and vibration check.
- Head loss associated with the particulate filter, as indicated by vacuum gauge readings before and after the filter.
- Vacuum reading at the well manifold.
- PID readings of the influent and effluent air stream if carbon treatment is still be provided, or if just the air discharge if no carbon treatment is provided.
- Notation of which wells are on-line or closed (using valves installed on each of the eight well lines at the manifold).
- Individual vacuum readings on each of the wells on-line, obtained using a magnehelic gauge and sample petcock on each of the individual well lines located on the manifold and inside the wellheads. Performance monitoring will determine if there is any significant difference in where the readings are obtained.

- Blower motor run timer reading.
- Notation of the setting for the 24-hour cycle timer for blower operation, if in use.
- Check for water in the separation tank.
- Check for any piping leaks.
- Note any changes made to the system.

Outdoor Inspection Items:

- Confirm building and fence enclosures are secured (locked).
- Condition of the well ahead vaults, noting any deficiencies. The covers are to be left secured with rim bolts.
- Condition and proper installation of inner caps on the wells. Refer to Figure 9 for the as-built condition of the wellhead components. This includes an airtight expansion well cap, a well isolation valve, and well labcock valve and hose barb fitting for measure vacuum at the well heads.
- Measure and record the vacuum in each of the wells using the labcock valve fitting and a magnehelic gauge.
- Note any deficiencies, recommendations for building or system component maintenance or changes in the system operation.

A complete Oil Recovery System Inspection Checklist is presented in Appendix K. If any equipment readings are not within their typical range, any equipment is observed to be malfunctioning or the system is not performing within specifications, maintenance and repair as per the Operation and Maintenance Plan, timely corrections are to be completed and the ORS is to be restarted.

4.3.3 System Monitoring Devices and Alarms

The ORS has a warning light on the control panel indicating the system has shut down in response to a failsafe condition. This will either be in response to a high water level condition in the separation tank or activation of the blower thermal overload protection (indicator of a blower malfunction). Routine logging of the motor run-time meter will also indicate the system has not operated as required by the pre-set conditions (full time operation or on the 24-hour cycle timer presets). In the event the warning device is activated or the system has not run as set by the cycle timer, applicable maintenance and repairs will be conducted as specified in the Operation and Maintenance Plan and the system restarted. Operational problems will be noted in the subsequent Periodic Review Report.

4.3.4 Free Product Checks

Performance monitoring for the oil recovery system will be gauged by the free product monitoring and recovery information obtained while operating the system. After completing the system inspection checklist (Appendix K), "free product checks" are to be completed in all wells. The checks are to determine the absence or presence of floating oil layers and will provide a measurement of the thickness of any oil layers present. The protocol for conducting the free product checks is described as follows:

- Turn off the blower vacuum to the well by shutting off the valve located inside the wellhead vault. This will allow the vacuum in the other wells to remain applied.

- Remove the well cap.

- Measure the depth of the water in the well using an electronic water level probe or oil-water interface probe. If an electronic water level meter is used, the depth of the water table should be determined based on the cessation of the ring coming out of the water column if oil is present. However, if oil is present, an oil-water interface probe is recommended. Field measurements are to be recorded on the log in Appendix F and tabulated in Table 5.

- Check for the presence or absence of free product in the well by either the transparent bailer method (taking a slow cut of the upper portion of the well water column from the well using a bottom filling bailer) or the oil-water interface probe. Refer to Appendix G for the standard operating procedures for free product checks using the bailer method.

- For each well, record if oil was absent or present and the thickness of the oil layer, if present.

- Replace and tighten the airtight well cap and reopen the well line valve.

- Until disposal can be arranged, product removed from the well is to be stored in the remediation building in new, watertight, DOT-approved steel drums for transport, as discussed in the following section.

4.3.5 Free Product Recovery, Storage and Disposal

In conjunction with each free check completed, the oil present in the wells is to be removed from the wells as follows:

- Oil recovery is to be conducted by minimizing the withdrawal of water from the wells to the extent practical.

- Product can be removed by the bailer method, taking small cuts off the top of the well fluid column. Measurements of depth to the water and thickness of the free product layer determined from the free product checks will allow a precise determination of how deep to lower the bailer to receive cuts of product minimizing water. Continue such bailing from the well until the majority of the fluid removed has changed from oil to water, removing as much product as practical.

- Accurately record the volume of oil and water recovered from each well using a graduated pail of other suitable container. Measurements are to be accurate to within ¼ cup (2 fluid ounces).

- Place the recovered oil and water in new, 55-gallon, steel drums located inside the remediation shed for temporary storage. Check that the drum caps are placed and tighten on the drums when finished.

- The amount of oil recovery from each of the wells is to be recorded on the field log and the recovery system spread sheet, provided as Table 6.

An environmental contractor is to be retained periodically as needed to properly profile, manifest for transporting and properly dispose of the recovered oil at an appropriate oil reclamation or disposal facility. No more than two 55-gallon drums of recovered free product are to be stored at the Site between disposal events. Disposal will require laboratory analytical testing, until such time the receiving facility may waive the analytical requirements after a consistent track record is established. Analytical testing, profiling and disposal information for the recovered free product is included in Appendix L.

4.4 MAINTENANCE AND PERFORMANCE MONITORING REPORTING REQUIREMENTS

Maintenance reports and any other information generated during regular operations at the site will be kept on file. All reports, forms and other relevant information generated will be available upon request to the NYSDEC and submitted as part of the Periodic Review Report, as specified in the Section 5 of this SMP.

4.4.1 Routine Inspection Reports

A system inspection checklist (Appendix K) will be completed during each routine inspection event. The checklist form will include, but not be limited to the following information:

- Date;

- Name, company, and position of person(s) conducting maintenance activities;

- Maintenance activities conducted if any:

- Any modifications to the system;

- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and

- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc. (attached to the checklist/form).

- System operating vacuums, pressure readings, PID readings, routine maintenance checks, etc., as indicated on the form.

4.4.2 Non-Routine Maintenance Reports

During each non-routine maintenance event**,** the system inspection form (Appendix K) can also be used and will to include, but not be limited to, the following information:

- Date;

- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;

- Condition requiring diagnosis or maintenance;

- Date of repair;

- Other repairs or adjustments made to the system;

- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet);

- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form); and

- System operating vacuums, pressure readings, PID readings, routine maintenance checks, etc., as indicated on the form.

5.0 INSPECTIONS, REPORTING AND CERTIFICATIONS

5.1 SITE INSPECTIONS

5.1.1 Inspection Frequency

All inspections will be conducted at the frequency specified in the schedules provided in the Monitoring Plan (Section 3) and Operation and Maintenance Plan (Section 4) of this SMP. At a minimum, a site-wide inspection will be conducted annually. Inspections of remedial components will also be conducted when a breakdown of any treatment system component has occurred or whenever a severe condition has taken place, such as an erosion or flooding event that may affect the ECs.

5.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

All inspections and monitoring events for the ORS will be recorded on the appropriate forms (Appendices F and J). Additionally, a general site-wide inspection form will be completed during the site-wide inspection (Appendix I). These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including any disposal records for recovered free product and system maintenance reports, generated for the site during the reporting period will be provided in electronic format in the Periodic Review Report.

5.1.3 Evaluation of Records and Reporting

The results of the inspection and site monitoring data will be evaluated as part of the EC/IC certification to confirm that the:

- EC/ICs are in place, are performing properly, and remain effective;
- The Monitoring Plan is being implemented;

- Operation and maintenance activities are being conducted properly and based on the above items;

- The site remedy continues to be protective of public health and the environment and is performing as designed in the RAWP and FER.

5.2 CERTIFICATION OF ENGINEERING AND INSTITUTIONAL CONTROLS

After the last inspection of the reporting period, a qualified environmental professional or Professional Engineer licensed to practice in New York State will prepare the following certification:

For each institutional or engineering control identified for the site, I certify that all of the following statements are true:

- The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;

- The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;

- Nothing has occurred that would impair the ability of the control to protect the public health and environment;

- Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;

- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;

- If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;

- Use of the site is compliant with the environmental easement;

- The engineering control systems are performing as designed and are effective;

- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program and generally accepted engineering practices; and

- The information presented in this report is accurate and complete.

- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative] [I have been authorized and designated by all site owners to sign this certification] for the Site.

The signed certification will be included in the Periodic Review Report described below.

5.3 PERIODIC REVIEW REPORT

A Periodic Review Report will be submitted to the Department beginning eighteen months after the Certificate of Completion or equivalent document is issued and thereafter on a frequency determined by the NYSDEC. In the event that the Site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site described in Appendix A. The report will be prepared in accordance with NYSDEC DER-10 and submitted within 45 days of the end of each certification period. Media sampling results will also incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site;

- Results of the required annual site inspections and severe condition inspections, if applicable;

- All applicable inspection forms and other records generated for the site during the reporting period in electronic format;

- A summary of disposal documentation for recovered oil and water generated during the reporting period with comments and conclusions;

- Data summary tables and graphical representations of the amount of oil recovered from the system, including a presentation of past data as part of an evaluation;

- Results of all analyses (if any), copies of all laboratory data sheets and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;

- A site evaluation which includes the following:

    - The compliance of the remedy with the requirements of the site-specific RAWP and ROD;

    - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;

    - Any new conclusions or observations regarding oil recovery based on inspections or data generated by the Monitoring Plan.

    - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and

- The overall performance and effectiveness of the remedy.

- A performance summary for all treatment systems at the site during the calendar year, including information such as:

  - The number of days the system was run for the reporting period;

  - A description of breakdowns and/or repairs along with an explanation for any significant downtime;

  - A description of the resolution of performance problems;

  - A summary of the performance, effluent and/or effectiveness monitoring; and

  - Comments, conclusions, and recommendations based on data evaluation.

The Periodic Review Report will be submitted, in hard-copy and electronic format, to the NYSDEC Region 7, Division of Environmental Remediation, Syracuse Regional Office.

5.4 CORRECTIVE MEASURES PLAN

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

TABLES

QUANTA RESOURCES SITE
2802 - 2810 Lodi Street
City of Syracuse, Onondaga County, New York
DEC Site No. 7-34-013

TABLE 1 - SUMMARY OF REMAINING SOIL CONTAMINATION COMPARED TO INDUSTRIAL, COMMERCIAL AND UNRESTRICTED LEVELS - VOCs

Volatile Compounds (mg/kg)	Part 375 SCO[5] (mg/kg)			S-1[1,2]	S-2[1,2,3]	S-3	S-4[4]	S-5	S-6	S-7[1,2]	S-8	S-9[1,2]	S-10[1,2]	S-11[1,2]	S-12	S-13[1,2]	S-14	S-15[4]	S-16[1,2]	S-17[1,2]
				Sample Date																
				11/15/2011	11/16/2011	11/16/2011	11/17/2011	11/25/2011	11/25/2011	11/25/2011	11/25/2011	11/25/2011	11/28/2011	11/28/2011	11/28/2011	11/29/2011	11/30/2011	12/1/2011	12/1/2011	12/1/2011
				Sample Depth (feet)																
	U	C	I	14	6	12	7 - 9	4	9	6	10	9	6	8	10	8	14 - 16	12	12	12
1,1,1-Trichloroethane	0.68	500	1000	ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
1,1,2,2-Tetrachloroethane				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61 Q	< 0.58
1,1,2-Trichloroethane				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
1,1-Dichloroethane	0.27	240	480	ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
1,1-Dichloroethene	0.33	500	1000	ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
1,2,3-Trichlorobenzene				ND < 0.63 Q	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
1,2,4-Trichlorobenzene				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	0.011	< 0.029	< 0.61	< 0.58
1,2,4-Trimethylbenzene	3.6	190	380	ND < 0.63	ND < 0.55	ND < 0.0065	**11**	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	0.12	0.081	< 0.61	< 0.58
1,2-Dibromo-3-chloropropane				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
1,2-Dibromoethane				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
1,2-Dichlorobenzene	1.1	500	1000	ND < 0.63	ND < 0.55	ND < 0.0065	0.30	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	0.017	0.03 J	< 0.61	< 0.58
1,2-Dichloroethane	0.02	30	60	ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
1,2-Dichloropropane				ND < 0.63	ND < 0.55	ND < 0.0065	0.20	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
1,3,5-Trimethylbenzene	8.4	190	380	ND < 0.63	ND < 0.55 J	ND < 0.0065	3.60	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	0.042	0.04	< 0.61	< 0.58
1,3-Dichlorobenzene	2.4	280	560	ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	0.002 J	< 0.029	< 0.61	< 0.58
1,4-Dichlorobenzene	1.8	130	250	ND < 0.63	ND < 0.55 J	ND < 0.0065 J	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	0.002 J	< 0.029	< 0.61	< 0.58
1,4-Dioxane	0.1	130	250	ND < 0.013	ND < 11	ND < 0.0130	ND < 12	< 0.13	< 0.11	< 13	< 0.12	< 0.58	< 13	< 0.6	< 0.12	< 1.3	< 0.13	< 0.59	< 12	< 12
2-Butanone				ND < 1.3	ND < 1.1	0.02	ND < 1.2	< 0.013	< 0.011	< 1.3	< 0.012	< 0.058	< 1.3	< 0.06	< 0.012	< 0.13	< 0.013	< 0.059	< 1.2	< 1.2
2-Hexanone				ND < 1.3	ND < 1.1	ND < 0.013	ND < 1.2	< 0.013	< 0.011	< 1.3	< 0.012	< 0.058	< 1.3	< 0.06	< 0.012	< 0.13	< 0.013	< 0.059	< 1.2	< 1.2
4-Methyl-2-pentanone				ND < 1.3	ND < 1.1	ND < 0.013	ND < 1.2	< 0.013	< 0.011	< 1.3	< 0.012	< 0.058	< 1.3	< 0.06	< 0.012	< 0.13	< 0.013	< 0.059	< 1.2	< 1.2
Acetone	0.05	500	1000	ND < 1.3	ND < 1.1 J	**0.15** J	ND < 1.2	0.047	0.032	< 1.3	0.015	< 0.058	**1.5**	< 0.06 Q	< 0.012 Q	< 0.13 Q	**0.076**	**0.09**	< 1.2	< 1.2
Benzene	0.06	44	89	ND < 0.63	ND < 0.55 J	ND < 0.0065	ND < 0.62 J	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
Bromochloromethane				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
Bromodichloromethane				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
Bromoform				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64 Q	< 0.03	< 0.0061	< 0.063	< 0.0063 Q	< 0.029 Q	< 0.61	< 0.58 Q
Bromomethane				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03 Q	< 0.0061 Q	< 0.063 Q	< 0.0063	< 0.029	< 0.61	< 0.58
Carbon disulfide				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
Carbon tetrachloride	0.76	22	44	ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
Chlorobenzene	1.1	500	1000	ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
Chloroethane				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065 Q	< 0.0056 Q	< 0.64 Q	< 0.006 Q	< 0.029 Q	< 0.64	< 0.03 Q	< 0.0061 Q	< 0.063 Q	< 0.0063	< 0.029	< 0.61	< 0.58
Chloroform	0.37	350	700	ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
Chloromethane				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03 Q	< 0.0061 Q	< 0.063 Q	< 0.0063	< 0.029	< 0.61	< 0.58
cis-1,2-Dichloroethene	0.25	500	1000	ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	0.002 J	< 0.063	< 0.0063	0.056	< 0.61	< 0.58
cis-1,3-Dichloropropene				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
Cyclohexane				ND < 0.63	ND < 0.55	ND < 0.0065	2.50	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	0.037	0.045	< 0.61	< 0.58
Dibromochloromethane				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
Dichlorodifluoromethane				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065 Q	< 0.0056 Q	< 0.64 Q	< 0.006 Q	< 0.029 Q	< 0.64 Q	< 0.03 Q	< 0.0061 Q	< 0.063 Q	< 0.0063 Q	< 0.029 Q	< 0.61 Q	< 0.58 Q
Ethylbenzene	1	390	780	ND < 0.63	ND < 0.55 J	ND < 0.0065	1.20	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
Freon-113				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
Isopropylbenzene				ND < 0.63	ND < 0.55	ND < 0.0065	0.68	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	0.019	0.03	< 0.61	< 0.58
m,p-Xylene	1.6	500	1000	ND < 0.63	ND < 0.55	ND < 0.0065	**5.40**	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	0.037	0.02 J	< 0.61	< 0.58
Methyl Acetate				ND < 0.63 Q	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
Methyl tert-butyl ether	0.93	500	1000	ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03 Q	< 0.0061 Q	< 0.063 Q	< 0.0063	< 0.029	< 0.61	< 0.58
Methylcyclohexane				1.700	0.69	ND < 0.0065	8.000	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	0.0085	< 0.063	0.069	0.14	1.1	< 0.58
Methylene chloride	0.05	500	1000	ND < 0.63	**0.57**	ND < 0.0065	ND < 0.62 J	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64 Q	< 0.03 Q	< 0.0061 Q	< 0.063 Q	< 0.0063 Q	< 0.029 Q	< 0.61	< 0.58 Q
n-Butylbenzene	12	500	1000	ND < 0.63	ND < 0.55	ND < 0.0065	0.96	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	0.0073	< 0.063	0.028	0.06	< 0.61	< 0.58
n-Propylbenzene	3.9	500	1000	ND < 0.63	ND < 0.55	ND < 0.0065	1.20	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	0.006	< 0.063	0.037	0.053	< 0.61	< 0.58
o-Xylene	0.26	500	1000	ND < 0.63	ND < 0.55	ND < 0.0065	0.87	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	0.011	< 0.029	< 0.61	< 0.58
sec-Butylbenzene	11	500	1000	ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	0.017	0.056	< 0.61	< 0.58
Styrene				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
tert-Butylbenzene	5.9	500	1000	ND < 0.63	ND < 0.55 J	ND < 0.0065	ND < 0.62 J	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
Tetrachloroethene	1.3	150	300	ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065 Q	< 0.0056 Q	< 0.64 Q	< 0.006 Q	< 0.029 Q	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61 Q	< 0.58
Toluene	0.7	500	1000	ND < 0.63	ND < 0.55 J	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
trans-1,2-Dichloroethene	0.19	500	1000	ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
trans-1,3-Dichloropropene				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61	< 0.58
Trichloroethene	0.47	200	400	ND < 0.63	**0.85**	0.01	ND < 0.62	< 0.0065	0.003 J	< 0.64	0.004 J	< 0.029	< 0.64	0.02 J	0.015	< 0.063	0.011	0.02 J	< 0.61	< 0.58
Trichlorofluoromethane				ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03	< 0.0061	< 0.063	< 0.0063	< 0.029	< 0.61 Q	< 0.58
Vinyl chloride	0.02	13	27	ND < 0.63	ND < 0.55	ND < 0.0065	ND < 0.62	< 0.0065	< 0.0056	< 0.64	< 0.006	< 0.029	< 0.64	< 0.03 Q	< 0.0061 Q	< 0.063 Q	< 0.0063	< 0.029	< 0.61	< 0.58

Notes:

[1]The reporting limits were raised due to the matrix interference

[2]Petroleum Hydrocarbon pattern detected

[3]Methylene Chloride is a common laboratory solvent

[4]The reporting limits were raised due to the high concentration of target compounds

[5]DEC Final Commissioner Policy, CP-51 / Soil Cleanup Guidance, issued October 21, 2010.

U Unrestricted Use

C Commercial Use

I Industrial Use (Project Specific SCOs)

J Analyte detected below quantitation limits

Q Outlying QC recoveries were associated with this parameter

mg/kg milligrams per killogram

BOLD denotes exceedance of SCOs

QUANTA RESOURCES SITE
2802 - 2810 Lodi Street
City of Syracuse, Onondaga County, New York
DEC Site No. 7-34-013

TABLE 1 - SUMMARY OF REMAINING SOIL CONTAMINATION COMPARED TO INDUSTRIAL, COMMERCIAL AND UNRESTRICTED LEVELS - VOCs

Volatile Compounds (mg/kg)	Part 375 SCO[5] (mg/kg)			S-18	S-19[1,2]	S-20[4]	S-21	S-22[1,2]	S-23	S-24	S-25	S-26[1,2]	S-27[1,2]	S-28	S-29	S-30[1,2]	S-31[1,2]	S-32[1,2]	S-33[1,2]	S-34
				Sample Date																
				12/1/2011	12/5/2011	12/5/2011	12/6/2011	12/6/2011	12/6/2011	12/7/2011	12/7/2011	12/7/2011	12/7/2011	12/7/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011
				Sample Depth (feet)																
	U	C	I	6	12	12	5 - 6	12	6	8	10	12	12	6	4	6	12	6	7	7
1,1,1-Trichloroethane	0.68	500	1000	< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
1,1,2,2-Tetrachloroethane				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
1,1,2-Trichloroethane				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
1,1-Dichloroethane	0.27	240	480	< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
1,1-Dichloroethene	0.33	500	1000	< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
1,2,3-Trichlorobenzene				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
1,2,4-Trichlorobenzene				< 0.0066	< 0.6	0.075	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057 Q
1,2,4-Trimethylbenzene	3.6	190	380	< 0.0066	< 0.6	0.68	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057 Q
1,2-Dibromo-3-chloropropane				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
1,2-Dibromoethane				< 0.0066	< 0.6 J	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
1,2-Dichlorobenzene	1.1	500	1000	< 0.0066	< 0.6	0.27	< 0.0061	0.02 J	< 0.0061	< 0.0067	< 0.0066	0.04 J	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	0.03 J	0.02 J	< 0.0057
1,2-Dichloroethane	0.02	30	60	< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
1,2-Dichloropropane				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
1,3,5-Trimethylbenzene	8.4	190	380	< 0.0066	< 0.6	0.21	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
1,3-Dichlorobenzene	2.4	280	560	< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
1,4-Dichlorobenzene	1.8	130	250	< 0.0066	< 0.6	0.03 J	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
1,4-Dioxane	0.1	130	250	< 0.13	< 12	< 1.2	< 0.12	< 1.2	< 0.12	< 0.13	< 0.13	< 1.2	< 1.2	< 0.12	< 0.13	< 1.3	< 1.3	< 1.3	< 1.3	< 0.11
2-Butanone				0.02	< 1.2	< 0.12	< 0.012	< 0.12	< 0.012	0.01 J	< 0.013	< 0.12	< 0.12	< 0.012	< 0.013	< 0.13	< 0.13	< 0.13	< 0.13	< 0.011
2-Hexanone				< 0.013	< 1.2	< 0.12	< 0.012	< 0.12	< 0.012	< 0.013	< 0.013	< 0.12	< 0.12	< 0.012	< 0.013	< 0.13	< 0.13	< 0.13	< 0.13	< 0.011
4-Methyl-2-pentanone				< 0.013	< 1.2	< 0.12	< 0.012	< 0.12	< 0.012	< 0.013	< 0.013	< 0.12	< 0.12	< 0.012	< 0.013	< 0.13	< 0.13	< 0.13	< 0.13	< 0.011
Acetone	0.05	500	1000	**0.12**	< 1.2	**0.27**	< 0.012	< 0.12	< 0.012	**0.11**	0.025	< 0.12	< 0.12	0.013	0.027	**0.13**	< 0.13	**0.31**	< 0.13	0.033
Benzene	0.06	44	89	< 0.0066	< 0.6 J	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Bromochloromethane				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Bromodichloromethane				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Bromoform				< 0.0066 Q	< 0.6	< 0.06 Q	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057 Q
Bromomethane				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Carbon disulfide				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Carbon tetrachloride	0.76	22	44	< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Chlorobenzene	1.1	500	1000	< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Chloroethane				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Chloroform	0.37	350	700	< 0.0066	< 0.6	0.03 J	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Chloromethane				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
cis-1,2-Dichloroethene	0.25	500	1000	0.004 J	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
cis-1,3-Dichloropropene				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Cyclohexane				< 0.0066	< 0.6	0.21	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Dibromochloromethane				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Dichlorodifluoromethane				< 0.0066 Q	< 0.6	< 0.06 Q	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Ethylbenzene	1	390	780	< 0.0066	< 0.6 J	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Freon-113				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057 Q
Isopropylbenzene				< 0.0066	< 0.6	0.086	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
m,p-Xylene	1.6	500	1000	< 0.0066	< 0.6	0.04 J	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Methyl Acetate				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Methyl tert-butyl ether	0.93	500	1000	< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Methylcyclohexane				< 0.0066	< 0.6	0.62	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057 Q
Methylene chloride	0.05	500	1000	< 0.0066 Q	< 0.6 J	< 0.06 Q	< 0.0061	**0.064**	< 0.0061	< 0.0067	< 0.0066	**0.074**	**0.061**	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	**0.082**	< 0.0057
n-Butylbenzene	12	500	1000	< 0.0066	< 0.6	0.34	< 0.0061	0.072	< 0.0061	< 0.0067	< 0.0066	0.08	< 0.059	< 0.0059	< 0.0066	0.085	< 0.064	0.11	0.092	< 0.0057
n-Propylbenzene	3.9	500	1000	< 0.0066	< 0.6	0.13	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
o-Xylene	0.26	500	1000	< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
sec-Butylbenzene	11	500	1000	< 0.0066	< 0.6	0.25	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057 Q
Styrene				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
tert-Butylbenzene	5.9	500	1000	< 0.0066	< 0.6 J	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057 Q
Tetrachloroethene	1.3	150	300	< 0.0066	< 0.6	< 0.06	< 0.0061 Q	< 0.058 Q	< 0.0061 Q	< 0.0067 Q	< 0.0066 Q	< 0.059 Q	< 0.059 Q	< 0.0059 Q	< 0.0066 Q	< 0.064 Q	< 0.064 Q	< 0.064 Q	< 0.065 Q	< 0.0057 Q
Toluene	0.7	500	1000	< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
trans-1,2-Dichloroethene	0.19	500	1000	< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
trans-1,3-Dichloropropene				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Trichloroethene	0.47	200	400	0.003 J	< 0.6	< 0.06	0.004 J	< 0.058	< 0.0061	< 0.0067	0.006 J	0.01 J	< 0.059	0.002 J	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Trichlorofluoromethane				< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057
Vinyl chloride	0.02	13	27	< 0.0066	< 0.6	< 0.06	< 0.0061	< 0.058	< 0.0061	< 0.0067	< 0.0066	< 0.059	< 0.059	< 0.0059	< 0.0066	< 0.064	< 0.064	< 0.064	< 0.065	< 0.0057

Notes:

[1]The reporting limits were raised due to the matrix interference

[2]Petroleum Hydrocarbon pattern detected

[3]Methylene Chloride is a common laboratory solvent

[4]The reporting limits were raised due to the high concentration of target compounds

[5]DEC Final Commissioner Policy, CP-51 / Soil Cleanup Guidance, issued October 21, 2010.

U Unrestricted Use

C Commercial Use

I Industrial Use (Project Specific SCOs)

J Analyte detected below quantitation limits

Q Outlying QC recoveries were associated with this parameter

mg/kg milligrams per kilogram

BOLD denotes exceedance of SCOs

QUANTA RESOURCES SITE
2802 - 2810 Lodi Street
City of Syracuse, Onondaga County, New York
DEC Site No. 7-34-013

TABLE 2 - SUMMARY OF REMAINING SOIL CONTAMINATION COMPARED TO INDUSTRIAL, COMMERCIAL AND UNRESTRICTED LEVELS - SVOCs

Semi-Volatile Compounds (mg/kg)	Part 375 SCO[2] (mg/kg)			S-1[1]	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10	S-11	S-12[1]	S-13[1]	S-14[1]	S-15[1]	S-16[1]	S-17
				Sample Date																
				11/15/2011	11/16/2011	11/16/2011	11/17/2011	11/25/2011	11/25/2011	11/25/2011	11/25/2011	11/25/2011	11/28/2011	11/28/2011	11/28/2011	11/29/2011	11/30/2011	12/1/2011	12/1/2011	12/1/2011
				Sample Depth (Feet)																
	U	C	I	14	6	12	7 - 9	4	9	6	10	9	6	8	10	8	14 - 16	12	12	12
(3+4)-Methylphenol				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
1,2,4,5-Tetrachlorobenzene				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
1,2,4-Trichlorobenzene				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
1,2-Dichlorobenzene				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
1,3-Dichlorobenzene	1.8	280	560	< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
1,4-Dichlorobenzene	1.8	130	250	< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
2,4,5-Trichlorophenol				< 4.2	< 0.36	< 0.43	< 0.41	< 0.43	< 0.37	< 0.43	< 0.4	< 0.39	< 0.42	< 0.4	< 4	< 4.2	< 4.1	< 3.9	< 4	< 0.39
2,4,6-Trichlorophenol				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
2,4-Dichlorophenol				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
2,4-Dimethylphenol				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
2,4-Dinitrophenol				< 4.2	< 0.36	< 0.43	< 0.41	< 0.43	< 0.37	< 0.43	< 0.4	< 0.39	< 0.42	< 0.4	< 4	< 4.2	< 4.1	< 3.9	< 4	< 0.39
2,4-Dinitrotoluene				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
2,6-Dinitrotoluene				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
2-Chloronaphthalene				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
2-Chlorophenol				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
2-Methylnaphthalene				< 2.1	< 0.19	0.39	5 E	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	0.33	< 0.21	< 2.1	< 2.1	1 J	0.7 J	0.9 J	0.32
2-Methylphenol				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
2-Nitroaniline				< 4.2	< 0.36	< 0.43	< 0.41	< 0.43	< 0.37	< 0.43	< 0.4	< 0.39	< 0.42	< 0.4	< 4	< 4.2	< 4.1	< 3.9	< 4	< 0.39
2-Nitrophenol				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
3,3´-Dichlorobenzidine				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
3-Nitroaniline				< 4.2	< 0.36	< 0.43	< 0.41	< 0.43	< 0.37	< 0.43	< 0.4	< 0.39	< 0.42	< 0.4	< 4	< 4.2	< 4.1	< 3.9	< 4	< 0.39
4,6-Dinitro-2-methylphenol				< 4.2	< 0.36	< 0.43	< 0.41	< 0.43	< 0.37	< 0.43	< 0.4	< 0.39	< 0.42	< 0.4	< 4	< 4.2	< 4.1	< 3.9	< 4	< 0.39
4-Bromophenyl phenyl ether				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
4-Chloro-3-methylphenol				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
4-Chloroaniline				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
4-Chlorophenyl phenyl ether				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
4-Nitroaniline				< 4.2	< 0.36	< 0.43	< 0.41	< 0.43	< 0.37	< 0.43	< 0.4	< 0.39	< 0.42	< 0.4	< 4	< 4.2	< 4.1	< 3.9	< 4	< 0.39
4-Nitrophenol				< 4.2	< 0.36	< 0.43	< 0.41	< 0.43	< 0.37	< 0.43	< 0.4	< 0.39	< 0.42	< 0.4	< 4	< 4.2	< 4.1	< 3.9	< 4	< 0.39
Acenaphthene	20	500	1000	< 2.1	0.07 J	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Acenaphthylene	100	500	1000	< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Acetophenone				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Anthracene	100	500	1000	< 2.1	0.1 J	0.09 J	0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Atrazine				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Benz(a)anthracene	1	5.6	11	< 2.1	0.41	< 0.22	0.31	< 0.22	< 0.19	< 0.22	0.07 J	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Benzaldehyde				< 2.1	< 0.19	0.06 J	0.85	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Benzo(a)pyrene	1	1	1.1	< 2.1	0.39	< 0.22	0.2 J	< 0.22	< 0.19	< 0.22	0.07 J	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Benzo(b)fluoranthene	1	5.6	11	< 2.1	0.55	< 0.22	0.35	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Benzo(g,h,i)perylene	100	500	1000	< 2.1	0.2 J	< 0.22	0.2 J	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Benzo(k)fluoranthene	0.8	56	110	< 2.1	0.2 J	< 0.22	0.1 J	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Biphenyl				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Bis(2-chloroethoxy)methane				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Bis(2-chloroethyl)ether				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Bis(2-chloroisopropyl)ether				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Bis(2-ethylhexyl)phthalate				12	0.21 B	1.8 B	1.9 B	< 0.22	0.25	< 0.22	< 0.2	0.2 J	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Butyl benzyl phthalate				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Caprolactam				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Carbazole				< 2.1	0.09 J	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Chrysene	1	56	110	< 2.1	0.39	< 0.22	0.5	< 0.22	< 0.19	< 0.22	0.06 J	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Di-n-butyl phthalate				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Di-n-octyl phthalate				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Dibenz(a,h)anthracene	0.33	0.56	1.1	< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Dibenzofuran				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Diethyl phthalate				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Dimethyl phthalate				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Fluoranthene	100	500	1000	< 2.1	0.64	< 0.22	0.21	< 0.22	< 0.19	< 0.22	0.1 J	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Fluorene	30	500	1000	< 2.1	0.09 J	< 0.22	0.43	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Hexachlorobenzene	3.2	6	12	< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Hexachlorobutadiene				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Hexachlorocyclopentadiene				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Hexachloroethane				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Indeno(1,2,3-cd)pyrene	0.5	5.6	11	< 2.1	0.22	< 0.22	0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Isophorone				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
N-Nitrosodi-n-propylamine				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
N-Nitrosodiphenylamine				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Naphthalene	12	500	1000	< 2.1	0.04 J	< 0.22	1.8	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Nitrobenzene				< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Pentachlorophenol	0.08	6.7	55	< 4.2	< 0.36	< 0.43	< 0.41	< 0.43	< 0.37	< 0.43	< 0.4	< 0.39	< 0.42	< 0.4	< 4	< 4.2	< 4.1	< 3.9	< 4	< 0.39
Phenanthrene	100	500	1000	< 2.1	0.55	0.56	1.1	< 0.22	< 0.19	< 0.22	< 0.2	0.07 J	0.29	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	0.22
Phenol	0.33	500	1000	< 2.1	< 0.19	< 0.22	< 0.21	< 0.22	< 0.19	< 0.22	< 0.2	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2
Pyrene	100	500	1000	< 2.1	0.84	< 0.22	0.97	< 0.22	< 0.19	0.06 J	0.1 J	< 0.2	< 0.22	< 0.21	< 2.1	< 2.1	< 2.1	< 2	< 2.1	< 0.2

Notes:

mg/kg milligrams per killogram

U Unrestricted Use

C Commerical Use

I Industrial Use

[1]The reporting limits were raised due to the matrix interference

J Analyte detected below quantitation limits

E Value above quantiation range

B Analyte detected in the associated Method Blank

[2]DEC Final Commissioner Policy, CP-51 / Soil Cleanup Guidance, issued October 21, 2010.

QUANTA RESOURCES SITE
2802 - 2810 Lodi Street
City of Syracuse, Onondaga County, New York
DEC Site No. 7-34-013

TABLE 2 - SUMMARY OF REMAINING SOIL CONTAMINATION COMPARED TO INDUSTRIAL, COMMERCIAL AND UNRESTRICTED LEVELS - SVOCs

Semi-Volatile Compounds (mg/kg)	Part 375 SCO[2] (mg/kg)			S-18	S-19	S-20	S-21	S-22	S-23	S-24	S-25	S-26	S-27	S-28	S-29	S-30	S-31	S-32	S-33[1]	S-34
				Sample Station																
				12/1/2011	12/5/2011	12/5/2011	12/6/2011	12/6/2011	12/6/2011	12/7/2011	12/7/2011	12/7/2011	12/7/2011	12/7/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011
				Sample Depth (Feet)																
	U	C	I	6	12	12	5 - 6	12	6	8	10	12	12	6	4	6	12	6	7	7
(3+4)-Methylphenol				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
1,2,4,5-Tetrachlorobenzene				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
1,2,4-Trichlorobenzene				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
1,2-Dichlorobenzene				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
1,3-Dichlorobenzene	1.8	280	560	< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
1,4-Dichlorobenzene	1.8	130	250	< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
2,4,5-Trichlorophenol				< 0.44	< 0.4	< 0.4	< 0.4	< 0.38	< 0.4	< 0.44	< 0.43	< 0.39	< 0.39	< 0.39	< 0.43	< 0.43	< 0.42	< 0.42	< 4.3	< 0.38
2,4,6-Trichlorophenol				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
2,4-Dichlorophenol				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
2,4-Dimethylphenol				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
2,4-Dinitrophenol				< 0.44	< 0.4	< 0.4	< 0.4	< 0.38	< 0.4	< 0.44	< 0.43	< 0.39	< 0.39	< 0.39	< 0.43	< 0.43	< 0.42	< 0.42	< 4.3	< 0.38
2,4-Dinitrotoluene				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
2,6-Dinitrotoluene				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
2-Chloronaphthalene				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
2-Chlorophenol				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
2-Methylnaphthalene				< 0.22	< 0.21	1.8	< 0.21	0.84	< 0.21	< 0.23	< 0.22	0.08 J	0.1 J	< 0.2	< 0.22	0.64	0.87	0.38	0.7 J	< 0.19
2-Methylphenol				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
2-Nitroaniline				< 0.44	< 0.4	< 0.4	< 0.4	< 0.38	< 0.4	< 0.44	< 0.43	< 0.39	< 0.39	< 0.39	< 0.43	< 0.43	< 0.42	< 0.42	< 4.3	< 0.38
2-Nitrophenol				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
3,3´-Dichlorobenzidine				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
3-Nitroaniline				< 0.44	< 0.4	< 0.4	< 0.4	< 0.38	< 0.4	< 0.44	< 0.43	< 0.39	< 0.39	< 0.39	< 0.43	< 0.43	< 0.42	< 0.42	< 4.3	< 0.38
4,6-Dinitro-2-methylphenol				< 0.44	< 0.4	< 0.4	< 0.4	< 0.38	< 0.4	< 0.44	< 0.43	< 0.39	< 0.39	< 0.39	< 0.43	< 0.43	< 0.42	< 0.42	< 4.3	< 0.38
4-Bromophenyl phenyl ether				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
4-Chloro-3-methylphenol				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
4-Chloroaniline				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
4-Chlorophenyl phenyl ether				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
4-Nitroaniline				< 0.44	< 0.4	< 0.4	< 0.4	< 0.38	< 0.4	< 0.44	< 0.43	< 0.39	< 0.39	< 0.39	< 0.43	< 0.43	< 0.42	< 0.42	< 4.3	< 0.38
4-Nitrophenol				< 0.44	< 0.4	< 0.4	< 0.4	< 0.38	< 0.4	< 0.44	< 0.43	< 0.39	< 0.39	< 0.39	< 0.43	< 0.43	< 0.42	< 0.42	< 4.3	< 0.38
Acenaphthene	20	500	1000	< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Acenaphthylene	100	500	1000	< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Acetophenone				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Anthracene	100	500	1000	< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Atrazine				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Benz(a)anthracene	1	5.6	11	< 0.22	< 0.21	< 0.2	0.05 J	0.1 J	< 0.21	< 0.23	0.05 J	0.09 J	0.09 J	< 0.2	< 0.22	0.08 J	0.1 J	0.1 J	< 2.2	< 0.19
Benzaldehyde				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Benzo(a)pyrene	1	1	1.1	< 0.22	< 0.21	< 0.2	0.05 J	0.07 J	< 0.21	< 0.23	< 0.22	0.09 J	0.06 J	< 0.2	< 0.22	< 0.22	0.07 J	< 0.22	< 2.2	< 0.19
Benzo(b)fluoranthene	1	5.6	11	< 0.22	< 0.21	< 0.2	< 0.21	0.1 J	< 0.21	< 0.23	< 0.22	0.1 J	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Benzo(g,h,i)perylene	100	500	1000	< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Benzo(k)fluoranthene	0.8	56	110	< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Biphenyl				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Bis(2-chloroethoxy)methane				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Bis(2-chloroethyl)ether				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Bis(2-chloroisopropyl)ether				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Bis(2-ethylhexyl)phthalate				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Butyl benzyl phthalate				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Caprolactam				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Carbazole				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Chrysene	1	56	110	< 0.22	< 0.21	< 0.2	< 0.21	0.1 J	< 0.21	< 0.23	< 0.22	0.09 J	0.08 J	< 0.2	< 0.22	0.06 J	0.1 J	0.1 J	< 2.2	< 0.19
Di-n-butyl phthalate				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Di-n-octyl phthalate				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Dibenz(a,h)anthracene	0.33	0.56	1.1	< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Dibenzofuran				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Diethyl phthalate				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Dimethyl phthalate				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Fluoranthene	100	500	1000	< 0.22	< 0.21	< 0.2	0.07 J	0.31	< 0.21	< 0.23	0.1 J	0.1 J	0.21	< 0.2	< 0.22	0.2 J	0.27	0.22	0.9 J	< 0.19
Fluorene	30	500	1000	< 0.22	< 0.21	0.22	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	0.1 J	< 0.22	0.28	< 2.2	< 0.19
Hexachlorobenzene	3.2	6	12	< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Hexachlorobutadiene				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Hexachlorocyclopentadiene				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Hexachloroethane				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Indeno(1,2,3-cd)pyrene	0.5	5.6	11	< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Isophorone				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
N-Nitrosodi-n-propylamine				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
N-Nitrosodiphenylamine				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Naphthalene	12	500	1000	< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Nitrobenzene				< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Pentachlorophenol	0.08	6.7	55	< 0.44	< 0.4	< 0.4	< 0.4	< 0.38	< 0.4	< 0.44	< 0.43	< 0.39	< 0.39	< 0.39	< 0.43	< 0.43	< 0.42	< 0.42	< 4.3	< 0.38
Phenanthrene	100	500	1000	< 0.22	0.1 J	0.67	< 0.21	1	< 0.21	< 0.23	< 0.22	0.2 J	0.36	< 0.2	< 0.22	0.35	0.54	0.97	1 J	< 0.19
Phenol	0.33	500	1000	< 0.22	< 0.21	< 0.2	< 0.21	< 0.2	< 0.21	< 0.23	< 0.22	< 0.2	< 0.2	< 0.2	< 0.22	< 0.22	< 0.22	< 0.22	< 2.2	< 0.19
Pyrene	100	500	1000	< 0.22	< 0.21	< 0.2	0.07 J	0.66	< 0.21	< 0.23	0.08 J	0.2 J	0.28	< 0.2	0.05 J	0.2 J	0.44	0.47	1 J	0.05 J

Notes:

mg/kg milligrams per killogram

U Unrestricted Use

C Commerical Use

I Industrial Use

[1]The reporting limits were raised due to the matrix interference

J Analyte detected below quantitation limits

E Value above quantiation range

B Analyte detected in the associated Method Blank

[2]DEC Final Commissioner Policy, CP-51 / Soil Cleanup Guidance, issued October 21, 2010.

QUANTA RESOURCES SITE
2802 - 2810 Lodi Street
City of Syracuse, Onondaga County, New York
DEC Site No. 7-34-013

TABLE 3 - SUMMARY OF REMAINING SOIL CONTAMINATION COMPARED TO INDUSTRIAL, COMMERCIAL AND UNRESTRICTED LEVELS - METALS, PCBs

Metals (mg/kg)	Part 375 SCO[2] (mg/kg)			S-1[1]		S-2[1]		S-3[1]		S-4[1]		S-5[1]		S-6[1]		S-7[1]		S-8[1]		S-9[1]		S-10[1]		S-11[1]		S-12[1]		S-13[1]		S-14[1]		S-15[1]		S-16[1]		S-17[1]	
				Sample Date																															
				11/15/2011		11/16/2011		11/16/2011		11/17/2011		11/25/2011		11/25/2011		11/25/2011		11/25/2011		11/25/2011		11/28/2011		11/28/2011		11/28/2011		11/29/2011		11/30/2011		12/1/2011		12/1/2011		12/1/2011	
				Sample Depth (feet)																															
	U	C	I	14		6		12		7 - 9		4		9		6		10		9		6		8		10		8		14 - 16		12		12		12	
Aluminum				27000	Q	6300	Q	17000	Q	15000	Q	22000		21000		27000		21000		25000		15000		14000		14000		17000		9800		12000		13000		11000	
Barium	350	400	10000	52		92		43		110		40	J	39		20	J	20	J	30		30	QJ	20	QJ	20	QJ	30	QJ	30	QJ	30	QJ	40	QJ	30	QJ
Beryllium	7.2	590	2700	0.75		< 0.55		< 0.65		< 0.62		< 0.65		< 0.56		0.79		0.69		0.85		< 0.64	Q	< 0.60	Q	< 0.61	Q	< 0.63	Q	< 0.63	Q	< 0.59	Q	< 0.61	Q	< 0.58	Q
Cadmium	2.5	9.3	60	2.1		0.93		1.4		1.1		**3.4**		**3.5**		**3.5**		1.5		< 0.58		1.6		1.6		1.5		1.6		1.4		1.7		**2.5**		1.5	
Calcium				5000		1800		1900		18000		600		240		4000		59000		9400		38000		45000		31000		47000		60000		43000		24000		19000	
Chromium,trivalent	30	1500	6800	**38**		8.4		26		21		**33**	Q	31	Q	**43**	Q	**30**	Q	**34**	Q	24		21		23		26		16		19		22		18	
Cobalt				22		7.6		21		8.7		9.8		19		9.4		36		12		10		9.0		7.1		6	J	17		23		41		25	
Copper	50	270	10000	**72**		14		39		39		9.3	Q	15	Q	24	Q	3.6	Q	5.9	Q	16		17		10		7.6		31		35		82		41	
Iron				37000		18000		27000		22000		29000	Q	28000		33000	Q	28000	Q	30000	Q	21000	Q	19000	Q	20000	Q	22000	Q	20000	Q	24000	Q	34000	Q	23000	Q
Magnesium				17000		1600		2100		12000		1400	Q	1800	Q	2500	Q	5300	Q	6100	Q	22000		32000		28000		37000		44000		54000		27000		18000	
Manganese	1600	10000	10000	250		390		370		600		380	Q	360	Q	260	Q	430	Q	490	Q	340		290		280		350		370		280		250		320	
Nickel	30	310	10000	**54**	Q	14	Q	**50**	Q	20	Q	**32**		41	Q	**37**		**61**	Q	**37**	Q	29	Q	28	Q	24	Q	24	Q	**33**	Q	**42**	Q	**52**	Q	**43**	Q
Potassium				8000		880		910		4000		3200		2700		3400		2700		3500		2900		2900		2500		3800		1600		2000		2200		1700	
Silver	2	1500	6800	< 6.3	Q	< 5.5	Q	< 6.5	Q	< 6.2	Q	< 6.5		< 5.6		< 6.4		< 6.0		< 5.8		< 6.4	Q	< 6.0	Q	< 6.1	Q	< 6.3	Q	< 6.3	Q	< 5.9	Q	< 6.1	Q	< 5.8	Q
Sodium				190	Q	78	Q	230	Q	100	Q	110		82		140		260		330		150	Q	230	Q	150	Q	420	Q	210	Q	180	Q	92	Q	890	Q
Vanadium				<38	J	<33	J	<39	J	<37	J	30	J	30	J	30	J	20	J	30		20	J	20	J	20	J	20	J	10	J	20	J	20	J	10	J
Zinc	109	10000	10000	56		43		71		55		47		55		76		37		51		47		61		42		39		38		45		51		76	
Antimony				< 6.3		< 5.5		< 6.5		< 6.2		< 6.5		< 5.6		< 6.4		< 6.0		< 5.8		< 6.4	Q	13	Q	< 6.1	Q	< 6.3	Q	< 6.3	Q	< 5.9	Q	< 6.1	Q	< 5.8	Q
Arsenic	13	16	16	**26**		12		**19**		7.2		< 6.5		< 5.6		< 6.4		< 6.0		< 5.8		< 6.4	Q	< 6.0	Q	< 6.1	Q	< 6.3	Q	10	Q	**23**	Q	**34**	Q	**13**	Q
Lead	63	1000	3900	**63**	Q	17	Q	52	Q	55	Q	4.9		9.3		5.6		< 3.6		12		16		16		8.3		6.7		35		29		39		17	
Selenium	3.9	1500	6800	< 3.8		< 3.3		< 3.9		< 3.7		< 3.9		< 3.4		< 3.9		< 3.6		< 3.5		< 3.8		3.8		< 3.6		< 3.8		< 3.8		< 3.5		< 3.6		< 3.5	
Thallium				< 3.8		< 3.3		< 3.9		< 3.7		< 3.9		< 3.4		< 3.9		< 3.6		< 3.5		< 3.8	Q	< 3.6	Q	< 3.6	Q	< 3.8	Q	< 3.8	Q	< 3.5	Q	< 3.6	Q	< 3.5	Q
Cyanide				< 1.26		< 1.10		< 1.30		< 1.24		< 1.29		< 1.13		< 1.29		< 1.20		< 1.17		< 1.28		< 1.21		< 1.21		< 1.26		< 1.26		< 1.17		< 1.21		< 1.17	
Chromium, hexavalent	1	400	800	< 2.5		< 2.2		< 2.6		< 2.5		< 2.6		< 2.3		< 2.6		< 2.4		< 2.3		< 2.6		< 2.4		< 2.4		< 2.5		< 2.5		< 2.3		< 2.4		< 2.3	
PCBs (mg/kg)																																					
PCB-1016				< 0.10		< 0.091		< 0.11		< 0.10		< 0.11		< 0.093		< 0.11		< 0.099		< 0.097		< 0.11		< 0.10		< 0.10		< 0.10		< 0.10		< 0.097		< 0.10		< 0.097	
PCB-1221				< 0.10		< 0.091		< 0.11		< 0.10		< 0.11		< 0.093		< 0.11		< 0.099		< 0.097		< 0.11		< 0.10		< 0.10		< 0.10		< 0.10		< 0.097		< 0.10		< 0.097	
PCB-1232				< 0.10		< 0.091		< 0.11		< 0.10		< 0.11		< 0.093		< 0.11		< 0.099		< 0.097		< 0.11		< 0.10		< 0.10		< 0.10		< 0.10		< 0.097		< 0.10		< 0.097	
PCB-1242				< 0.10		< 0.091		< 0.11		< 0.10		< 0.11		< 0.093		< 0.11		< 0.099		< 0.097		< 0.11		< 0.10		< 0.10		< 0.10		< 0.10		< 0.097		< 0.10		< 0.097	
PCB-1248				< 0.10		< 0.091		< 0.11		< 0.10		< 0.11		< 0.093		< 0.11		< 0.099		< 0.097		< 0.11		< 0.10		< 0.10		< 0.10		< 0.10		< 0.097		< 0.10		< 0.097	
PCB-1254				< 0.10		< 0.091		< 0.11		< 0.10		< 0.11		< 0.093		< 0.11		< 0.099		< 0.097		< 0.11		< 0.10		< 0.10		< 0.10		< 0.10		< 0.097		< 0.10		< 0.097	
PCB-1260				< 0.10	Q	0.41	Q	< 0.11	Q	< 0.10	Q	< 0.11	Q	< 0.093	Q	< 0.11	Q	< 0.099	Q	< 0.097	Q	< 0.11	Q	< 0.10	Q	< 0.10	Q	< 0.10	Q	< 0.10	Q	< 0.097	Q	< 0.10	Q	< 0.097	Q
Total PCBs	0.1	25	1	0		***0.41***		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	

Notes:

[1]The reporting limits were raised due to the matrix interference

[2]DEC Final Commissioner Policy, CP-51 / Soil Cleanup Guidance, issued October 21, 2010.

U Unrestricted Use

C Commercial Use

I Industrial Use

J Analyte detected below quantitation limits

Q Outlying QC recoveries were associated with this parameter

mg/kg milligrams per kilogram

BOLD denotes exceedance of SCOs

QUANTA RESOURCES SITE
2802 - 2810 Lodi Street
City of Syracuse, Onondaga County, New York
DEC Site No. 7-34-013

TABLE 3 - SUMMARY OF REMAINING SOIL CONTAMINATION COMPARED TO INDUSTRIAL, COMMERCIAL AND UNRESTRICTED LEVELS - METALS, PCBs

Metals (mg/kg)	Part 375 SCO[2] (mg/kg)			S-18[1]		S-19[1]		S-20[1]		S-21[1]		S-22[1]		S-23[1]		S-24[1]		S-25[1]		S-26[1]		S-27[1]		S-28[1]		S-29[1]		S-30[1]		S-31[1]		S-32[1]		S-33[1]		S-34[1]	
				Sample Date																															
				12/1/2011		12/5/2011		12/5/2011		12/6/2011		12/6/2011		12/6/2011		12/7/2011		12/7/2011		12/7/2011		12/7/2011		12/7/2011		12/8/2011		12/8/2011		12/8/2011		12/8/2011		12/8/2011		12/8/2011	
				Sample Depth (feet)																															
	U	C	I	6		12		12		5 - 6		12		6		8		10		12		12		6		4		6		12		6		7		7	
Aluminum				23000		14000		12000		18000		13000		24000		22000		19000		16000		16000		16000		19000		23000		17000		15000		29000		14000	
Barium	350	400	10000	40	Q	37	Q	30	QJ	42	Q	30	QJ	30	QJ	40	QJ	30	QJ	20	QJ	30	QJ	20	QJ	30	QJ	30	QJ	30	QJ	58	Q	46	Q	20	QJ
Beryllium	7.2	590	2700	< 0.66	Q	< 0.60	Q	< 0.60	Q	< 0.61		< 0.58		< 0.61		0.68		< 0.66		< 0.59		< 0.59		< 0.59		< 0.66		0.70		< 0.64		< 0.64		0.89		< 0.57	
Cadmium	2.5	9.3	60	2.2		1.5		1.8		< 0.61		< 0.58		< 0.61		< 0.67		< 0.66		< 0.59		< 0.59		< 0.59		< 0.66		< 0.64		< 0.64		< 0.64		< 0.65		< 0.57	
Calcium				2500		36000		28000		49000		69000		60000		3700		23000		57000		56000		48000		48000		6300		13000		34000		12000		44000	
Chromium,trivalent	30	1500	6800	**39**		21		20		28		19		**35**		**33**		29		25		24		25		28		**33**		26		24		**44**		20	
Cobalt				27		22		15		9.4		17		19		29		18		40		34		39		20		57		23		15		18		24	
Copper	50	270	10000	17		37		**62**		10	Q	46	Q	7.8	Q	22	Q	15	Q	6.3	Q	13	Q	6.8	Q	6.8	Q	8.8		71		26		15		3.8	
Iron				33000	Q	23000	Q	25000	Q	23000		25000		33000		34000		27000		23000		24000		24000		26000		29000		31000		23000		51000		18000	
Magnesium				20000		43000		23000		49000		53000		59000		19000		34000		46000		43000		42000		44000		18000		18000		26000		29000		36000	
Manganese	1600	10000	10000	440		300		290		390		390		430		330		320		370		380		350		380		300		220		290		330		390	
Nickel	30	310	10000	**48**	Q	**38**	Q	**39**	Q	**30**	Q	**42**	Q	**57**	Q	**54**	Q	**39**	Q	**47**	Q	**45**	Q	**45**	Q	**36**	Q	**57**	Q	**56**	Q	**38**	Q	**47**	Q	**34**	
Potassium				3900		2600		1800		3300		3600		3600		3600		2800		2800		3400		2400		2900		4800		4100		2300		5700		3000	
Silver	2	1500	6800	< 6.6	Q	< 6.0	Q	< 6.0	Q	< 6.1		< 5.8		< 6.1		< 6.7		< 6.6		< 5.9		< 5.9		**3**	QJ	< 6.6	QJ	< 6.4	Q	< 6.4	Q	< 6.4	Q	< 6.5	Q	< 5.7	Q
Sodium				170	Q	940	Q	130	Q	220		210		240		< 67		76		200		200		180		190		79		260		190		180		200	
Vanadium				30	J	20	J	20	J	20	J	20	J	20	J	30	J	20	J	20	J	20	J	20	QJ	20	QJ	30	QJ	20	QJ	20	QJ	30	QJ	10	QJ
Zinc	109	10000	10000	46		45		43		45		38		49		66		43		33		34		32		49		40		42		77		56		24	
Antimony				< 6.6	Q	< 6.0	Q	< 6.0	Q	< 6.1	Q	< 5.8	Q	< 6.1	Q	< 6.7	Q	< 6.6	Q	< 5.9	Q	< 5.9	Q	< 5.9	Q	< 6.6	Q	< 6.4	Q	< 6.4	Q	< 6.4	Q	< 6.5	Q	< 5.7	Q
Arsenic	13	16	16	< 6.6	Q	9.5	Q	16	Q	< 6.1	Q	**14**	Q	< 6.1	Q	7.1	Q	< 6.6	Q	< 5.9	Q	< 5.9	Q	< 5.9	Q	< 6.6	Q	< 6.4	Q	28	Q	8.7	Q	12	Q	< 5.7	Q
Lead	63	1000	3900	10		22		40		11	Q	47	Q	7.3	Q	22	Q	8.6	Q	< 3.5		10	Q	< 3.6	Q	4.8	Q	6.0	Q	38	Q	**84,000**		39	Q	< 3.4	Q
Selenium	3.9	1500	6800	< 4.0		< 3.6		< 3.6		< 3.7	Q	< 3.5	Q	< 3.6	Q	< 4.0	Q	< 3.9	Q	< 3.5	Q	< 3.5	Q	< 3.6	Q	< 4.0	Q	< 3.9	Q	< 3.8	Q	< 3.8	Q	< 3.9	Q	< 3.4	Q
Thallium				< 4.0	Q	< 3.6	Q	< 3.6	Q	< 3.7	Q	< 3.5	Q	< 3.6	Q	< 4.0	Q	< 3.9	Q	< 3.5	Q	< 3.5	Q	< 3.6	Q	< 4.0	Q	< 3.9	Q	< 3.8	Q	< 3.8	Q	< 3.9	Q	< 3.4	Q
Cyanide				< 1.32		< 1.21		< 1.20		< 1.23		< 1.16		< 1.21		< 1.34		< 1.32		< 1.18		< 1.18		< 1.19		< 1.32		< 1.29		< 1.28		< 1.27		< 1.30		< 1.14	
Chromium, hexavalent	1	400	800	< 2.6		< 2.4		< 2.4		< 2.5		< 2.3		< 2.4		< 2.7		< 2.6		< 2.4		< 2.4		< 2.4		< 2.6		< 2.6		< 2.6		< 2.5		< 2.6		< 2.3	
PCBs (mg/kg)																																					
PCB-1016				< 0.11		< 0.10		< 0.10		< 0.10		< 0.097		< 0.10		< 0.11		< 0.11		< 0.098		< 0.098		< 0.098		< 0.11		< 0.11		< 0.11		< 0.11		< 0.11		< 0.095	
PCB-1221				< 0.11		< 0.10		< 0.10		< 0.10		< 0.097		< 0.10		< 0.11		< 0.11		< 0.098		< 0.098		< 0.098		< 0.11		< 0.11		< 0.11		< 0.11		< 0.11		< 0.095	
PCB-1232				< 0.11		< 0.10		< 0.10		< 0.10		< 0.097		< 0.10		< 0.11		< 0.11		< 0.098		< 0.098		< 0.098		< 0.11		< 0.11		< 0.11		< 0.11		< 0.11		< 0.095	
PCB-1242				< 0.11		< 0.10		< 0.10		< 0.10		< 0.097		< 0.10		< 0.11		< 0.11		< 0.098		< 0.098		< 0.098		< 0.11		< 0.11		< 0.11		< 0.11		< 0.11		< 0.095	
PCB-1248				< 0.11		< 0.10		< 0.10		< 0.10		< 0.097		< 0.10		< 0.11		< 0.11		< 0.098		< 0.098		< 0.098		< 0.11		< 0.11		< 0.11		< 0.11		< 0.11		< 0.095	
PCB-1254				< 0.11		< 0.10		< 0.10		< 0.10		< 0.097		< 0.10		< 0.11		< 0.11		< 0.098		< 0.098		< 0.098		< 0.11		< 0.11		< 0.11		< 0.11		< 0.11		< 0.095	
PCB-1260				< 0.11	Q	< 0.10	Q	< 0.10	Q	< 0.10		< 0.097		< 0.10		< 0.11		< 0.11		< 0.098		< 0.098		< 0.098		< 0.11		< 0.11		< 0.11		< 0.11		< 0.11		< 0.095	
Total PCBs	0.1	25	1	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	

Notes:

[1]The reporting limits were raised due to the matrix interference

[2]DEC Final Commissioner Policy, CP-51 / Soil Cleanup Guidance, issued October 21, 2010.

U Unrestricted Use
C Commercial Use
I Industrial Use
J Analyte detected below quantitation limits
Q Outlying QC recoveries were associated with this parameter
mg/kg milligrams per killogram
BOLD denotes exceedance of SCOs

QUANTA RESOURCES SITE
2802-2810 Lodi Street
City of Syracuse, Onondaga County, New York
DEC Site No. 7-34-013

TABLE 4 - WELL AS-BUILT, WATER LEVELS AND BASELINE FREE PRODUCT DATA

WELL ID	MW-lD	MW-lS	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12
RISER ELEVATION	407.02	407.19	406.92	399.9	399.9	399.45	408.5	404.94	406.06	406.9	406.86	406.74	403.44
GROUND ELEVATION	405.04	404.64	405.45	398.42	398.09	398.11	406.01	402.52	403.61	404.38	404	404.22	401.01
ELEVATIONS OF (Top)	365.04	370.64	377.45	373.42	366.09	376.11	387.51	389.02	386.11	386.88	384.5	384.72	381.51
SCREEN INTERVAL (Bottom)	360.04	365.64	367.45	358.42	356.09	361.61	367.51	373.02	372.11	370.88	369.5	369.72	366.51
BOTTOM OF BORING ELEVATION	357.04	365.64	367.45	356.92	355.59	359.11	367.01	372.52	371.61	370.38	369.00	369.22	366.01
DATE INSTALLED	11/18/91	11/25/91	11/21/91	11/26/91	11/25/91	11/27/91	12/18/08	12/11/08	12/09/08	12/10/08	12/16/08	06/25/09	07/09/09
DIAMETER (Inches)	2	2	2	2	2	2	2	2	2	2	2	2	2
CASING MATERIAL	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC
SCREEN MATERIAL	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC
SLOT SIZE (Inches)	0.010	0.010	0.010	0.010	0.010	0.010	0.020	0.020	0.020	0.020	0.020	0.020	0.020
DATE*	GROUNDWATER ELEVATION												
02/06/1992	374.45	376.81	377.8	374.03	374.00	378.46	NI	NI	NI	NI	NI	NI	NI
04/15/1992	375.37	377.77	378.62	374.96	374.89	378.56	NI	NI	NI	NI	NI	NI	NI
03/10/2008*	374.37	378.52 (4.5')	376.58 (2.3')	373.51	373.29	377.33	NI	NI	NI	NI	NI	NI	NI
3/12/2008	374.5	NM	NM	373.43	373.33	377.06	NI	NI	NI	NI	NI	NI	NI
12/16/2008	NM	NM	NM	NM	NM	NM	NI	375.36	377.56	377.59	NI	NI	NI
12/18/2008*	NM	NM	NM	NM	NM	NM	NI	375.61 (.04')	378.05	377.55	377.04 0	NI	NI
12/23/2008	NM	NM	NM	NM	NM	NM	377.05	375.60 (.16')	377.73	377.53	376.78 0	NI	NI
1/5/2009	375.58	NM	NM	374.6	374.55	376.53	377.41	376.41 (.26')	378.3	378.26	377.52 0	NI	NI
01/23/2009*	374.41	375.63 (2.4')	376.78 (2.07')	374.14	374.01	375.65	375.77	375.22 (.44')	377.5	376.99	376.49 0	NI	NI
06/25/2009*	374.37	375.34 (2.35')	375.94 (1.86')	373.79	373.69	375.7	375.41	375.06 (.38')	377.64	376.67	376.32 (.25')	NI	NI
06/29/2009*	374.36	375.17 (2.23')	376.10 (1.51')	373.72	373.66	375.97	375.22	374.86 (.64')	377.37	376.61	376.15 (.29')	374.54	NI
07/14/2009*	374.16	374.87 (2.04')	375.81 (1.8')	373.61	373.54	375.44	374.99	374.45 (.9')	376.97	376.25	375.61 (.85')	374.34	373.94

Notes:

All elevations reported in feet above mean sea level.

* Wells contained free product layers on the water column. A Corrected Depth To Water (CDTW) calculation was used to estimate the groundwater level without the free product using this equation: CDTW = Static DTW - (PxG); where P = Measured Product thickness (which is notated in parenthesis) and G = Specific Gravity. Specific Gravity is currently estimated to be 0.85 based on field observations and published values.

NI Not installed

NM Not measured

All wells were re-surveyed on 01/05/09 by Plumley Engineering and those elevations were used for all groundwater data from 03/10/08 to present.

QUANTA RESOURCES SITE
2802-2810 Lodi Street
City of Syracuse, Onondaga County, New York

TABLE 5 - FREE PRODUCT THICKNESS

Date	Free Product Measurements (Feet)																
	MW-1S	MW-2	MW-7	MW-10	RW-1	RW-2	RW-3	RW-4	MW-1D	MW-3	MW-4	MW-5	MW-6	MW-8	MW-9	MW-11	MW-12
07/14/09	2.04	1.80	0.90	0.85	NI	NI	NI	NI	---	---	---	---	---	---	---	---	---
2011	Completed Remedial Excavation																
09/20/12	3.23	1.07	4.03	2.09	---	0.05	0.76	---	---	---	---	---	---	---	---	---	---
09/20/12	System Startup																

Notes:

--- Not Present
NI Well not installed
NA Oil-water interface probe malfunction
NM Not measured
Free product measurements taken with an oil/water interface probe.

QUANTA RESOURCES SITE
2802-2810 Lodi Street
City of Syracuse, Onondaga County, New York

TABLE 6 - FREE PRODUCT RECOVERY

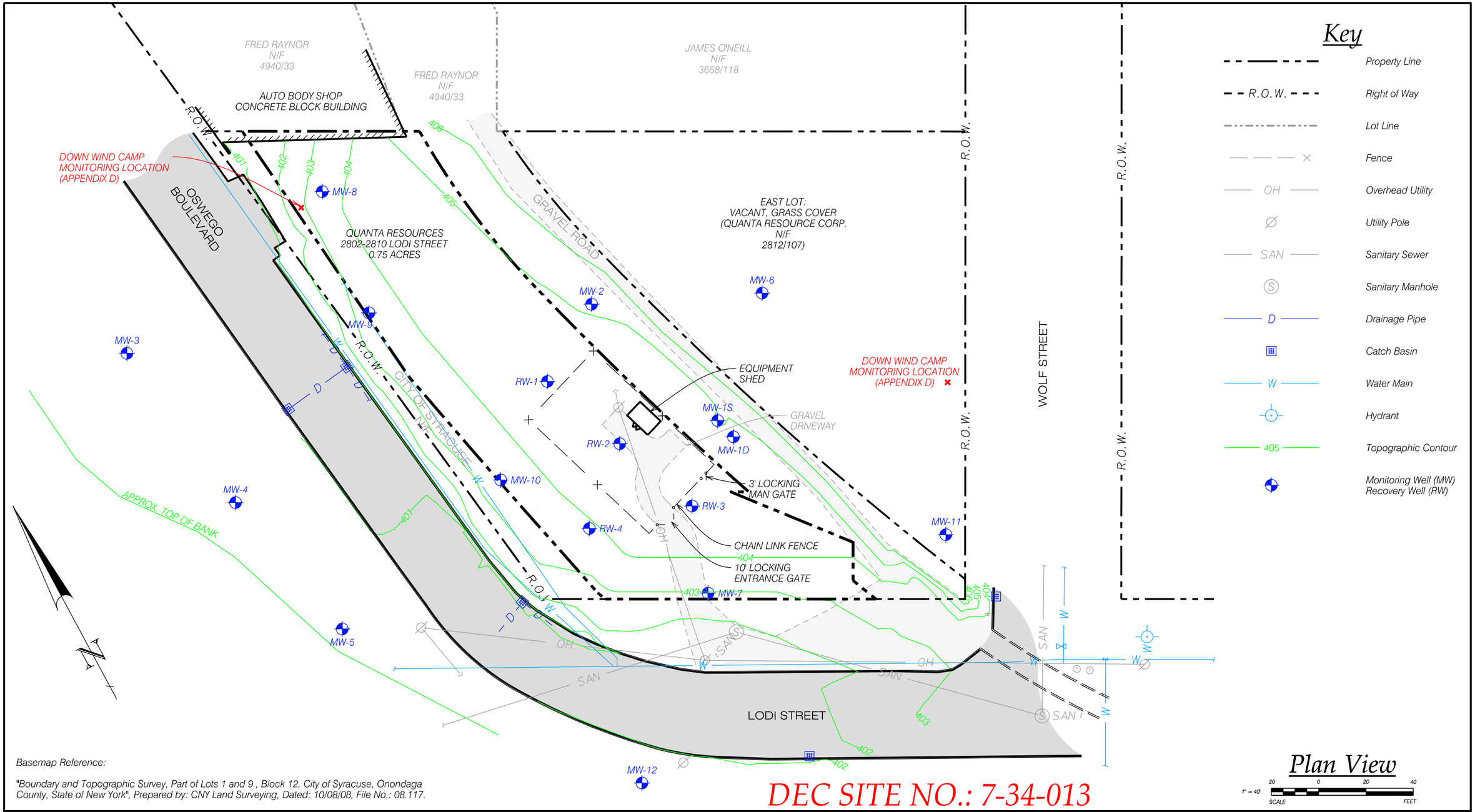
Date	MW-1S	MW-2	MW-7	MW-10	RW-2	RW-3	Total	Cumulative Total (liters)	Cumulative Total (gallons)
Total (liters)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		
Total (gallons)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		

Notes:

*Based on estimate in each bailer. Actual free product recovery based on drum accumulation.

For wells not listed, free product is not present.
Blank indicates not removed.

FIGURES



Basemap Reference:

"Boundary and Topographic Survey, Part of Lots 1 and 9 , Block 12, City of Syracuse, Onondaga County, State of New York", Prepared by: CNY Land Surveying, Dated: 10/08/08, File No.: 08.117.

Key

- Property Line
- R.O.W. — Right of Way
- Lot Line
- Fence
- OH — Overhead Utility
- Utility Pole
- SAN — Sanitary Sewer
- S — Sanitary Manhole
- D — Drainage Pipe
- Catch Basin
- W — Water Main
- Hydrant
- 405 — Topographic Contour
- Monitoring Well (MW)
  Recovery Well (RW)

Plan View

1" = 40' SCALE 20 0 20 40 FEET

DEC SITE NO.: 7-34-013

PLUMLEY ENGINEERING

PLUMLEY ENGINEERING, P.C.
8232 LOOP ROAD
BALDWINSVILLE, NY 13027

TELEPHONE: (315) 638-8587
FAX: (315) 638-9740
WWW.PLUMLEYENG.COM

Civil and Environmental Engineering

REVISIONS:	DATE:	BY:
SMP	02/17/12	FAK

PROJECT: **SITE MANAGEMENT PLAN**

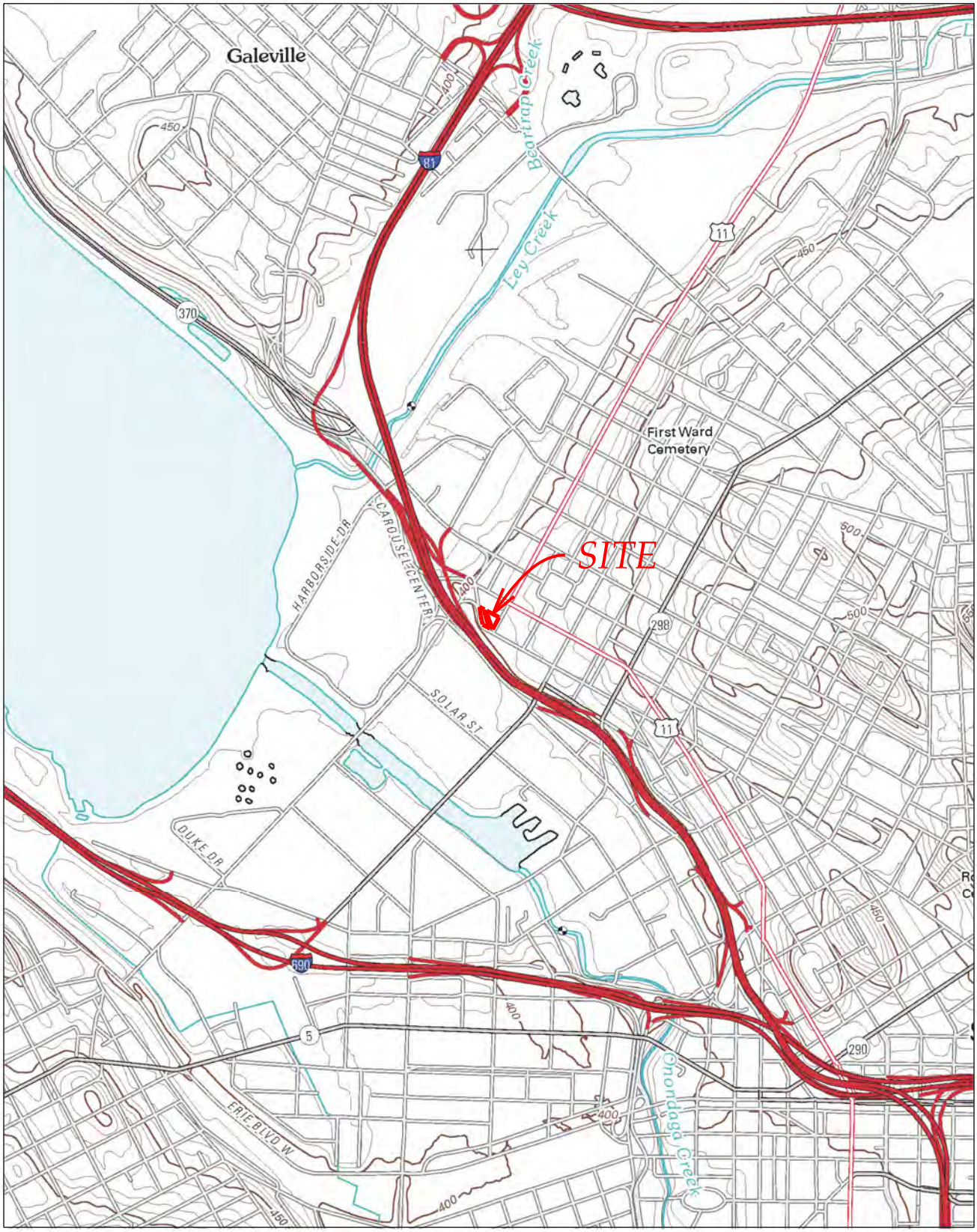
DWG. TITLE: **SITE PLAN (WITH BOUNDARIES)**

CLIENT: 2802-2810 LODI STREET

LOCATION: CITY OF SYRACUSE, ONONDAGA COUNTY, NEW YORK

PROJECT No.:	2010131
FILE NAME.:	Figure1
SCALE:	AS NOTED
DATE:	FEB. 2012
ENG'D BY:	FAK
DRAWN BY:	JMD
CHECKED BY:	FAK

SHEET NO.: FIGURE 1



REF.: USGS - SYRACUSE WEST (NY) QUAD., 2010, 7.5 MIN. SCALE: 1"=2000'

DEC SITE NO.: 7-34-013

PLUMLEY ENGINEERING
Civil and Environmental Engineering

PLUMLEY ENGINEERING, P.C.
8232 LOOP ROAD
BALDWINSVILLE, NY 13027

TELEPHONE: (315) 638-8587
FAX: (315) 638-9740
WWW.PLUMLEYENG.COM

PROJECT: SITE MANAGEMENT PLAN

DWG. TITLE: SITE LOCATION MAP

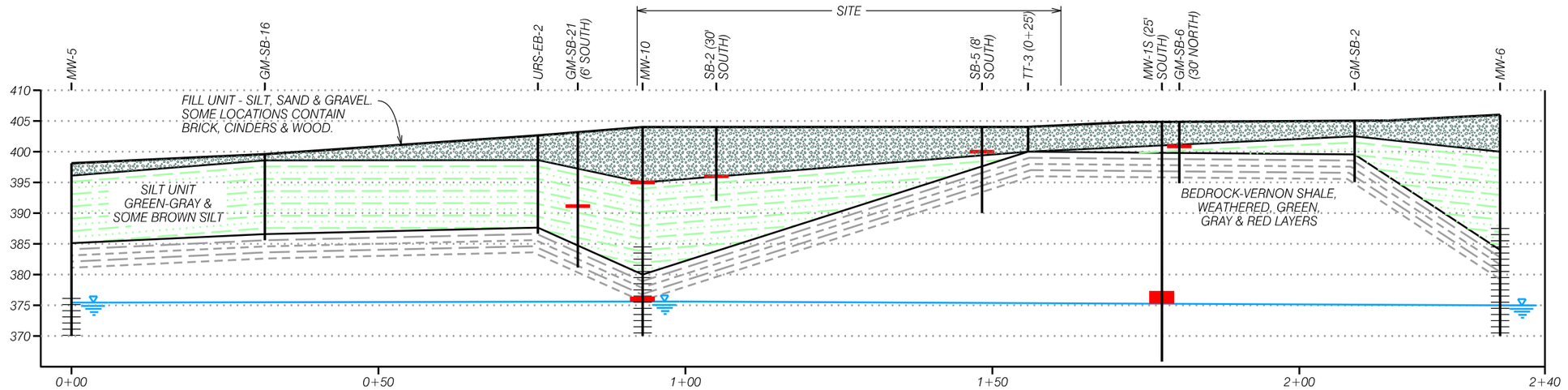
CLIENT: 2802-2810 LODI STREET

LOCATION: CITY OF SYRACUSE, ONONDAGA COUNTY, NEW YORK

PROJECT No.:	2010131
FILE NAME.:	FIGURE 2
SCALE:	AS NOTED
DATE:	FEB. 2012
ENG'D BY:	FAK
DRAWN BY:	JMD
CHECKED BY:	FAK

Key

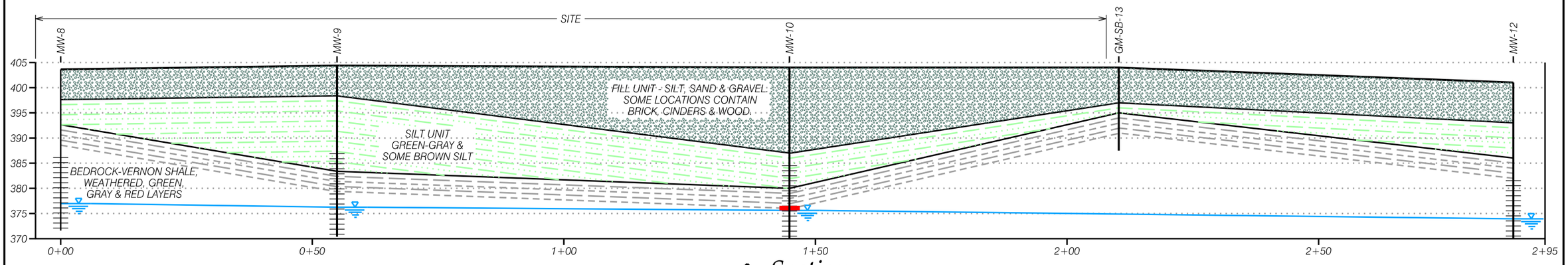
Free-Phase Oil Present



A / FIG. 5

Section

Scale: 1"=20'



B / FIG. 5

Section

Scale: 1"=20'

DEC SITE NO.: 7-34-013

PLUMLEY ENGINEERING

PLUMLEY ENGINEERING, P.C.
8232 LOOP ROAD
BALDWINSVILLE, NY 13027

TELEPHONE: (315) 638-8587
FAX: (315) 638-9740
WWW.PLUMLEYENG.COM

Civil and Environmental Engineering

REVISIONS:	DATE:	BY:
SMP	02/17/12	FAK

PROJECT: SITE MANAGEMENT PLAN

DWG. TITLE: GEOLOGIC CROSS SECTIONS

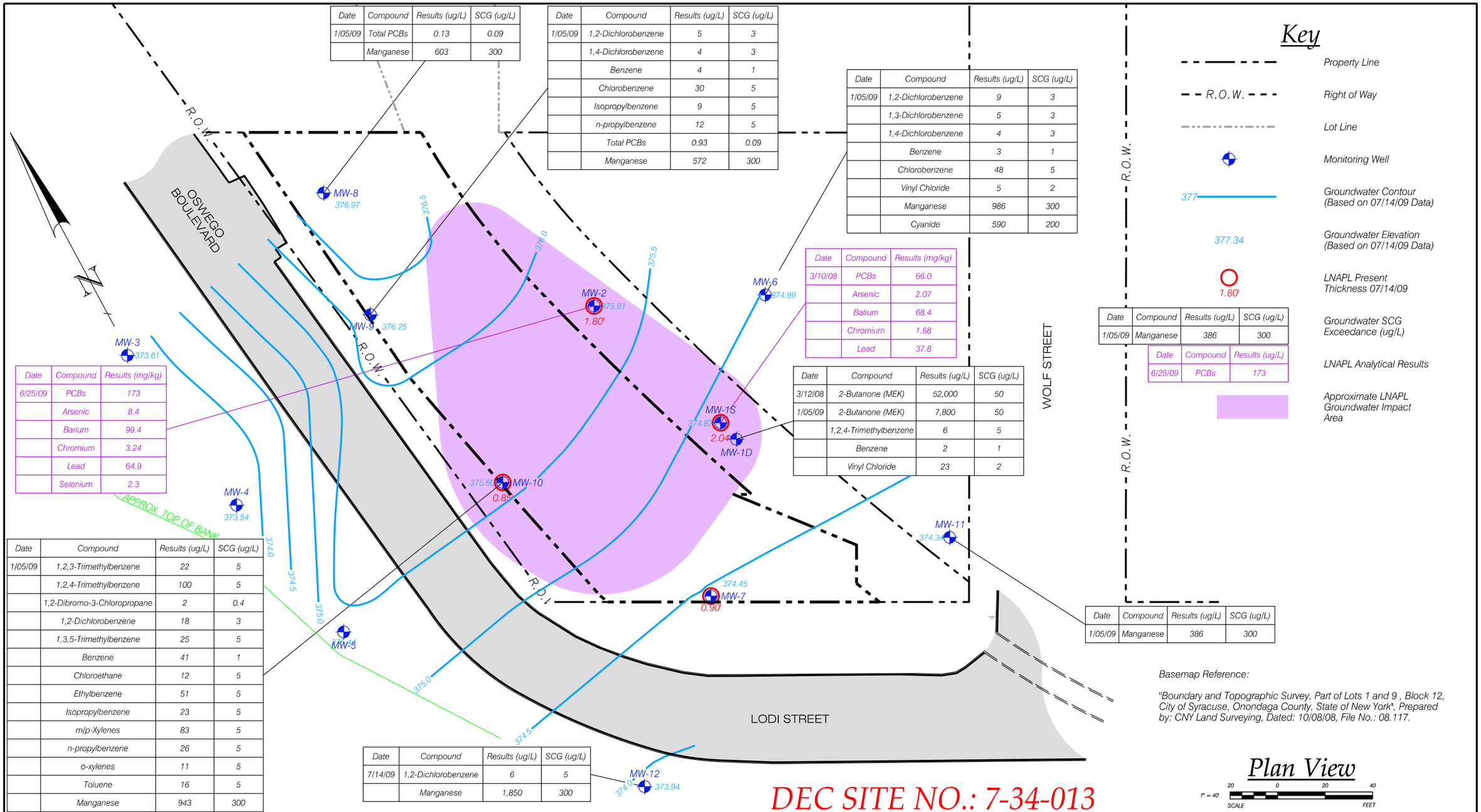
CLIENT: 2802-2810 LODI STREET

LOCATION: CITY OF SYRACUSE, ONONDAGA COUNTY, NEW YORK

PROJECT No.:	2010131
FILE NAME.:	Figure3
SCALE:	AS NOTED
DATE:	FEB. 2012
ENG'D BY:	FAK
DRAWN BY:	JMD
CHECKED BY:	FAK

SHEET NO.:

FIGURE 3



Date	Compound	Results (ug/L)	SCG (ug/L)
1/05/09	Total PCBs	0.13	0.09
	Manganese	603	300

Date	Compound	Results (ug/L)	SCG (ug/L)
1/05/09	1,2-Dichlorobenzene	5	3
	1,4-Dichlorobenzene	4	3
	Benzene	4	1
	Chlorobenzene	30	5
	Isopropylbenzene	9	5
	n-propylbenzene	12	5
	Total PCBs	0.93	0.09
	Manganese	572	300

Date	Compound	Results (ug/L)	SCG (ug/L)
1/05/09	1,2-Dichlorobenzene	9	3
	1,3-Dichlorobenzene	5	3
	1,4-Dichlorobenzene	4	3
	Benzene	3	1
	Chlorobenzene	48	5
	Vinyl Chloride	5	2
	Manganese	986	300
	Cyanide	590	200

Date	Compound	Results (mg/kg)
3/10/08	PCBs	66.0
	Arsenic	2.07
	Batium	68.4
	Chromium	1.68
	Lead	37.8

Date	Compound	Results (mg/kg)
6/25/09	PCBs	173
	Arsenic	8.4
	Barium	99.4
	Chromium	3.24
	Lead	64.9
	Selenium	2.3

Date	Compound	Results (ug/L)	SCG (ug/L)
3/12/08	2-Butanone (MEK)	52,000	50
1/05/09	2-Butanone (MEK)	7,800	50
	1,2,4-Trimethylbenzene	6	5
	Benzene	2	1
	Vinyl Chloride	23	2

Date	Compound	Results (ug/L)	SCG (ug/L)
1/05/09	Manganese	386	300

Date	Compound	Results (ug/L)
6/25/09	PCBs	173

Date	Compound	Results (ug/L)	SCG (ug/L)
1/05/09	1,2,3-Trimethylbenzene	22	5
	1,2,4-Trimethylbenzene	100	5
	1,2-Dibromo-3-Chloropropane	2	0.4
	1,2-Dichlorobenzene	18	3
	1,3,5-Trimethylbenzene	25	5
	Benzene	41	1
	Chloroethane	12	5
	Ethylbenzene	51	5
	Isopropylbenzene	23	5
	m/p-Xylenes	83	5
	n-propylbenzene	26	5
	o-xylenes	11	5
	Toluene	16	5
	Manganese	943	300

Date	Compound	Results (ug/L)	SCG (ug/L)
7/14/09	1,2-Dichlorobenzene	6	5
	Manganese	1,850	300

Basemap Reference:

"Boundary and Topographic Survey, Part of Lots 1 and 9 , Block 12, City of Syracuse, Onondaga County, State of New York", Prepared by: CNY Land Surveying, Dated: 10/08/08, File No.: 08.117.

Plan View

1" = 40' SCALE 20 0 20 40 FEET

DEC SITE NO.: 7-34-013

PLUMLEY ENGINEERING

PLUMLEY ENGINEERING, P.C.
8232 LOOP ROAD
BALDWINSVILLE, NY 13027

TELEPHONE: (315) 638-8587
FAX: (315) 638-9740
WWW.PLUMLEYENG.COM

Civil and Environmental Engineering

REVISIONS:	DATE:	BY:
1 SMP	02/17/12	FAK

PROJECT: SITE MANAGEMENT PLAN

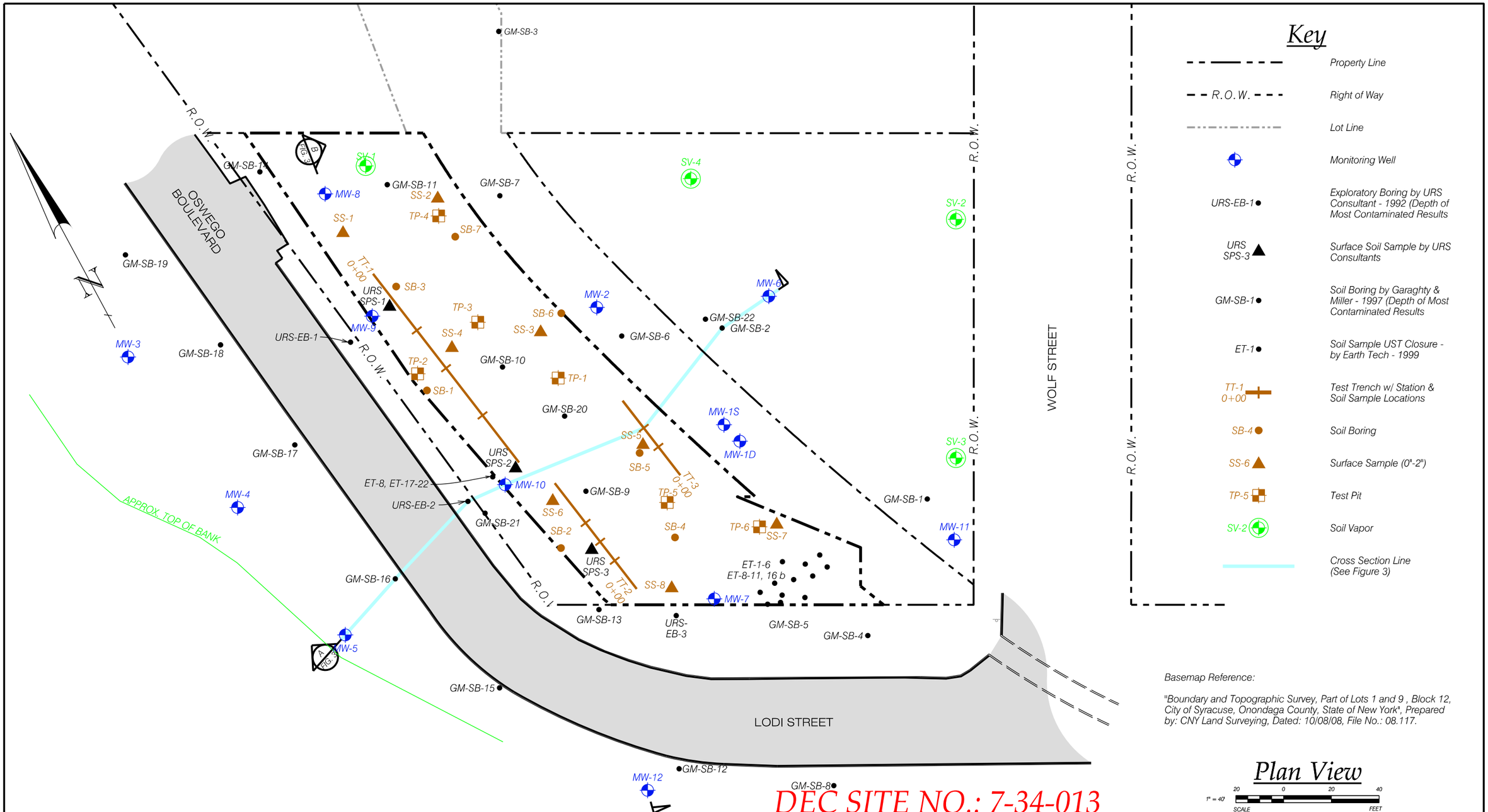
DWG. TITLE: REMEDIAL INVESTIGATION GROUNDWATER DATA PLAN

CLIENT: 2802-2810 LODI STREET

LOCATION: CITY OF SYRACUSE, ONONDAGA COUNTY, NEW YORK

PROJECT No.:	2010131
FILE NAME.:	Figure4
SCALE:	AS NOTED
DATE:	FEB. 2012
ENG'D BY:	FAK
DRAWN BY:	JMD
CHECKED BY:	FAK

SHEET NO.: FIGURE 4



Key

- Property Line
- R.O.W. — Right of Way
- Lot Line
- Monitoring Well
- URS-EB-1 — Exploratory Boring by URS Consultant - 1992 (Depth of Most Contaminated Results
- URS SPS-3 — Surface Soil Sample by URS Consultants
- GM-SB-1 — Soil Boring by Garaghty & Miller - 1997 (Depth of Most Contaminated Results
- ET-1 — Soil Sample UST Closure - by Earth Tech - 1999
- TT-1 0+00 — Test Trench w/ Station & Soil Sample Locations
- SB-4 — Soil Boring
- SS-6 — Surface Sample (0"-2")
- TP-5 — Test Pit
- SV-2 — Soil Vapor
- Cross Section Line (See Figure 3)

Basemap Reference:

"Boundary and Topographic Survey, Part of Lots 1 and 9 , Block 12, City of Syracuse, Onondaga County, State of New York", Prepared by: CNY Land Surveying, Dated: 10/08/08, File No.: 08.117.

Plan View

1" = 40' SCALE — 20 0 20 40 FEET

DEC SITE NO.: 7-34-013

PLUMLEY ENGINEERING
PLUMLEY ENGINEERING, P.C.
8232 LOOP ROAD
BALDWINSVILLE, NY 13027
TELEPHONE: (315) 638-8587
FAX: (315) 638-9740
WWW.PLUMLEYENG.COM
Civil and Environmental Engineering

REVISIONS:	DATE:	BY:
1 SMP	02/17/12	FAK

PROJECT: SITE MANAGEMENT PLAN

DWG. TITLE: REMEDIAL INVESTIGATION LOCATIONS

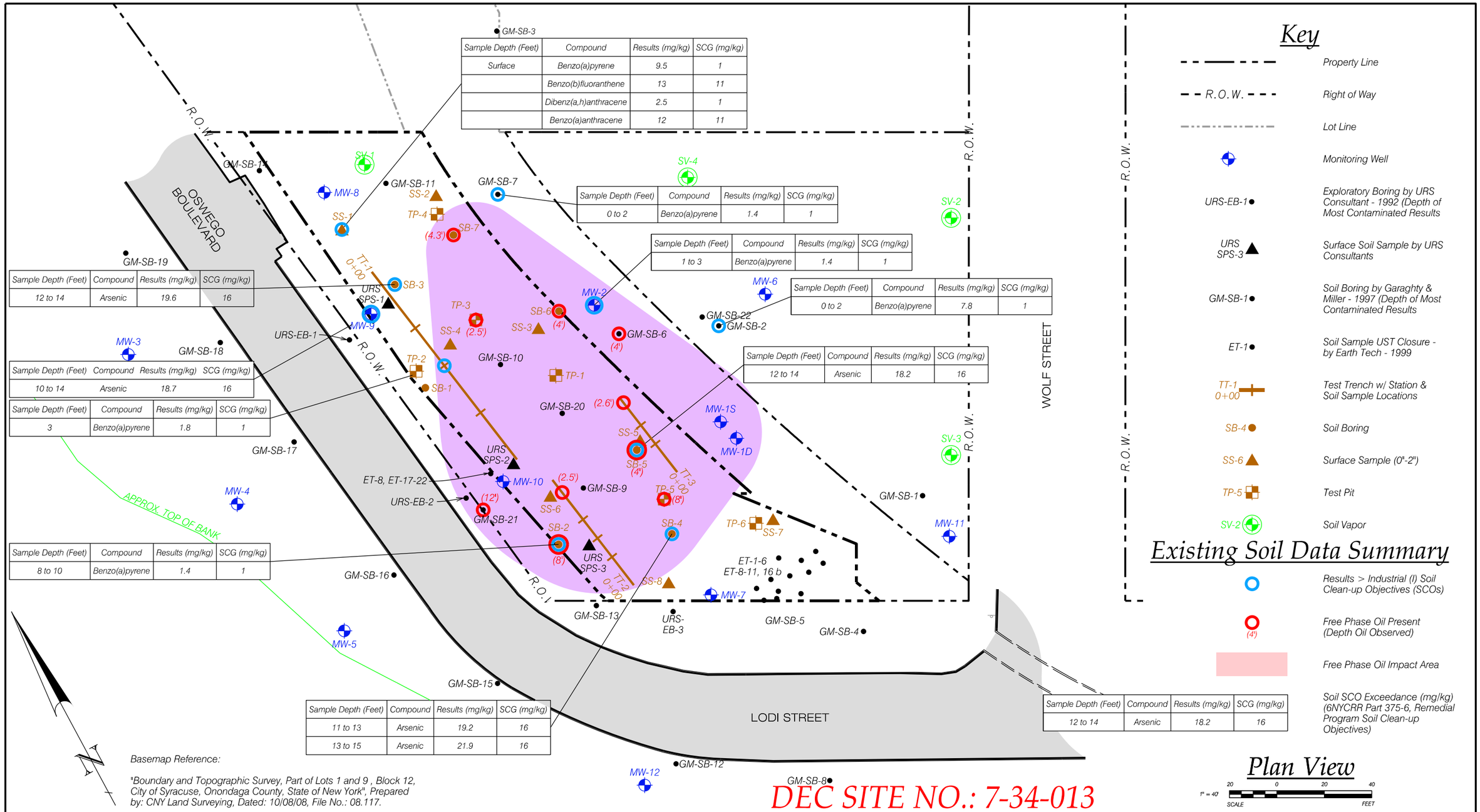
CLIENT: 2802-2810 LODI STREET

LOCATION: CITY OF SYRACUSE, ONONDAGA COUNTY, NEW YORK

Note: No alteration permitted hereon except as provided under Section 7209 Subdivision 2 of the New York State Education Law.

PROJECT No.:	2010131
FILE NAME.:	Figure5
SCALE:	AS NOTED
DATE:	FEB. 2012
ENG'D BY:	FAK
DRAWN BY:	JMD
CHECKED BY:	FAK

SHEET NO.: FIGURE 5



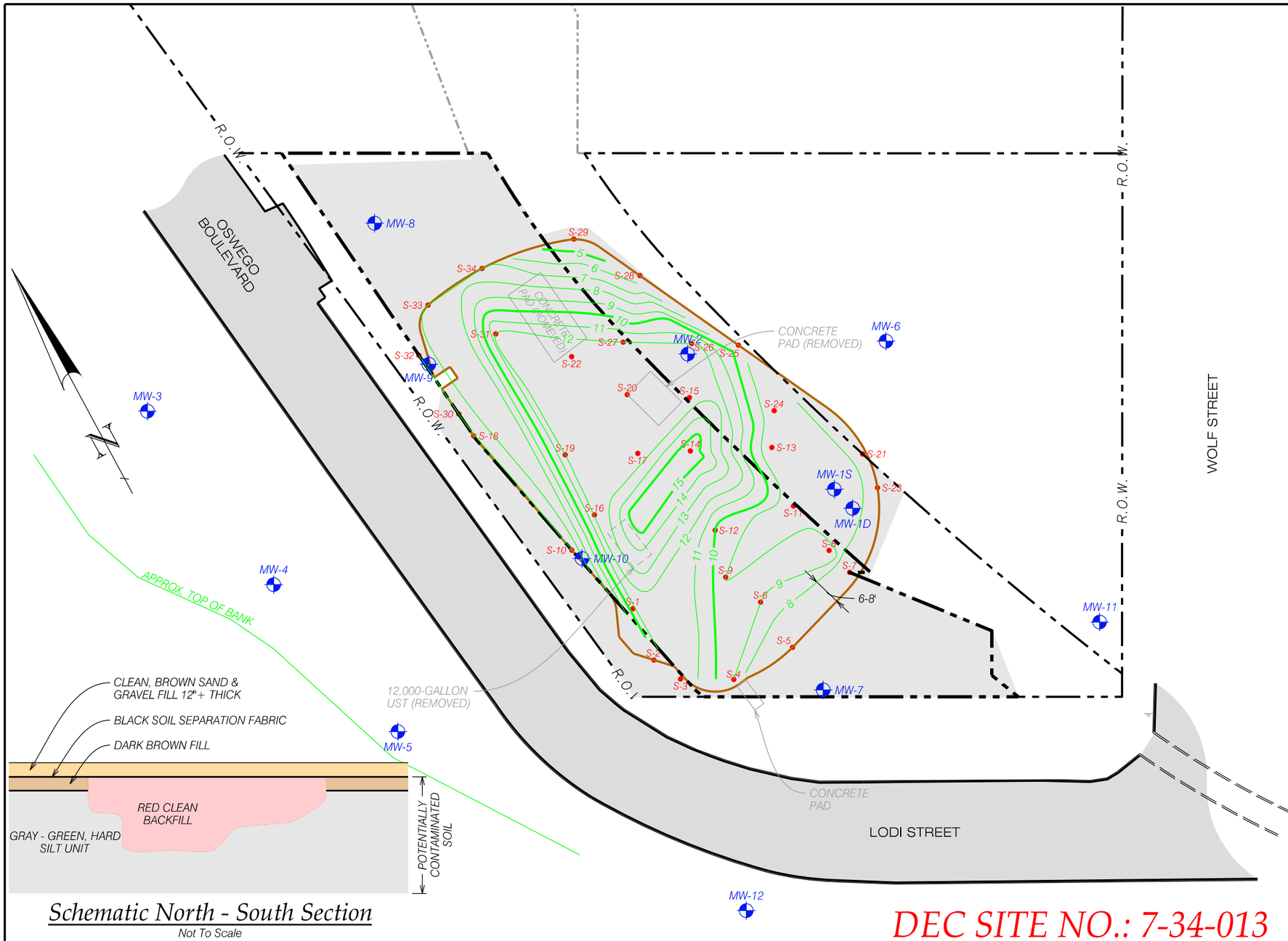
PLUMLEY ENGINEERING
Civil and Environmental Engineering
PLUMLEY ENGINEERING, P.C.
8232 LOOP ROAD
BALDWINSVILLE, NY 13027
TELEPHONE: (315) 638-8587
FAX: (315) 638-9740
WWW.PLUMLEYENG.COM

REVISIONS: DATE: BY:
SMP 02/17/12 FAK

PROJECT: SITE MANAGEMENT PLAN
DWG. TITLE: REMEDIAL INVESTIGATION SOIL CONTAMINATION SUMMARY
CLIENT: 2802-2810 LODI STREET
LOCATION: CITY OF SYRACUSE, ONONDAGA COUNTY, NEW YORK

PROJECT No.: 2010131
FILE NAME.: Figure6
SCALE: AS NOTED
DATE: FEB. 2012
ENG'D BY: FAK
DRAWN BY: JMD
CHECKED BY: FAK

SHEET NO.: FIGURE 6

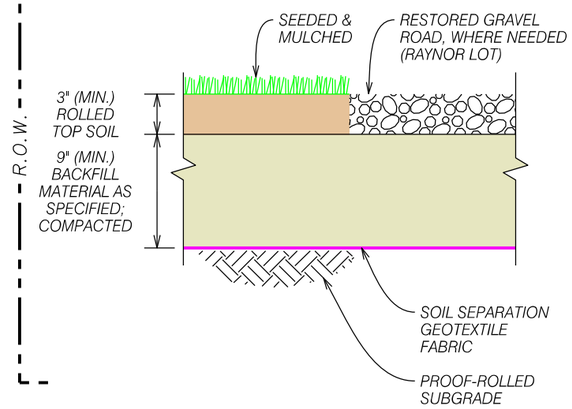


Schematic North - South Section

Not To Scale

Key

- Property Line
- R.O.W. — Right of Way
- Lot Line
- Monitoring Well (MW) / Recovery Well (RW)
- S-18 — Soil Confirmation Sample Location (Collected 2011)
- 2011 Excavation Area
- 10 — Contours of Soil Excavation (Depth Below Grade: In Feet)
- Area with 12" Soil Cap



Typical Soil Cap Construction - Section

Not To Scale

Basemap Reference:

"Boundary and Topographic Survey, Part of Lots 1 and 9 , Block 12, City of Syracuse, Onondaga County, State of New York", Prepared by: CNY Land Surveying, Dated: 10/08/08, File No.: 08.117.

Plan View

1" = 40' SCALE — 20 0 20 40 FEET

DEC SITE NO.: 7-34-013

PLUMLEY ENGINEERING

PLUMLEY ENGINEERING, P.C.
8232 LOOP ROAD
BALDWINSVILLE, NY 13027

TELEPHONE: (315) 638-8587
FAX: (315) 638-9740
WWW.PLUMLEYENG.COM

Civil and Environmental Engineering

REVISIONS:	DATE:	BY:
SMP	02/17/12	FAK

PROJECT: **SITE MANAGEMENT PLAN**

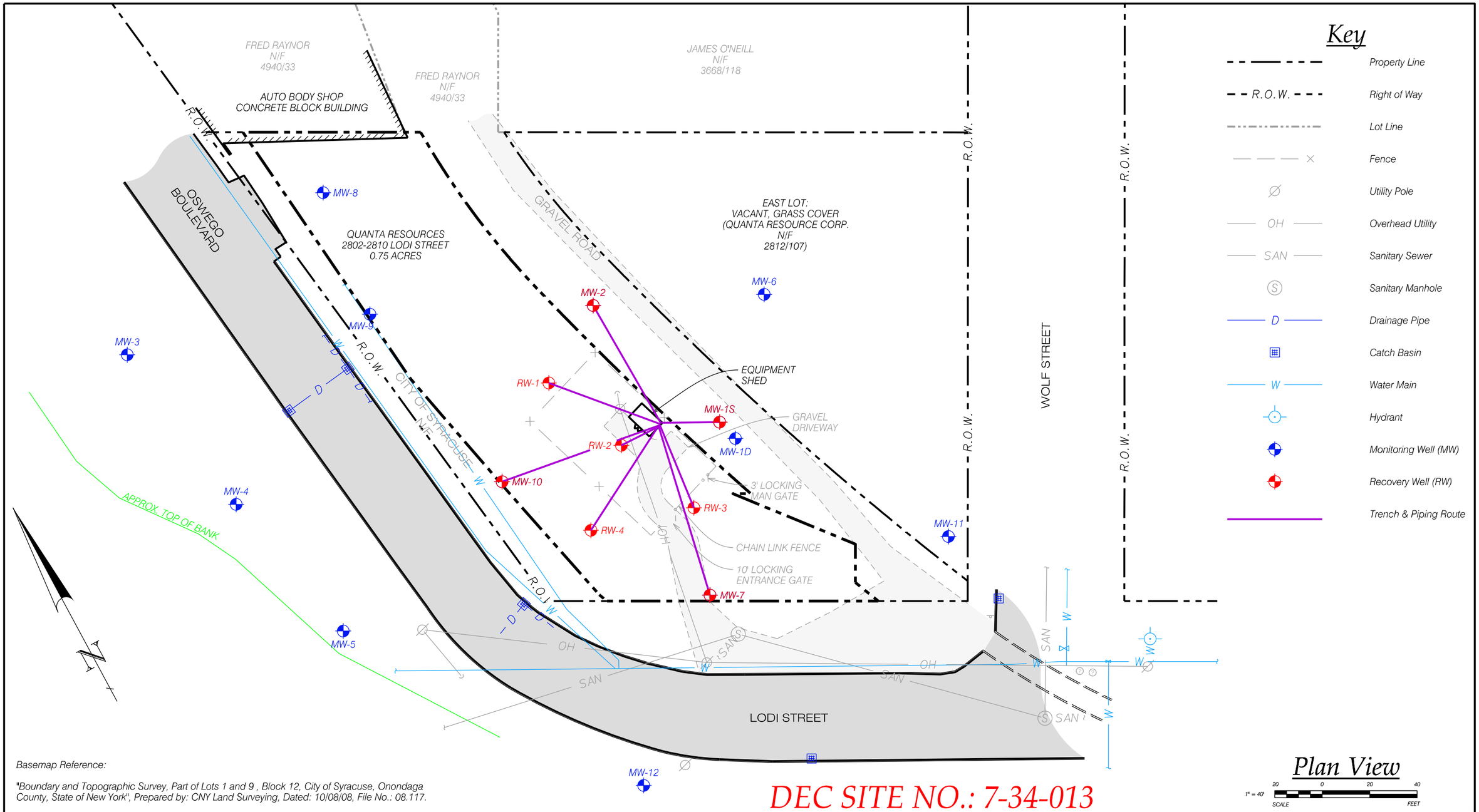
DWG. TITLE: EXTENT OF REMEDIAL EXCAVATION PERFORMED

CLIENT: 2802-2810 LODI STREET

LOCATION: CITY OF SYRACUSE, ONONDAGA COUNTY, NEW YORK

PROJECT No.:	2010131
FILE NAME.:	Figure7
SCALE:	AS NOTED
DATE:	FEB. 2012
ENG'D BY:	FAK
DRAWN BY:	JMD
CHECKED BY:	FAK

SHEET NO.: FIGURE 7



Basemap Reference:

"Boundary and Topographic Survey, Part of Lots 1 and 9 , Block 12, City of Syracuse, Onondaga County, State of New York", Prepared by: CNY Land Surveying, Dated: 10/08/08, File No.: 08.117.

Plan View

1" = 40' SCALE — 20 0 20 40 FEET

DEC SITE NO.: 7-34-013

PLUMLEY ENGINEERING

PLUMLEY ENGINEERING, P.C.
8232 LOOP ROAD
BALDWINSVILLE, NY 13027

TELEPHONE: (315) 638-8587
FAX: (315) 638-9740
WWW.PLUMLEYENG.COM

Civil and Environmental Engineering

REVISIONS:	DATE:	BY:
1 SMP	02/17/12	FAK

PROJECT: **SITE MANAGEMENT PLAN**

DWG. TITLE: **REMEDIAL OIL RECOVERY SYSTEM PLAN**

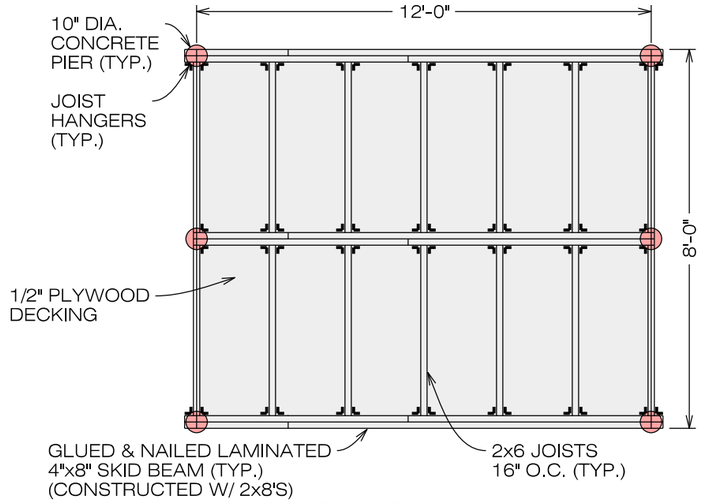
CLIENT: 2802-2810 LODI STREET

LOCATION: CITY OF SYRACUSE, ONONDAGA COUNTY, NEW YORK

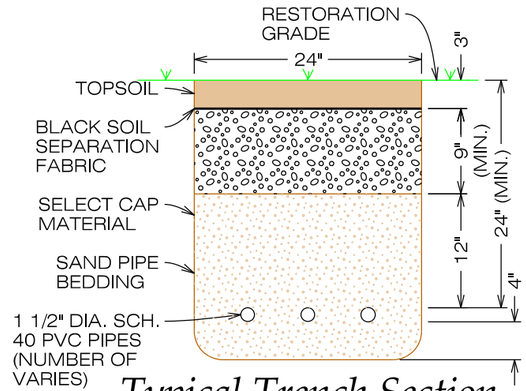
PROJECT No.:	2010131
FILE NAME.:	Figure8
SCALE:	AS NOTED
DATE:	FEB. 2012
ENG'D BY:	FAK
DRAWN BY:	JMD
CHECKED BY:	FAK

SHEET NO.:

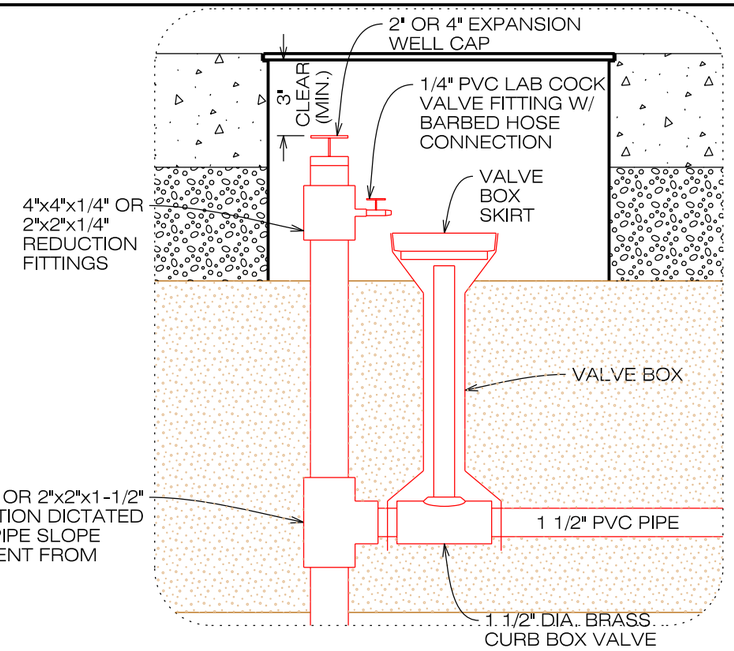
FIGURE 8



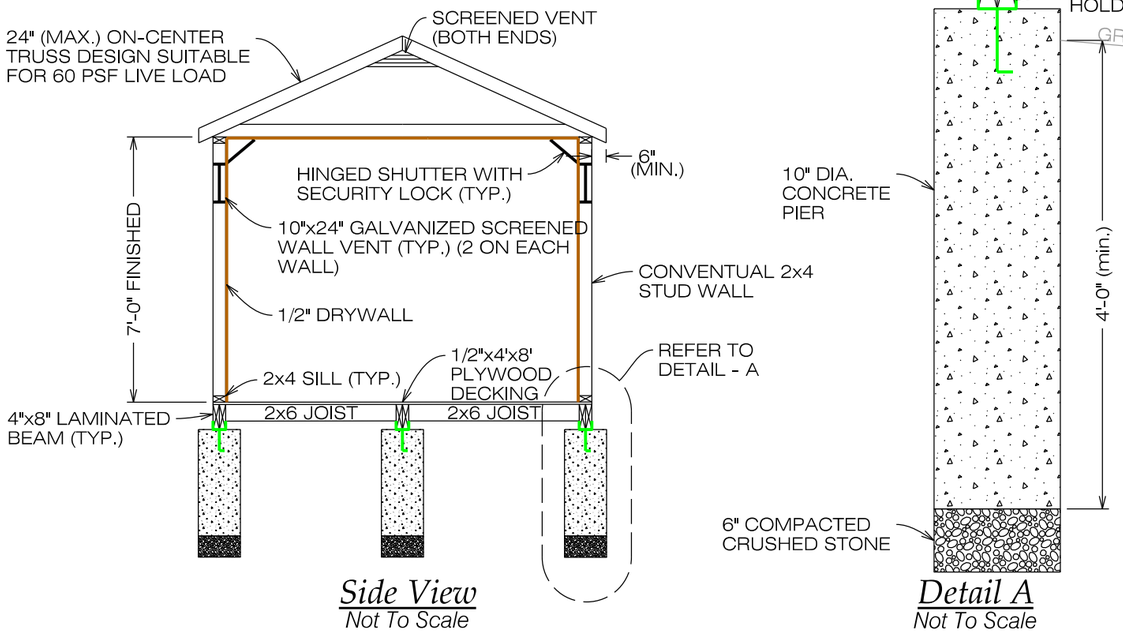
Plan View
Not To Scale



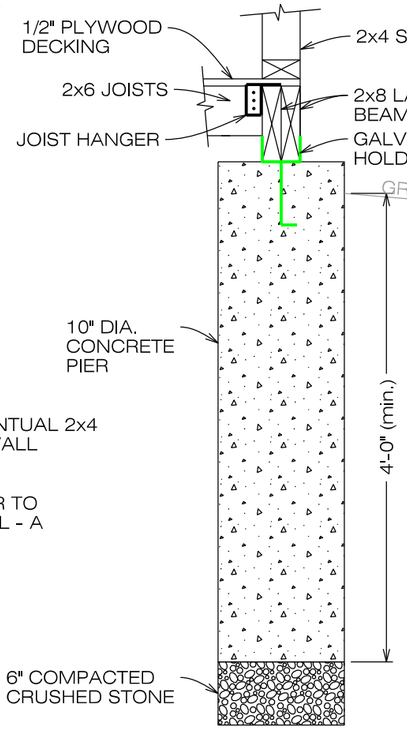
Typical Trench Section
Scale: 3/4"=1'-0"



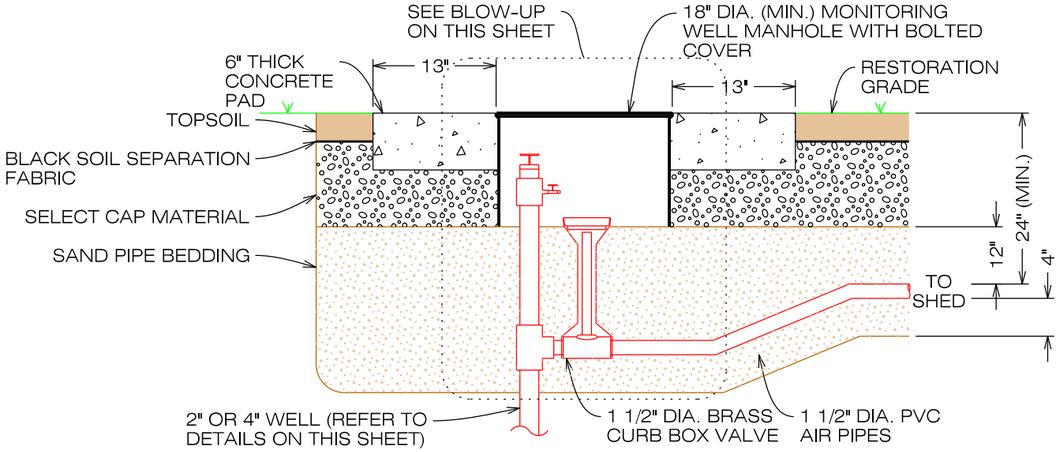
Wellhead Blow Up
Not To Scale



Side View
Not To Scale



Detail A
Not To Scale



Typical Well Head (8 Installationed)
Not To Scale

Building Details

DEC SITE NO.: 7-34-013

PLUMLEY ENGINEERING
PLUMLEY ENGINEERING, P.C.
8232 LOOP ROAD
BALDWINSVILLE, NY 13027
TELEPHONE: (315) 638-8587
FAX: (315) 638-9740
WWW.PLUMLEYENG.COM
Civil and Environmental Engineering

REVISIONS:	DATE:	BY:
SMP	02/17/12	FAK

PROJECT: SITE MANAGEMENT PLAN

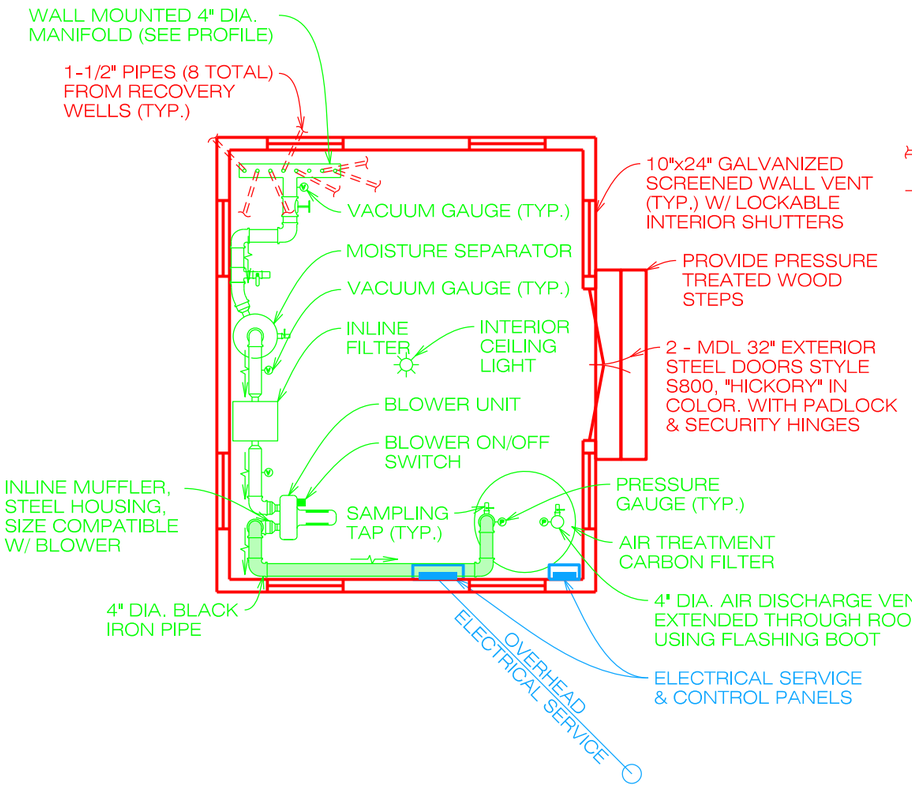
DWG. TITLE: REMEDIAL OIL RECOVERY SYSTEM DETAILS

CLIENT: 2802-2810 LODI STREET

LOCATION: CITY OF SYRACUSE, ONONDAGA COUNTY, NEW YORK

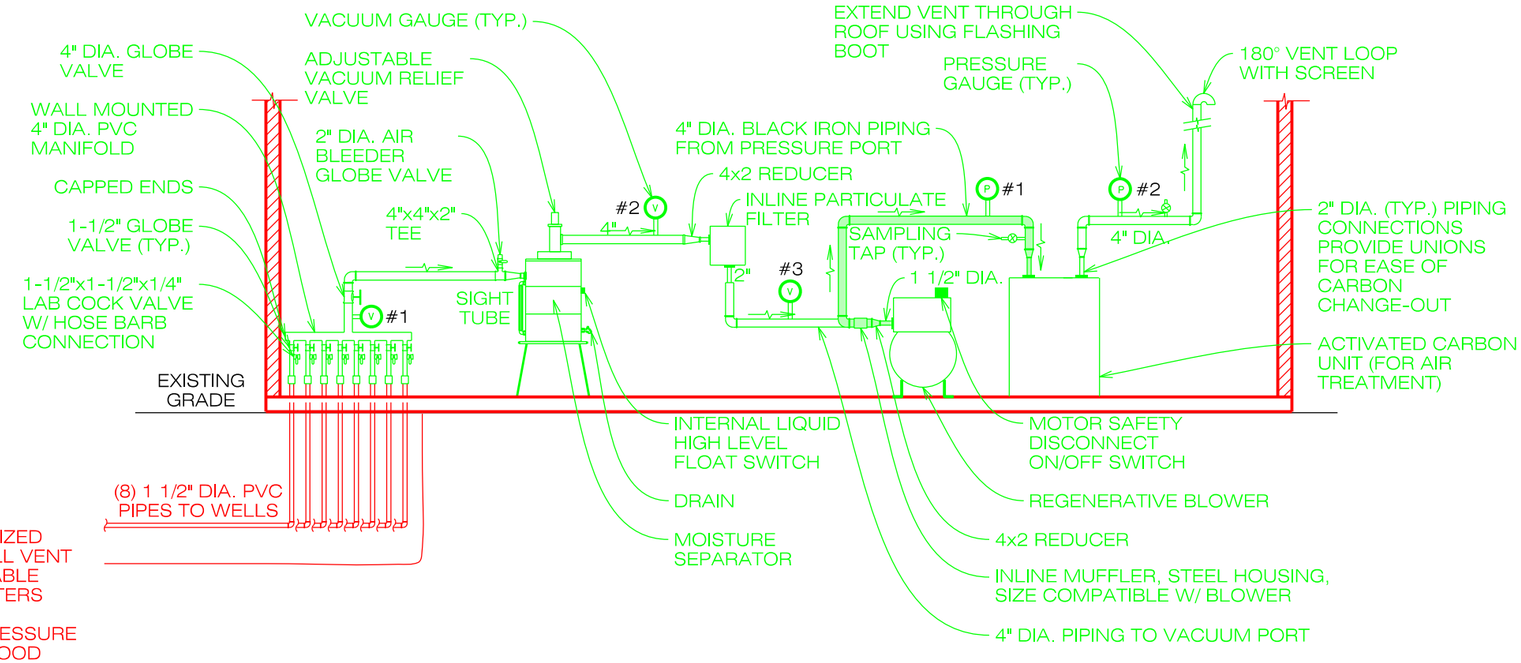
PROJECT No.:	2010131
FILE NAME.:	Figure9
SCALE:	AS NOTED
DATE:	FEB. 2012
ENG'D BY:	FAK
DRAWN BY:	JMD
CHECKED BY:	FAK

SHEET NO.: FIGURE 9



Interior Equipment Layout & Building

Not To Scale



Air Pump System Schematic Profile

Schematic - Not To Scale

DEC SITE NO.: 7-34-013

PLUMLEY ENGINEERING

PLUMLEY ENGINEERING, P.C.
8232 LOOP ROAD
BALDWINSVILLE, NY 13027

TELEPHONE: (315) 638-8587
FAX: (315) 638-9740
WWW.PLUMLEYENG.COM

Civil and Environmental Engineering

REVISIONS:	DATE:	BY:
⚠ SMP	02/17/12	FAK

PROJECT: *SITE MANAGEMENT PLAN*

DWG. TITLE: REMEDIAL OIL RECOVERY SYSTEM DETAILS

CLIENT: 2802-2810 LODI STREET

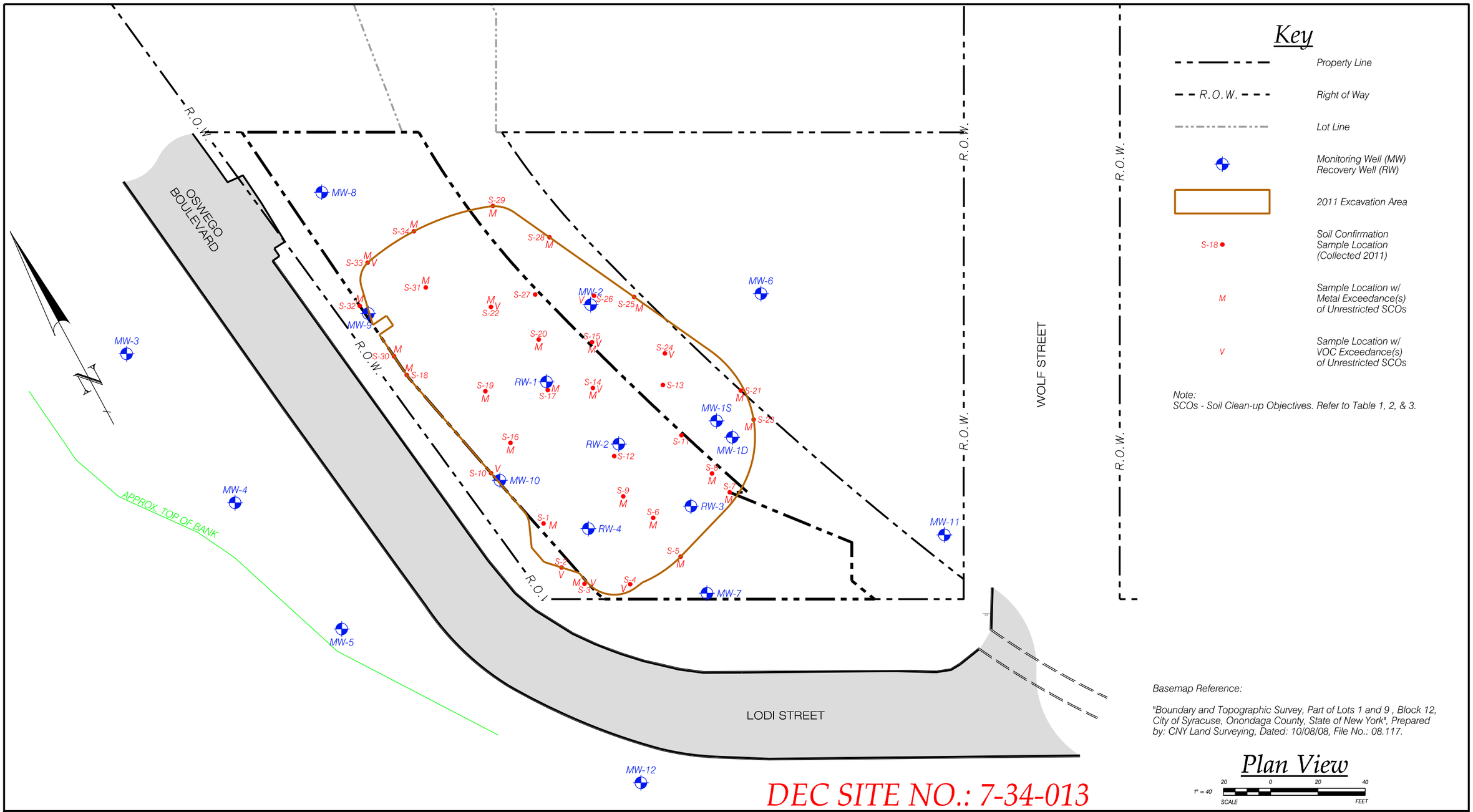
LOCATION: CITY OF SYRACUSE, ONONDAGA COUNTY, NEW YORK

Note: No alteration permitted hereon except as provided under Section 7209 Subdivision 2 of the New York State Education Law.

PROJECT No.:	2010131
FILE NAME.:	Figure10
SCALE:	AS NOTED
DATE:	FEB. 2012
ENG'D BY:	FAK
DRAWN BY:	JMD
CHECKED BY:	FAK

SHEET NO.:

FIGURE 10



Key

- Property Line
- R.O.W. — Right of Way
- Lot Line
- Monitoring Well (MW) / Recovery Well (RW)
- 2011 Excavation Area
- S-18 — Soil Confirmation Sample Location (Collected 2011)
- M — Sample Location w/ Metal Exceedance(s) of Unrestricted SCOs
- V — Sample Location w/ VOC Exceedance(s) of Unrestricted SCOs

Note:
SCOs - Soil Clean-up Objectives. Refer to Table 1, 2, & 3.

Basemap Reference:

"Boundary and Topographic Survey, Part of Lots 1 and 9 , Block 12, City of Syracuse, Onondaga County, State of New York", Prepared by: CNY Land Surveying, Dated: 10/08/08, File No.: 08.117.

Plan View

1" = 40' SCALE: 20 0 20 40 FEET

DEC SITE NO.: 7-34-013

PLUMLEY ENGINEERING

PLUMLEY ENGINEERING, P.C.
8232 LOOP ROAD
BALDWINSVILLE, NY 13027

TELEPHONE: (315) 638-8587
FAX: (315) 638-9740
WWW.PLUMLEYENG.COM

Civil and Environmental Engineering

REVISIONS:	DATE:	BY:
1 SMP	02/17/12	FAK

PROJECT: **SITE MANAGEMENT PLAN**

DWG. TITLE: LOCATION OF REMAINING SOIL CONTAMINATION ABOVE UNRESTRICTED LEVELS

CLIENT: 2802-2810 LODI STREET

LOCATION: CITY OF SYRACUSE, ONONDAGA COUNTY, NEW YORK

Note: No alteration permitted hereon except as provided under Section 7209 Subdivision 2 of the New York State Education Law.

PROJECT No.:	2010131
FILE NAME.:	Figure11
SCALE:	AS NOTED
DATE:	FEB. 2012
ENG'D BY:	FAK
DRAWN BY:	JMD
CHECKED BY:	FAK

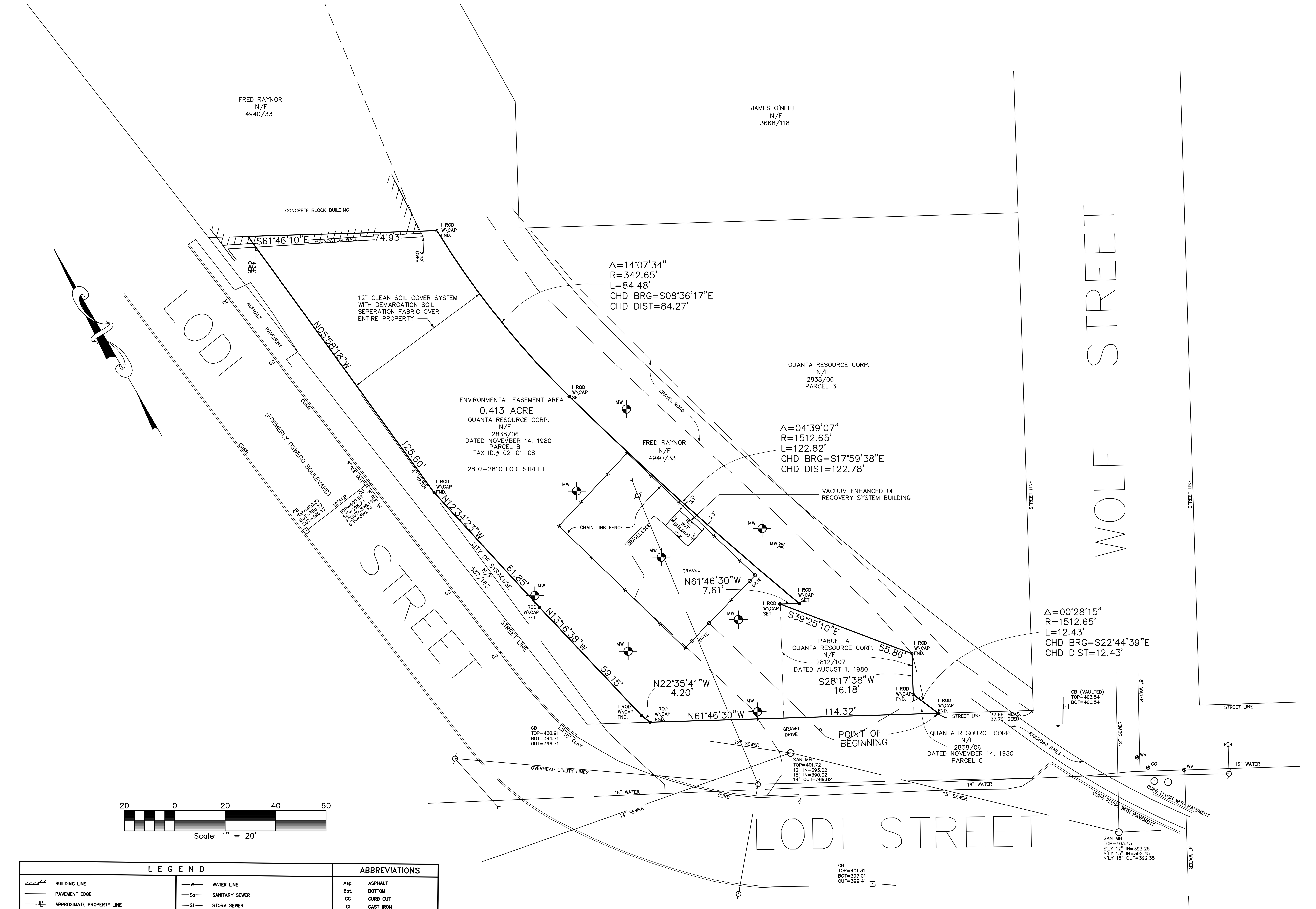
SHEET NO.:

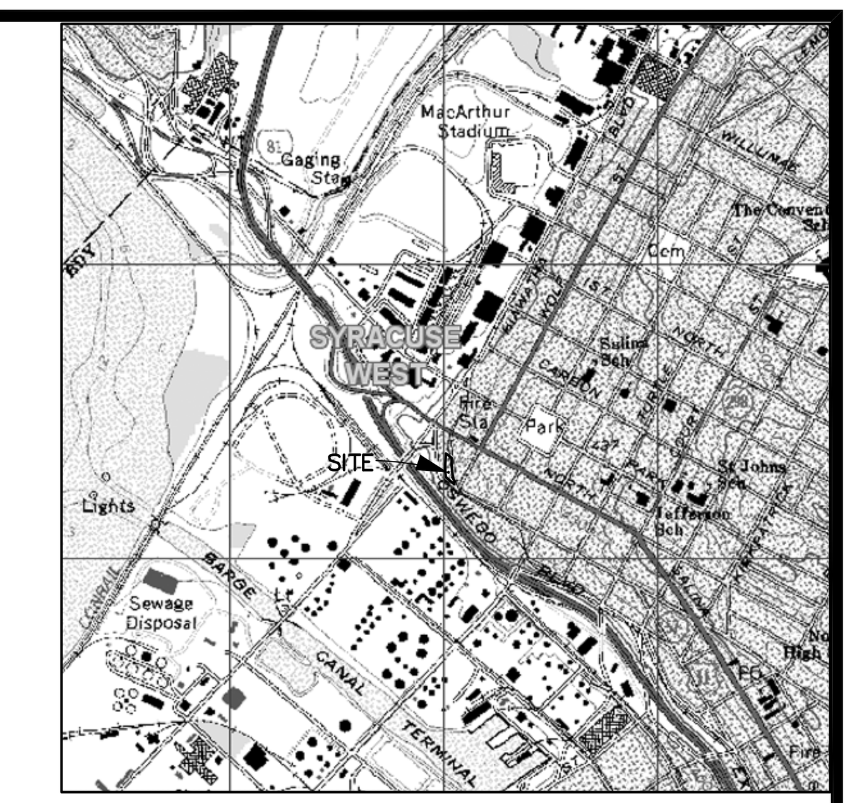
FIGURE 11

APPENDICES

APPENDIX A

SURVEY MAP
WITH METES AND BOUNDS





SITE LOCATION MAP

LEGEND				ABBREVIATIONS	
	BUILDING LINE	—W—	WATER LINE	Asp.	ASPHALT
	PAVEMENT EDGE	—Sa—	SANITARY SEWER	Bot.	BOTTOM
	APPROXIMATE PROPERTY LINE	—St—	STORM SEWER	CC	CURB CUT
	APPROXIMATE ROADWAY BOUNDARY	UP	UTILITY POLE	CI	CAST IRON
SW	SIDEWALK – CONCRETE UNLESS OTHERWISE NOTED	UP	UTILITY POLE WITH LIGHT	Conc.	CONCRETE
	CURB – CONCRETE UNLESS OTHERWISE NOTED		GUY WIRE & ANCHOR	ELEV.	ELEVATION
414.12	BOTTOM OF CURB ELEVATION	CB	CATCH BASINS	FF	FIRST FLOOR ELEVATION
	CENTERLINE	MH	MANHOLE	Inv.	INVERT
×413.95	SPOT ELEVATION	HYD	HYDRANT	N / F	NOW OR FORMERLY
IRF	IRON ROD FOUND	WV	WATER VALVE	NM	NIAGARA MOHAWK
IPF	IRON PIN FOUND	GV	GAS VALVE	Pvmt.	PAVEMENT
C.P. 4	SURVEY CONTROL POINT	24"	DECIDUOUS TREE, DIAMETER AT BREAST HEIGHT	STY.	STORY
	SIGN – SINGLE POST	MW	MONITORING/RECOVERY WELLS		

TO THE PEOPLE OF THE STATE OF NEW YORK ACTING THROUGH ITS COMMISSIONER OF THE DEPARTMENT OF ENVIROMENTAL CONSERVATION, ELITE ABSTRACT SERVICES, LLC, STEWART TITLE INSURANCE COMPANY AND QUANTA RESOURCES CORPORATION.
THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE MINIMUM STANDARD DETAIL REQUIREMENTS FOR NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION.
THE FIELD WORK WAS COMPLETED ON 5/17/2012.

DATE OF PLAT OR MAP: MAY 21, 2012.

QUANTA RESOURCES SITE
2802-2810 LODI STREET DEC SITE
NO. 734013

P:\EP-2012\12038\12038.DWG

In charge of D.J. REITH
Drawn by M.R. HUNTER
Designed by ______
Checked by D.J. REITH

NO ALTERATION PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

THE UNDERSIGNED HEREBY CERTIFIES THAT THIS IS A CORRECT MAP MADE FROM AN ACTUAL SURVEY.

DOUGLAS JAY REITH
LICENSED LAND SURVEYOR

CNY LAND SURVEYING
2075 CHURCH ROAD
BALDWINSVILLE, NEW YORK 13027
(315) 635-4614

PART OF LOTS 1 AND 9, BLOCK 12
CITY OF SYRACUSE
COUNTY OF ONONDAGA
STATE OF NEW YORK

DRAWING TITLE
BOUNDARY SURVEY FOR ENVIRONMENTAL EASEMENT DESCRIPTION 734013

Date Issued 10/31/12

Revisions
06/11/13– CHANGES PER ATTY. COMMENTS
06/19/13– CHANGES PER ATTY. COMMENTS
08/13/13– CERTIFICATION & NOTE
10/31/13– ADDED ENGINEERING CONTROLS
11/05/13– ADDED DEC NOTE
11/09/13– ADDED DEC NOTES & ENG. CONTROL BOX

FILE NO. 12.038
Scale 1" = 20'
Drawing No. 1 OF 2

NOTES

SURVEY WAS DONE WITH THE BENEFIT OF AN ABSTRACT OF TITLE PREPARED BY ELITE ABSTRACT SERVICES, LLC, TITLE NO. 75794, DATED FEBRUARY 23, 2013.

THE LOCATION OF UNDERGROUND UTILITIES ARE OBTAINED BY FIELD MEASUREMENT WHERE PRACTICABLE, OTHERWISE FROM VARIOUS SOURCES AND ARE APPROXIMATE ONLY. THERE MAY BE OTHERS, THE LOCATION OF WHICH ARE UNKNOWN.

UNDERGROUND UTILITY INFORMATION FOR NATURAL GAS LINE LOCATION COULD NOT BE OBTAINED FROM NATIONAL GRID.

EASEMENT GRANT TO MACK–MILLER CANDLE CO., INC., DATED NOVEMBER 14, 1980 AND FILED IN LIBER OF DEEDS #2839, PAGE #1 DOES NOT AFFECT SURVEYED PREMISES.

"THE ENGINEERING AND INSTITUTIONAL CONTROLS FOR THIS EASEMENT ARE SET FORTH IN THE SITE MANGEMENT PLAN (SMP). A COPY OF THE SMP MUST BE OBTAINED BY ANY PARTY WITH AN INTEREST IN THE PROPERTY. THE SMP CAN BE OBTAINED FROM THE NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DIVISION OF ENVIRONMENTAL REMEDIATION, SITE CONTROL SECTION, 625 BROADWAY, ALBANY, NEW YORK 12244 OR AT DERWEB@GW.DEC.STATE.NY.US."

THE LEGAL DESCRIPTION FOR THE EASEMENT AREA REFERENCES THE EASEMENT AREA BEING COMPRISED OF PART OF LOTS 1 AND 9, BLOCK 12. THE PARCEL'S TAX MAP BLOCK AND LOT NUMBER DIFFER BECAUSE THE TAX MAPPING HAS CHANGED SINCE THE ORIGINAL CONVEYANCE. TAX MAP NUMBERS DO NOT NECESSARILY CORRESPOND TO LEGAL DESCRIPTIONS.

ENVIRONMENTAL EASEMENT ACCESS AREA

THE DEC OR THEIR AGENT MAY ACCESS THE ENVIRONMENTAL EASEMENT AREA AS SHOWN HEREON THROUGH ANY EXISTING STREET ACCESS OR BUILDING INGRESS/EGRESS ACCESS POINT,

THIS PROPERTY IS SUBJECT TO AN ENVIRONMENTAL EASEMENT HELD BY THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PURSUANT TO TITLE 36 OF ARTICLE 71 OF THE NEW YORK ENVIRONMENTAL CONSERVATION LAW.

ENGINEERING/INSTITUTIONAL CONTROLS

1. ALL ENGINEERING CONTROLS MUST BE OPERATED AND MAINTAINED AS SPECIFIED IN THE SITE MANAGEMENT PLAN (SMP).
2. ALL ENGINEERING CONTROLS ON THE CONTROLLED PROPERTY MUST BE INSPECTED AT A FREQUENCY AND IN A MANNER DEFINED IN THE SMP.
3. GROUNDWATER MONITORING AND OTHER ENVIRONMENTAL OR PUBLIC HEALTH MONITORING MUST BE PERFORMED AS DEFINED IN THE SMP.
4. GROUNDWATER USE RESTRICTION– THE USE OF GROUNDWATER UNDERLYING THE PROPERTY IS PROHIBITED WITHOUT TREATMENT RENDERING IT SAFE FOR INTENDED USE.
5. VAPOR INTRUSION– THE POTENTIAL FOR VAPOR INTRUSION MUST BE EVALUATED FOR ANY BUILDINGS DEVELOPED ON THE SITE; AND ANY POTENTIAL IMPACTS THAT ARE IDENTIFIED MUST BE MONITORED OR MITIGATED.
6. VEGETABLE GARDENS– AND FARMING ON THE PROPERTY ARE PROHIBITED.
7. SOIL COVER– ANY BREACH OF THE NATURAL SITE COVER, INCLUDING FOR THE PURPOSES OF CONSTRUCTION OR UTILITIES WORK, MUST BE REPLACED OR REPAIRED ACCORDING TO THE SITE MANAGEMENT PLAN (SMP). SITE SOIL EXCAVATED AND REMOVED FROM THE PROPERTY MUST BE MANAGED, CHARACTERIZED, AND PROPERLY DISPOSED OF IN ACCORDANCE WITH THE NYSDEC REGULATIONS AND DIRECTIVES. GUIDELINES FOR MANAGEMENT OF SUBSURFACE SOILS/FILL AND LONG–TERM MAINTENANCE OF THE NATURAL SITE COVER IS PROVIDED IN THE SMP.
8. LAND USE– THE USE AND DEVELOPMENT OF THE SITE IS LIMITED TO INDUSTRIAL USES ONLY AS DEFINED IN 6 NYCRR PART 375–1.8(G)(2) (III) & (IV).

PARCEL A:

ALL THAT TRACT OR PARCEL OF LAND, SITUATE IN THE CITY OF SYRACUSE, COUNTY OF ONONDAGA AND STATE OF NEW YORK AND BEING PART OF LOT NUMBER NINE IN BLOCK NUMBER TWELVE OF THE FORMER VILLAGE OF SALINA, NOW CITY OF SYRACUSE, BOUNDED AND DESCRIBED AS FOLLOWS: BEGINNING ON LODI STREET AT A POINT NINETY–NINE (99) FEET WESTERLY FROM THE CORNER OF WOLF AND LODI STREETS; THENCE EASTERLY ALONG LODI STREET FIFTY–ONE AND TWO–THIRDS (51–2/3) FEET; THENCE NORTHERLY PARALLEL WITH WOLF STREET FORTY– FIVE AND ONE–FOURTH (45 1/4) FEET; THENCE WESTERLY PARALLEL WITH LODI STREET FIFTY–ONE AND TWO–THIRDS (51–2/3) FEET; THENCE SOUTHERLY PARALLEL WITH WOLF STREET TO THE PLACE OF BEGINNING.

EXCEPTING THAT PART THEREOF SOLD FOR RAILROAD PURPOSES AND DESCRIBED AS FOLLOWS: BEGINNING ON THE DIVISION LINE BETWEEN LANDS FORMERLY OWNED BY PATRICK MALONEY, ANNA BURGESS AND OTHER MENTIONED AT ABSTRACT 8 OF A CERTAIN SEARCH AND ABSTRACT OF TITLE OF SAID PREMISES AND THOSE FORMERLY OWNED BY ELIZUR CLARK ON THE EAST AND TWENTY–FOUR FEET NORTHERLY FROM THE NORTHERLY LINE OF LODI STREET MEASURED ON SAID DIVISION LINE; THENCE NORTH THIRTY–FOUR DEGREES (34) E. TWENTY –SIX (26) FEET TO CORNER; THENCE N. FIFTY–SIX (56)W, FORTY–ONE AND ONE–HALF FEET; THENCE S. TWENTY DEGREES THIRTY MINUTES (20 30') E TO THE PLACE OF BEGINNING.

PARCEL B:

ALL THAT TRACT OR PARCEL OF LAND SITUATE IN THE CITY OF SYRACUSE, COUNTY OF ONONDAGA AND STATE OF NEW YORK, BEING DESIGNATED AS PARCEL NO. NYF–20C–096 ON RAILROAD VALUATION MAP NO. 500–1220–0–4B–4 AND BEING MORE PARTICULARLY BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT IN THE NORTHERLY LINE OF LODI STREET, DISTANT 99 FEET MEASURED ALONG THE NORTHERLY LINE OF LODI STREET FROM THE INTERSECTION OF THE NORTHERLY LINE OF LODI STREET WITH THE WESTERLY LINE OF WOLF STREET; THENCE NORTH 61 46'30" WEST, A DISTANCE OF 53.00 FEET ALONG THE NORTHERLY LINE OF LODI STREET TO A POINT ON THE EASTERLY LINE OF PROPERTY CONVEYED TO THE CITY OF SYRACUSE AS RECORDED IN THE ONONDAGA COUNTY CLERK'S OFFICE IN BOOK OF DEEDS 537 AT PAGE 163, SAID EASTERLY PROPERTY LINE BEING THE FORMER OSWEGO CANAL "BLUE LINE"; THENCE NORTH 22 35' 41" WEST, A DISTANCE OF 4.20 FEET ALONG THE EASTERLY LINE OF PROPERTY OF THE CITY OF SYRACUSE AND THE FORMER OSWEGO CANAL "BLUE LINE" TO A POINT THEREIN; THENCE NORTH 13 16'38" WEST, A DISTANCE OF 59.15 FEET ALONG AFORESAID FORMER "BLUE LINE" TO AN ANGLE POINT THEREIN; THENCE NORTH 12 34'23" WEST, A DISTANCE OF 61.85 FEET ALONG AFORESAID FORMER "BLUE LINE" TO AN ANGLE POINT THEREIN; THENCE NORTH 5 58'18" WEST, A DISTANCE OF 125.60 FEET ALONG AFORESAID FORMER "BLUE LINE" TO THE NORTHERLY BOUNDARY OF SAID LOT NO. 1, BLOCK 12; THENCE SOUTH 61 46'10" EAST ALONG THE NORTHERLY BOUNDARY OF SAID LOT 1 OF BLOCK 12, A DISTANCE OF 74.93 FEET TO A POINT ON A CURVE, SAID POINT BEING DISTANT 15 FEET MEASURED SOUTHWESTERLY AND RADIALLY FROM THE CENTERLINE OF THE NEAR WESTERLY RAILROAD TRACK; THENCE SOUTHERLY ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 342.65 FEET, AN ARC DISTANCE OF 84.48 FEET TO A POINT OF COMPOUND CURVATURE; THENCE SOUTHERLY ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 1512.65 FEET, AN ARC DISTANCE OF 122.81 FEET TO THE NORTHERLY BOUNDARY OF LANDS CONVEYED TO PORTLAND HOLDING CORPORATION TO QUANTA RESOURCES CORPORATION BY DEED DATE JULY 29, 1980 AND RECORDED IN THE ONONDAGA COUNTY CLERK'S OFFICE AUGUST 1, 1980 IN BOOK 2812 OF DEEDS AT PAGE 107, SAID POINT BEING 15 FEET DISTANT SOUTHWESTERLY AND RADIALLY FROM THE CENTERLINE OF THE NEAR WESTERLY RAILROAD TRACT; THENCE NORTH 61 46' 30" WEST ALONG THE NORTHERLY BOUNDARY OF LANDS CONVEYED TO QUANTA RESOURCES CORPORATION, A DISTANCE OF 7.59 FEET TO THE NORTHWESTERLY CORNER THEREOF; THENCE SOUTH 26 15'30" WEST ALONG THE WESTERLY BOUNDARY OF LANDS OF QUANTA RESOURCES CORPORATION, A DISTANCE OF 45.25 FEET TO THE POINT OF BEGINNING.

PARCEL C:

ALL THAT TRACT OR PARCEL OF LAND, SITUATE IN THE CITY OF SYRACUSE, COUNTY OF ONONDAGA, STATE OF NEW YORK, AND BEING PART OF LOT 9 OF BLOCK 12 IN THE CITY OF SYRACUSE, BEING DESIGNATED AS PARCEL NO. NYF–20C–096 ON RAILROAD VALUATION MAP NO. 500–1200–0–4B–4 AND BEING MORE PARTICULARLY BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT IN THE NORTHERLY STREET LINE OF LODI STREET, SAID POINT BEING LOCATED NORTH 61 46'30" WEST, A DISTANCE OF 37.70 FEET AS MEASURED ALONG THE NORTHERLY LINE OF LODI STREET FROM THE INTERSECTION OF THE NORTHERLY LINE OF LODI STREET WITH THE WESTERLY LINE OF WOLF STREET, SAID POINT OF BEGINNING ALSO BEING 15 FEET DISTANT MEASURED SOUTHWESTERLY AND RADIALLY FROM THE CENTERLINE OF THE NEAR WESTERLY RAILROAD TRACK; THENCE NORTH 61 46'30" WEST ALONG THE NORTHERLY LINE OF LODI STREET, A DISTANCE OF 9.64 FEET TO THE SOUTHWESTERLY CORNER OF SAID LANDS CONVEYED TO QUANTA RESOURCES CORPORATION; THENCE NORTH 28 15'30" EAST, ALONG THE EASTERLY BOUNDARY OF SAID LANDS, A DISTANCE OF 7.81 FEET TO A POINT ON A CURVE, SAID POINT BEING 15 FEET DISTANT AS MEASURED SOUTHWESTERLY AND RADIALLY FROM THE CENTERLINE OF THE NEAR WESTERLY RAILROAD TRACK: THENCE SOUTHERLY ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 1512.65 FEET FOR A DISTANCE OF 12.40 FEET TO THE POINT OF BEGINNING.

THE ABOVE DESCRIBED PARCELS ARE MORE RECENTLY DESCRIBED BY THE FOLLOWING PERIMETER DESCRIPTION:

ALL THAT TRACT OR PARCEL OF LAND, SITUATE IN THE CITY OF SYRACUSE, COUNTY OF ONONDAGA, STATE OF NEW YORK, BEING PART OF LOTS 1 AND 9, BLOCK 12 IN SAID CITY AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT AN IRON ROD WITH CAP FOUND IN THE NORTHERLY LINE OF LODI STREET, SAID IRON ROD WITH CAP BEING N.61 46'30"W., 37.68 FEET FROM THE INTERSECTION OF THE NORTHERLY LINE OF SAID LODI STREET WITH THE WESTERLY LINE OF WOLF STREET, SAID POINT ALSO BEING THE INTERSECTION OF THE COMMON LINE BETWEEN LANDS NOW OR FORMERLY OWNED BY QUANTA RESOURCE CORPORATION AS RECORDED IN THE ONONDAGA COUNTY CLERK'S OFFICE IN LIBER OF DEEDS #2838, PAGE #06 AND LANDS NOW OR FORMERLY OWNED BY FRED RAYNOR AS RECORDED IN THE ONONDAGA COUNTY CLERK'S OFFICE IN LIBER OF DEEDS #4940, PAGE #33 WITH THE NORTHERLY LINE OF SAID LODI STREET;

THENCE N.61 46'30"W., ALONG THE NORTHERLY LINE OF SAID LODI STREET A DISTANCE OF 114.32 FEET TO AN IRON ROD WITH CAP FOUND FOR CORNER IN THE EASTERLY LINE OF LANDS NOW OR FORMERLY OWNED BY THE CITY OF SYRACUSE;

THENCE N.22 35'41"W., ALONG THE EASTERLY LINE OF SAID CITY OF SYRACUSE PROPERTY A DISTANCE OF 4.20 FEET TO AN IRON ROD WITH CAP FOUND FOR CORNER;

THENCE N.13 16'38"W., CONTINUING ALONG THE EASTERLY LINE OF SAID CITY OF SYRACUSE PROPERTY A DISTANCE OF 59.15 FEET TO AN IRON ROD WITH CAP SET FOR CORNER;

THENCE N.12 34'23"W., CONTINUING ALONG THE EASTERLY LINE OF SAID CITY OF SYRACUSE PROPERTY A DISTANCE OF 61.85 FEET T AND IRON RO D WITH CAP FOUND FOR CORNER IN THE EASTERLY LINE OF SAID LODI STREET;

THENCE N.05 58'18"W., ALONG THE EASTERLY LINE OF SAID LODI STREET A DISTANCE F 125.60 FET TO A POINT FOR CORNER IN THE SOUTHERLY LINE OF LANDS NOW OR FORMERLY OWNED BY FRED RAYNOR AS RECORDED IN THE ONONDAGA COUNTY CLERK'S OFFICE IN LIBER OF DEEDS #4940, PAGE #33;

THENCE S.61 46'10"E., ALONG THE SOUTHERLY LINE OF SAID RAYNOR PROPERTY, A DISTANCE OF 74.93 FEET TO NA IRON ROD WITH CAP FOUND FOR CORNER IN THE CURVING WESTERLY LINE OF SAID RAYNOR PROPERTY, SAID CURVE BEING TO THE LEFT AND HAVING A CENTRAL ANGLE OF 14 07'34", A RADIUS OF 342.65 FEET AND A CHORD BEARING AND DISTANCE OF S.08 36'17"E., 84.27 FEET;

THENCE ALONG SAID CURVE TO THE LEFT AND THE WESTERLY LINE OF SAID RAYNOR PROPERTY AN ARC DISTANCE OF 84.48 FEET TO AN IRON ROD WITH CAP SET FOR THE BEGINNING OF A COMPOUND CURVE TO THE LEFT HAVING A CENTRAL ANGLE OF 04 39'07", A RADIUS OF 1512.65 FEET AND A CHORD BEARING AND DISTANCE OF S.17 59'38"E., 122.78 FEET;

THENCE ALONG SAID CURVE TO THE LEFT AND THE WESTERLY LINE OF SAID RAYNOR PROPERTY AN ARC DISTANCE OF 122.82 FEET TO AN IRON ROD WITH CAP SET FOR CORNER;

THENCE N.61 46'30"W., A DISTANCE OF 7.61 FEET TO AN IRON ROD WITH CAP SET FOR CORNER;

THENCE S.39 25'10"E., ALONG THE WESTERLY LINE OF SAID RAYNOR PROPERTY, A DISTANCE OF 55.86 FEET TO AN IRON ROD WITH CAP FOUND FOR CORNER;

THENCE S.28 17'38"W., CONTINUING ALONG THE WESTERLY LINE OF SAID RAYNOR PROPERTY A DISTANCE OF 16.18 FEET TO AN IRON ROAD WITH CAP FOUND IN THE CURVING WESTERLY LINE OF SAID PAYMOR PROPERTY, SAID CURVE BEING TO THE LEFT AND HAVING A CENTRAL ANGLE OF 00 28'15", A RADIUS OF 1512.65 FEET AND A CHORD BEARING AND DISTANCE OF S.22 44'39"E., 12.43 FEET;

THENCE ALONG SAID CURVE TO THE LEFT AND THE WESTERLY LINE OF SAID RAYNOR PROPERTY, AN ARC DISTANCE OF 12.43 FEET TO THE POINT OF BEGINNING. CONTAINING 0.413 ACRE OF LAND MORE OR LESS.

DEED REFERENCES:
PORTLAND HOLDING CORPORATION TO QUANTA RESOURCES CORPORATION, LIBER OF DEEDS 2812, PAGE 107
THE OWASCO RIVER RAILWAY, INC. TO QUANTA RESOURCES CORPORATION, LIBER OF DEEDS 2838, PAGE 5

QUANTA RESOURCES SITE
2802–2810 LODI STREET DEC SITE
NO. 734013

P:\EP–2012\12038\12038.DWG

In charge of D.J. REITH
Designed by ____________
Drawn by D.J. REITH
Checked by D.J. REITH

NO ALTERATION PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

THE UNDERSIGNED HEREBY CERTIFIES THAT THIS MAP IS MADE FROM AN ACTUAL SURVEY OF THE PROPERTY SHOWN HEREON.

DOUGLAS JAY REITH
LICENSED LAND SURVEYOR

CNY LAND SURVEYING
2075 CHURCH ROAD
BALDWINSVILLE, NEW YORK 13027
(315) 635–4614

PART OF LOTS 1 AND 9, BLOCK 12
CITY OF SYRACUSE
COUNTY OF ONONDAGA
STATE OF NEW YORK

DRAWING TITLE
BOUNDARY SURVEY FOR ENVIRONMENTAL EASEMENT DESCRIPTION 734013

Date Issued 10/31/12

Revisions
06/11/13– CHANGES PER ATTY. COMMENTS
06/19/13– CHANGES PER ATTY. COMMENTS
08/13/13– CERTIFICATION & NOTE
10/31/13– ADDED ENGINEERING CONTROLS
11/05/13– ADDED DEC NOTE
11/09/13– ADDED DEC NOTES & ENG. CONTROL BOX

FILE NO. 12.038
Scale 1" = 20'
Drawing No. 2 OF 2

APPENDIX B

EXCAVATION WORK PLAN

EXCAVATION WORK PLAN

NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination below the soil cap or the imported, clean excavation backfill (Figure 7), the site owner or their representative will notify the Department. Currently, this notification will be made to:

Christopher F. Mannes, P.E.
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
Region 7, Division of Environmental Remediation
615 Erie Boulevard West
Syracuse, New York 13204-2400

This notification will include:

- A description of the work to be performed, including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control;

- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;

- A schedule for the work, detailing the start and completion of all intrusive work;

- A summary of the applicable components of this EWP;

- A statement that the work will be performed in compliance with this EWP;

- A copy of the contractor's health and safety plan, in electronic format (a preliminary HASP for the Site is provided in Appendix C of the SMP);

- Identification of disposal facilities for potential waste streams; and

- Identification of sources of any anticipated backfill, along with all required chemical testing results.

SOIL SCREENING METHODS

Soil screening will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC. Soil screening shall be accomplished by use of a photoionization detection (PID) meter, visual observations and olfactory indicators.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil.

STOCKPILE METHODS

Stockpiles of excavated soil will be kept covered at all times with appropriately anchored tarps or polyethylene sheeting. Stockpiles of clean, imported fill other than gravel that can potentially erode or produce dust shall also be covered. Stockpiles will be routinely inspected and damaged covers will be promptly replaced. If the excavation and final backfilling involves more than one

day to complete, a silt fence is to be installed along the western property line and hay bales will be used as needed in drainage ways and near catch basins.

For projects of long duration, stockpiles will be inspected at a minimum of once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained for inspection by NYSDEC.

MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated. It will be determined by the qualified environmental professional whether a risk or impediment to the planned work under the SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements). Excavated soils that have been stockpiled are to remain covered until load out is undertaken.

The qualified environmental professional will be responsible for ensuring that all outbound trucks leaving the site do not track contaminated soil or excessive debris onto the roadways until the activities performed under this section are complete.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to leaving the site unless dedicated liners are used for all loads. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Truck transport routes are as follows: Oswego Boulevard north to the Route 81 and Hiawatha Boulevard intersection, then proceeding south (left) on Hiawatha Boulevard to Route 690 or directly onto Route 81 North. All trucks loaded with site materials will use this approved truck route. This is the most appropriate route and takes into account limiting transport through residential areas, use of city mapped truck routes and limiting total distance to major highways.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

MATERIALS DISPOSAL OFF-SITE

All soil/fill/solid waste excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated sampling and analysis plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

MATERIALS REUSE ON-SITE

The following soils and related protocols are provided allowing for the reuse of on-site soil materials ("reuse on-site" means reuse of material that originates at the site and does not leave the site during or after the excavation):

- Cap soils currently at the site placed above the demarcation soil separation fabric can be kept separately stockpiled for reuse as soil cap or general backfill anywhere on the site.

- The red soil backfill below the soil cap that was placed in the remedial excavation during the remedial actions can be kept separately stockpiled for reuse as soil cap or general backfill anywhere on-site.

- Site soils excavated below the cap and outside the remedial excavation, including beneath the thick lift of red fill placed in the remedial excavation (Figure 7), may be reused on the site provided that the qualified environmental professional inspects and approves it for reuse. Visual, olfactory and PID screening information from the soil is to be obtained sufficiently by the qualified environmental professional to insure the soil is not grossly impacted. Grossly impacted refers to soil impacted with free product (oil), either sheen or free phase liquid of any discernable quantity. Arrangements for off-site disposal (Sections A3-A6 applicable) must be made for this type of soil. Soil excavated and confirmed not to be grossly impacted and reused must be placed beneath the 12-inch soil cap layer.

The qualified environmental professional will ensure that procedures defined for materials reuse in the SMP are followed.

Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

FLUIDS MANAGEMENT

All liquids to be removed from the site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, but will be managed off-site.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities, the cover system will be restored in a manner that complies with the ROD and cover system as-built condition reported in the SMP (Sections 1.4.1 and 2.2.1.1; Figure 7). The demarcation layer (black soil filter fabric) and minimum of 12 inches of clean cover soil is to be replaced in all areas of excavation. Grass or stone stabilization shall surface the soil cap. If the type of cover system changes from that which exists prior to the excavation (i.e., the minimum 12-inch soil cap is replaced by asphalt, refer to Section 2.2.1.1), this will constitute a modification of the cover element of the remedy and a figure showing the modified surface will be included in the subsequent Periodic Review Report and in any updates to the SMP.

BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in the SMP prior to receipt at the site. The source of the material is to be from a mine or processing facility with an approved DEC operating permit.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in the regulations. The number of soil samples required for analysis and list of analytical methods are provided in regulations. Soils that meet “exempt” fill requirements under 6NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC.

Prior to arranging for the purchase and importation of any fill, the NYSDEC or the qualified environmental professional is to be contacted, the source of the material identified, copies of appropriate operating permit and sieve testing results, as applicable, provided. Subsequently, a determination will be made as to sampling and analysis requirements and logistics.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

STORMWATER POLLUTION PREVENTION

For construction projects exceeding 1 acre, a Storm Water Pollution Prevention Plan (SWPPP) that conforms to the requirements of NYSDEC Division of Water guidelines and NYS regulations will need to be prepared by a professional engineer. As the site is 0.75 acres in size, this requirement will likely not be required unless additional acreage is affected.

For any excavation projects that will take longer than one day to complete in its entirety, provisions for eliminating off-site releases of eroded materials (sediments) shall be implemented, to include the following minimum requirements:

- Install a silt fence along the western property line. All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

- Identify drainage ways leaving the site and install appropriate hay bale checks. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

- Keep all stockpiles covered.

- Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Inspect the site for any deficiencies at least once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained for inspection by the NYSDEC. Any necessary repairs shall be made immediately.

- Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development-related construction, excavation activities will be suspended until:

- The DEC contact or a qualified environmental professional is notified to advise and provide recommendations as may be needed for the implementation of any sampling and analysis, disposal or spill response activities that may be required.

- Sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 5 of the SMP.

COMMUNITY AIR MONITORING PLAN

A Community Air Monitoring Plan (CAMP) shall be implemented concurrently with soil excavation work that penetrates into the "remaining contaminated soil" zone beneath the soil cap or remedial excavation back fill. The CAMP provided in Appendix D of the SMP. The location of air sampling stations will be based on prevailing wind conditions. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used incorporated into the project on a routine basis. Odor control measures are discussed below. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the property owner's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; (c) using foams to cover exposed odorous soils; and (d) keeping excavated stockpiles covered. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (e) direct load-out of soils to trucks for off-site disposal; (f) use of chemical odorants in spray or misting systems; (g) use of staff to monitor odors in surrounding neighborhoods; and (h) limiting the work periods to time more conducive to eliminating receptor impacts (e.g., cooler weather, better wind directions).

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas, including excavations and stockpiles.

- Excavation work will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.

- Gravel will be used on roadways to provide a clean and dust-free road surface.

- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

APPENDIX C

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

for the

QUANTA RESOURCES SITE
2802-2810 Lodi Street
City of Syracuse
Onondaga County, New York
NYSDEC Site No. 7-34-013

Prepared for:

QUANTA RESOURCES / SYRACUSE PRP GROUP

Prepared by:

PLUMLEY ENGINEERING

8232 Loop Road
Baldwinsville, New York 13027
(315) 638-8587
Project No. 2010131

September 2013

TABLE OF CONTENTS

1.0 PURPOSE AND APPLICABILITY

This Health and Safety Plan (HASP) outlines precautions and protective measures that employees and subcontractors ("Workers") of Plumley Engineering must take to minimize the risk to health and safety while performing field tasks to be conducted at the former Quanta Resources site located at 2802-2810 Lodi Street in the City of Syracuse, Onondaga County, New York. The site was listed on the New York Department of Environmental Conservation (DEC) list of inactive hazardous waste sites. Remediation was completed and a certificate of completion was obtained from the DEC. Each worker shall review the HASP prior to working on the site and sign an acknowledgement indicating the worker agrees to comply with the HASP requirements. All on-site workers must have received the appropriate level of training for their specific duties in accordance with Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 (e).

2.0 SITE DESCRIPTION

The site is located in a commercial-industrial area at 2802-2810 Lodi Street in Syracuse, New York and was an abandoned waste-oil recycling facility with an operational period beginning in the 1920's through 1981. Through the 1990's, site investigation and remedial activities administered by the United States Environmental Protection Agency (EPA) led to the abandonment and removal of the former buildings, above and below ground tanks, highly contaminated soils adjacent to the below ground tanks, and the processing infrastructure associated with the waste-oil plant. The site was remediated by Quanta Resources in 2011. A final engineering report was prepared by Plumley Engineering, P.C. and can be referenced for additional information. The site is 0.75 acres in size. The site is currently grass covered with a fenced area and gravel drive for the remediation system building.

Refer to Figures 1 and 2 in the Site Management Plan for additional information.

3.0 SCOPE OF WORK

Planned site activities include the following:

- Free-product measurements and manual bailing from recovery wells
- Operation and maintenance of low vacuum oil recovery enhancement system
- Groundwater water sampling
- Mowing and snow plowing as needed.
- Cap system inspection and maintenance.

Any ground intrusive work will, including management of soils, backfilling, air monitoring, preservation of the site cover system and others, as specified in the Site Management Plan (SMP) prepared by Plumley Engineering.

4.0 HEALTH AND SAFETY PERSONNEL

The following personnel are responsible for the development, implementation and maintenance of this HASP:

Project Manager.....Dale R. Vollmer, P.E.

Site Safety Officer.....Frank A. Karboski, C.P.G.

Although responsibility for implementing this HASP is with the Site Safety Officer, the primary responsibility for health and safety lies with the individual workers. Each worker must be familiar with and conform to the safety procedures outlined in this HASP. The Site Safety Officer is responsible for all decisions regarding health and safety policies, procedures and protective measures. It is the responsibility of the Site Safety Officer to provide the resources required to allow the work to be conducted in conformance with this HASP.

The Site Safety Officer will also be responsible for:

- Maintaining a complete copy of the HASP at the site during all field activities.
- Assuring that all workers at the site are familiar with the procedures outlined in the HASP.
- Assuring that all workers have undergone the required OSHA training program.
- Assuring that workers have, and properly use and maintain, all specified personal protective and other health and safety equipment.
- Assuring that proper decontamination procedures are followed.
- Initiating immediate response actions, if necessary, and coordinating these actions with all workers at the site, any other individuals at the site, any involved agencies or medical facilities.
- Recommending improvements to this HASP, if needed.

The Site Safety Officer has the authority to:

- Direct any worker to alter or suspend any work practice they deem is not sufficient to protect human health.
- Deny access to the site to any individual or organization that does not have a complete copy of the HASP, and the appropriate training and personal protective equipment (PPE) for the potential health and safety hazards at the site.

The presence or absence of the Site Safety Officer shall in no way relieve any person or organization of its obligation to comply with the HASP or any applicable Federal, State and local laws and regulations.

5.0 GENERAL INFORMATION

Plan Prepared By / Date:

Plumley Engineering, P.C. / September 2013

Plan Approved By / Date:

Dale R. Vollmer, P.E. / September 2013

Proposed Date(s) of Work:

Ongoing.

Background Review:

Preliminary __ Complete X

Relevant data provided herein regarding the types of contaminants present at the site was obtained through the course of related investigation activities undertaken by others.

6.0 SITE CONTAMINANT CHARACTERISTICS

Definition of Site Contaminants of Concern (COCs):

The site was a former waste-oil recovery recycling facility reported to have handled a variety of waste oils. As such, a variety of different chemicals are anticipated. Based on our review of site report information, the following types of chemical compounds are identified as site contaminants:

Main Constituents (believed to be more prevalent at the site):

- Halogenated and non-halogenated volatile organic compounds (VOCs)
- Semi-volatile organic compounds (SVOCs)
- Polychlorinated biphenyls (PCBs)

Lesser Constituents (believed to be less prevalent at the site):

- Metals (RCRA list)

There are no uncontrolled surface exposures of these materials, such as heavily stained areas, open lagoons, etc. at the site.

Potential Hazardous Material(s):

The more prevalent halogenated VOCs at the site include 1,1,1-trichloroethane, tetra-chloroethene and trichloroethene.

The more prevalent non-halogenated VOCS present at the site include benzene, xylene, ethylbenzene and toluene.

SVOCs compounds found prevalently at the site include a large number of polycyclic aromatic hydrocarbons (PAHs), including acenaphthene, fluorene, phenanthrene, anthracene, chrysene, benzo(a)pyrene, naphthalene, 2-methylnaphthalene, among others.

Hazardous Substance Fact Sheets for selected COCs are included in *Attachment B.*

Media and Contaminant Types (X):

[X] Liquid	[ ] Solid	[ ] Sediment	[X] Soil Gas	[X] Soil
[X] Toxic	[ ] Reactive	[ ] Radioactive	[ ] Unknown	

COCs are known to occur at the site in the soil and potentially the groundwater. It is to be assumed that COCs may be present in site soils below the protective, minimum 12-inch thick soil cover system (or concrete, asphalt surfaces) or beneath the remedial excavation backfill completed in 2011. Refer to the SMP for additional details.

7.0 HAZARD EVALUATION AND REDUCTION

The VOCs are volatile and can present an inhalation hazard from breathing air contaminated with these materials resulting from direct contact with contaminated equipment, site soils or groundwater disturbed by remediation activities. The SVOCs are also volatile, but less so than the VOCs, and may be also be present in the breathing zone. Metals, pesticides and PCBs are not significantly volatile compounds.

All chemicals are anticipated to occur in soil and groundwater at the site, and thus pose a dermal exposure risk that can result from handling site soil and groundwater or equipment that has come into contact with impacted soil or groundwater.

According to the Hazardous Substance Fact Sheets, the COCs are recognized to pose a variety of hazards, including irritation of the eyes, respiratory tract and skin, and potentially increased risk of cancer and reproductive damage. The current OSHA permissible exposure limits (PEL) standards are provided in *Attachment B.* Workers are not expected to be exposed to conditions exceeding the PEL.

Based on the nature of the contaminant and the type of work being performed, the most significant hazards at this site are:

- Direct contact with COC-bearing materials or equipment during intrusive subsurface activities and soil and groundwater sampling activities. The PPE requirements for the project are designed to eliminate this risk to the extent practical.

- Physical hazards related to operating and working with the oil recovery system. All inspectors shall be familiar with the associated physical hazards. The PPE requirements for the project are designed to eliminate this risk to the extent practical.

There are three primary pathways by which site workers can be exposed to chemical hazards: inhalation, ingestion and dermal contact. The chemical exposures across these pathways can cause two types of effects: acute and chronic. Acute effects happen during or shortly after exposure to a sufficiently high concentration of a chemical. Chronic effects occur after repeated or constant exposures for a long period of time. Regulatory exposure limits, such as PELs, are related to both acute effects, such as respiratory irritation, and chronic effects, such as cancer. Symptoms of chemical exposure may include behavioral changes, breathing difficulties, skin color changes, coordination difficulties, coughing, dizziness, weakness, irritability, skin irritation, eye irritation, respiratory tract irritation, headache, nausea, lightheadedness, sneezing, etc.

The primary pathway exposures associated with site VOCs is inhalation and dermal contact with affected media or tools that have come into contact with the affected media. SVOCs may also be present in the breathing air, although typically at concentrations less than VOCs. Real-time ambient air monitoring, appropriate engineering controls, PPE and good hygiene practices will be employed to minimize exposure to VOCs. Exposures to SVOCs, metals, pesticides and PCBs is primarily by dermal contact with affected media or tools that have come into contact with the affected media.

Another potential pathway for exposure to COCs is through inhalation and dermal contact with airborne dust derived from contaminated soil. However, there are no site activities proposed at this time that will expose large areas of unstabilized soil, and vegetation is well developed at the site.

The following precautions will be taken to reduce the potential exposure to site COCs during site remediation activities:

- During the work, field personnel will conduct air monitoring with a photoionization detection (PID) meter to measure total concentrations of VOCs in the work zone breathing space.

- If visible dust does become present in the breathing space, engineering controls and/or appropriate respiratory protection will be used.

- The work procedures shall be modified and/or a portable fan will be used as an engineering control if VOCs in the breathing space rise above action levels.

- Site remediation activities will be conducted in Level D PPE to minimize dermal exposure to potentially affected media (i.e., specifying the use of disposable protective gloves when handling site materials during field sampling activities) and reduce the risk of physical hazards (by requiring hard hats and safety glasses when inspecting drilling or test pits) as detailed in Section 8. The PPE will be upgraded, as necessary, for organic vapor, dermal and dust inhalation hazards.

- Any non-disposable PPE that comes in contact with potentially affected facility media will be decontaminated prior to leaving the work area.

- Soap, clean water and paper towels for washing hands will be provided at the site during all field activities. Hands will be washed thoroughly prior to eating, drinking and leaving the site.

The Site Safety Officer will have the NIOSH *Pocket Guide to Chemical Hazards* available for reference at the site. This reference identifies exposure routes, exposure symptoms, physical properties, chemical incompatibilities, first aid treatment and other information for many chemical compounds.

Physical hazards expected during the remediation activities are related to slip, trip and fall hazards. Additional physical hazards may include heat or cold stress. These hazards will be evaluated by the Site Safety Officer prior to beginning work in a new area and as conditions change in the work area. The following precautions will be taken to reduce the physical hazard:

- "Tailgate" safety briefings will be conducted by the Site Safety Officer to identify additional safety protocols, as needed.
- The specified PPE shall be worn by all workers in the project exclusion zone.
- No confined space entries will take place under this HASP. If a confined space entry becomes necessary, appropriate confined space entry procedures will be detailed in an addendum to this plan.
- A warming space will be provided during cold weather, if needed.
- Good housekeeping in the work area will be maintained.

Encountering unknown or unexpected substances or containers of a hazardous nature is possible, though not expected based on the degree of prior investigation and remedial activities completed at the site. Work will be discontinued if field measurements or observations indicate there is potential exposure to a hazard that was not anticipated, is not adequately characterized and controlled, or may exceed the protection provided by the PPE specified for the task.

8.0 SITE SAFETY WORK PLAN

Site Security:

A security fence with a locked gate encloses the site. The gate is kept locked at all times except during times when investigation activities are underway. The gate will be closed when personnel are on-site working to limit incoming traffic to authorized personnel only.

Training:

All authorized workers will receive a HASP briefing and will be required to read and sign the HASP at the beginning of the field project. The following main items shall be covered:

- The tasks the workers will be required to perform, as detailed in the Work Plan.
- Site ingress, egress and decontamination procedures.
- Site hazards, accident prevention and overexposure symptoms.
- The required PPE plan and exclusion zone requirements.
- Emergency response procedures.

Attachment A is a record of all authorized workers who have either attended the startup training session or received a similar briefing from the Site Safety Officer, to include any visitors. This shall be kept up-to-date throughout the project.

Should unexpected site conditions be encountered requiring utilization of Level C or higher protection and/or other specialized operations (e.g., a confined space entry), the work shall not be carried out until a Response Team is formed to carry out such work, comprised of personnel with proper training in accordance 29 CFR Part 1910.120 (e) (f) (g), as appropriate.

When any new personnel are assigned to this project, they shall receive the HASP briefing and shall be required to read and sign the HASP before being allowed to perform work. The briefing will be given by the Site Safety Officer or a delegated safety representative who has previously completed this training.

The Site Safety Officer will be responsible for insuring that visitors receive the necessary site-specific visitor training applicable to the visitors' anticipated activities. Site visitors shall not be allowed access to the project exclusion zone unless they receive a site-specific training brief, can demonstrate they have received the appropriate training per 29 CFR Part 1910.120 (e) and have received the required project PPE equipment.

Zone(s) of Contamination Identified:

Potentially contaminated soil occurs beneath the 12-inch soil cover system and remedial excavation backfill. Groundwater is impacted with oil containing PCBs. Refer to the SMP for additional information.

Medical Surveillance:

Follow medical surveillance requirements for the work in accordance with 29 CFR Part 1910.120 (f) if respirators are used.

Attachment B details the symptoms of overexposure to the COCs. All site workers shall be familiar with these.

Exclusion Zone:

The exclusion zone for free-product monitoring and recovery is defined as the fenced-in area and local area around the wells outside the fence. An appropriate exclusion zone will be defined for other work on the site.

Decontamination Area:

Any excavation work below the cover system will follow the Excavation Work Plan and include a decontamination plan.

Personal Protection Equipment:

- Level of protection in the exclusion zone shall be Level D – Modified.

- Level D PPE in the exclusion zone shall consist of the use of hard hats, gloves, steel-toed boots, ear plugs and safety glasses. Latex gloves will be used by workers for handling soil and water.

- A cellular telephone in proper working order shall be available at the work site at all times.

- Eating, drinking, smoking and carrying food or tobacco products are prohibited in the exclusion zone.

Decontamination Procedures:

- ***Personnel:*** Workers shall remove coveralls and gloves prior to leaving the site.

- ***Protective Equipment:*** All protective equipment will be disposable.

- ***Sampling Equipment:*** All sampling equipment will be disposable. The oil/water interface probe shall be wiped free of oil with disposable towels and then wiped with an Alconox solution-soaked disposable towel.

- ***Disposal:*** Gloves, coveralls, disposable towels, etc. used at the site will be collected in a designated drum inside the equipment shed and labeled appropriately. Disposal will be in accordance with all applicable laws of the State of New York.

Equipment Checklist:

Level D Modified

Hard hat

Steel-toed work boots and rubber overshoes, or steel toed rubber boots

Safety glasses

Safety goggles or shield

Tyvek coveralls

Rubber and latex gloves

Hearing Protection

Ear Plugs

Decontamination Materials

Alconox Solution

Disposable Towels

Field Instruments

PID / Calibrated HNU, 10.6 eV

Oil/Water Interface Probe

Other

Eye wash bottles

Portable body washing equipment; water, soap and paper towels

First aid kit

Glove and helmet liners for cold weather

9.0 ENVIRONMENTAL MONITORING PLAN

Work Zone Monitoring:

Work zone air monitoring should be conducted if excavations are undertaken to depths below the soil cover system in accordance with the Excavation Work Plan requirements.

Air monitoring in the exclusion zone near the point of operation will be periodically tested by the Site Safety Officer using a PID meter as a general precaution at a frequency of once every 60 minutes, or whenever a fugitive odor suggestive of possible VOCs is encountered. Should readings exceeding 5 parts per million (ppm) be recorded, additional readings in the operator breathing zone will be obtained. Should these levels continue to exceed 5 ppm over a sustained period of one minute, work will be discontinued until appropriate engineering controls (e.g. fan ventilating, vapor suppression) are employed. The Site Safety Officer will continue to evaluate the situation and, if necessary, upgrade the PPE requirements to include air-purifying respirators. Should Level C respirator PPE be required, all workers shall have had the proper training for their use and have had a fitness test performed current within the previous one year period in accordance with 29 CFR 1910.120.134, Appendix A. Readings will be documented on the form provided in *Attachment C.*

Community Air Monitoring Program:

The Community Air Monitoring Plan (CAMP) requires real-time monitoring for VOCs and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at the site. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors, including residences and businesses, and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions and/or work shutdown. A CAMP is provided within the SMP as Appendix D.

10.0 EMERGENCY RESPONSE PLAN

A copy of the HASP and a NIOSH *Pocket Guide of Chemical Hazards* shall be available at the site at all times.

The Site Safety Officer is to be immediately notified of any on-site emergency.

USE THE 911 SYSTEM FOR ANY THREATENING EMERGENCY.

Upon the occurrence of an emergency involving a potentially ongoing dangerous condition, for example a fire, explosion or electrical condition within or adjacent to the site, all workers will be alerted and the affected area evacuated immediately.

Emergency situations will be evaluated by the Site Safety Officer and initial emergency response measures will be undertaken, if appropriate.

Contact the Project Manager as soon as possible. Emergency telephone numbers are provided.

The following general sequential guidelines are provided for emergency situations:

1. If possible, remove the exposed or injured person(s) from the immediate danger. Other personnel on the property shall be evacuated to a safe distance until the Site Safety Officer determines it is safe to return to work.

2. Obtain paramedic and ambulance service (or fire department response, if needed) immediately by calling 911. Render first aid, as applicable to the rescuers' training.

3. If there is any doubt regarding the condition of the area, work shall not commence until all safety issues are resolved.

4. At the earliest time practical, the Site Safety Officer shall contact the Project Manager, giving details of the incident.

5. A written report of the incident shall be forwarded to the Project Manager within 24 hours following the incident.

EMERGENCY TELEPHONE NUMBERS

FOR ALL EMERGENCIES..... 911

(Fire Department, Police Department, Ambulance)

Other Agencies:

Syracuse Fire Department – Prevention Section .....(315) 473-5525

Onondaga County Department of Water Environment Protection.....(315) 435-2260

National Grid (Gas or Electrical Emergency.....(800) 892-2345

Syracuse Water Department – Emergencies.....(315) 473-2860

St. Joseph's Hospital Emergency Room.....(315) 448-5101

DEC Region 7, Syracuse Office Spill Section.....(315) 426-7519

DEC Spill Hotline.....(800) 457-7362

Nearest Hospital (*Hospital Location Map, Figure 1*):

Name: St. Joseph's Hospital Health Center

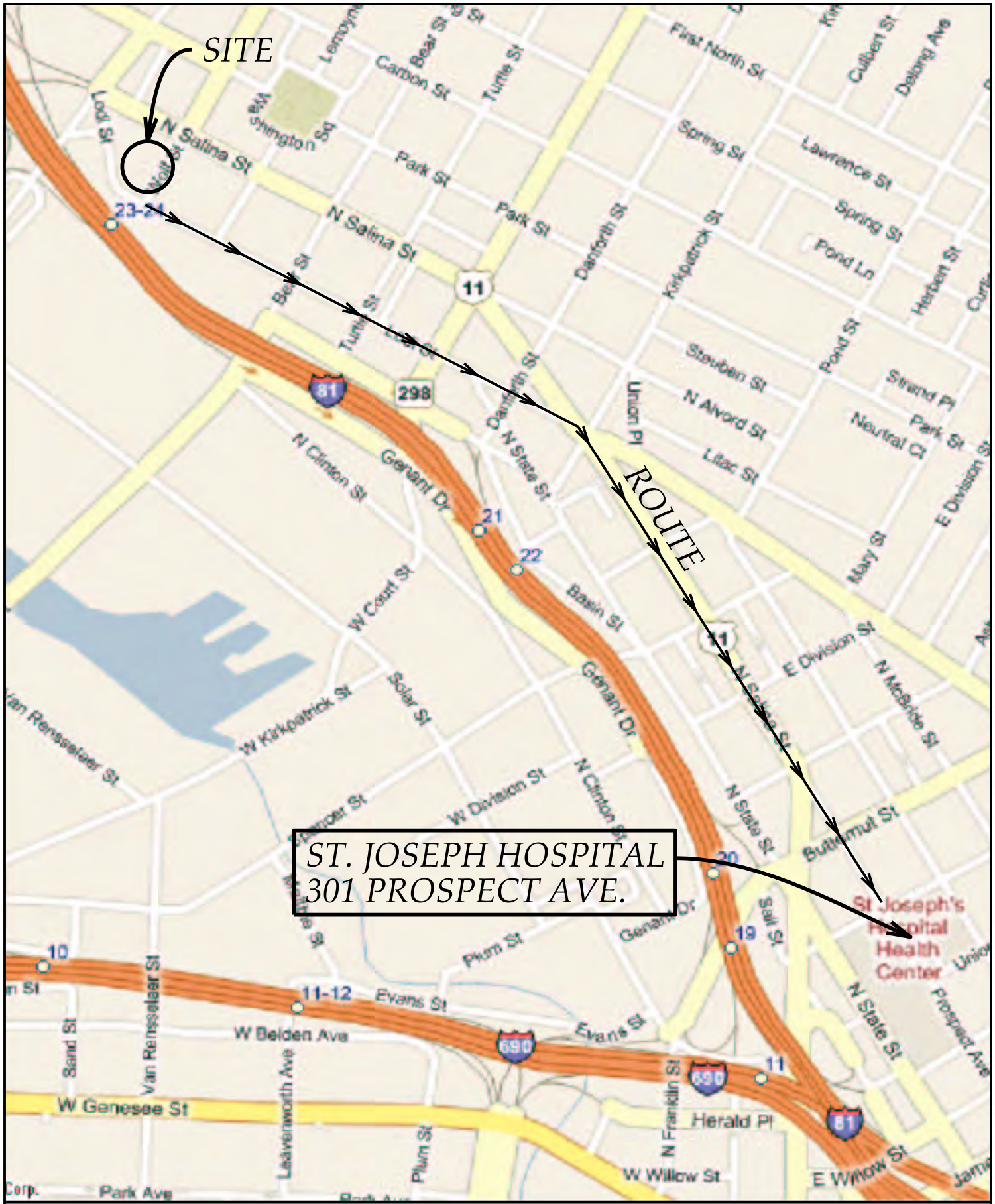
Location 301 Prospect Avenue
Syracuse, New York 13203
(approximately 1.5 miles from site)

Telephone: (315) 448-5101 (Emergency Room)

Written directions to Hospital from the site:

- Head southeast on Lodi Street
- Turn right on North Salina Street
- Bear left onto Prospect Avenue to Emergency Department

FIGURES



PLUMLEY ENGINEERING

Civil and Environmental Engineering

PLUMLEY ENGINEERING, P.C.
8232 LOOP ROAD
BALDWINSVILLE, NY 13027

TELEPHONE: (315) 638-8587
FAX: (315) 638-9740
WWW.PLUMLEYENG.COM

PROJECT: QUANTA RESOURCES - SYRACUSE

DWG. TITLE: HOSPITAL LOCATION MAP

CLIENT: QUANTA RESOURCES PRP GROUP

LOCATION: CITY OF SYRACUSE, ONONDAGA COUNTY, NEW YORK

FIGURE 1

PROJECT No.: 2010131

ATTACHMENTS

ATTACHMENT A
NYSDEC Site No. 7-34-013

AUTHORIZED PERSONNEL

I have read, understand and by signing, agree to comply with the provisions contained in the health and safety plan for this site.

	Name	Representing	Signature	Date
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				

ATTACHMENT B
HAZARDOUS SUBSTANCE FACT SHEETS

Arsenic (inorganic compounds, as As)

Synonyms & Trade Names Arsenic metal: Arsenia
Other synonyms vary depending upon the specific As compound. [Note: OSHA considers "Inorganic Arsenic" to mean copper acetoarsenite and all inorganic compounds containing arsenic except ARSINE.]

CAS No. 7440-38-2 (metal)	RTECS No. CG0525000 (metal) (/niosh-rtecs/CG802C8.html)	DOT ID & Guide 1558 152 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=152) (http://www.cdc.gov/Other/disclaimer.html) (metal) 1562 152 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=152) (http://www.cdc.gov/Other/disclaimer.html) (dust)
Formula As (metal)	Conversion	IDLH Ca [5 mg/m3 (as As)] See: 7440382 (/niosh/idlh/7440382.html)

Exposure Limits
NIOSH REL : Ca C 0.002 mg/m3 [15-minute] See Appendix A (nengapdxa.html)
OSHA PEL : [1910.1018] TWA 0.010 mg/m3

Measurement Methods
NIOSH 7300 (/niosh/docs/2003-154/pdfs/7300.pdf), 7301 (/niosh/docs/2003-154/pdfs/7301.pdf), 7303 (/niosh/docs/2003-154/pdfs/7303.pdf), 7900 (/niosh/docs/2003-154/pdfs/7900.pdf), 9102 (/niosh/docs/2003-154/pdfs/9102.pdf);
OSHA ID105 (http://www.osha.gov/dts/sltc/methods/inorganic/id105/id105.html) (http://www.cdc.gov/Other/disclaimer.html)
See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Metal: Silver-gray or tin-white, brittle, odorless solid.

MW: 74.9	BP: Sublimes	MLT: 1135°F (Sublimes)	Sol: Insoluble	VP: 0 mmHg (approx)	IP: NA
Sp.Gr: 5.73 (metal)	Fl.P: NA	UEL: NA	LEL: NA		

Metal: Noncombustible Solid in bulk form, but a slight explosion hazard in the form of dust when exposed to flame.

Incompatibilities & Reactivities Strong oxidizers, bromine azide [Note: Hydrogen gas can react with inorganic arsenic to form the highly toxic gas arsine.]

[arsine is formed, the highly toxic gas arsine.]

Exposure Routes inhalation, skin absorption, skin and/or eye contact, ingestion

Symptoms Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen]

Target Organs Liver, kidneys, skin, lungs, lymphatic system

Cancer Site [lung & lymphatic cancer]

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated/Daily
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations
(See Appendix E) (nengapdxe.html)

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0013 (/niosh/ipcsneng/neng0013.html) See MEDICAL TESTS: 0017 (/niosh/docs/2005-110/nmed0017.html)

Page last reviewed: April 4, 2011
Page last updated: November 18, 2010
Content source: National Institute for Occupational Safety and Health (NIOSH) Education and Information Division

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

Coal tar pitch volatiles

Synonyms & Trade Names Synonyms vary depending upon the specific compound (e.g., pyrene, phenanthrene, acridine, chrysene, anthracene & benzo(a)pyrene). [Note: NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products.]

CAS No.	RTECS No.	DOT ID & Guide
65996-93-2	GF8655000 (/niosh-rtecs/GF841098.html)	2713 153 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=153) (http://www.cdc.gov/Other/disclaimer.html) (acridine)
	Conversion	IDLH Ca [80 mg/m3] See: 65996932 (/niosh/idlh/65996932.html)

Exposure Limits

NIOSH REL : Ca TWA 0.1 mg/m3 (cyclohexane-extractable fraction)
See Appendix A (nengapdxa.html)
See Appendix C (nengapdxc.html)
OSHA PEL : TWA 0.2 mg/m3 (benzene-soluble fraction) [1910.1002] See Appendix C (nengapdxc.html)

Measurement Methods

OSHA 58 (http://www.osha.gov/dts/sltc/methods/organic/org058/org058.html) (http://www.cdc.gov/Other/disclaimer.html)
See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Black or dark-brown amorphous residue.

Properties vary depending upon the specific compound.					

Combustible Solids

Incompatibilities & Reactivities Strong oxidizers

Exposure Routes inhalation, skin and/or eye contact

Symptoms dermatitis, bronchitis, [potential occupational carcinogen]

Target Organs respiratory system, skin, bladder, kidneys

Cancer Site [lung, kidney & skin cancer]

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: Daily
Remove: No recommendation
Change: Daily

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 1415 (/niosh/ipcsneng/neng1415.html) See MEDICAL TESTS: 0054 (/niosh/docs/2005-110/nmed0054.html)

Page last reviewed: April 4, 2011
Page last updated: November 18, 2010
Content source: National Institute for Occupational Safety and Health (NIOSH) Education and Information Division

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

Vinyl chloride

Synonyms & Trade Names Chloroethene, Chloroethylene, Ethylene monochloride, Monochloroethene, Monochloroethylene, VC, Vinyl chloride monomer (VCM)

CAS No. 75-01-4	RTECS No. KU9625000 (/niosh-rtecs/KU92DDA8.html)	DOT ID & Guide 1086 116P (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=116&poly=1) (http://www.cdc.gov/Other/disclaimer.html) (inhibited)
Formula CH_2=CHCl	Conversion 1 ppm = 2.56 mg/m3	IDLH Ca [N.D.] See: IDLH INDEX (/niosh/idlh/intridl4.html)

Exposure Limits
NIOSH REL : Ca See Appendix A (nengapdxa.html)
OSHA PEL : [1910.1017] TWA 1 ppm C 5 ppm [15-minute]

Measurement Methods
NIOSH 1007 (/niosh/docs/2003-154/pdfs/1007.pdf); **OSHA** 4 (http://www.osha.gov/dts/sltc/methods/organic/org004/org004.html) (http://www.cdc.gov/Other/disclaimer.html), 75 (http://www.osha.gov/dts/sltc/methods/organic/org075/org075.html) (http://www.cdc.gov/Other/disclaimer.html)
See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless gas or liquid (below 7°F) with a pleasant odor at high concentrations. [Note: Shipped as a liquefied compressed gas.]

MW: 62.5	BP: 7°F	FRZ: -256°F	Sol(77°F): 0.1%	VP: 3.3 atm	IP: 9.99 eV
	Fl.P: NA (Gas)	UEL: 33.0%	LEL: 3.6%	RGasD: 2.21	

Flammable Gas

Incompatibilities & Reactivities Copper, oxidizers, aluminum, peroxides, iron, steel [Note: Polymerizes in air, sunlight, or heat unless stabilized by inhibitors such as phenol. Attacks iron & steel in presence of moisture.]

Exposure Routes inhalation, skin and/or eye contact (liquid)

Symptoms lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frostbite; [potential occupational carcinogen]

Target Organs Liver, central nervous system, blood, respiratory system, lymphatic system

Cancer Site [liver cancer]

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Frostbite
Eyes: Frostbite
Wash skin: No recommendation
Remove: When wet (flammable)
Change: No recommendation
Provide: Frostbite wash

First Aid (See procedures (firstaid.html))
Eye: Frostbite
Skin: Frostbite
Breathing: Respiratory support

Respirator Recommendations
(See Appendix E) (nengapdxe.html)

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0082 (/niosh/ipcsneng/neng0082.html)
See MEDICAL TESTS: 0241 (/niosh/docs/2005-110/nmed0241.html)

Page last reviewed: April 4, 2011
Page last updated: November 18, 2010
Content source: National Institute for Occupational Safety and Health (NIOSH) Education and Information Division

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

Chlorobenzene

Synonyms & Trade Names Benzene chloride, Chlorobenzol, MCB, Monochlorobenzene, Phenyl chloride

CAS No. 108-90-7	RTECS No. CZ0175000 (/niosh-rtecs/CZ2AB98.html)	DOT ID & Guide 1134 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula C_6H_5Cl	Conversion 1 ppm = 4.61 mg/m3	IDLH 1000 ppm See: 108907 (/niosh/idlh/108907.html)
Exposure Limits NIOSH REL : See Appendix D (nengapdxd.html) OSHA PEL : TWA 75 ppm (350 mg/m3)		Measurement Methods **NIOSH** 1003 (/niosh/docs/2003-154/pdfs/1003.pdf); **OSHA** 7 (http://www.osha.gov/dts/sltc/methods/organic/org001/org001.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with an almond-like odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
112.6	270°F	-50°F	0.05%	9 mmHg	9.07 eV
Sp.Gr:	**Fl.P:**	**UEL:**	**LEL:**		
1.11	82°F	9.6%	1.3%		

Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.

Incompatibilities & Reactivities Strong oxidizers

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose; drowsiness, incoordination; central nervous system depression; in animals: liver, lung, kidney injury

Target Organs Eyes, skin, respiratory system, central nervous system, liver

Personal Protection/Sanitation (See protection codes (protect.html))	First Aid (See procedures (firstaid.html))
Skin: Prevent skin contact **Eyes:** Prevent eye contact **Wash skin:** When contaminated **Remove:** When wet (flammable)	**Eye:** Irrigate immediately **Skin:** Soap wash promptly **Breathing:** Respiratory support **Swallow:** Medical attention immediately

Remove: When wet (flammable)
Change: No recommendation

Respirator Recommendations
OSHA

Up to 1000 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode£
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)£
(APF = 50) Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s)
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0642 (/niosh/ipcsneng/neng0642.html) See MEDICAL TESTS: 0253 (/niosh/docs/2005-110/nmed0253.html)

Page last reviewed: April 4, 2011
Page last updated: November 18, 2010
Content source: National Institute for Occupational Safety and Health (NIOSH) Education and Information Division

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

Benzene

Synonyms & Trade Names Benzol, Phenyl hydride

CAS No. 71-43-2	RTECS No. CY1400000 (/niosh-rtecs/CY155CCo.html)	DOT ID & Guide 1114 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula C_6H_6	Conversion 1 ppm = 3.19 mg/m3	IDLH Ca [500 ppm] See: 71432 (/niosh/idlh/71432.html)

Exposure Limits

NIOSH REL : Ca TWA 0.1 ppm ST 1 ppm See Appendix A (nengapdxa.html)
OSHA PEL : [1910.1028] TWA 1 ppm ST 5 ppm See Appendix F (nengapdxf.html)

Measurement Methods

NIOSH 1500 (/niosh/docs/2003-154/pdfs/1500.pdf), 1501 (/niosh/docs/2003-154/pdfs/1501.pdf), 3700 (/niosh/docs/2003-154/pdfs/3700.pdf), 3800 (/niosh/docs/2003-154/pdfs/3800.pdf);
OSHA 12 (http://www.osha.gov/dts/sltc/methods/organic/org012/org012.html) (http://www.cdc.gov/Other/disclaimer.html), 1005 (http://www.osha.gov/dts/sltc/methods/validated/1005/1005.html) (http://www.cdc.gov/Other/disclaimer.html)
See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless to light-yellow liquid with an aromatic odor. [Note: A solid below 42°F.]

MW: 78.1	BP: 176°F	FRZ: 42°F	Sol: 0.07%	VP: 75 mmHg	IP: 9.24 eV
Sp.Gr: 0.88	Fl.P: 12°F	UEL: 7.8%	LEL: 1.2%		

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers, many fluorides & perchlorates, nitric acid

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, blood, central nervous system, bone marrow

Cancer Site [leukemia]

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)
Change: No recommendation
Provide: Eyewash, Quick drench

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations
(See Appendix E) (nengapdxe.html)

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0015 (/niosh/ipcsneng/neng0015.html) See MEDICAL TESTS: 0022 (/niosh/docs/2005-110/nmed0022.html)

Page last reviewed: April 4, 2011
Page last updated: November 18, 2010
Content source: National Institute for Occupational Safety and Health (NIOSH) Education and Information Division

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

2-Butanone

Synonyms & Trade Names: Ethyl methyl ketone, MEK, Methyl acetone, Methyl ethyl ketone		
CAS No. 78-93-3	RTECS No. EL6475000 (/niosh-rtecs/EL62CCF8.html)	DOT ID & Guide 1193 127 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=127) (http://www.cdc.gov/Other/disclaimer.html)
Formula $CH_3COCH_2CH_3$	Conversion 1 ppm = 2.95 mg/m3	IDLH 3000 ppm See: 78933 (/niosh/idlh/78933.html)
Exposure Limits NIOSH REL : TWA 200 ppm (590 mg/m3) ST 300 ppm (885 mg/m3) OSHA PEL † (nengapdxg.html): TWA 200 ppm (590 mg/m3)		Measurement Methods **NIOSH** 2500 (/niosh/docs/2003-154/pdfs/2500.pdf), 2555 (/niosh/docs/2003-154/pdfs/2555.pdf), 3800 (/niosh/docs/2003-154/pdfs/3800.pdf); **OSHA** 16 (http://www.osha.gov/dts/sltc/methods/organic/org016/org016.html) (http://www.cdc.gov/Other/disclaimer.html), 84 (http://www.osha.gov/dts/sltc/methods/organic/org084/org084.html) (http://www.cdc.gov/Other/disclaimer.html), 1004 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1004/1004.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description: Colorless liquid with a moderately sharp, fragrant, mint- or acetone-like odor.

MW: 72.1	BP: 175°F	FRZ: -123°F	Sol: 28%	VP: 78 mmHg	IP: 9.54 eV
Sp.Gr: 0.81	Fl.P: 16°F	UEL(200°F): 11.4%	LEL(200°F): 1.4%		

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities: Strong oxidizers, amines, ammonia, inorganic acids, caustics, isocyanates, pyridines

Exposure Routes: inhalation, ingestion, skin and/or eye contact

Symptoms: irritation eyes, skin, nose; headache; dizziness; vomiting; dermatitis

Target Organs: Eyes, skin, respiratory system, central nervous system

Personal Protection/Sanitation (See protection codes (protect.html)) **Skin:** Prevent skin contact **Eyes:** Prevent eye contact **Wash skin:** When contaminated **Remove:** When wet (flammable) **Change:** No recommendation **Provide:** Eyewash	First Aid (See procedures (firstaid.html)) **Eye:** Irrigate immediately **Skin:** Water wash immediately **Breathing:** Fresh air **Swallow:** Medical attention immediately

Respirator Recommendations
NIOSH/OSHA

Up to 3000 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode[£]
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)[£]
(APF = 50) Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s)
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0179 (/niosh/ipcsneng/neng0179.html) See MEDICAL TESTS: 0133 (/niosh/docs/2005-110/nmed0133.html)

Page last reviewed: April 4, 2011
Page last updated: November 18, 2010
Content source: National Institute for Occupational Safety and Health (NIOSH) Education and Information Division

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

Chlorodiphenyl (54% chlorine)

Synonyms & Trade Names Aroclor® 1254, PCB, Polychlorinated biphenyl

CAS No. 11097-69-1	RTECS No. TQ1360000 (/niosh-rtecs/TQ14C080.html)	DOT ID & Guide 2315 171 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=171) (http://www.cdc.gov/Other/disclaimer.html)
Formula $C_6H_3Cl_2C_6H_2Cl_3$ (approx)	Conversion	IDLH Ca [5 mg/m3] See: IDLH INDEX (/idlh/intridl4.html)

Exposure Limits
NIOSH REL *: Ca TWA 0.001 mg/m3 See Appendix A (nengapdxa.html) [*Note: The REL also applies to other PCBs.]
OSHA PEL : TWA 0.5 mg/m3 [skin]

Measurement Methods
NIOSH 5503 (/niosh/docs/2003-154/pdfs/5503.pdf);
OSHA PV2088 (http://www.osha.gov/dts/sltc/methods/partial/t-pv2088-01-8812-ch/t-pv2088-01-8812-ch.html) (http://www.cdc.gov/Other/disclaimer.html)
See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless to pale-yellow, viscous liquid or solid (below 50°F) with a mild, hydrocarbon odor.

MW: 326 (approx)	BP: 689-734°F	FRZ: 50°F	Sol: Insoluble	VP: 0.00006 mmHg	IP: ?
Sp.Gr(77°F): 1.38	Fl.P: NA	UEL: NA	LEL: NA		

Nonflammable Liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans, and chlorinated dibenzo-p-dioxins.

Incompatibilities & Reactivities Strong oxidizers

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, chloracne; liver damage; reproductive effects; [potential occupational carcinogen]

carcinogen]

Target Organs Skin, eyes, liver, reproductive system

Cancer Site [in animals: tumors of the pituitary gland & liver, leukemia]

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0939 (/niosh/ipcsneng/neng0939.html) See MEDICAL TESTS: 0176 (/niosh/docs/2005-110/nmed0176.html)

Page last reviewed: April 4, 2011
Page last updated: November 18, 2010
Content source: National Institute for Occupational Safety and Health (NIOSH) Education and Information Division

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

Toluene

Synonyms & Trade Names Methyl benzene, Methyl benzol, Phenyl methane, Toluol

CAS No. 108-88-3	**RTECS No.** XS5250000 (/niosh-rtecs/XS501BDo.html)	**DOT ID & Guide** 1294 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula $C_6H_5CH_3$	**Conversion** 1 ppm = 3.77 mg/m3	**IDLH** 500 ppm See: 108883 (/niosh/idlh/108883.html)
Exposure Limits **NIOSH REL** : TWA 100 ppm (375 mg/m3) ST 150 ppm (560 mg/m3) **OSHA PEL** † (nengapdxg.html) : TWA 200 ppm C 300 ppm 500 ppm (10-minute maximum peak)		**Measurement Methods** **NIOSH** 1500 (/niosh/docs/2003-154/pdfs/1500.pdf), 1501 (/niosh/docs/2003-154/pdfs/1501.pdf), 3800 (/niosh/docs/2003-154/pdfs/3800.pdf), 4000 (/niosh/docs/2003-154/pdfs/4000.pdf); **OSHA** 111 (http://www.osha.gov/dts/sltc/methods/organic/org111/org111.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with a sweet, pungent, benzene-like odor.

MW: 92.1	**BP:** 232°F	**FRZ:** -139°F	**Sol(74°F):** 0.07%	**VP:** 21 mmHg	**IP:** 8.82 eV
Sp.Gr: 0.87	**Fl.P:** 40°F	**UEL:** 7.1%	**LEL:** 1.1%		

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage

Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys

Personal Protection/Sanitation (See protection codes (protect.html)) **Skin:** Prevent skin contact	**First Aid** (See procedures (firstaid.html)) **Eye:** Irrigate immediately **Skin:** Soap wash promptly

Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)
Change: No recommendation

Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

Up to 500 ppm:
(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0078 (/niosh/ipcsneng/neng0078.html) See MEDICAL TESTS: 0232 (/niosh/docs/2005-110/nmed0232.html)

Page last reviewed: April 4, 2011
Page last updated: November 18, 2010
Content source: National Institute for Occupational Safety and Health (NIOSH) Education and Information Division

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

Tetrachloroethylene

Synonyms & Trade Names Perchlorethylene, Perchloroethylene, Perk, Tetrachlorethylene

CAS No. 127-18-4	**RTECS No.** KX3850000 (/niosh-rtecs/KX3ABF10.html)	**DOT ID & Guide** 1897 160 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=160) (http://www.cdc.gov/Other/disclaimer.html)
Formula $Cl_2C=CCl_2$	**Conversion** 1 ppm = 6.78 mg/m3	**IDLH** Ca [150 ppm] See: 127184 (/niosh/idlh/127184.html)

Exposure Limits

NIOSH REL : Ca Minimize workplace exposure concentrations. See Appendix A (nengapdxa.html)

OSHA PEL † (nengapdxg.html) : TWA 100 ppm
C 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm

Measurement Methods

NIOSH 1003 (/niosh/docs/2003-154/pdfs/1003.pdf) ; **OSHA** 1001 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1001/1001.html) (http://www.cdc.gov/Other/disclaimer.html)
See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with a mild, chloroform-like odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
165.8	250°F	-2°F	0.02%	14 mmHg	9.32 eV
Sp.Gr:	**Fl.P:**	**UEL:**	**LEL:**		
1.62	NA	NA	NA		

Noncombustible Liquid, but decomposes in a fire to hydrogen chloride and phosgene.

Incompatibilities & Reactivities Strong oxidizers; chemically-active metals such as lithium, beryllium & barium; caustic soda; sodium hydroxide; potash

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, liver, kidneys, central nervous system

Cancer Site [in animals: liver tumors]

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation
Provide: Eyewash, Quick drench

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0076 (/niosh/ipcsneng/neng0076.html) See MEDICAL TESTS: 0179 (/niosh/docs/2005-110/nmed0179.html)

Page last reviewed: April 4, 2011
Page last updated: November 18, 2010
Content source: National Institute for Occupational Safety and Health (NIOSH) Education and Information Division

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

p-Xylene

Synonyms & Trade Names 1,4-Dimethylbenzene; para-Xylene; p-Xylol

CAS No. 106-42-3	**RTECS No.** ZE2625000 (/niosh-rtecs/ZE280DE8.html)	**DOT ID & Guide** 1307 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula $C_6H_4(CH_3)_2$	**Conversion** 1 ppm = 4.41 mg/m³	**IDLH** 900 ppm See: 95476 (/niosh/idlh/95476.html)
Exposure Limits **NIOSH REL** : TWA 100 ppm (435 mg/m³) ST 150 ppm (655 mg/m³) **OSHA PEL** † (nengapdxg.html): TWA 100 ppm (435 mg/m³)		**Measurement Methods** **NIOSH** 1501 (/niosh/docs/2003-154/pdfs/1501.pdf), 3800 (/niosh/docs/2003-154/pdfs/3800.pdf); **OSHA** 1002 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1002/1002.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with an aromatic odor. [Note: A solid below 56°F.]

MW:	BP:	FRZ:	Sol:	VP:	IP:
106.2	281°F	56°F	0.02%	9 mmHg	8.44 eV
Sp.Gr:	**Fl.P:**	**UEL:**	**LEL:**		
0.86	81°F	7.0%	1.1%		

Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.

Incompatibilities & Reactivities Strong oxidizers, strong acids

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis

Target Organs Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys

Personal Protection/Sanitation (See protection codes (protect.html)) **Skin:** Prevent skin contact **Eyes:** Prevent eye contact **Wash skin:** When contaminated **Remove:** When wet (flammable)	**First Aid** (See procedures (firstaid.html)) **Eye:** Irrigate immediately **Skin:** Soap wash promptly **Breathing:** Respiratory support **Swallow:** Medical attention immediately

Change: No recommendation

Respirator Recommendations

NIOSH/OSHA

Up to 900 ppm:
(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0086 (/niosh/ipcsneng/neng0086.html)

Page last reviewed: April 4, 2011
Page last updated: November 18, 2010
Content source: National Institute for Occupational Safety and Health (NIOSH) Education and Information Division

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

o-Xylene

Synonyms & Trade Names 1,2-Dimethylbenzene; ortho-Xylene; o-Xylol

CAS No. 95-47-6	**RTECS No.** ZE2450000 (/niosh-rtecs/ZE256250.html)	**DOT ID & Guide** 1307 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula $C_6H_4(CH_3)_2$	**Conversion** 1 ppm = 4.34 mg/m³	**IDLH** 900 ppm See: 95476 (/niosh/idlh/95476.html)
Exposure Limits **NIOSH REL** : TWA 100 ppm (435 mg/m³) ST 150 ppm (655 mg/m³) **OSHA PEL** † (nengapdxg.html): TWA 100 ppm (435 mg/m³)		**Measurement Methods** **NIOSH** 1501 (/niosh/docs/2003-154/pdfs/1501.pdf), 3800 (/niosh/docs/2003-154/pdfs/3800.pdf); **OSHA** 1002 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1002/1002.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with an aromatic odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
106.2	292°F	-13°F	0.02%	7 mmHg	8.56 eV
Sp.Gr:	**Fl.P:**	**UEL:**	**LEL:**		
0.88	90°F	6.7%	0.9%		

Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.

Incompatibilities & Reactivities Strong oxidizers, strong acids

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis

Target Organs Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys

Personal Protection/Sanitation (See protection codes (protect.html)) **Skin:** Prevent skin contact **Eyes:** Prevent eye contact **Wash skin:** When contaminated **Remove:** When wet (flammable)	**First Aid** (See procedures (firstaid.html)) **Eye:** Irrigate immediately **Skin:** Soap wash promptly **Breathing:** Respiratory support **Swallow:** Medical attention immediately

Change: No recommendation

Respirator Recommendations

NIOSH/OSHA

Up to 900 ppm:
(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0084 (/niosh/ipcsneng/neng0084.html)

Page last reviewed: April 4, 2011
Page last updated: November 18, 2010
Content source: National Institute for Occupational Safety and Health (NIOSH) Education and Information Division

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives. Protecting People.™

Search the Pocket Guide

SEARCH

Enter search terms separated by spaces.

m-Xylene

Synonyms & Trade Names 1,3-Dimethylbenzene; meta-Xylene; m-Xylol

CAS No. 108-38-3	**RTECS No.** ZE2275000 (/niosh-rtecs/ZE22B6B8.html)	**DOT ID & Guide** 1307 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula $C_6H_4(CH_3)_2$	**Conversion** 1 ppm = 4.34 mg/m³	**IDLH** 900 ppm See: 95476 (/niosh/idlh/95476.html)

Exposure Limits
NIOSH REL : TWA 100 ppm (435 mg/m³)
ST 150 ppm (655 mg/m³)
OSHA PEL † (nengapdxg.html) : TWA 100 ppm (435 mg/m³)

Measurement Methods
NIOSH 1501 (/niosh/docs/2003-154/pdfs/1501.pdf), 3800 (/niosh/docs/2003-154/pdfs/3800.pdf);
OSHA 1002 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1002/1002.html) (http://www.cdc.gov/Other/disclaimer.html)
See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with an aromatic odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
106.2	282°F	-54°F	Slight	9 mmHg	8.56 eV
Sp.Gr:	**Fl.P:**	**UEL:**	**LEL:**		
0.86	82°F	7.0%	1.1%		

Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.

Incompatibilities & Reactivities Strong oxidizers, strong acids

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis

Target Organs Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Change: No recommendation

Respirator Recommendations

NIOSH/OSHA

Up to 900 ppm:
(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0085 (/niosh/ipcsneng/neng0085.html)

Page last reviewed: April 4, 2011
Page last updated: November 18, 2010
Content source: National Institute for Occupational Safety and Health (NIOSH) Education and Information Division

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

Ethyl benzene

Synonyms & Trade Names Ethylbenzol, Phenylethane

CAS No. 100-41-4	**RTECS No.** DA0700000 (/niosh-rtecs/DAAAE60.html)	**DOT ID & Guide** 1175 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula $CH_3CH_2C_6H_5$	**Conversion** 1 ppm = 4.34 mg/m3	**IDLH** 800 ppm [10%LEL] See: 100414 (/niosh/idlh/100414.html)

Exposure Limits
NIOSH REL : TWA 100 ppm (435 mg/m3) ST 125 ppm (545 mg/m3)
OSHA PEL † (nengapdxg.html): TWA 100 ppm (435 mg/m3)

Measurement Methods
NIOSH 1501 (/niosh/docs/2003-154/pdfs/1501.pdf); **OSHA** 7 (http://www.osha.gov/dts/sltc/methods/organic/org001/org001.html) (http://www.cdc.gov/Other/disclaimer.html), 1002 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1002/1002.html) (http://www.cdc.gov/Other/disclaimer.html)
See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with an aromatic odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
106.2	277°F	-139°F	0.01%	7 mmHg	8.76 eV
Sp.Gr:	**Fl.P:**	**UEL:**	**LEL:**		
0.87	55°F	6.7%	0.8%		

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma

Target Organs Eyes, skin, respiratory system, central nervous system

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)
Change: No recommendation

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Water flush promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH/OSHA

Up to 800 ppm:
(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0268 (/niosh/ipcsneng/neng0268.html)
See MEDICAL TESTS: 0098 (/niosh/docs/2005-110/nmed0098.html)

Page last reviewed: April 4, 2011
Page last updated: November 18, 2010
Content source: National Institute for Occupational Safety and Health (NIOSH) Education and Information Division

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

Methyl chloroform

Synonyms & Trade Names Chlorothene; 1,1,1-Trichloroethane; 1,1,1-Trichloroethane (stabilized)

CAS No. 71-55-6	**RTECS No.** KJ2975000 (/niosh-rtecs/KJ2D6518.html)	**DOT ID & Guide** 2831 160 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=160) (http://www.cdc.gov/Other/disclaimer.html)
Formula CH_3CCl_3	**Conversion** 1 ppm = 5.46 mg/m³	**IDLH** 700 ppm See: 71556 (/niosh/idlh/71556.html)
Exposure Limits **NIOSH REL** : C 350 ppm (1900 mg/m³) [15-minute] See Appendix C (nengapdxc.html) (Chloroethanes) **OSHA PEL** † (nengapdxg.html): TWA 350 ppm (1900 mg/m³)		**Measurement Methods** **NIOSH** 1003 (/niosh/docs/2003-154/pdfs/1003.pdf) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with a mild, chloroform-like odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
133.4	165°F	-23°F	0.4%	100 mmHg	11.00 eV
Sp.Gr: 1.34	**Fl.P:** ?	**UEL:** 12.5%	**LEL:** 7.5%		

Combustible Liquid, but burns with difficulty.

Incompatibilities & Reactivities Strong caustics; strong oxidizers; chemically-active metals such as zinc, aluminum, magnesium powders, sodium & potassium; water [Note: Reacts slowly with water to form hydrochloric acid.]

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depression, poor equilibrium; dermatitis; cardiac arrhythmias; liver damage

Target Organs Eyes, skin, central nervous system, cardiovascular system, liver

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations
NIOSH/OSHA

Up to 700 ppm:
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0079 (/niosh/ipcsneng/neng0079.html) See MEDICAL TESTS: 0141 (/niosh/docs/2005-110/nmed0141.html)

Page last reviewed: April 4, 2011
Page last updated: November 18, 2010
Content source: National Institute for Occupational Safety and Health (NIOSH) Education and Information Division

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

ATTACHMENT C
NYSDEC Site No. 7-34-013

DAILY WORK ZONE AND PERIMETER AIR MONITORING LOG SHEET

Job:_____ Date:_____ Start Time:_____

Monitoring Personnel:_____

Instruments (circle): PID:_____ HNU LEL Draeger Tubes Other_____

Weather Conditions

Temperature:_____ Sky (circle): Clear P. Cloudy Cloudy Overcast

Wind Speed (approx.):_____ Wind Direction:_____ Precipitation:_____

TIME	PID/LEL READINGS	WORK ZONE OR PERIMETER	COMMENTS (activities, changes in wind direction, temperature, etc.)

Monitoring Performed By:_____

Were Respirators Worn: Yes No

How Long? _____ Who? _____

Why? _____

APPENDIX D

COMMUNITY AIR MONITORING PLAN

COMMUNITY AIR MONITORING PROGRAM

The Community Air Monitoring Program (CAMP) will provide real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of the work area when contaminated soil is disturbed or soil treatment activities are in progress at the site. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors, including residences and businesses, and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of the work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions and/or work shutdown. Refer to Figure 1 of the Site Management Plan for suggested upwind and downwind monitoring locations.

VOC Monitoring, Response Levels and Actions

- VOCs will be monitored at the downwind perimeter of the work area. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed with a photoionization detection (PID) meter using a 10.6 eV lamp. The equipment will be calibrated at least daily for the VOCs or for an appropriate surrogate. The equipment will be capable of recording and calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of site VOCs at the downwind work zone monitoring station exceeds 5 parts per million (ppm) for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the VOC level readily decreases (per instantaneous readings) below 5 ppm, work activities will resume with continued monitoring.

- If the concentration of VOCs at the downwind work zone monitoring station persists at levels in excess of 5 ppm but less than 25 ppm, work activities will be halted, the source

of vapors identified, corrective actions taken to abate emissions and monitoring continued. Work activities will resume after these steps, provided the VOC level 200 feet downwind of the work zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less, is below 5 ppm for the 15-minute average.

- If the VOC level is above 25 ppm at the perimeter of the work area, activities must be shut down.

- PID audio alarm settings for project action levels may be specified by the project engineer.

- All 15-minute readings will be recorded and made available to the project engineer and/or DEC for review in *Excel* format. Instantaneous readings, if any, used for decision purposes will also be recorded.

Particulate Monitoring, Response Levels and Actions

Particulate concentrations will be monitored at the upwind and downwind perimeters of the work zone at portable particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be outfitted with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (µg/m³) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work may continue with dust suppression techniques, provided that downwind PM-10 particulate levels do not exceed 150 µg/m³ above the upwind level and no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 µg/m³ above the upwind level, work will be stopped and a reevaluation of activities initiated. Work will resume, provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 µg/m³ of the upwind level and in preventing visible dust migration.

- All readings will be recorded and made available to the project engineer and/or DEC for review in *Excel* format.

VOC and/or Dust Suppression Measures

Available suppression measures for VOC or dust emission include:

- Keeping soil stockpiles and windrows covered.

- Minimizing the handling and disturbance of untreated soil at any one time.

- Providing a source of water and pressurized sprayer to moisten stockpiles soil surfaces and equipment.

- Applying water on disturbed areas in the work area.

- Restricting vehicle speeds to 10 miles per hour or less.

APPENDIX E

MONITORING WELL CONSTRUCTION LOGS

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. MW-15

PROJECT: QUANTA RESOURCES
CLIENT: NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
BORING CONTRACTOR: AMERICAN AUGER & DITCHING CO.
SHEET NO. 1 OF 1
JOB NO.: 35235.10
BORING LOCATION:
GROUND ELEVATION: 405.46'
DATE STARTED: 11-19-91
DATE FINISHED: 11-20-91
DRILLER: LEE PENROD
GEOLOGIST: SCOTT SWANSON
REVIEWED BY: DUANE LENHARDT

GROUND WATER:				CAS.	SAMP	CORE	TUBE
DATE	TIME	LEV	TYPE	TYPE		SPLIT SPOON (SS)	
11-21	8:30AM	31.15'	TOP RISER	DIA.		2"	
11-25	6:10PM	31.75'	TOP RISER	WT.		140 lb	
				FALL		30"	
				* POCKET PENETROMETER READING			

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	CLASS USCS	HNU (PPM)	REMARKS
								SEE WELL LOG MW-1D FOR SOIL DESCRIPTIONS OF 0-16'			
15											
20		1	SS	6 42 50/4"	100%	BLACK OLIVE-BROWN LT. GREEN	VERY DENSE.	DECOMPOSED SILTSTONE OR SHALE	VBR	VBR	V. MOIST-WET CLAYEY SANDY SILT IN SPOON DUE TO SLOUGH
25		2	SS	22 50/2"	100%					5-20	DRY
30		3*	SS	44 32 22 30	100%	RED-SOME BLUE-GREEN MOTTLED		CRUMBLY SILT SOFT WHERE MOIST		25	DRY-SL. MOIST
		4	SS	28 50/5"	100%					20	V. MOIST SL. MOIST
		5	SS	36 50/4"	100%	RED				15-50	
35		6	SS	50/2"	100%					20-30	MOIST UPPER LOWER DRY
		7	SS	22 50/5"	100%	GREEN		BROKEN FRACTURED SILTSTONE / MUDSTONE / SHALE		0	V. MOIST-WET
40								TOTAL DEPTH 39' WELL SCREEN 29-36			
45											

A-3205

COMMENTS DRILL RIG: TRUCK-MOUNTED MOBILE B-57
* ENVIRONMENTAL SOIL SAMPLE COLLECTED FOR FULL TCL AND CYANIDE ANALYSES

PROJECT NO. 35235.10
BORING NO. MW-15

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. MW-1D

PROJECT: QUANTA RESOURCES
CLIENT: NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
BORING CONTRACTOR: AMERICAN AUGER & DITCHING CO.
SHEET NO. 1 OF 2
JOB NO.: 35235.10
BORING LOCATION:
GROUND ELEVATION: 405.01' USCEGS
DATE STARTED: 11-15-91
DATE FINISHED: 11-18-91
DRILLER: LEE PENROD
GEOLOGIST: SCOTT SWANSEN
REVIEWED BY: DUANE LENHARDT

GROUND WATER:

DATE	TIME	LEV	TYPE
11-15	3:25PM	37.85	BGS (HSA)
11-18	9:45AM	30.15	BGS (HSA)
11-19	1:25PM	31.80	TOP RISER
11-24	8:40AM	31.90	" "

11-25 6:05PM 31.60 T.RISER

	CAS.	SAMP	CORE	TUBE
TYPE		SPLIT SPOON (SS)		
DIA.		2"		
WT.		140 lb.		
FALL		30"		

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY ROD %	DESCRIPTION: COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	HNU (PPM)	REMARKS
		1	SS	4 7 / 9 4	60%	BLACK	MEDIUM DENSE	FINE GRAVELLY SILT	ML	0	SL. MOIST
		2	SS	9 10 / 12 16	75%	GREEN-BLUE BROWN	STIFF	CLAYEY SILT SL. PLASTIC	ML/CL	0	MOIST
5		3	SS	17 18 / 18 20	100%	MOTTLED	VERY STIFF			0	SL. MOIST SL. ODOR
		4	SS	20 50 / 50/5"	75%		HARD			0	DRY
		5	SS	7 9 / 20 22	50%	GRAY-GREEN	MEDIUM DENSE	DECOMPOSED SILTSTONE OR SHALE FISSILE/CRUMBLY	VBR	0	
10											
15		6	SS	4 9 / 6 6	85%	GREEN				5-20	DRY
											CUTTINGS BALLING UP
20		7*	SS	22 32 / 30 17	100%		V. DENSE			90	SL. MOIST
25		8	SS	10 50/5"	90%	RED		BRITTLE CONSISTENCY EXTREMELY WEATHERED SILTSTONE SHALE		30	DRY
30		9	SS	7 10 / 10 12	95%	GREEN-RED MOTTLED RED		SOME CLAYEY SILTSTONE FISSILE		20-30	V. MOIST / WET
		10	SS	22 50/4"	100%					10	DRY
35		11	SS	38 50/2"	100%					5-10	

A-3205

COMMENTS: DRILL RIG: TRUCK-MOUNTED MOBILE B-57
* COLLECTED ENVIRONMENTAL SOIL SAMPLE FOR FULL TCL AND CYANIDE ANALYSES

PROJECT NO. 35235.10
BORING NO. MW-1D

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. MW-1D

PROJECT: QUANTA RESOURCES
SHEET NO. 2 OF 2
CLIENT: NYSDEC
JOB NO.: 35235.10

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY RQD %	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	HNU (PPM)	REMARKS
36											
40		12	SS	22 / 50/3"	42 / 100%	RED-GREEN-DK. GRAY	VERY DENSE	MUDSTONE/ SILTSTONE SHALE	BR	<5	WET / DRY
45		13	SS	37	50/2" / 100%	DK. GRAY				<1	WET
		14	SS	50/5"	100%			SOLID IN BOTTOM OF SPOON		<1	DRY
50								TOTAL DEPTH 48' WELL SCREEN 42-47'			

A-3205A

COMMENTS

PROJECT NO. 35235.10
BORING NO. MW-1D

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. MW-2

PROJECT: QUANTA RESOURCES
CLIENT: NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
BORING CONTRACTOR: AMERICAN AUGER & DITCHING CO.
SHEET NO. 1 OF 2
JOB NO. : 35235.10
BORING LOCATION:
GROUND ELEVATION: 405.73 'USC&GS
DATE STARTED: 11-21-91
DATE FINISHED: 11-21-91
DRILLER: LEE PENROD
GEOLOGIST: SCOTT SWANSON
REVIEWED BY: DUANE LENHARDT

GROUND WATER:

DATE	TIME	LEV	TYPE
11-25	6:25PM	30.70	TOP RISER

	CAS.	SAMP	CORE	TUBE
TYPE		SPLIT SPOON	(SS)	
DIA.		2"		
WT.		140lb.		
FALL		30"		

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	HNU (ppm)	REMARKS
		12*	SS	4 4 / 10 11		BLACK	MEDIUM DENSE	SILT		0-4	WET, PETROLEUM ODOR
5		1	SS	3 3 / 5 7	100%	GREEN-BLUE SOME BROWN MOTTLED	MEDIUM STIFF	CLAYEY SILT SL. PLASTIC	ML/CL	10-15	MOIST
10		2	SS	4 4 / 7 8	100%	OLIVE GREEN BLUE-GRAY		CRUMBLY		5-20	MOIST-SL. MOIST
15		3	SS	6 9 / 9 9	50%		MEDIUM DENSE	DECOMPOSED SILTSTONE PLATY AND FRIABLE	VBR	20-40	SL. MOIST
20		4	SS	18 26 / 22 19	70%		DENSE			50-60	DRY
25		5	SS	41 50/2"	100%	RED		SEMI-BRITTLE AND SOME CRUMBLY, POWDERY		2-5	DRY
30		6+	SS	9 10 / 19 40	100%	SOME BLUE-GREEN MOTTLED				20-70	V. MOIST-WET
		7	SS	40 50/3.5"	100%		VERY DENSE			0-5	DRY-SL. MOIST
35		8	SS	31 50/3.5"	100%					50	V. MOIST
								CONTINUED ON SHEET 2			

A-3205

COMMENTS DRILL RIG: TRUCK-MOUNTED MOBILE B-57
* ENVIRONMENTAL SOIL SAMPLE COLLECTED AT 1-3' FOR FULL TCL AND CYANIDE ANALYSES
+ GEOTECHNICAL SAMPLE COLLECTED FOR GRAIN SIZE ANALYSIS

PROJECT NO. 35235.10
BORING NO. MW-2

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. MW-2

PROJECT: QUANTA RESOURCES
SHEET NO. 2 OF 2

CLIENT: NEW YORK STATE DEPT. OF ENV. CONSERVATION
JOB NO. : 35235.10

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"		RECOVERY RQD %	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	HNU (PPM)	REMARKS
35												
	SSS	9	SS	50/5"		100%	RED	VERY DENSE	DECOMPOSED SILTSTONE		12	MOIST - DRY
	SSS	10	SS	50/5"		100%					10	↓
	SSS	11	SS	66	100/3"	100%	GREEN					MOISTURE
												DRIVEN OFF BY SPOON IMPACT
40									TOTAL DEPTH 38'			
									WELL SCREEN 28-38'			
45												

A-3205A

COMMENTS

PROJECT NO. 35235.10
BORING NO. MW-2

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. MW-3

PROJECT: QUANTA RESOURCES
CLIENT: NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
BORING CONTRACTOR: AMERICAN AUGER & DITCHING CO.
GROUND WATER:

DATE	TIME	LEV	TYPE
11-26	7:45AM	26.45	BGS (HSA)

	CAS.	SAMP	CORE	TUBE
TYPE		SPLIT SPOON	(SS)	
DIA.		2"		
WT.		140lb		
FALL		30"		

* POCKET PENETROMETER READING

SHEET NO. 1 OF 2
JOB NO. : 35235.10
BORING LOCATION:
GROUND ELEVATION: 398.98' MSL & GS
DATE STARTED: 11-25-91
DATE FINISHED: 11-26-91
DRILLER: JOHN PIETRUCH
GEOLOGIST: SCOTT SWANSON
REVIEWED BY: DUANE LENHARDT

DEPTH FT	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	CLASS USCS	HNU (PPM)	REMARKS
		1	SS	2 8 / 9 13	30%	DARK BROWN	MEDIUM DENSE	SILT, TRACE SAND, ROOTS	ML		MOIST RAINY HNU NOT WORKING
5		2	SS	13 19 / 12 21	100%	DARK GRAY OLIVE-BROWN	DENSE	TR. BROKEN 1½" GRAVEL BECOMING COMPACTED TIGHTER			DRY
10		3	SS	14 18 / 13 18	50%	LT. GREEN		DECOMPOSED SILTSTONE, SHALE	VBR		
15		4	SS	16 26 / 12 16	50%	RED					
20		5	SS	14 26 / 46 55	60%	TR. GREEN	V. DENSE				
25		6	SS	24 88 / 50/3"	100%						
30		7*	SS	38 28 / 24 35	65%	DARK GREEN		Poorly fissile		50-100	ODOR WHILE DRILLING @ 29' SL MOIST
35		8*	SS	7 9 / 43 64	100%	BLUE/GRAY		friable		3-4	

A-3205

COMMENTS DRILL RIG: TRUCK-MOUNTED MOBILE B-57
* ENVIRONMENTAL SOIL SAMPLES COLLECTED FROM 29-31 (VOA'S ONLY) AND 34-36' (AB
PESTICIDES/PCBS, METALS AND CYANIDE ANALYSES

PROJECT NO. 35235.10
BORING NO. MW-3

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. MW-3

PROJECT: QUANTA RESOURCES
SHEET NO. 2 OF 2
CLIENT: NYSDEC
JOB NO. : 35235.10

DEPTH FT	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	HNU (ppm)	REMARKS
36											
		9	SS	17 51 / 65 65	100%	BLUE GRAY	VERY DENSE	DECOMPOSED SILTSTONE 8' ROD WET		1	UPPER 6" WET LOWER 18" MOIST TO DRY
		10+	SS	31 36 / 51 54	100%	DK GRAY	HARD	CLAYEY SILT SL. PLASTIC LOWER LAMINATED	ML	0	WET
40		11	SS	36 43 / 50/3"	100%	LT GRAY		SILT		0	SL. MOIST
								TOTAL DEPTH 41.5'			
45								WELL SCREEN 25-40'			

A-3205A

COMMENTS + GEOTECHNICAL SAMPLE COLLECTED FOR GRAIN SIZE ANALYSIS

PROJECT NO. 35235.10
BORING NO. MW-3

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. MW-4

PROJECT: QUANTA RESOURCES
CLIENT: NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
BORING CONTRACTOR: AMERICAN AUGER & DITCHING CO.

SHEET NO. 1 OF 2
JOB NO. : 35235.10
BORING LOCATION:
GROUND ELEVATION: 398.84' USC&GS
DATE STARTED: 11-22-91
DATE FINISHED: 11-25-91
DRILLER: LEE PENROD
GEOLOGIST: SCOTT SWANSON
REVIEWED BY: DIANE LENHARDT

GROUND WATER:

DATE	TIME	LEV	TYPE
11-25	8:20AM	23.2	BGS (HSA)
11-25	5:45PM	25.65	T. RISER

	CAS.	SAMP	CORE	TUBE
TYPE		SPLIT SPOON	(SS)	
DIA.		2"		
WT.		140lb		
FALL		30"		

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	HNU (PPM)	REMARKS
		1	SS	7 5 / 7 7	75%	BROWN-BLACK GREEN RED BROWN WHITE	MEDIUM DENSE	SILT, BITS OF RED BRICK FILL TR. 1½" Rock GRAVEL	ML MATRIX	0	NO ODOR SL. MOIST
		2	SS	9 9 / 17 15	45%						
5		3	SS	12 10 / 8 12	70%	TAN-BROWN GREEN-GRAY OLIVE	DENSE	SILT, TRACE TINY GRAVEL CHIPS THIN LAYERING	ML		DRY-SL. MOIST
		4	SS	6 15 / 16 15	60%						
		5	SS	10 35 / 40 50	75%	LIGHT YELLOW-GREEN	V. DENSE	DECOMPOSED SILTSTONE, SHALE POORLY FISSILE unfossiliferous	VBR		DRY
10		6	SS	15 27 / 13 16	100%	BROWN ALONG PARTINGS	DENSE				
		7	SS	14 40 / 40 32	75%		V. DENSE				
15		8	SS	18 28 / 32 50/5"	75%	RED					
		9	SS	25 50/5"	100%						
		10	SS	17 50/4"	95%	GREEN					
20		11	SS	16 25 / 40 16	65%	RED-SOME BLUE-GREEN MOTTLED RED				7	
		12	SS	16 31 / 50/5"	45%					25	
25		13	SS	25 50/5"	95%					5	
		14	SS	36 50/3"	100%					20	
		15	SS	17 41 / 50/3"	90%	GREEN				100	
30		16	SS	17 48 / 50/2"	100%					110	
		17	SS	32 32 / 50/5"	100%					10	MOIST
35		18	SS	28 32 / 50/1"	100%	BROWN		FINE SANDY SILT		0	

A-3205

COMMENTS DRILL RIG: TRUCK MOUNTED MOBILE B-57

PROJECT NO. 35235.10
BORING NO. MW-4

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. MW-4

PROJECT: QUANTA RESOURCES
SHEET NO. 2 OF 2
CLIENT: NYSDEC
JOB NO. : 35235.10

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY RQD %	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	HNU (ppm)	REMARKS
36											
		19*	SS	11 17 / 50/4"	100%	BROWN / BLUE-GRAY	VERY DENSE	SILT, SOME FINE SAND		40	WET
								WEATHERED DECOMPOSED SILTSTONE, SHALE			V. MOIST
40		20	SS	24 50/4"	100%			CRUMBLY, POWDERY		25	DRY
		21+	SS	20 33 / 50/5"	100%					0	WET
								TOTAL DEPTH 42.5'			
45								WELL SCREEN 32-42			

A-3205A

COMMENTS * ENVIRONMENTAL SOIL SAMPLE COLLECTED FOR FULL TCL AND CYANIDE ANALYSES
+ GEOTECHNICAL SAMPLE COLLECTED FOR GRAIN SIZE ANALYSIS

PROJECT NO. 35235.10
BORING NO. MW-4

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. MW-5

PROJECT: QUANTA RESOURCES
CLIENT: NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
BORING CONTRACTOR: AMERICAN AUGER & DITCHING CO.
SHEET NO. 1 OF 2
JOB NO. : 35235.10
BORING LOCATION:
GROUND ELEVATION: 398.62' USC&GS
DATE STARTED: 11-26-91
DATE FINISHED: 11-27-91
DRILLER: LEE PENROD
GEOLOGIST: SCOTT SWANSON
REVIEWED BY: DUANE LENHARDT

GROUND WATER:					CAS.	SAMP	CORE	TUBE
DATE	TIME	LEV	TYPE	TYPE		SPLIT SPOON	(SS)	
11-26	4:30PM	34	BGS (HSA)	DIA.		2"		
11-27	8:30AM	22.5	BGS (HSA)	WT.		140lb		
				FALL		30"		
				* POCKET PENETROMETER READING				

DEPTH FT	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	RECOVERY RQD %	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	HNU (PPM)	REMARKS
		1	SS	4 5 / 6 18	60%	OLIVE-BROWN / LT. GREEN	LOOSE	GRAVELLY SILT	ML	0	WET-V. MOIST
							VERY DENSE	SILT	ML		MOIST
		2	SS	11 22 / 50/3"	40%					0	DRY
5											
		3	SS	35 50/3"	75%			SOFT TR 1" GRAVEL		0	
10											
		4	SS	28 41 / 50/5"	88%	LIGHT GREEN		DECOMPOSED SILTSTONE, SHALE SOFT, CRUMBLY	VBR	0	
15											
		5	SS	17 25 / 50/5"	82%	RED LIGHT GREEN		PLATY, POORLY FISSILE SEMI-CONSOLIDATED		0	
20											
		6	SS	25 50/5"	100%	RED-GREEN MOTTLED				0	
25											
		7*	SS	26 50/5"	100%	RED				50-200	MOIST-DRY
30											
		8+	SS	20 50/5"						125	
35											

A-3205

COMMENTS DRILL RIG: TRUCK-MOUNTED MOBILE B-57
* ENVIRONMENTAL SOIL SAMPLE COLLECTED FOR FULL TCL AND CYANIDE ANALYSIS
+ GEOTECHNICAL SAMPLE COLLECTED FOR GRAIN SIZE ANALYSIS

PROJECT NO. 35235.10
BORING NO. MW-5

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. MW-5

PROJECT: QUANTA RESOURCES
SHEET NO. 2 OF 2
CLIENT: NYSDEC
JOB NO.: 35235.10

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	BLOWS PER 6"	RECOVERY ROD %	DESCRIPTION COLOR	DESCRIPTION CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	DESCRIPTION CLASS USCS	PID (ppm)	REMARKS
36							GREEN		DECOMPOSED SILTSTONE			
							↓ BLUE-GRAY		↓ Poorly fissile			
		9	SS	20	50/5"	90%					50	MOIST
40									TOTAL DEPTH 39'			4' WATER IN BOTTOM
									WELL SCREEN 22-36.5'			
45												

A-3205A

COMMENTS

PROJECT NO. 35235.10
BORING NO. MW-5

B-14

DRILLING SUMMARY

Geologist: Scott Swanson

Drilling Company: American Auger

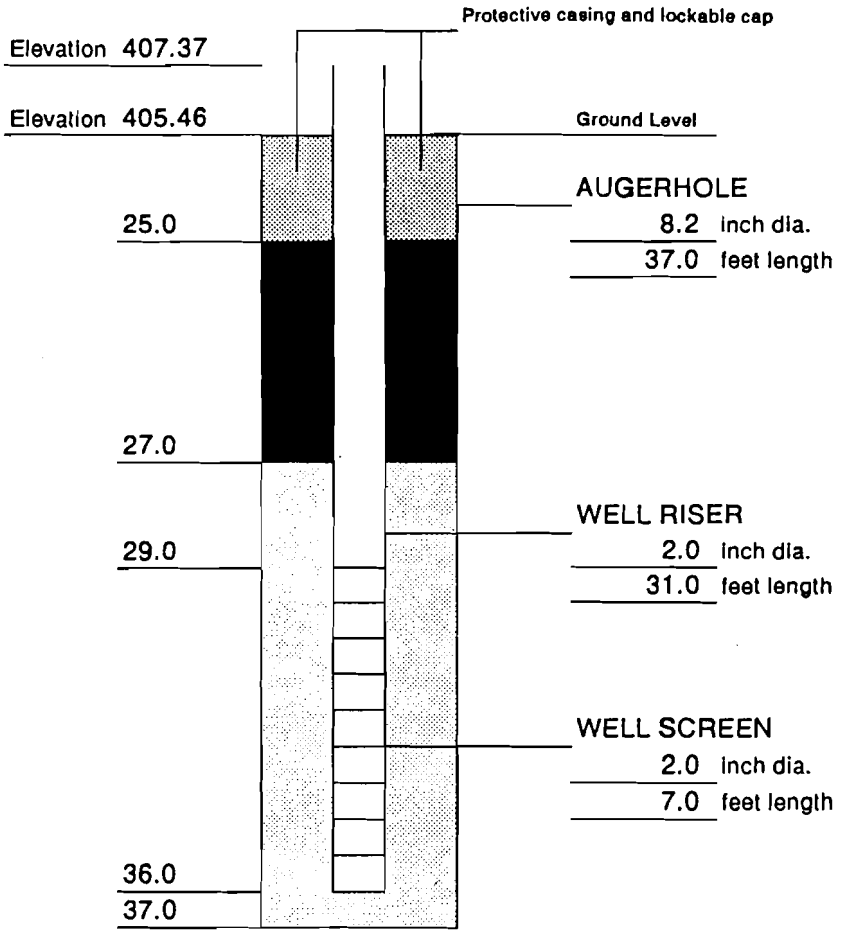
Driller: Lee Penrod

Date: 11/21-25/91

GEOLOGIC LOG

depth(ft.)	lithology
0-2	Fine Gravelly silt
2-8	Clayey Silt
8-39	Decomposed Siltstone Shale

DEPTH (Ft.)



WELL DESIGN

CASING MATERIAL	*SCREEN MATERIAL*	*SEAL MATERIAL*
Surface: Steel	Type: Schedule 40 PVC	Seal #1 Type Bentonite Pellets Setting: 25-27'
Monitor: Schedule 40 PVC	Slot Size: .010"	Seal #2 Type Cement-Bentonite Setting: 0-25'

FILTER MATERIAL	*ROCK CORING*	*LEGEND*
Type: #3 Q-Rok	Cored Interval: NA	Cement/Bentonite Grout
Setting: 27-37'	Core Diameter: NA	Bentonite Seal
	Reamed Diameter: NA	Silica Sandpack

Client: NYSDEC	Project: Quanta Resources	Project No. 35235.10
U R S Consultants Inc.	Monitoring Well Construction Details	Well Number: MW-1S

DRILLING SUMMARY

Geologist: Scott Swanson

Drilling Company: American Auger

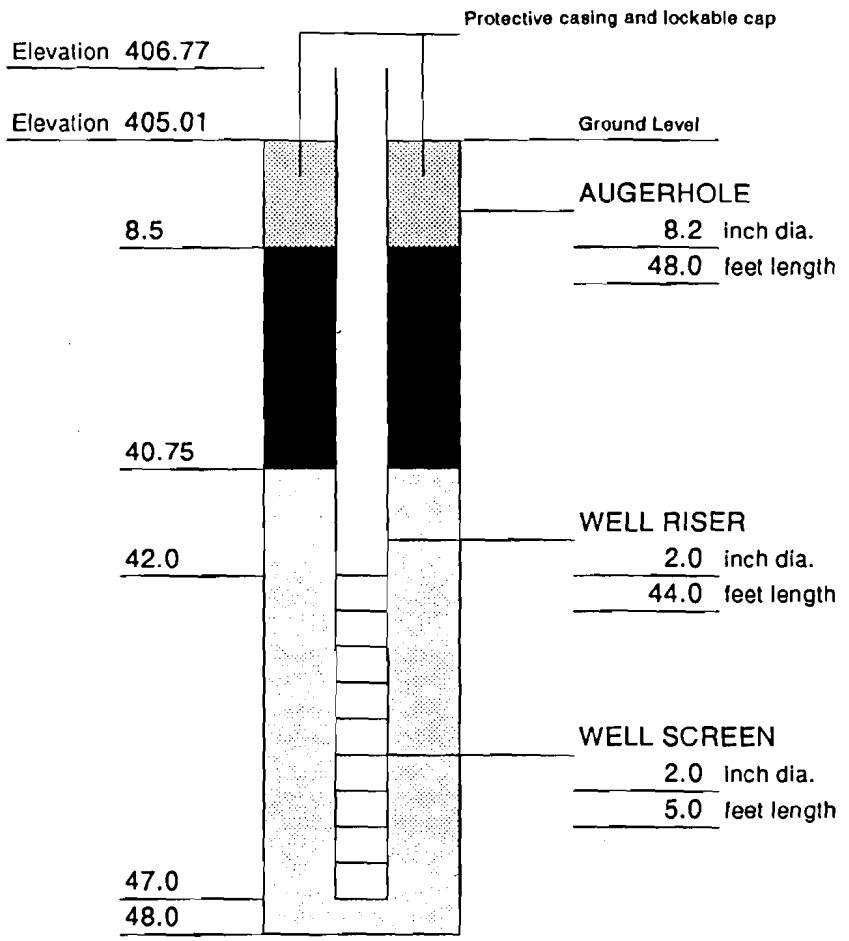
Driller: Lee Penrod

Date: 11/15-18/91

GEOLOGIC LOG

depth(ft.)	lithology
0-2	Fine Gravelly Silt
2-8	ClayeySilt
8-48	Decomposed Siltstone Shale

D E P T H (Ft.)



WELL DESIGN

CASING MATERIAL

Surface: Steel

Monitor: Schedule 40 PVC

SCREEN MATERIAL

Type: Schedule 40 PVC

Slot Size: .010"

SEAL MATERIAL

Seal #1 Type Bentonite Slurry
Setting: 8.5'-40.75'

Seal #2 Type Cement-Sand
Setting: 0-8.5'

FILTER MATERIAL

Type: #3 Q-Rok

Setting: 40.75'-48'

ROCK CORING

Cored Interval: NA

Core Diameter: NA

Reamed Diameter: NA

LEGEND

Cement/Bentonite Grout

Bentonite Seal

Silica Sandpack

Client: NYSDEC	Project: Quanta Resources	Project No. 35235.10
U R S Consultants Inc.	Monitoring Well Construction Details	Well Number: MW-1D

DRILLING SUMMARY

Geologist: Scott Swanson

Drilling Company: American Auger

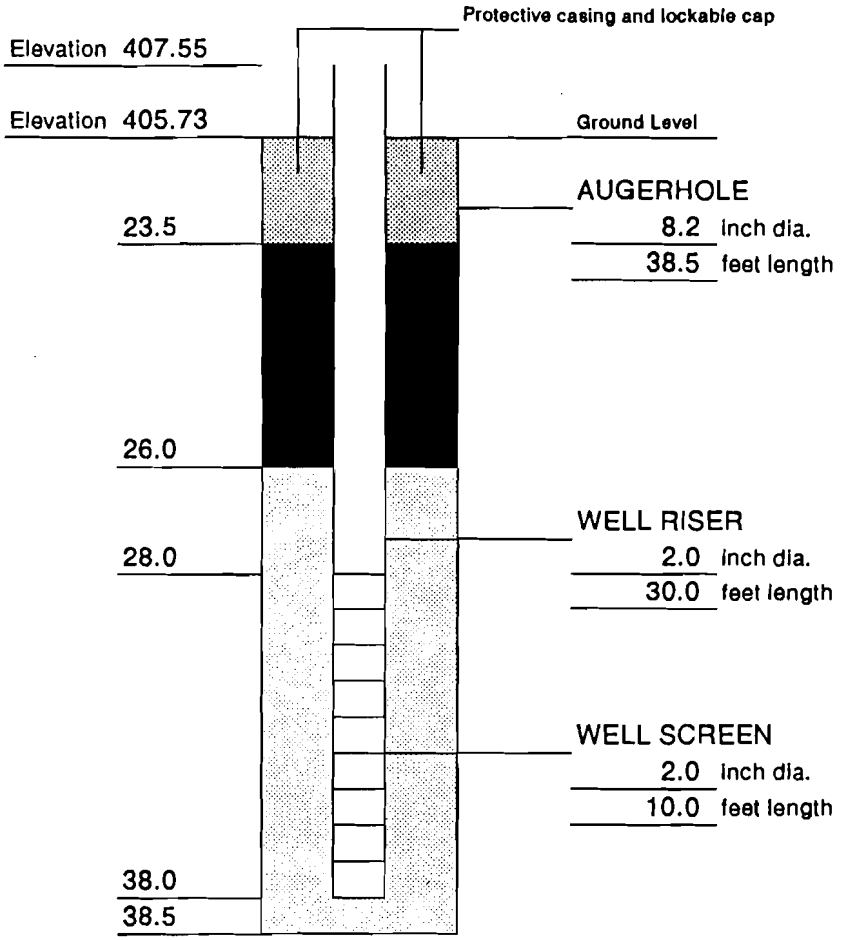
Driller: Lee Penrod

Date: 11/21/91

GEOLOGIC LOG

depth(ft.)	lithology
0–4	Silt
4–14	Clayey Silt
14–38	Decompsed Siltstone Shale

DEPTH (Ft.)



WELL DESIGN

CASING MATERIAL	*SCREEN MATERIAL*	*SEAL MATERIAL*
Surface: Steel	Type: Schedule 40 PVC	Seal #1 Type Bentonite Pellets Setting: 23.5–26'
Monitor: Schedule 40 PVC	Slot Size: .010"	Seal #2 Type Cement–Bentonite Setting: 0–23.5'

FILTER MATERIAL	*ROCK CORING*	*LEGEND*
Type: #3 Q-Rok	Cored Interval: NA	Cement/Bentonite Grout
Setting: 26–38.5'	Core Diameter: NA	Bentonite Seal
	Reamed Diameter: NA	Silica Sandpack

Client: NYSDEC	Project: Quanta Resources	Project No. 35235.10
U R S Consultants Inc.	Monitoring Well Construction Details	Well Number: MW-2

DRILLING SUMMARY

Geologist: Scott Swanson

Drilling Company: American Auger

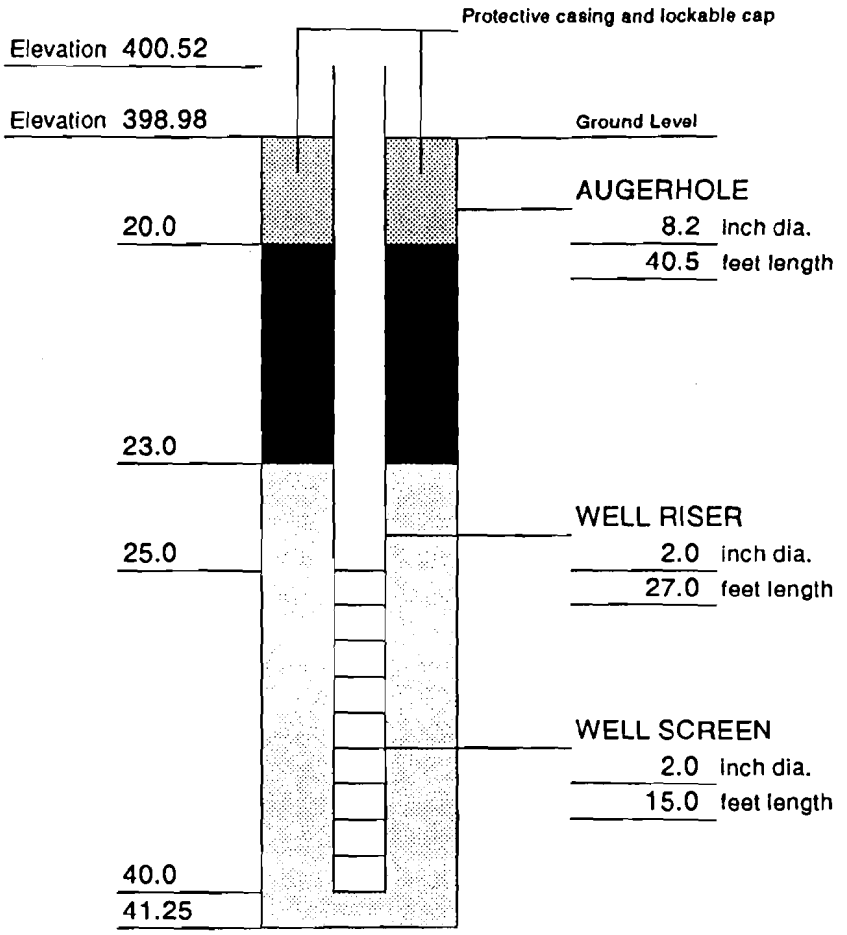
Driller: Lee Penrod

Date: 11/25,26/91

GEOLOGIC LOG

depth(ft.)	lithology
0–9	Silt trace Sand & Gravel
9–38	Decomposed Siltstone Shale
38–41.25	Clayey Silt

D E P T H (Ft.)



WELL DESIGN

CASING MATERIAL	*SCREEN MATERIAL*	*SEAL MATERIAL*
Surface: Steel	Type: Schedule 40 PVC	Seal #1 Type Bentonite Pellets Setting: 20–23'
Monitor: Schedule 40 PVC	Slot Size: .010"	Seal #2 Type Cement–Bentonite Setting: 0–20'

FILTER MATERIAL	*ROCK CORING*	*LEGEND*
Type: #3 Q–Rok	Cored Interval: NA	Cement/Bentonite Grout
Setting: 23–41.25'	Core Diameter: NA	Bentonite Seal
	Reamed Diameter: NA	Silica Sandpack

Client: NYSDEC	Project: Quanta Resources	Project No. 35235.10
U R S Consultants Inc.	Monitoring Well Construction Details	Well Number: MW–3

DRILLING SUMMARY

Geologist: Scott Swanson

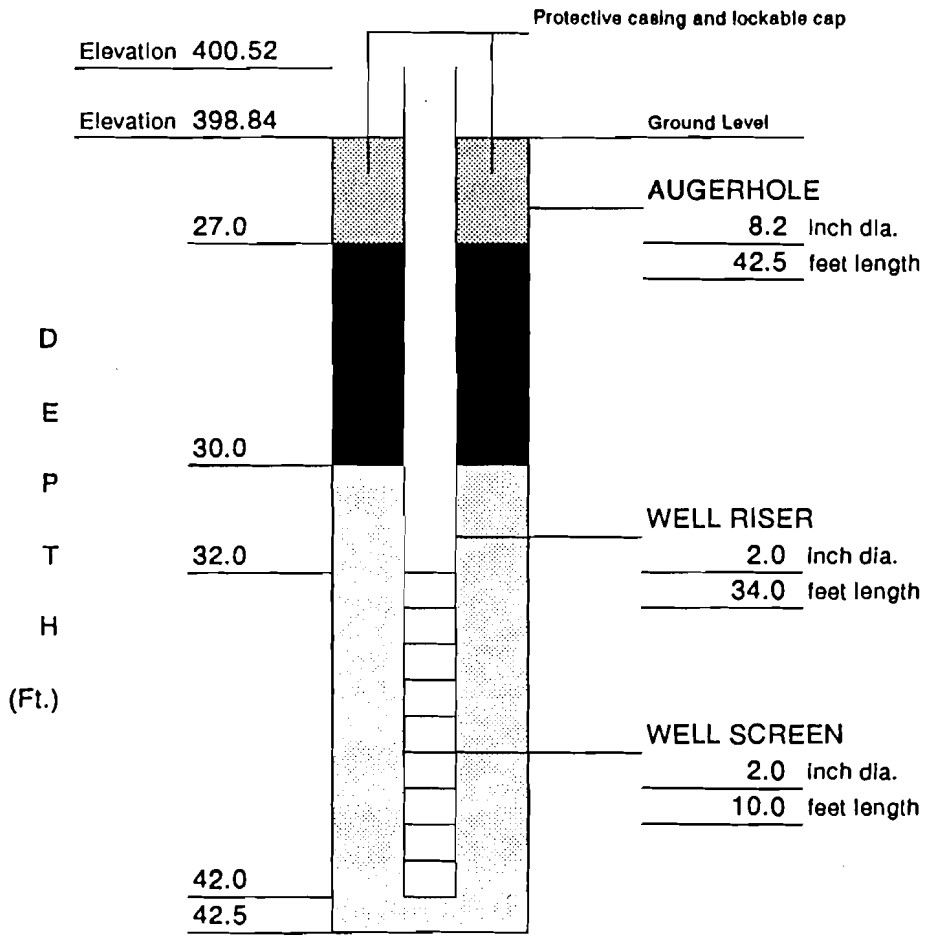
Drilling Company: American Auger

Driller: Lee Penrod

Date: 11/22-25/91

GEOLOGIC LOG

depth(ft.)	lithology
0-4	Silt Fill
4-8	Silt trace tiny Gravel chips
8-35.5	Decomposed Siltstone Shale
35.5-37	Sandy Silt
37-42.5	Decomposed Siltstone Shale



WELL DESIGN

CASING MATERIAL

Surface: Steel

Monitor: Schedule 40 PVC

SCREEN MATERIAL

Type: Schedule 40 PVC

Slot Size: .010"

SEAL MATERIAL

Seal #1 Type Bentonite Pellets
Setting: 27-30'

Seal #2 Type Cement-Bentonite
Setting: 0-27'

FILTER MATERIAL

Type: #3 Q-Rok

Setting: 30-42.5'

ROCK CORING

Cored Interval: NA

Core Diameter: NA

Reamed Diameter: NA

LEGEND

Cement/Bentonite Grout

Bentonite Seal

Silica Sandpack

Client: NYSDEC	Project: Quanta Resources	Project No. 35235.10
U R S Consultants Inc.	Monitoring Well Construction Details	Well Number: MW-4

DRILLING SUMMARY

Geologist: Scott Swanson

Drilling Company: American Auger

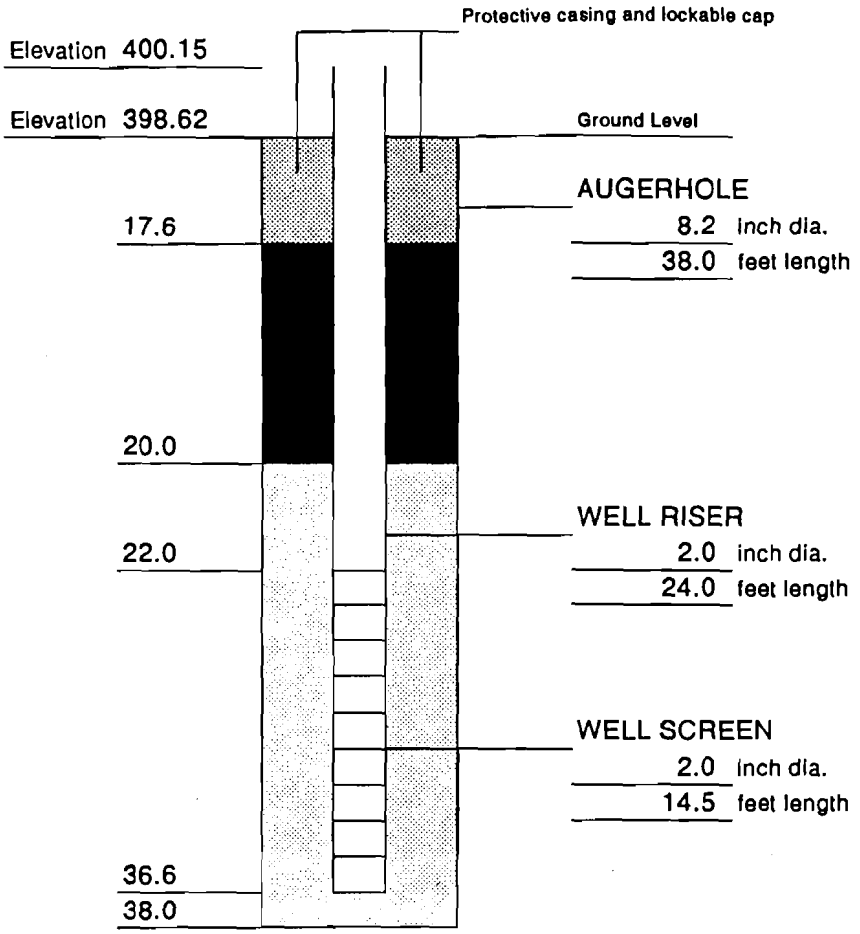
Driller: Lee Penrod

Date: 11/26-27/91

GEOLOGIC LOG

depth(ft.)	lithology
0-1	Gravelly Silt
1-13.5	Silt trace Gravel
13.5-39	Decomposed Siltstone Shale

DEPTH (Ft.)



WELL DESIGN

CASING MATERIAL	*SCREEN MATERIAL*	*SEAL MATERIAL*
Surface: Steel	Type: Schedule 40 PVC	Seal #1 Type Bentonite Pellets Setting: 17.6-20
Monitor: Schedule 40 PVC	Slot Size: .010"	Seal #2 Type Cement-Bentonite Setting: 0-17.6'

FILTER MATERIAL	*ROCK CORING*	*LEGEND*
Type: #3 Q-Rok	Cored Interval: NA	Cement/Bentonite Grout
Setting: 20-38'	Core Diameter: NA	Bentonite Seal
	Reamed Diameter: NA	Silica Sandpack

Client: NYSDEC	Project: Quanta Resources	Project No. 35235.10
URS Consultants Inc.	Monitoring Well Construction Details	Well Number: MW-5

Paragon Environmental Construction, Inc. 8141 Brewerton Road Cicero, NY 13039 Phone: 315-699-0840 Fax: 315-699-0845	**Field Drilling Log**	Boring No: MW-6 Project No: 2008008 Date Started:12-17-08 Date Completed: 12-18-08 Sheet: 1 of 1

Project: Environmental Borings and Monitoring Wells
Location: Lodi and Wolf Streets, Syracuse, NY

Cave Depth: N/A

Depth of Water: 36 feet

Depth (ft.)	Sample No.	Blows on Soil Sampler 0.0'-0.5'	0.5'-1.0'	1.0'-1.5'	1.5'-2.0'	N	Recovery (ft.)	MATERIAL DESCRIPTION	REMARKS
0-2	1	3	3	7	11	10	.1	Brown m-c SAND and f-m Gravel, wet-loose 2.5'	
2-4	2	7	9	12	15	21	1.4		
4-6	3	13	14	39	14	53	1.6		
6-8	4	9	9	10	12	19	1.0	Brown SILT, little f-Sand, trace f-gravel, v-stiff 13.0'	
8-10	5	3	13	14	18	27	1.0		
10-12	6	6	9	5	5	14	1.3		
12-14	7	4	4	5	4	9	.6		
14-16	8	3	2	1	2	3	.7	Brown and Green SILT, trace f-sand, trace clay, trace f-gravel, saturated-medium 20.0'	
16-18	9	2	2	3	2	5	.8		
18-20	10	2	4	5	2	9	.9		
20-22	11	5	6	9	7	15	.8		
22-24	12	20	24	20	32	44	1.3		
24-26	13	15	15	32	50	47	1.3	Light Brown and Green SILT, little f-Sand, trace f-gravel (Vernon shale), dry-hard 25.0'	
26-26.4	14	50/.4					.4		
28-29.4	15	15	15	50/.4			1.4	Red weathered SHALE, dry-v-compact 28.5'	
30-30.4	16	50/.4					.4		
32-34	17	8	14	28	34	42	1.6	Gray and Green weathered SHALE, moist- v-compact 32.2'	
34-34.9	18	38	50/.4				.9		
36-36.7	19	37	50/.2				.7	Red weathered SHALE, dry-hard 36.0'	
38-38.9	20	42	50.4				.9	Red weathered SHALE, wet-v-compact Set well at 39 feet, 20' of .020 screen B.O.B. 39.0' 39.0'	

Sampling Method: ASTM D-1586, unless otherwise noted
Notes: 4 1/4" I.D. Hollow Stem Augers

Visually Classified by: Robert Baldoze

Paragon Environmental Construction, Inc. 8141 Brewerton Road Cicero, NY 13039 Phone: 315-699-0840 Fax: 315-699-0845	**Field Drilling Log**	Boring No: MW-7 Project No: 2008008 Date Started:12-11-08 Date Completed: 12-11-08 Sheet: 1 of 1
Project: Environmental Borings and Monitoring Wells Location: Lodi and Wolf Streets, Syracuse, NY		Cave Depth: N/A Depth of Water: 30 feet

Depth (ft.)	Sample No.	Blows on Soil Sampler				N	Recovery (ft.)	MATERIAL DESCRIPTION	REMARKS
		0.0'-0.5'	0.5'-1.0'	1.0'-1.5'	1.5'-2.0'				
0-2	1	6	5	7	4	12	1.5	Brown SILT, trace Sand, trace f-Gravel, moist-stiff 3.5'	
2-4	2	8	11	11	15	22	1.0		
4-6	3	7	18	21	25	39	1.5	Gray SILT and weathered Shale, moist-stiff	
6-6.4	4	50/.4					.4	10.0'	
8-10	5	12	17	18	21	35	2.0	Brown and Gray SILT, trace clay,stiff-moist	
10-12	6	6	7	11	14	18	2.0		
12-13	7	14	32				1.0	14.5'	
14-15	8	27	50				1.0	Gray weathered SHALE, dry-hard	
18-20	9	37	39	44	50	83	1.5		
20-22	10	18	21	19	55	40	1.5	22.5'	
22-23.2	11	19	30	50/.2			1.0	Red weathered SHALE, dry-hard	
24-24.3	12	50/.3					.3		
26-26.2	13	50/.2					.2		
28-29	14	42	50				1.0		
30-30.3	15	50/.3					.3	30.0'	
32-32.3	16	50/.3					.3	Red weathered SHALE, wet-hard Set well at 36 feet, 16' of .020 screen B.O.B. 36 feet	

Sampling Method: ASTM D-1586, unless otherwise noted Notes:_____4_____1/4" I.D. Hollow Stem Augers	Visually Classified by: Robert Baldoze

Paragon Environmental Construction, Inc. 8141 Brewerton Road Cicero, NY 13039 Phone: 315-699-0840 Fax: 315-699-0845	**Field Drilling Log**	Boring No: MW-8 Project No:20008008 Date Started:12-8-08 Date Completed: 12-9-08 Sheet: 1 of 1
Project: Environmental Borings and Monitoring Wells Location: Lodi and Wolf Streets, Syracuse, NY		Cave Depth: N/A Depth of Water: 25 feet

Depth (ft.)	Sample No.	Blows on Soil Sampler 0.0'-0.5'	0.5'-1.0'	1.0'-1.5'	1.5'-2.0'	N	Recovery (ft.)	MATERIAL DESCRIPTION	REMARKS
0-2	1	5	7	7	8	14	1.0	Brown SILT, trace f-c Gravel, trace Sand,moist-stiff 2.0'	
2-4	2	4	7	14	3	21	1.0	Brown and Black SILT ,trace f-c Gravel moist v-stiff 4.0'	
4-6	3	3	4	8	15	12	1.5		
6-8	4	5	7	7	11	14	1.5	Gray SILT, trace f-sand moist-stiff 13.5'	
8-10	5	11	8	7	10	15	1.5		
10-12	6	2	7	7	11	14	1.5		
12-14	7	8	15	27	41	42	1.5	Green and Gray weathered SHALE, moist-v-compact 18.5'	
14-16	8	17	42	25	21	67	1.5		
16-17.9	9	17	44	41	50/.4	85	2.0	Red weathered SHALE, dry-hard 25.0'	
18-19.2	10	25	44	50/.2			1.2		
20-20.7	11	50	50/.2				.7		
25-27	12	16	8	12	15	20	2.0		
27-28.4	13	33	42	50/.4			1.4	Red weathered SHALE, wet-hard Set well at 32 feet 14'of .020 screen B.O.B. 32 feet	
29-29.8	14	43	50/.3				.8		
30-30.4	15	50/.4					.4	32.0'	

Sampling Method: ASTM D-1586, unless otherwise noted Notes:_____4_____1/4" I.D. Hollow Stem Augers	Visually Classified by: Robert Baldoze

Paragon Environmental Construction, Inc. 8141 Brewerton Road Cicero, NY 13039 Phone: 315-699-0840 Fax: 315-699-0845	**Field Drilling Log**	Boring No: MW-9 Project No: 2008008 Date Started:12-9-08 Date Completed: 12-9-08 Sheet: 1 of 1

Project: Environmental Borings and Monitoring Wells
Location: Lodi and Wolf Streets, Syracuse, NY

Cave Depth: N/A

Depth of Water: 29 feet

Depth (ft.)	Sample No.	Blows on Soil Sampler 0.0'-0.5'	0.5'-1.0'	1.0'-1.5'	1.5'-2.0'	N	Recovery (ft.)	MATERIAL DESCRIPTION	REMARKS
0-2	1	3	2	2	3	5	1.5	Brown f-c GRAVEL and Brick, trace silt, trace f-sand, moist loose	
2-4	2	5	5	6	6	11	1.5		
4-6	3	2	2	1	2	3	1.0	7.0'	
6-8	4	5	7	8	11	15	1.5	Gray SILT, trace f-sand, moist-stiff	
8-10	5	5	7	7	7	14	1.5		
10-12	6	7	8	11	18	19	1.5		
12-14	7	19	10	14	10	24	1.5		
14-15.4	8	22	28	50/.4			1.0		
16-18	9	11	21	23	18	44	1.5		
18-19.4	10	10	18	50/.4			1.4		
20-21.4	11	22	28	50/.4			1.4	21.0'	
22-24	12	11	17	12	24	29	1.2	Red weathered SHALE, dry-v-compact 22.0'	
24-24.4	13	50/.4					.4	Gray weathered SHALE, moist-firm 23.0'	
26-27.2	14	28	32	50/.2			1.0	Red weathered SHALE, dry-hard 29.0'	
30-30.9	15	37	50/.4				.9	Red weathered SHALE, wet-v-compact	
								Set well at 34 feet, 16' of .020 screen B.O.B. 34.0' 34.0'	

Sampling Method: ASTM D-1586, unless otherwise noted
Notes: 4 1/4" I.D. Hollow Stem Augers

Visually Classified by: Robert Baldoze

Paragon Environmental Construction, Inc. 8141 Brewerton Road Cicero, NY 13039 Phone: 315-699-0840 Fax: 315-699-0845	**Field Drilling Log**	Boring No: MW-10 Project No: 2008008 Date Started:12-16-08 Date Completed: 12-16-08 Sheet: 1 of 1

Project: Environmental Borings and Monitoring Wells
Location: Lodi and Wolf Streets, Syracuse, NY

Cave Depth: N/A

Depth of Water: 28 feet

Depth (ft.)	Sample No.	Blows on Soil Sampler 0.0'-0.5'	0.5'-1.0'	1.0'-1.5'	1.5'-2.0'	N	Recovery (ft.)	MATERIAL DESCRIPTION	REMARKS
16-18	1	9	8	11	5	19	.5	Gray weathered SHALE, dry-v-stiff	Drilled to 16' before sampling
								21.0'	
18-20	2	9	9	15	14	24	1.5	Red weathered SHALE, dry-hard	
20-21.2	3	15	21	50/.2			1.0		
								28.0'	
22-23.5	4	9	11	42		53	1.0	Red weathered SHALE, wet-hard Set well at 35 feet, 15' of .020 screen B.O.B. 35 feet	
24-25.7	5	25	32	32	50/.2	64	1.5		
26-28	6	19	27	29	34	56	1.5		
28-29.3	7	25	47	50/.3			1.0		
30-31.2	8	42	48	50/.2			1.0		
32-33.4	9	42	44	50/.4			1.0	35.0'	

Sampling Method: ASTM D-1586, unless otherwise noted
Notes: 4 1/4" I.D. Hollow Stem Augers

Visually Classified by: Robert Baldoze

parratt wolff inc

TEST BORING LOG

5879 Fisher Road
East Syracuse, NY 13057

PROJECT **Quanta Site - Lodi Street**

LOCATION **Syracuse, New York**

HOLE NO. MW-11
JOB NUMBER: **08011C**
SURF. EL.
DATE STARTED: **06/25/09**
DATE COMPLETED: **06/25/09**

GROUNDWATER DEPTH
WHILE DRILLING **30.5'**

BEFORE CASING
REMOVED **Dry**

AFTER CASING **Installed**
REMOVED **Well**

N - NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" - ASTM D-1586 STANDARD PENETRATION TEST

C - NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING "/ OR PERCENT CORE RECOVERY

CASING TYPE **HOLLOW STEM AUGER**

SHEET 1 OF 1

DRILLERS FIELD LOG

DEPTH	SAMPLE DEPTH	SAMPLE NO.	Rec	SAMPLE DRIVE RECORD PER 6"		N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	**1**		**5**	**8**		**Brown-black moist medium dense fine to**	
	2.0'			**5**	**5**	**13**	**coarse SAND and CINDERS**	
	2.0'-	**2**		**4**	**5**			
	4.0'			**6**	**6**	**11**		**4.3'**
5.0	**4.0'-**	**3**		**12**	**22**		**Gray-green dry very dense to medium**	
	6.0'			**40**	**28**	**62**	**dense weathered SHALE**	
	6.0'-	**4**		**23**	**19**			
	8.0'			**22**	**23**	**41**		
	8.0'-	**5**		**12**	**17**			
10.0	**10.0'**			**24**	**27**	**41**		
	10.0'-	**6**		**10**	**11**			
	12.0'			**15**	**17**	**26**		
	12.0'-	**7**		**13**	**16**			
	14.0'			**21**	**28**	**37**	**Note:**	
15.0	**14.0'-**	**8**		**19**	**21**		**Installed 2" PVC 10-slot screen from 36.3' to 26.3'**	
	16.0'			**29**	**36**	**50**	**Installed 2" PVC riser from 26.3' to grade**	
	16.0'-	**9**		**26**	**36**		**Installed #0 sand from 36.3' to 24.3'**	
	18.0'			**32**	**36**	**62**	**Installed bentonite seal from 24.3' to 22.3'**	
	18.0'-	**10**		**50-.4'**			**Installed grout seal from 22.3' to grade**	
20.0	**18.4'**						**Completed installation with 4" stick-up protective**	
	20.0'-	**11**		**50-.4'**			**cover**	
	20.4'							
	22.0'-	**12**		**50-.4'**				
	22.4'							
25.0	**24.0'-**	**13**		**30**	**50-.2'**			
	24.7'							
	26.0'-	**14**		**11**	**50-.4'**			
	26.9'							
	28.0'-	**15**		**50-.4'**				
30.0	**28.4'**							
WL▼	**30.0'-**	**16**		**18**	**50-.4'**			**30.5'**
	30.9'						**Red wet hard very dense weathered**	
	32.0'-	**17**		**30**	**50-.3'**		**SHALE**	
	32.8'							
35.0	**34.0'-**	**18**		**50-.3'**				
	34.3'							
	36.0'-	**19**		**50-.3'**			**Bottom of Boring**	**36.3'**
	36.3'							
40.0								

parratt wolff inc

TEST BORING LOG

5879 Fisher Road
East Syracuse, NY 13057

PROJECT **Quanta Site - Lodi Street**

LOCATION **Syracuse, New York**

HOLE NO. MW-12
JOB NUMBER: **08011D**
SURF. EL.
DATE STARTED: **07/09/09**
DATE COMPLETED: **07/09/09**

GROUNDWATER DEPTH
WHILE DRILLING

BEFORE CASING
REMOVED

AFTER CASING **Installed**
REMOVED **Well**

N - NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" - ASTM D-1586 STANDARD PENETRATION TEST

C - NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING "/ OR PERCENT CORE RECOVERY

CASING TYPE **HOLLOW STEM AUGER**

SHEET 1 OF 1

DRILLERS FIELD LOG

DEPTH	SAMPLE DEPTH	SAMPLE NO.	Rec	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		DIRECT		Brown moist SILT, some fine to medium sand, little fine to medium gravel	
	2.0'			PUSH			
	2.0'-	2		DIRECT			
	4.0'			PUSH			4.0'
5.0	4.0'-	3		DIRECT		Brown moist SILT, some fine to medium sand, little fine to medium gravel, little brick fragments	
	6.0'			PUSH			
	6.0'-	4		DIRECT			
	8.0'			PUSH			8.0'
	8.0'-	5		DIRECT		Gray-red-brown moist SILT, little fine to medium sand, trace fine gravel, trace clay	
10.0	10.0'			PUSH			
	10.0'-	6		DIRECT			
	12.0'			PUSH			12.0'
	12.0'-	7		DIRECT		Red-brown-gray SILT, little clay, little fine sand	
	14.0'			PUSH			14.0'
15.0	14.0'-	8		DIRECT		Green-tan moist SILT, little shale fragments, little fine sand	
	15.5'			PUSH			
	16.0'-	9		DIRECT			
	16.9'			PUSH			
	18.0'-	10		DIRECT			
20.0	20.0'			PUSH			
	20.0'-	11		DIRECT			
	20.6'			PUSH			22.0'
	22.0'-	12		DIRECT		Red-brown moist damp SILT, little shale fragments, trace clay, trace fine sand	
	23.1'			PUSH			24.0'
25.0	24.0'-	13		DIRECT		Green-red moist SILT, some shale fragments, little clay, trace fine sand	
	25.0'			PUSH			26.0'
	26.0'-	14		DIRECT		Red moist to wet SILT, some clay, some shale fragments	
	27.4'			PUSH			
	28.0'-	15		DIRECT		Note: Installed 2" PVC 20-slot screen from 36.0' to 26.0, installed 2" PVC riser from 26.0' to grade, installed #1 sand from 36.0' to 24.0', installed bentonite seal from 24.0' to 21.5', installed grout seal from 21.5' to grade, completed installation with 4" stick-up protective cover	
30.0	29.5'			PUSH			
	30.0'-	16		DIRECT			
	30.4'			PUSH			
	32.0'-	17		DIRECT			
	32.5'			PUSH			34.0'
35.0	34.0'-	18		DIRECT		Green moist weathered SHALE, little clay	
	34.5'			PUSH			
						Bottom of Boring	36.0'
40.0							

parratt wolff inc

TEST BORING LOG

5879 Fisher Road
East Syracuse, NY 13057

PROJECT **Quanta Resources Site**
Lodi Street
LOCATION **Syracuse, New York**

HOLE NO. RW-1
JOB NUMBER: **11154**
SURF. EL.
DATE STARTED: **12/15/11**
DATE COMPLETED: **12/15/11**

GROUNDWATER DEPTH
WHILE DRILLING **23.0'**

BEFORE CASING REMOVED — N - NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" - ASTM D-1586 STANDARD PENETRATION TEST

AFTER CASING REMOVED — C - NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING "/ OR PERCENT CORE RECOVERY

CASING TYPE **8" Casing - 7 7/8" Fluid Rotary - (water)**

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NO.	Rec	SAMPLE DRIVE RECORD PER 6"		N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
5.0								
10.0								
							Red-green vernon SHALE	**11.0'**
15.0							**Note:**	
20.0							**Set 8" Temporary casing at 11.0' below grade** **7 7/8" Fluid rotary to 40.0' below grade** **Installed 4" PVC well at 40.0"** **Installed 20 slot screen from 20.0' to 40.0'** **Installed PVC riser from 20.0' to surface'** **Installed #1 sand from 18.0' to 40.0'** **Installed bentonite seal from 16.0' to 18.0'** **Installed cement bentonite grout from 16.0' to 4.0' below grade**	
WL▼ 25.0							**Well head completion by others**	
30.0								
35.0								
40.0							**Bottom of Boring**	**40.0'**

parratt wolff inc

TEST BORING LOG

5879 Fisher Road
East Syracuse, NY 13057

PROJECT **Quanta Resources Site**
Lodi Street
LOCATION **Syracuse, New York**

HOLE NO. RW-2
JOB NUMBER: **11154**
SURF. EL.
DATE STARTED: **12/16/11**
DATE COMPLETED: **12/16/11**

GROUNDWATER DEPTH
WHILE DRILLING **23.0'**

BEFORE CASING REMOVED — N - NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" - ASTM D-1586 STANDARD PENETRATION TEST

AFTER CASING REMOVED — C - NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING "/ OR PERCENT CORE RECOVERY

CASING TYPE **8" Casing - 7 7/8" Fluid Rotary - (water)**

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NO.	Rec	SAMPLE DRIVE RECORD PER 6"		N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
5.0								
10.0								
							Red-green vernon SHALE	**11.0'**
15.0							**Note:** **Set 8" Temporary casing at 11.0' below grade** **7 7/8" Fluid rotary to 40.0' below grade**	
20.0							**Installed 4" PVC well at 40.0"** **Installed 20 slot screen from 20.0' to 40.0'** **Installed PVC riser from 20.0' to surface'** **Installed #1 sand from 18.0' to 40.0'** **Installed bentonite seal from 16.0' to 18.0'**	
WL▼ **25.0**							**Installed cement bentonite grout from 16.0' to 4.0' below grade** **Well head completion by others**	
30.0								
35.0								
40.0							**Bottom of Boring**	**40.0'**

parratt wolff inc

TEST BORING LOG

5879 Fisher Road
East Syracuse, NY 13057

PROJECT **Quanta Resources Site**
Lodi Street
LOCATION **Syracuse, New York**

HOLE NO. RW-3
JOB NUMBER: **11154**
SURF. EL.
DATE STARTED: **12/19/11**
DATE COMPLETED: **12/19/11**

GROUNDWATER DEPTH
WHILE DRILLING **23.0'**

BEFORE CASING REMOVED — N - NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" - ASTM D-1586 STANDARD PENETRATION TEST

AFTER CASING REMOVED — C - NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING "/ OR PERCENT CORE RECOVERY

CASING TYPE **8" Casing - 7 7/8" Fluid Rotary - (water)**

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NO.	Rec	SAMPLE DRIVE RECORD PER 6"		N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
5.0								
10.0								
							Red-green vernon SHALE	**11.0'**
15.0							**Note:** **Set 8" Temporary casing at 11.0' below grade** **7 7/8" Fluid rotary to 40.0' below grade**	
20.0							**Installed 4" PVC well at 40.0"** **Installed 20 slot screen from 20.0' to 40.0'** **Installed PVC riser from 20.0' to surface'** **Installed #1 sand from 18.0' to 40.0'** **Installed bentonite seal from 16.0' to 18.0'**	
WL▼ **25.0**							**Installed cement bentonite grout from 16.0' to 4.0' below grade** **Well head completion by others**	
30.0								
35.0								
40.0							**Bottom of Boring**	**40.0'**

parratt wolff inc

TEST BORING LOG

5879 Fisher Road
East Syracuse, NY 13057

PROJECT **Quanta Resources Site**
Lodi Street
LOCATION **Syracuse, New York**

HOLE NO. RW-4
JOB NUMBER: **11154**
SURF. EL.
DATE STARTED: **12/19/11**
DATE COMPLETED: **12/20/11**

GROUNDWATER DEPTH
WHILE DRILLING **23.0'**

BEFORE CASING
REMOVED

N - NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER
FALLING 30" - ASTM D-1586 STANDARD PENETRATION TEST

AFTER CASING
REMOVED

C - NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER
FALLING "/ OR PERCENT CORE RECOVERY

CASING TYPE **8" Casing - 7 7/8" Fluid Rotary - (water)**

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NO.	Rec	SAMPLE DRIVE RECORD PER 6"		N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
5.0								
10.0								
							Red-green vernon SHALE	**11.0'**
15.0							**Note:** **Set 8" Temporary casing at 11.0' below grade** **7 7/8" Fluid rotary to 40.0' below grade**	
20.0							**Installed 4" PVC well at 40.0"** **Installed 20 slot screen from 20.0' to 40.0'** **Installed PVC riser from 20.0' to surface'** **Installed #1 sand from 18.0' to 40.0'** **Installed bentonite seal from 16.0' to 18.0'**	
WL▼ **25.0**							**Installed cement bentonite grout from 16.0' to 4.0' below grade** **Well head completion by others**	
30.0								
35.0								
40.0							**Bottom of Boring**	**40.0'**

APPENDIX F

WELL INSPECTION LOG

WELL INSPECTION LOG

2802-2810 LODI STREET
DEC Site No. 7-34-013
City of Syracuse, Onondaga County, New York

Inspector: _____ Date: _____
Company: _____

Recovery Well	Well Head Conditions: OK / Not OK	Depth to Water (feet)	Free Product: Present (Yes) Absent (No)	Free Product Thickness (inches)	Free Product Volume Removed (gallons)	Comments
MW-1S						
MW-2						
MW-7						
MW-10						
RW-1						
RW-2						
RW-3						
RW-4						

Monitoring Well	Well Head Conditions: OK / Not OK	Depth to Water (feet)	Free Product: Present (Yes) Absent (No)	Comments
MW-1D				
MW-3				
MW-4				
MW-5				
MW-6				
MW-8				
MW-9				
MW-11				
MW-12				

APPENDIX G

STANDARD OPERATING PROCEDURE
FREE PRODUCT CHECK AND BAILING

STANDARD OPERATING PROCEDURE

MONITORING OR RECOVERY WELL
FREE PRODUCT CHECK AND BAILING

This procedure is utilized to inspect a monitoring or recovery well for the presence and thickness of a floating oil layer on the well water column, and for bailing the free product from the well. Consult the Equipment Checklist for required materials. HASP precautions are required when handling free phase oils.

INSTRUCTIONS

1. Read over the scope of work to become familiar with the specifics of the program and obtain a site plan for identification of the involved wells.

2. Prepare the equipment necessary for the work:

    a. Bailer rope and clear, transparent bailers.

    b. Oil-water interface probe; test before leaving for the site.

    c. Personal protective equipment and expendables; gloves, Tyvek, eye protection, paper towels, plastic sheeting, buckets

3. Examine the monitoring well.

    a. Confirm the well identification.

    b. Note any damage in the field log.

4. Place a plastic sheet around the monitoring well so the field equipment (bailer, rope, meters, etc.) is not in direct contact with the ground, avoiding contamination.

5. Wipe the monitoring well's outer casing cover clean of any foreign material which might enter the well when it is opened.

6. Unlock the monitoring well.

7. If organic contamination is suspected in the groundwater, monitor the well headspace with a photoionization detector (PID).

    a. Open the outer well casing cover just enough to insert the PID probe.

    b. Monitor the well headspace for organic vapors.

    c. Remove the probe and close the casing cover.

    d. Record the results in the field log.

    e. Establish appropriate levels of personnel protection.

8. Remove the outer well casing cover.

9. Put on a new pair of disposable gloves before doing any field measurements.

10. Measure the depth to water and depth to free product using the oil-water indicator; note that water and oil each have a separate ring tone when entry into the fluid occurs. Record each measurement in the field log.

11. Calculate the thickness of the free product layer, if present, by subtracting the depth to the water level from the top of the free product; record in the field log.

12. If a bailer is going to be used to evacuate the free product from the well:

    a. Attach a spool of 3/16-inch polypropylene rope to the bailer, using at least two half hitches, and weave the rope end through the main rope several times. Mark the

rope from the bottom of the bailer at a point equal to the depth to the free product in the well.

b. Gently lower the bailer into the well until it contacts the top of the free product surface. The contact may be felt through the rope and may be audible. Lower the bailer slowly through the product layer to a depth calculated to be approximately 1 inch below the product layer.

c. Retrieve the bailer to the surface; examine the fluid in the bailer; measure the thickness of the product layer and thickness of the water layer, if present; record in field log.

d. Repeat process until only water is retrieved.

e. Convert the total amount of oil recovered into gallons totaling the number of bailer inches recovered and multiplying by the appropriate bailer volume conversion factor (0.16 gallons/foot for 2 inch bailer; 0.65 gallons/foot for 4 inch bailer). Record volumes of oil and water recovered in the field log.

13. Replace well cap and well cover and secure.

APPENDIX H

STANDARD OPERATING PROCEDURE GROUNDWATER SAMPLING

STANDARD OPERATING PROCEDURE

GROUNDWATER SAMPLING

This procedure ensures that a groundwater sample collected is representative of the hydrogeologic formation. This procedure is utilized anytime a monitoring well is sampled. There are no specific definitions for this procedure. Consult the Equipment Checklist for required materials. Precautions on the chemical preservative Material Safety Data Sheets must be followed.

INSTRUCTIONS

1. Read over the scope of work to become familiar with the specifics of the program.

2. Obtain appropriate sample containers from the laboratory.

3. Prepare sampling equipment necessary for the program.

    a. Consult the Equipment Checklist.

    b. Reserve equipment, if necessary.

        NOTE: Try to have enough equipment on site to avoid decontamination while sampling.

    c. Check, test and clean all equipment before leaving for the site.

    d. Always bring more than enough personnel protective equipment and expendables (i.e. gloves, Tyvek, rope, etc.) on-site to complete the program.

4. Examine the monitoring well.

    a. Confirm the well identification.

    b. Note any damage in the groundwater field log.

5. Place a plastic sheet around the monitoring well so the field equipment (bailer, rope, meters, etc.) is not in direct contact with the ground, avoiding contamination.

6. Wipe the monitoring well's outer casing cover clean of any foreign material which might enter the well when it is opened.

7. Unlock the monitoring well.

   NOTE: Securely lock the monitoring well when it is left unattended and is not in direct view.

8. If organic contamination is suspected in the groundwater, monitor the well headspace with a photoionization detector (PID).

   a. Open the outer well casing cover just enough to insert the PID probe.

   b. Monitor the well headspace for organic vapors.

   c. Remove the probe and close the casing cover.

   d. Record the results in the groundwater field log.

   e. Establish appropriate levels of personnel protection.

9. Remove the outer well casing cover.

10. Put on a new pair of disposable gloves before doing any field measurements, preventing cross-contamination.

11. Measure the depth to water and the total depth of the monitoring well with an electronic water level indicator.

12. Calculate the volume of water within the well and determine how much must be evacuated.

    Monitoring Well Volume Calculation:

SWL	=	Depth to Water	C	=	Conversion Factor
TD	=	Total Depth of Well	N	=	Number of Volumes to Evacuate
L	=	Length of Water Column	TV	=	Total Volume to Evacuate

TD - SWL= L L x C = 1 well volume

1 well volume x N = TV

Common Conversion Factors:

0.16	2-inch well	0.65	4-inch well

NOTE: Quick field calculations for 3 well volume evacuation.

2-inch well	divide the length of the water column (L) by 2
4 inch well	multiply the length of the water column (L) by 2

13. The monitoring wells shall be evacuated by manual bailing. Dedicated bailers are provided in each well. In the event any bailer is missing, a new bailer shall be dedicated to that well.

14. If initial field readings (i.e. eh, temperature, pH, specific conductivity, etc.) are necessary:

    a. Measurements are taken from the first water evacuated from the well.

       NOTE: Always calibrate field meters on site daily before initial use and check the calibration periodically.

    b. Field readings are taken in the following order:

       eh
       Temperature
       pH
       specific conductivity

    c. Record the readings in the groundwater field log.

15. If a bailer is going to be used to evacuate the monitoring well:

    a. Push only the bailer loop through the protective polyethylene wrap, leaving the rest of the bailer covered.

    b. Attach a spool of 3/16-inch polypropylene rope to the bailer, using at least two half hitches, and weave the rope end through the main rope several times.

    c. Keep the bailer in the protective wrap until just before it is lowered into the monitoring well.

    d. Gently lower the bailer into the well until it contacts the water surface.

       NOTE: The contact is felt through the rope and may be audible.

e. An immiscible layer check will be done prior to evacuation with the bailer:

(1) Lower the bailer about 2 feet into the water (skim the surface).

(2) Retrieve the bailer.

NOTE: The bailer rope is still attached to the spool and care must be taken to avoid contamination of the rope spool. In addition, the retrieved rope must not come in contact with sources of contamination.

(3) Pour the bailer contents into a clean glass container for observation.

(4) Return the bailer to the well.

(5) Record any amount of free product and associated observations in the field log (i.e. odor, sheen).

f. Gently lower the bailer to the bottom of the well.

NOTE: The bailer must go all the way to the bottom to ensure there is enough rope if the well must be bailed dry.

g. Cut the bailer rope from the spool.

h. Begin bailing.

(1) Gently retrieve the bailer.

(2) Empty the bailer into a graduated 5 gallon bucket.

(3) Gently lower the bailer 1 or 2 feet below the surface of the water.

(4) Repeat steps 1, 2 and 3 until the required water volume has been removed or the well is dry.

16. Evacuated well water is clumped away from the well so that it doesn't flow back towards any monitoring well.

NOTE: If the evacuated water is contaminated (ex. free product, strong odor or sheen) the purge water shall be stored on-site in a 55 gallon drum. Notify the client of status of drum after each sampling event and arrange appropriate disposal.

17. a. For samples collected for analysis by volatile parameters, 95% well recovery is not required. Sampling for VOCs should be performed as soon as sufficient volume of a sample can be collected without disturbing any sediment that may be present at the bottom of the well.

    NOTE: VOC samples must be collected within 2 hours of well evacuation.

    b. For samples collected for analysis by semi-volatile parameters, 95% well recovery is required prior to sampling. If 95% recovery is not noted within 24 hours, the DEC shall be consulted for proper sample collection procedure. This procedure is likely to consist of collecting the sample while taking care not to disturb any sediment that may be present at the bottom of the well.

18. If samples for both volatile and semi-volatile analysis are to be collected from the same well and 95% well recovery is not noted within 2 hours of well evacuation, the DEC shall be consulted for proper sample collection procedure. This will likely consist of collecting the samples separately by the procedures outlined in Item 17.

19. Before collecting any samples:

    a. Check the sample containers are properly labeled as to client name, sample location, analysis to be performed and container preservation.

    b. Check sample containers are stored in a contaminant-free environment.

20. Samples are collected from the screened portion of the monitoring well in the order of the parameters' volatilization sensitivity unless otherwise specified in the scope of work.

    a. Volatile organics

    b. Field readings

    c. Total organic carbon

    d. Extractable organics

    e. Total metals

    f. Dissolved metals

    g. Phenols

h. Cyanides

i. Sulfate and chloride

j. Turbidity

k. Nitrate and ammonia

l. Radionuclides

21. Begin sample collection.

a. Do not over fill preserved sample containers. This may result in inadequately preserved samples.

b. Containers for volatile analysis are filled slowly in such a way that the sample runs down the inner wall of the container reducing volatilization of the sample.

c. Containers for alkalinity and volatile analysis are filled with no headspace.

NOTE: If headspace is present in the container after it is capped, it is emptied out and refilled. The label is corrected to read “unpreserved”, if necessary.

d. Containers for semi-volatile analysis are filled with as little headspace as possible.

e. Keep the quality control requirements of the program in mind and collect adequate sample volumes.

22. Immediately after sampling:

a. Store all collected samples in a cooler maintained at 4 degrees centigrade.

b. Place the custody seals on the containers or coolers if the scope of work calls for them.

c. Fill out the chain of custody form.

d. Check the groundwater field log is complete.

NOTE: Field notes are critical to inform the client and laboratory personnel about the conditions of the well and other observations (i.e. weather, strong odors, bent

casing or flooded wells). These notes may help in running the samples, as well as in interpreting the analytical results.

23. Collect the used expendables (ex. gloves, rope etc.) in a plastic bag and properly dispose of them.

24. Lock the monitoring well.

25. Deliver the samples to the laboratory within all appropriate holding times for the parameters to be analyzed.

26. Clean all the used sampling equipment per standard procedures for decontamination.

STANDARD OPERATING PROCEDURE

GROUNDWATER SAMPLING – LOW FLOW PUMP METHOD

FIELD SCOPE OVERVIEW

1. Obtain site sampling scope details from project manager, also well identification table, site location map and any site entrance procedures.

2. Depth to water level; floating oil check based on probe condition.

3. Sample pump installation.

4. Low flow purging and parameter monitoring.

5. Sample collection and preservation.

6. Equipment removal.

7. Free product checks, top and bottom of water column

8. Secure well.

NOTE: Depth to water and free product checks may be completed the day before the sampling event. Refer to the Work Plan or investigation report for well construction details, depth to water information and additional scope of work details.

FIELD SAMPLING PROCEDURE

This sampling procedure can be utilized for sampling monitoring wells that are relatively deep, precluding the use of suction lift sampling pumps, or from shallow wells using peristaltic pumps. The procedure ensures that groundwater samples collected are representative of the hydrogeologic formation and are collected under low flow purging conditions to minimize sample turbidity and formation disturbance. Twelve-volt small diameter submersible sampling

pumps will be used for sample collection in deep wells. Multiple pumps may be provided to decrease the amount of field decontamination. The pumps are to be decontaminated before use in any wells and between wells. An equipment blank will be collected. A peristaltic pump may be used if the depth to water level allows. Consult the Equipment Checklist for additional required materials.

1. Read over the scope of work to become familiar with the specifics of the program.

2. Determine the order of the wells to be sampled based on site information, working from known cleaner wells to more contaminated wells.

3. Prepare sampling equipment necessary for the program.

    a. Consult the Equipment Checklist.

    b. Reserve equipment, if necessary.

        NOTE: Dedicated sampling materials and equipment will be used to the extent practical to minimize field decontamination procedures.

    c. Check, test and decontaminate all equipment before leaving for the site. Only new disposable materials or properly decontaminated materials and equipment shall be used.

    d. Always bring more than enough personal protective equipment and expendables (i.e. gloves, Tyvek, rope, etc.) on-site to complete the program.

    e. Recalibrate field meters immediately prior to each day's use.

4. Examine the monitoring well.

    a. Confirm the well identification.

    b. Note any damage in the groundwater field log.

5. Avoid placing down-the-well sampling equipment on the ground. Use a clean plastic sheet at the monitoring well as a staging area, as needed.

6. Wipe the monitoring well's outer casing cover clean of any foreign material which might enter the well when it is opened and unlock the monitoring well.

NOTE: Securely lock the monitoring well when it is left unattended and is not in direct view.

7. The headspace of all monitoring wells is to be sampled with a photoionization detector (PID) during the initial entry.

   a. Open the outer well casing cover just enough to insert the PID probe.

   b. Monitor the well headspace for organic vapors.

   c. Remove the probe and close the casing cover.

   d. Record the results in the groundwater field log.

   e. Establish appropriate level of personal protection equipment.

8. Remove the outer well casing cover in preparation for sampling work.

9. Put on a new pair of disposable gloves before doing any field measurements. Change gloves between wells and frequently, as needed, to prevent cross-contamination.

10. Avoid disturbing the water column to the extent practical prior to sample and when installing sampling equipment.

11. Measure the depth to water in the monitoring well with an electronic water level indicator. Do not measure the depth to the bottom of the well. Use published log data for this. Check the condition of the probe and note whether or not there are any indications of free phase oil.

12. Calculate the volume of water within the well for evaluating well purge volumes using standard conversion factors, as detailed on the well field logs.

13. Install the pump, tubing and wire leads to a position mid-way between the bottom of the well and the top of the water column, and secure in position at the top of the well (peristaltic pump may be used if depth to water allows). Discharge tubing (dedicated new tubing is to be provided for each well) is to extend beyond the well and remain suspended off the ground. A clean 5-gallon bucket is to be provided to receive the purge water.

14. Energize the pump and begin evacuating well water at its lowest flow rate. Monitor water level and adjust flow rate to maintain a drawdown of 0.3 feet or less. Collect initial field parameter readings from the initial water evacuated from the well, and periodically thereafter, to include:

    a. Temperature, pH, ORP, conductivity, dissolved oxygen (flow through cell).

    b. Turbidity level.

    c. Record periodic field parameter readings and record in the field log. If stabilized readings are not obtained after three well volumes, continue purging the well until stabilized readings are obtained (three similar readings measured within 5 to 10 minutes apart, determined by ±10% for turbidity, 10% for DO, 3% for conductivity, 3% for temperature, 0.1 unit for pH and 10 mv for ORP.

    d. If the well has a very low yield and a larger drawdown is necessary, minimize the pumping rate and drawdown to the extent practical and record water level being maintained. After stabilized parameters are obtained, shut pump off to allow recovery to at least 95% prior to sampling.

    e. If stabilized parameters are not being obtained, contact project manager.

15. Before collecting any samples:

    a. Measure the depth to water. The water level recovery must be at least 95% of static reading.

    b. Verify that the sample containers are properly labeled as to client name, sample location, analysis to be performed and container preservation.

    c. Confirm that sample containers are stored in a contaminant-free environment at the work area.

    d. Fill sample containers while pumping under low flow condition and keeping all tubing full of water, tilling VOCs first.

    e. Do not overfill preserved sample containers. This may result in inadequately preserved samples.

f. Containers for volatile analysis me to be filled slowly, in such a way that the sample runs down the inner wall of the container, reducing volatilization of the sample.

g. Containers for alkalinity and volatile analysis are to be filled with no headspace.

NOTE: If headspace is present in the container after it is capped, it is to be emptied and refilled. The label will be corrected to read "unpreserved", if necessary.

h. Containers for semi-volatile analysis are to be filled with as little headspace as possible.

i. Collect adequate sample volumes for required procedures and Quality Assurance/ Quality Control (QA/QC) requirements, as specified in the Work Plan.

16. Immediately after sampling:

a. Store all collected samples in a cooler maintained at 4° Centigrade.

b. Obtain final depth to water.

c. Place the custody seals on the containers or coolers if the scope of work calls for them.

d. Fill out the chain of custody form.

e. Verify that the groundwater field log is complete.

NOTE: Field notes are critical to inform the client and laboratory personnel about the conditions of the well and other observations (i.e. weather, strange odors, bent casing or flooded wells). These notes may help in running the samples, as well as interpreting the analytical results.

17. Collect the used expendables (i.e. gloves, rope, etc.) in a plastic bag and properly dispose of them.

18. Lock the monitoring well.

19. Evacuated well water is to be discharged away from the wells at a location in an area of the site designated by the project manager.

    NOTE: If the evacuated water is grossly contaminated (i.e. free product, strong odor or sheen), the purge water shall be stored on-site in a secured 55-gallon drum. Notify the project manager/client of the drum status after each sampling event and arrange for appropriate disposal.

20. Deliver the samples to the laboratory within all appropriate holding times for the parameters to be analyzed.

21. Clean all of the used sampling equipment per Standard Procedures for Decontamination.

EQUIPMENT LIST

- Multi-Parameter Meter (calibrated, with flow through cell)
- Water Level Indicator
- Field Turbidity Meter
- 12v Sampling Pumps (three) and Power Source and/or Peristaltic Pump with Dedicated Sampling Tubing
- Field Decontamination Materials: Potable Water, Paper Towels, Alconox, Brush
- Decontamination Wash Containers
- New Sampling Tubing (enough for dedicated tubes in all wells) Twine, Duct Tape
- 5-Gallon Buckets for Purge Water Storage
- Field Toolbox
- Well Keys

- Laboratory Sample Containers, Cooler, Ice
- Disposable Gloves and Softy Glasses
- Well Sampling Field Logs
- Chain of Custody
- Project Work Plan and HASP

APPENDIX I

SITE-WIDE INSPECTION FORM

SITE-WIDE INSPECTION FORM
2802 – 2810 Lodi Street
City of Syracuse, Onondaga County, New York

Date: _____

Name of Inspector: _____

Company: _____

Attach a scaled Facility Site Plan from the SMP depicting key features of the site (property lines, streets, monitoring wells, remediation shed, recovery wells, site grading, fencing etc).

A copy of the site's approved SMP should be reviewed prior to the inspection.

List any significant changes to the site facilities (new building, other new construction or grading projects, etc) and note their locations on the site plan and record with photographs. Changes noted are:

_____

_____

_____

Any indications of excavations on the site or breaching of the site's cover system?

_____

_____

_____

Inspection results (functioning as specified?) of any engineering controls operating on the site:

Cover system:

_____

_____

Oil recovery system:

_____

_____

_____

Any uses of the property taking place that are not compliant with the SMP (review institutional controls)?

_____

_____

_____

Monitoring and recovery well conditions (still present, accessible, caps in place, etc):

Additional Comments (attach additional notes and copies of photographs):

APPENDIX J

OIL RECOVERY SYSTEM
CUT SHEETS AND MANUALS

GARTNER
EQUIPMENT COMPANY, Inc.
302 Sand St., Syracuse, NY 13204
Mailing Address: PO Box 11199, Syracuse, NY 13218-1199
315 476-8321 800 395-4257 Fax: 315 476-8349

TO: Plumley Engineering
ATTN: Frank Karboski
FROM: Bruce Ruggles for Bob S
RE: • Quanta Resources
• Soil Vapor Extraction

DATE: 12/28/11)
PAGE: 1 of 14
FAX: 638-8587
PHONE#: 245-0786 (Rome)
Email: fkarboski@plumleyeng.com

Frank:

Here is our revised proposal.

The ABB Variable Frequency drive will be designed to accept a 230/1 input power supply and convert it to a 230/3 output power going to the inverter duty motor.

I understand that you will pass along this proposal to Joe Naselli at Op-Tech. Joe or his electrician can call me with any questions. Bob Scherfner will be returning from a vacation on January 3rd.

Regards,

Bruce Ruggles
ruggles@gartnerequipment.com
mna

attach.

TO: Plumley Engineering DATE: 6/9/11 (Revised 12/28/11)
ATTN: Frank Karboski PAGE: 1 of 14
FROM: Bruce Ruggles for Bob S FAX: 638-8587 or 9740
RE: Soil Vapor Extraction Email: fkarboski@plumleyeng.com
Email: pros@plumleyeng.com

We offer the following in accordance with the specifications provide.

Rating: 80 SCFM @ 42" W.G. Vac

System Includes the following:

1 Ametek Rotron Chemical Blower
- Model #DR454R72MA
- 1.5 H.P., Inverter Duty, three phase, 230/460 Volt, 60 Hz, T.E.F.C. Motor
- 1.5 F.N.P.T. Connections

1 Ametek Noise Reduction-Inline Muffler
- Model #550888
- 4" N.P.T. Connection

1 Ametek Inline Vacuum Filter
- Model #515254
- 1.5" F.N.P.T.
- Element #516434 Included

1 Ametek Vacuum Regulator
- Model #515092
- 1" F.N.P.T. Connection

1 Ametek Moisture Separator
- Model #MS200PS
- Vacuum Relief Valve
- Plastic Tank
- Float Switch
- ¾" N.P.T. Drain

2 Ametek Pressure Gauges
- Model #271949
- O – 160" W.G.
- ¼" N.P.T.

2 Ametek Vacuum Gauges
- Model #271950
- O – 160" W.G.
- ¼" N.P.T.

2 Mercer Vacuum Flex Connection
- Model #SFU1.5 N.P.T.
- 1.5 F.N.P.T. Connection

1 ABB Control Panel Model #ACS550-VED, 230/1 input, 230/3 output, 12A Normal Duty, 150% overload rated. Wall mount NEMA 3R Drive Package (29" H x 24" W x 12" D) includes:
- NEMA 3R rated Weatherflo Forced Air Enclosure, Thermostatically Controlled
- RAL 9003 White Polyester finish with low Solar Absorption
- Non-fused Disconnect, through the door operated
- Hand – off – auto selector switch
- Speed pot
- Seven day timer
- 150VA Control power transformer, fused
- Detachable Keypad Control Panel for user interface, parameter adjustment, and local drive operation mounted on the front of the drive
- Patent Pending Swinging Choke Design for Harmonic Mitigation, 5% Impedance
- (Two) Programmable Analog (4 – 20 mA) Outputs
- (Two) Programmable Analog (4 – 20 mA) Inputs
- (Three) 8A @ 24VDC or 250VAC Switching Capacity, single pole double throw Programmable Output Relays

TOTAL PRICE: **$10,886.00**
PRICE INCLUDES: Freight to the Syracuse, NY Area
SHIPMENT: 8 – 10 Weeks

The above items are all shipped loose. Price does not include installation, piping, wiring or any other item not shown above.

Please find the attached data. Feel free to contact me with any questions.

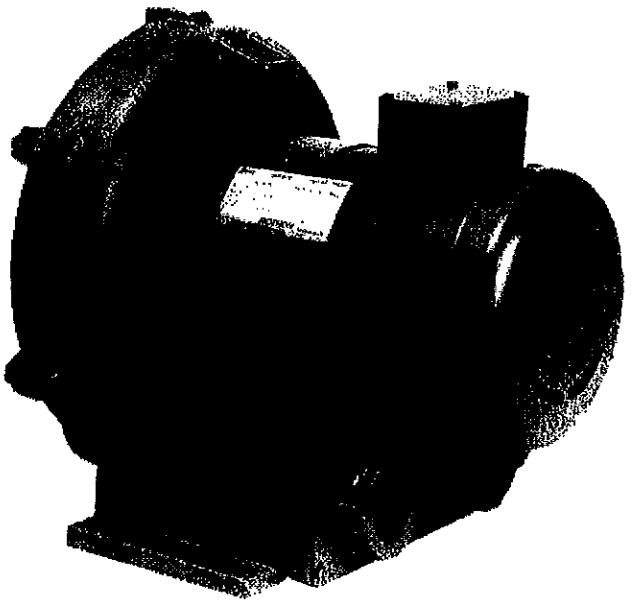
Best Regards,

Bob Scherfner
scherfner@gartnerequipment.com
www:gartnerequipment.com
mna

attach.

DR 454M & CP 454M Regenerative Blower

FEATURES
- Manufactured in the USA – ISO 9001 compliant
- CE compliant – Declaration of Conformity on file
- Maximum flow: 127 SCFM
- Maximum pressure: 65 IWG
- Maximum vacuum: 4.3" Hg (58.5 IWG)
- Standard motor: 1.5 HP, TEFC
- Cast aluminum blower housing, impeller & cover; cast iron flanges (threaded)
- UL & CSA approved motor with permanently sealed ball bearings
- Inlet & outlet internal muffling
- Quiet operation within OSHA standards

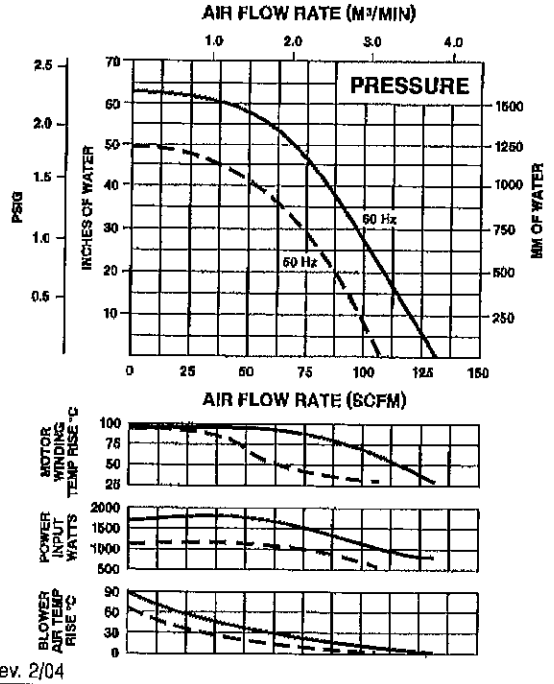


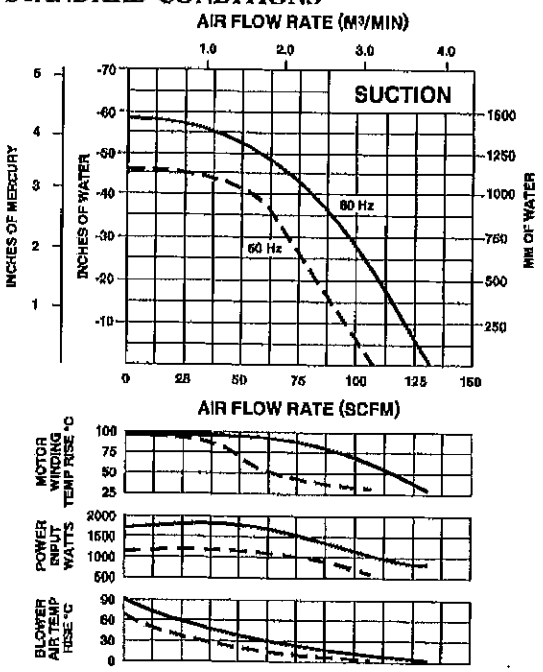
MOTOR OPTIONS
- International voltage & frequency (Hz)
- Chemical duty, high efficiency, inverter duty or industry-specific designs
- Various horsepowers for application-specific needs

BLOWER OPTIONS
- Corrosion resistant surface treatments & sealing options
- Remote drive (motorless) models
- Slip-on or face flanges for application-specific needs

ACCESSORIES (See Catalog Accessory Section)
- Flowmeters reading in SCFM
- Filters & moisture separators
- Pressure gauges, vacuum gauges & relief valves
- Switches – air flow, pressure, vacuum or temperature
- External mufflers for additional silencing
- Air knives (used on blow-off applications)
- Variable frequency drive package

BLOWER PERFORMANCE AT STANDARD CONDITIONS



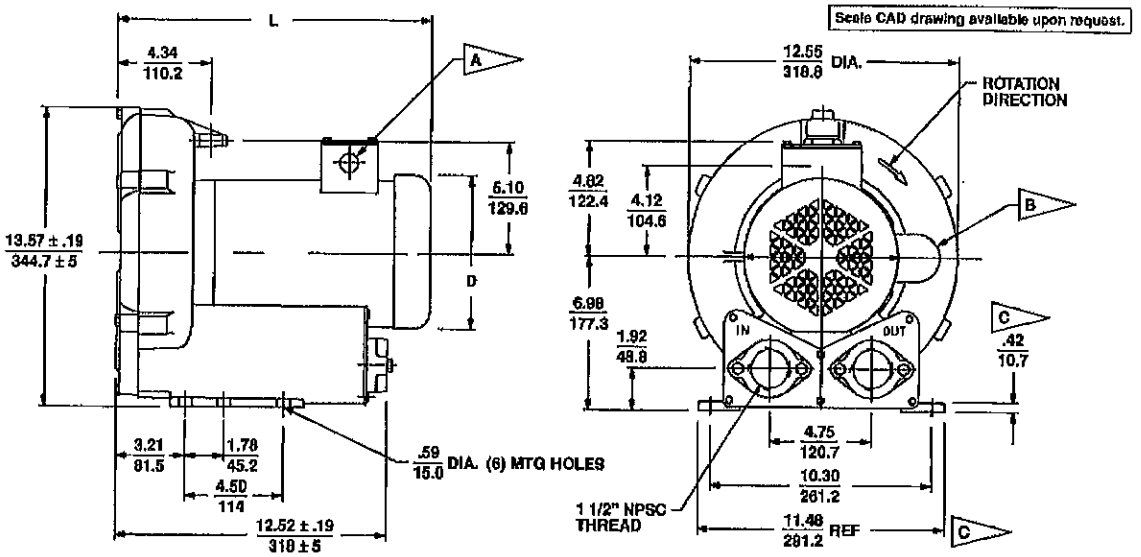


Rev. 2/04

AMETEK Technical and Industrial Products, Kent, OH 44240 • e mail: rotronindustrial@ametek.com • internet: www.ametektmd.com

DR 454M & CP 454M Regenerative Blower

Scale CAD drawing available upon request.



DIMENSIONS: IN / MM
TOLERANCES: .XX ± .08/2
(UNLESS OTHERWISE NOTED)

A — TERMINAL BOX CONNECTOR HOLE .88 (22) DIA.

B — CAPACITOR LOCATION ON SINGLE PHASE MOTORS

C — DIMENSION TAKEN FROM LARGE END OF DRAFT ANGLE

MODEL	L (IN)	L (MM)	D (IN)	D (MM)
DR454R56M	14.53	369.1	7.16	181.9
DR454R72M	12.54	318.6	6.83	173.5
DR454R86M	13.53	343.7	7.16	181.9
CP454EZ72MLR	12.54	318.6	6.83	173.5

SPECIFICATIONS

MODEL	DR454R56M	DR454R72M	DR454R86M	CP454EZ72MLR
Part No.	080481	080480	080482	080491
Motor Enclosure – Shaft Material	TEFC – CS	TEFC – CS	TEFC – CS	ChemTEFC – SS
Horsepower	1.5	1.5	1.5	Same as DR454R72M 080480 except add Chemical Processing (CP) features from catalog inside front cover
Voltage [1]	115/230	230/460	575	
Phase – Frequency [1]	Single - 50/60 Hz	Three - 50/60 Hz	Three - 60 Hz	
Insulation Class [2]	F	F	F	
NEMA Rated Motor Amps	15.6/7.8	4.6/2.3	1.8	
Service Factor	1.15	1.15	1.15	
Inrush Amps	84/42	32/16	12.8	
Max. Blower Amps [3]	19/9.5	6.2/3.1	2.1	
Recommended NEMA Starter Size	1/0	0/00	00	
Shipping Weight	76 lb (35 kg)	71 lb (32 kg)	66 lb (30 kg)	

[1] Rotron motors are designed to handle a broad range of world voltages and power supply variations. Our dual voltage 3 phase motors are factory tested and certified to operate on both: **208-230/415-460 VAC-3 ph-60 Hz** and **190-208/380-415 VAC-3 ph-50 Hz.** Our dual voltage 1 phase motors are factory tested and certified to operate on both: **104-115/208-230 VAC-1 ph-60 Hz** and **100-110/200-220 VAC-1 ph-50 Hz.** All voltages above can handle a ±10% voltage fluctuation. Special wound motors can be ordered for voltages outside our certified range.

[2] Maximum operating temperature: Motor winding temperature (winding rise plus ambient) should not exceed 140°C for Class F rated motors or 120°C for Class B rated motors. Blower outlet air temperature should not exceed 140°C (air temperature rise plus inlet temperature). Performance curve maximum pressure and suction points are based on a 40°C inlet and ambient temperature. Consult factory for inlet or ambient temperatures above 40°C.

[3] Maximum blower amps corresponds to the performance point at which the motor or blower temperature rise with a 40°C inlet and/or ambient temperature reaches the maximum operating temperature.

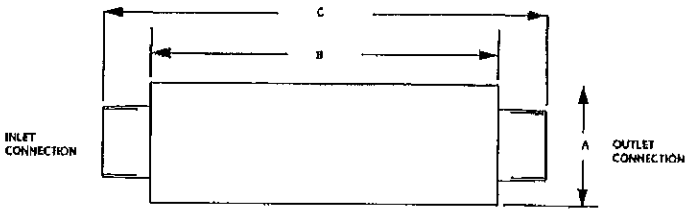
Specifications subject to change without notice. Please consult your Local Field Sales Engineer for specification updates.

Noise Reduction - Inline Muffler (Dual Connection)

ROTRON®

Inline Mufflers are utilized for noise reduction in applications where piping systems are connected directly to both ends of the muffler. Muffler may be used on inlet or outlet of blower.

SPECIFICATIONS:
HOUSING – Steel
MEDIA – Acoustical Material



Specification	Units	Part/Model Number 550888	522948	529900	551377	515185	511569	515210	551565	516264	516265
Ref Blower Model	-	D	E	E	E	F	G	G	G	H	H
Inlet Connection	-	1.5 NPT-M	2.0 NPT-M	2.0 NPSC-F	2.0 NPT-M	2.5 NPT-M	3.0 NPT-M	4.0 NPT-M	4.0 NPT-M	4.0 NPT-M	6.0 NPT-M
Outlet Connection	-	2.0 NPT-F	2.0 NPSC-F	2.0 NPSC-F	2.0 NPT-M	2.5 NPT-F	3.0 NPT-F	4.0 NPT-F	4.0 NPT-M	4.0 NPT-F	6.0 NPT-F
Dimension A	Inches	4.00	4.00	4.38	4.00	6.12	7.00	10.00	10.00	8.00	12.00
	mm	101.6	101.6	111.3	101.6	155.4	177.8	254	254	203.2	304.8
Dimension B	Inches	7.75	15.75	15.75	15.75	15.00	18.00	24.00	24.00	22.00	30.00
	mm	196.9	400.1	400.1	400.1	381	457.2	609.6	609.6	558.8	762
Dimension C	Inches	16.5	18.45	18.45	18.15	19.00	22.25	30.00	30.00	27.75	36.75
	mm	419.1	468.6	468.6	461	482.6	565.2	762	762	704.9	933.5

Blower Model Reference Key	
A = SPIRAL	E = DR/EN/CP 656, 6, 633, S7
B = DR/EN/CP 068, 083, 101, 202	F = DR/EN/CP 757, 808, 858, S9, P9 (Inlet Only)
C = DR/EN/CP 303, 312, 313, 353	G = DR/EN/CP 833, S13, P13 (Inlet Only)
D = DR/EN/CP 404, 454, 513, 505, 555, 523	H = DR/EN/CP 909, 979, 1233, 14, S15, P15 (Inlet Only)

AMETEK TECHNICAL & INDUSTRIAL PRODUCTS
75 North Street, Saugerties, NY 12477
USA: +1 215-256-6601 - Europe: +44 (0) 845 356 9664 - Asia: +86 21 5763 1258
Customer Service Fax: +1 215.256.1338
www.ametektip.com

AMETEK®
TECHNICAL & INDUSTRIAL PRODUCTS

Protection - Pressure Regulating Diaphram Valve

ROTRON®

The PRD Valve is installed to prevent excessive system pressure or vacuum that could result from line restrictions. Valves should be installed at the blower outlet (downstream) in pressure systems and at blower inlet (upstream) in vacuum systems. These valves are suitable for air, natural gas, propane, and other non-corrosive service.

Note: PRD valves are not factory preset, but are easily field adjustable.

SPECIFICATIONS:

VALVE BODY – Aluminum (1"), Cast Iron (2")
VALVE SPRING – Steel
DIAPHRAGM – Nitrile

NOTE: Blower Model P13 requires two 515093 relief valves.

Fig. 1

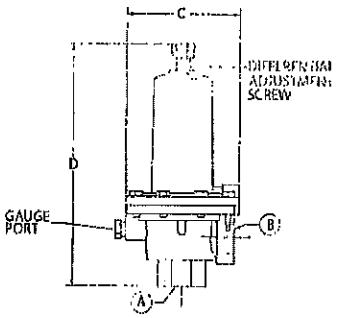
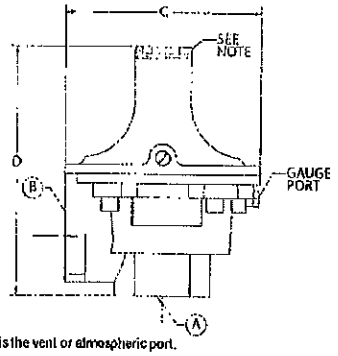


Fig. 2



PRESSURE RELIEF: (B) is the system port and (A) is the vent or atmospheric port.

VACUUM RELIEF: (A) is the system port and (B) is the vent or atmospheric port. For vacuum mode, customer must remove snap ring and screen.

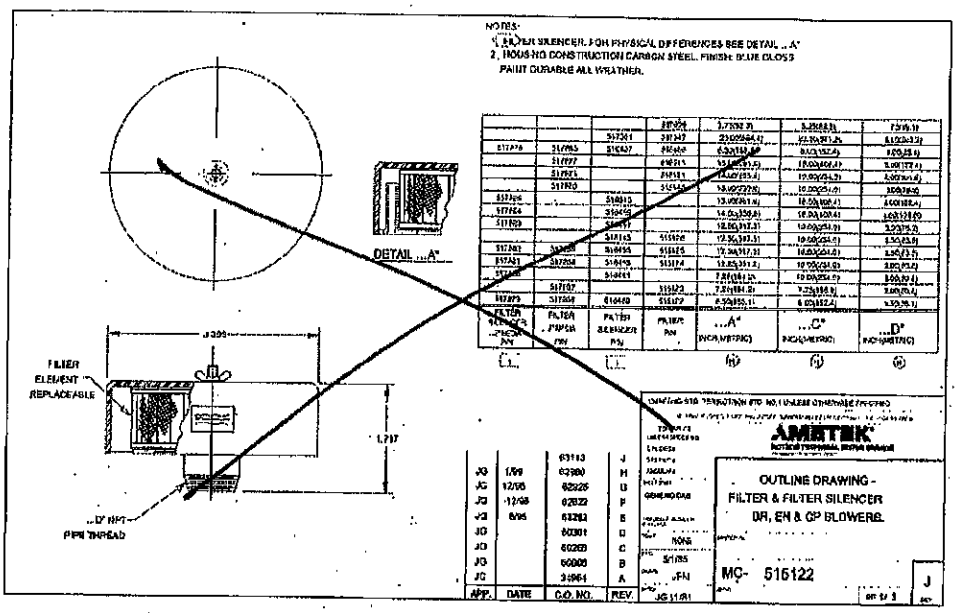
NOTE: Replace cap after adjusting setting. Valve will not operate with cap removed. Differential adjustment screw is under the cap.

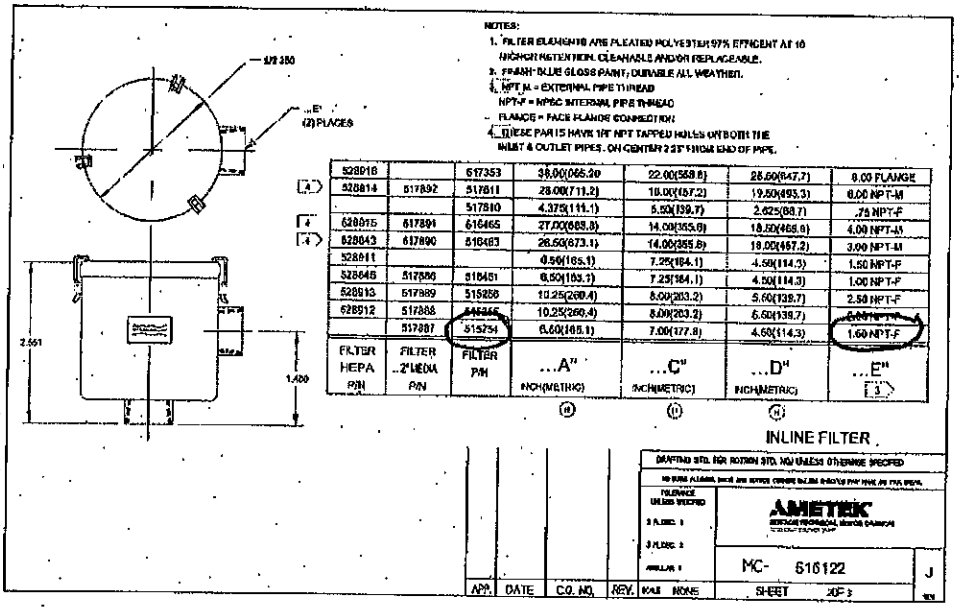
Specification	Units	Part/Model Number 515092	529612	529857	529858	551130	515093	529859	550246	550247
Range	In. H2O mbar	27-125 67.3-311.4	110-415 274-1033.8	277-554 690-1380	7-18 17.4-44.8	14-62 34.9-154.4	48-194 119.6-483.3	110-277 274-690	97-197 241.6-490.7	97-194 241.6-483.3
Description	-	Fig 1.	Fig 1.	Fig. 1	Fig. 2	Fig. 2	Fig. 2	Fig. 2	Not Shown	Not Shown
Ref Blower Model	-	B, C, D, C	B, C, D, E	B, C, D, E	F, G	F, G	F, G	F, G	H	H
Inlet Connection	-	1	1	1	2	2	2	2	2.5	2.5
Outlet Connection	-	1	1	1	2	2	2	2	2.5	2.5
Dimension A	Inches mm	1.00 25.4	1.00 25.4	1.00 25.4	2.00 50.8	2.00 50.8	2.00 50.8	2.00 50.8	2.50 63.5	2.50 63.5
Dimension B	Inches mm	1.00 25.4	1.00 25.4	1.00 25.4	2.00 50.8	2.00 50.8	2.00 50.8	2.00 50.8	2.50 63.5	2.50 63.5
Dimension C	Inches mm	4.12 104.6	4.12 104.6	4.12 104.6	7.12 180.8	7.12 180.8	7.12 180.8	7.12 180.8	6.19 157.2	6.19 157.2
Dimension D	Inches mm	8.70 221	8.70 221	8.70 221	9.00 228.6	9.00 228.6	9.00 228.6	9.00 228.6	7.65 194.3	7.65 194.3

Blower Model Reference Key	
A = SPIRAL	E = DR/EN/CP 656, 6, 633, S7
B = DR/EN/CP 068, 083, 101, 202	F = DR/EN/CP 757, 808, 858, S9, P9 (Inlet Only)
C = DR/EN/CP 303, 312, 313, 353	G = DR/EN/CP 833, S13, P13 (Inlet Only)
D = DR/EN/CP 404, 454, 513, 505, 555, 523	H = DR/EN/CP 909, 979, 1233, 14, S15, P15 (Inlet Only)

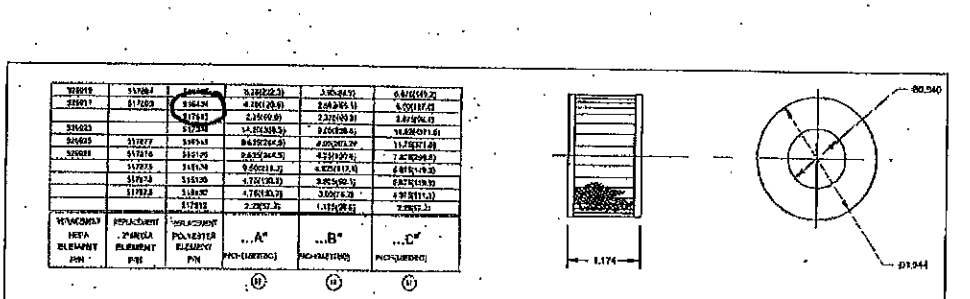
AMETEK TECHNICAL & INDUSTRIAL PRODUCTS
76 North Street, Saugerties, NY 12477
USA: +1 215-256-6601 - Europe: +44 (0) 845 366 9654 - Asia: +86 21 5763 1256
Customer Service Fax: +1 215.256.1338
www.ametektip.com

AMETEK®
TECHNICAL & INDUSTRIAL PRODUCTS





FILTER HEPA P/N	FILTER 2" MEDIA P/N	FILTER P/N	...A" INCH(METRIC)	...C" INCH(METRIC)	...D" INCH(METRIC)	...E"
528016		517353	38.00(965.2)	22.00(558.8)	28.50(647.7)	6.00 FLANGE
528014	517892	517811	28.00(711.2)	18.00(457.2)	19.50(493.3)	6.00 NPT-M
		517810	4.375(111.1)	5.50(139.7)	2.625(66.7)	.75 NPT-F
528015	517891	516465	27.00(685.8)	14.00(355.6)	18.50(469.9)	4.00 NPT-M
528043	517890	516463	26.50(673.1)	14.00(355.6)	18.00(457.2)	3.00 NPT-M
528011			6.50(165.1)	7.25(184.1)	4.50(114.3)	1.50 NPT-F
528048	517886	516451	6.50(165.1)	7.25(184.1)	4.50(114.3)	1.00 NPT-F
528013	517889	515258	10.25(260.4)	8.00(203.2)	5.50(139.7)	2.50 NPT-F
528012	517888	515255	10.25(260.4)	8.00(203.2)	5.50(139.7)	2.00 NPT-F
	517887	515254	6.50(165.1)	7.00(177.8)	4.50(114.3)	1.50 NPT-F



YAMAHA HEPA ELEMENT P/N	REPLACEMENT 2" MEDIA ELEMENT P/N	REPLACEMENT POLYESTER ELEMENT P/N	...A" INCH(METRIC)	...B" INCH(METRIC)	...C" INCH(METRIC)
528016	517892	517353	38.00(965.2)	4.00(101.6)	6.00(152.4)
528014		517811	28.00(711.2)	2.25(57.2)	2.81(71.4)
528015	517891	516465	27.00(685.8)	14.00(355.6)	18.50(469.9)
528043	517890	516463	26.50(673.1)	14.00(355.6)	18.00(457.2)
528011	517889	515258	10.25(260.4)	4.25(107.9)	7.25(184.1)
528048	517886	516451	6.50(165.1)	4.25(107.9)	7.25(184.1)
528013	517889	515258	10.25(260.4)	4.25(107.9)	8.00(203.2)
528012	517888	515255	10.25(260.4)	4.25(107.9)	8.00(203.2)
	517887	515254	6.50(165.1)	4.25(107.9)	7.00(177.8)

528016	517892	517353	517811	517810	516465	516463	516451	515258	515255	515254
528014	517891	517811	517810	516465	516463	516451	515258	515255	515254	
528015	517890	517810	516465	516463	516451	515258	515255	515254		
528043	517889	516465	516463	516451	515258	515255	515254			
528011	517888	516463	516451	515258	515255	515254				
528048	517887	516451	515258	515255	515254					
528013	517886	515258	515255	515254						
528012	517889	515255	515254							
528011	517888	515254								
FILTER HEPA P/N	FILTER ELEMENT	FILTER 2" MEDIA ELEMENT	FILTER ELEMENT	FILTER P/N	FILTER ELEMENT	FILTER P/N	FILTER ELEMENT	FILTER P/N	FILTER ELEMENT	FILTER P/N	FILTER ELEMENT

REPLACEMENT FILTER ELEMENT CROSS REFERENCE TABLE

(Included)
ELEMENT SHEET

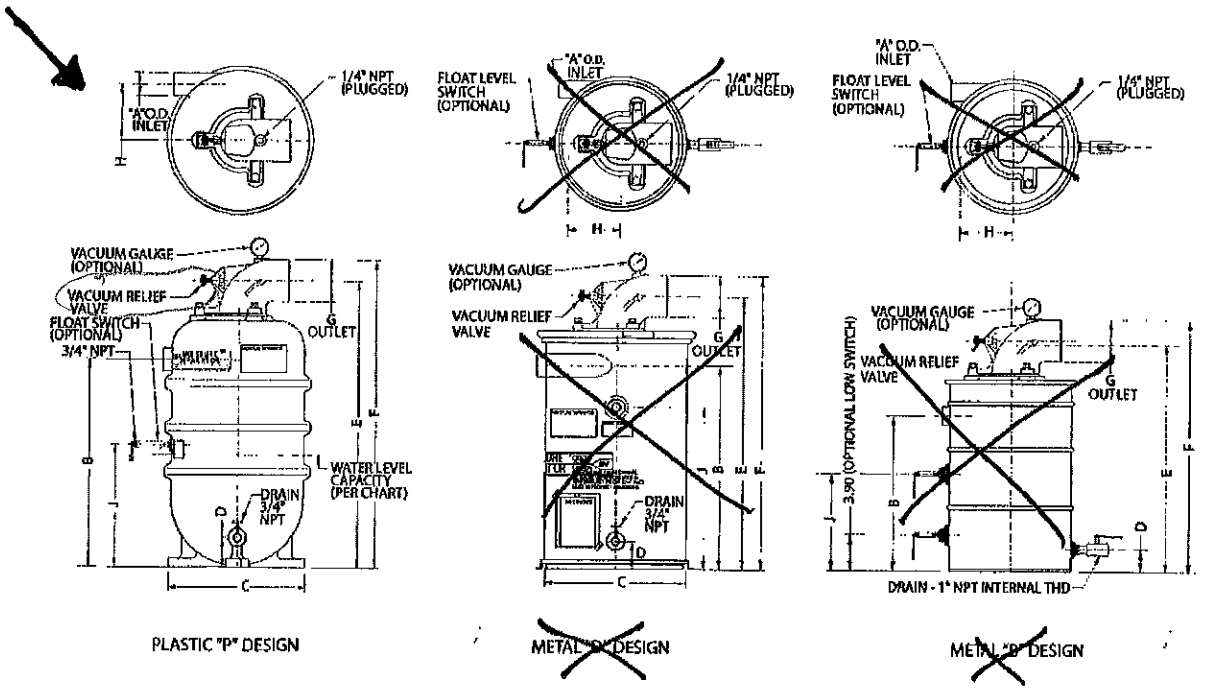
AMETEK
MC- 515122
J
SHEET 3 OF 3

Filtration - Moisture Separator

ROTRON®

By separating and containing entrained liquids, Rotron's™ moisture separator helps protect our regenerative blowers and the end treatment system from corrosion and mineralization damage. Recommended for all soil vacuum extraction applications.

SPECIFICATIONS:
SEPARATION METHOD – High Efficiency Cyclonic
RELIEF VALVE MATERIAL – Brass & Stainless Steel
FLOAT MATERIAL – Copper
FLOAT SWITCH – SPDT, Explosion-proof NEMA 7&9, 5 Amp max.



PLASTIC "P" DESIGN

METAL "S" DESIGN

METAL "B" DESIGN

Models without float switch available. Metal MS200/300DS models are not the standard stocked, but are available.

		Part/Model Number							
		MS200PS	MS300PS	MS200DS	MS300DS	MS350BS	MS500BS	MS600BS	MS1000BS
Specification	Units	038519	038520	080086	080087	038357	080660	080659	038914
CFM Max.	CFM	200	300	200	300	350	500	600	1000
Dimension A	Inches	2.38	2.88	2.00	2.50	3.25	3.25	4.00	6.00
Dimension B	Inches	22.46	22.46	22.12	22.12	28.00	28.00	27.00	31.00
Dimension C	Inches	16.00	16.00	16.75	16.75	23.00	23.00	23.00	27.00
Dimension D	Inches	3.25	3.25	2.75	2.75	4.00	4.00	4.00	4.00
Dimension E	Inches	31.05	31.05	27.92	27.92	37.25	37.37	37.37	47.32
Dimension F	Inches	33.30	33.30	30.17	30.17	39.50	54.50	54.50	51.70
Dimension G	Inches	4.50 OD	4.50 D	4.50 D	4.50 OD	4.50 OD	6.63 ID	6.63 ID	8.62 OD
Dimension H	Inches	6	6.00	6.56	6.81	9.75	9.75	9.25	10.00
Dimension J	Inches	13.25	13.25	12.62	12.62	17.50	17.50	17.50	19.88
Drain Internal Thd	-	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT	1" NPT	1" NPT	1" NPT	1" NPT
Shipping Weight	Lbs	42	42	42	42	82	95	96	150

AMETEK TECHNICAL & INDUSTRIAL PRODUCTS
76 North Street, Saugerties, NY 12477
USA: +1 215.256.6601 - Europe: +420 494 943 062 - Asia: (86-21) 57631258
Customer Service Fax: +1 215.256.1338
www.ametektip.com

AMETEK®
TECHNICAL & INDUSTRIAL PRODUCTS

ROTRON®

2.0 Moisture Separator™ Specifications

2.1 Duty

The moisture separator shall be designed for use in a soil vapor extraction system capable of continuous operation with a pressure drop of less than size inchecks of water at the rated flow of _____ SCFM. The separator shall be capable of operation under various inlet conditions ranging from a fine mist to slugs of water with high efficiency.

2.2 Principle of Operation

The moisture separator shall incorporate cyclonic separation to remove entrained water. The separator must protect against an overflow by fail safe mechanical means. An electrical switch or contact(s) alone is not an acceptable means of protection against overflow, but is a good backup.

2.3 Construction

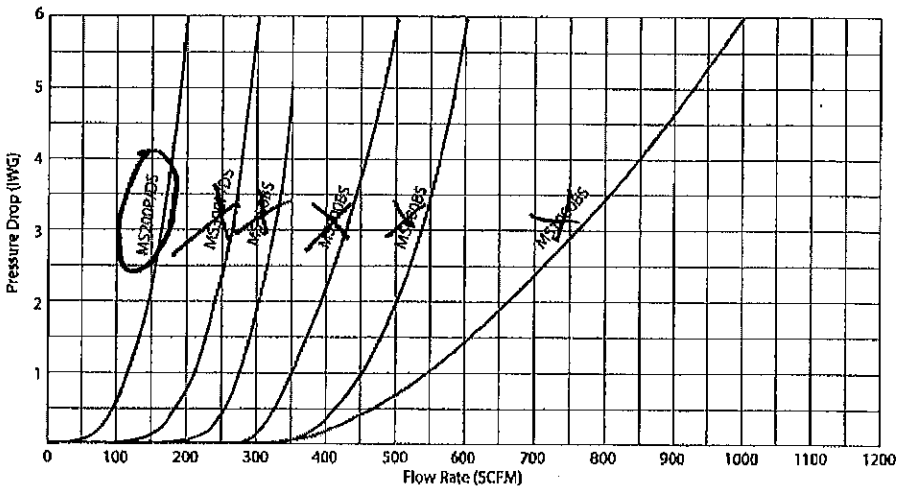
The body of the moisture separator shall be constructed of heavy wall plastic or heavy gauge cold rolled steel. The steel interior and exterior shall be epoxy (powder) coated to resist abrasion, corrosion, and chipping that might expose the surface. The inlet shall be tangentially located and welded to the body. The outlet port shall be constructed of PVC or cast aluminum allot, flanged and sealed to the center of the top of the separator. The separator shall incorporate a non-sparking copper float ball and an adjustable relief valve to protect against overflow and overheating the blower.

2.4 Capacity and Dimension

The moisture separator must have a liquid capacity of _____ gallons. The inlet shall be _____ inch OD slip-on type. The outlet shall be _____ inch OD slip-on type.

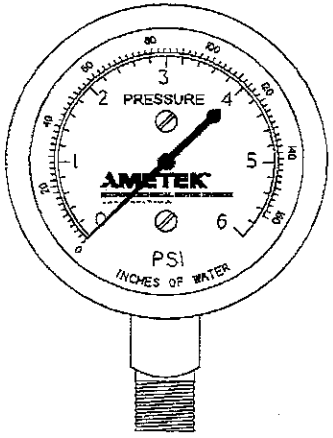
For DR/EN/CP Blower Model	Selector Moisture Separator Model	Liquid-holding Capacity (gallons)	Inlet (OD)	Outlet	Max Vacuum Allow (IHG)
404 454 505 513	MS200PS	7	2.38	4.5 OD	12
523 555 633 833	MS200DS	10	2.0		22
656	MS300PS	7	2.88		12
6 757	MS300DS	10	2.5		22
808	MS350BS	40	3.25	6.63 ID	
858 1233	MS500BS				
909	MS600BS		4.0		
979 14	MS1000BS	65	6.0	8.62 OD	

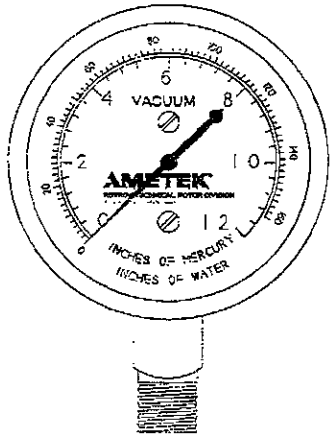
2.5 Pressure Drop



AMETEK TECHNICAL & INDUSTRIAL PRODUCTS
75 North Street, Saugerties, NY 12477
USA: +1 215.256.6601 - Europe: +420 494 943 662 - Asia: (86-21) 5763-1258
Customer Service Fax: +1 215.256.1338
www.ametektip.com

APP.	DATE	C.O. NO.	REV.





NOTES:

1. TYPE: 2 1/2" DIAL SIZE- DIAPHRAGM OPERATED.
2. CONNECTION-1/4" NPT MALE BOTTOM CONNECTION
3. MATERIAL-CASE: DRAWN STEEL,PHOSPHATIZED & FINISHED IN BAKED BLACK ENAMEL.
   DIAPHRAGM: PHOSPHOR BRONZE.
   MOVEMENT: BRASS INDEPENDENT MOUNTING.
   LENS: CLEAR PLASTIC.
4. ACCURACY-1% OF TOTAL SCALE RANGE IN MIDDLE HALF OF SCALE, 2% ELSEWHERE.
5. WEIGHT-APPROX. 1/2 LB.

PART NO.	GAUGE RANGE INNER MARKING		GAUGE TYPE	GAUGE RANGE OUTER MARKING (INCHES OF WATER)	DRAWING SHOWN
551376	0 TO 2	(PSI)	PRESSURE	0 TO 60	NO
271949	0 TO 6	(PSI)	PRESSURE	0 TO 160	YES
550407	0 TO 10	(PSI)	PRESSURE	0 TO 280	NO
529428	0 TO 4.5	(INCHES OF MERCURY)	VACUUM	0 TO 60	NO
271950	0 TO 12	(INCHES OF MERCURY)	VACUUM	0 TO 160	YES
550408	0 TO 20	(INCHES OF MERCURY)	VACUUM	0 TO 280	NO

TOLERANCE UNLESS SPECIFIED
2 PLACE ± ~
3 PLACE ± ~
ANGULAR ± ~

DWG FORMAT: VISUAL CAD

THIS DWG AVAILABLE IN DXF, DWG, AND PDF FORMAT

SCALE: NONE

DATE: 7/22/92

BY: SP

APPVD:

AMETEK
ROTRON TECHNICAL MOTOR DIVISION
REGENERATIVE BLOWER GROUP

OUTINE DRAWING
GAUGE
PRESSURE/VACUUM

MD- 29501

B

REV

SHT 1 OF 1

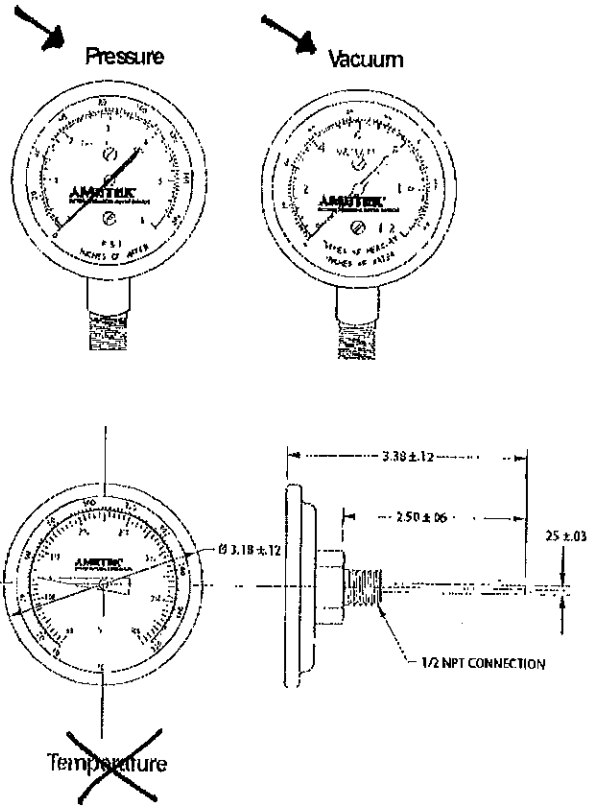
ROTRON®

ROTRON has a variety of gauges for pressure, vacuum and temperature measurements in various ranges. These gauges are reliable and rugged.

SPECIFICATIONS:

Pressure / Vacuum
CASE – Drawn Steel Finished in Black Enamel
DIAPHRAGM – Bronze
LENS – Clear Plastic
ACCURACY – 2%
WEIGHT – 1/2 lb.
CONNECTION – 1/4" NPT
FACE – 2 1/2" dia.

~~Temperature~~
CASE – Steel
LENS – Glass
ACCURACY – 1%
WEIGHT – 1/4 lb.
CONNECTION – 1/2" NPT
FACE – 3" Dial

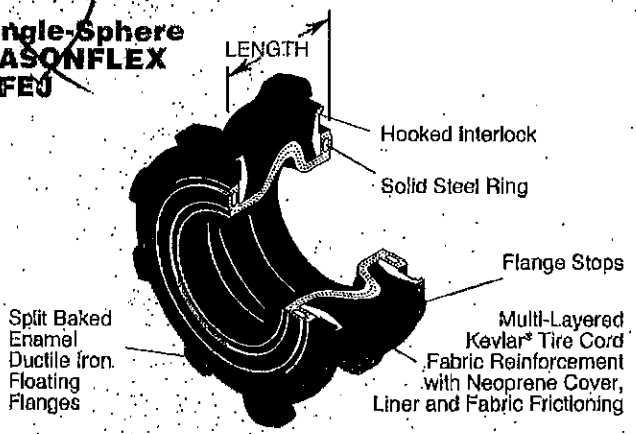


Specification	Units	Part/Model Number 551376	271949	550407	529426	271950	550408	551368
Range	-	Pressure	Pressure	Pressure	Vacuum	Vacuum	Vacuum	Temperature
Description	-	0-60 IWG	0-160 IWG	0-280 IWG	0-60 IWG	0-160 IWG	0-280 IWG	0-200 Deg C

AMETEK TECHNICAL & INDUSTRIAL PRODUCTS
75 North Street, Saugerties, NY 12477
USA: +1 215-256-6601 - Europe: +44 (0) 845 368 9564 - Asia: +86 21 6763 1258
Customer Service Fax: +1 215.256.1338
www.ametektlp.com

AMETEK®
TECHNICAL & INDUSTRIAL PRODUCTS

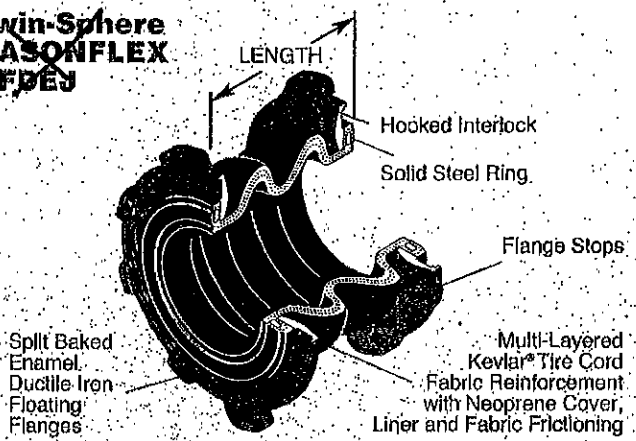
Single-Sphere MASONFLEX MFEJ



MASONFLEX MFEJ Dimensions and Allowable Movements

2 2 1/2	4	50 65	100	20° 19°	5/8	16	1/2	12	3/8	9.5
3 4 5 6 8	6	75 100 125 150 200	150	18° 17° 16° 15° 13°	7/8	22	5/8	16	5/8	16
10 12	8	250 300	200	12° 11°	1	25	3/4	19	3/4	19
14 16 18 20	9	350 400 450 500	225	10° 9° 8° 7°	1 1/8	29	7/8	22	7/8	22
24	10	600	250	6°	1 1/8	29	1	25	1	25

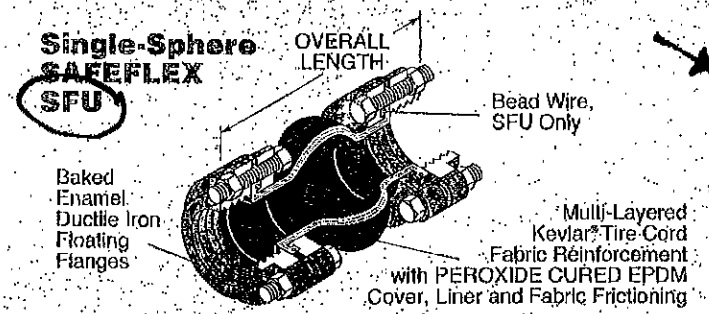
Twin-Sphere MASONFLEX MFDEJ



MASONFLEX MFDEJ Dimensions and Allowable Movements

1 1/2 2 2 1/2	6	40 50 65	150	30° 28° 27°	7/8	22	5/8	16	5/8	16
3 4 5 6 8	9	75 100 125 150 200	225	26° 25° 24° 23° 22°	1 1/8	29	7/8	22	7/8	22
10 12	12	250 300	300	21° 20°	1 1/2	38	1	25	1 1/4	32

Single-Sphere SAFEFLEX SFU

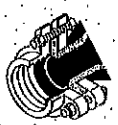


SAFEFLEX SFU-DI
Ductile Iron Threaded End

SAFEFLEX SFU Dimensions and Allowable Movements

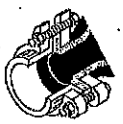
3/4	7	20	175	25						
1	7	25	175	24						
1 1/4	8	32	200	23	3/4	19	3/8	10	3/8	10
1 1/2	8	40	200	22						
2	8	50	200	21						

SFU FITTING OPTIONS

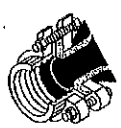


SAFEFLEX SFU-SS
Stainless Steel Threaded End

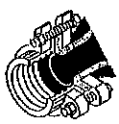
SAFEFLEX SFU-CT
Sweat End for Copper Tubing



SAFEFLEX SFU-PC
PVC Cement End



SAFEFLEX SFU-PT
PVC Threaded End



SAFEFLEX SFU-BT
Brass Threaded End

MASONFLEX MFEJ, MFDEJ, SAFEFLEX SFU and SFDCR with Kevlar® Reinforcement Standard and High Pressure Construction Temperature Corrections

MFEJ Standard 2"-16" 50mm-400mm	225	220	215	210	205	200	18"	15.5	15.2	14.8	14.5	14.1	13.8	0.6
MFEJ Standard 18"-24" 450mm-600mm	180	180	175	170	165	160	18"	12.4	12.4	12.1	11.7	11.4	11.0	0.6
MFDEJ Standard All Sizes	225	220	215	210	205	200	10"	15.5	15.2	14.8	14.5	14.1	13.8	0.3
SFDCR Standard All Sizes	250	245	240	235	230	230	14"	17.2	16.9	16.5	16.2	15.8	15.8	0.5
SFU Standard All Sizes	250	245	240	235	230	230	18"	17.0	16.5	16.5	16.2	15.8	15.8	0.6
MFEJ High Pressure 2"-16" 50mm-400mm	300	290	280	270	260	250	29"	20.7	20.0	19.3	18.6	18.0	17.2	1.0
MFEJ High Pressure 18"-24" 450mm-600mm	225	220	215	210	205	200	29"	15.5	15.2	14.8	14.5	14.1	13.8	1.0

Burst pressures are a minimum of three times Operating Pressures.
High Pressure 14" - 24" 450 - 600mm MFEJ are special order. All other models are stock.

GARTNER
EQUIPMENT COMPANY, Inc.
302 Sand St., Syracuse, NY 13204
Mailing Address: PO Box 11199, Syracuse, NY 13218-1199
315 476-8321 800 395-4257 Fax: 315 476-8349

TO: Plumley Engineering
ATTN: Frank Karboski
FROM: Bruce Ruggles for Bob S
RE: • Quanta Resources
• Soil Vapor Extraction

DATE: 12/28/11)
PAGE: 1 of 14
FAX: 638-8587
PHONE#: 245-0786 (Rome)
Email: fkarboski@plumleyeng.com

Frank:

Here is our revised proposal.

The ABB Variable Frequency drive will be designed to accept a 230/1 input power supply and convert it to a 230/3 output power going to the inverter duty motor.

I understand that you will pass along this proposal to Joe Naselli at Op-Tech. Joe or his electrician can call me with any questions. Bob Scherfner will be returning from a vacation on January 3rd.

Regards,

Bruce Ruggles
ruggles@gartnerequipment.com
mna

attach.

TO: Plumley Engineering DATE: 6/9/11 (Revised 12/28/11)
ATTN: Frank Karboski PAGE: 1 of 14
FROM: Bruce Ruggles for Bob S FAX: 638-8587 or 9740
RE: Soil Vapor Extraction Email: fkarboski@plumleyeng.com
Email: pros@plumleyeng.com

We offer the following in accordance with the specifications provide.

Rating: 80 SCFM @ 42" W.G. Vac

System Includes the following:

1 Ametek Rotron Chemical Blower
- Model #DR454R72MA
- 1.5 H.P., Inverter Duty, three phase, 230/460 Volt, 60 Hz, T.E.F.C. Motor
- 1.5 F.N.P.T. Connections

1 Ametek Noise Reduction-Inline Muffler
- Model #550888
- 4" N.P.T. Connection

1 Ametek Inline Vacuum Filter
- Model #515254
- 1.5" F.N.P.T.
- Element #516434 Included

1 Ametek Vacuum Regulator
- Model #515092
- 1" F.N.P.T. Connection

1 Ametek Moisture Separator
- Model #MS200PS
- Vacuum Relief Valve
- Plastic Tank
- Float Switch
- ¾" N.P.T. Drain

TO: Plumley Engineering 6/9/11 Page

2 Ametek Pressure Gauges
- Model #271949
- O – 160" W.G.
- ¼" N.P.T.

0 - 60"

2 Ametek Vacuum Gauges
- Model #271950
- O – 160" W.G.
- ¼" N.P.T.

0 - 60" 551376

2 Mercer Vacuum Flex Connection
- Model #SFU1.5 N.P.T.
- 1.5 F.N.P.T. Connection

1 ABB Control Panel Model #ACS550 VFD, 230/1 input, 230/3 output, 12A Normal Duty, 150% overload rated. Wall mount NEMA 3R Drive Package (29" H x 24" W x 12" D) includes:
- NEMA 3R rated Weatherflo Forced Air Enclosure, Thermostatically Controlled
- RAL 9003 White Polyester finish with low Solar Absorption
- Non-fused Disconnect, through the door operated
- Hand – off – auto selector switch
- Speed pot
- Seven day timer
- 150VA Control power transformer, fused
- Detachable Keypad Control Panel for user interface, parameter adjustment, and local drive operation mounted on the front of the drive
- Patent Pending Swinging Choke Design for Harmonic Mitigation, 5% Impedance
- (Two) Programmable Analog (4 – 20 mA) Outputs
- (Two) Programmable Analog (4 – 20 mA) Inputs
- (Three) 8A @ 24VDC or 250VAC Switching Capacity, single pole double throw Programmable Output Relays

TOTAL PRICE: **$10,886.00**
PRICE INCLUDES: Freight to the Syracuse, NY Area
SHIPMENT: 8 – 10 Weeks

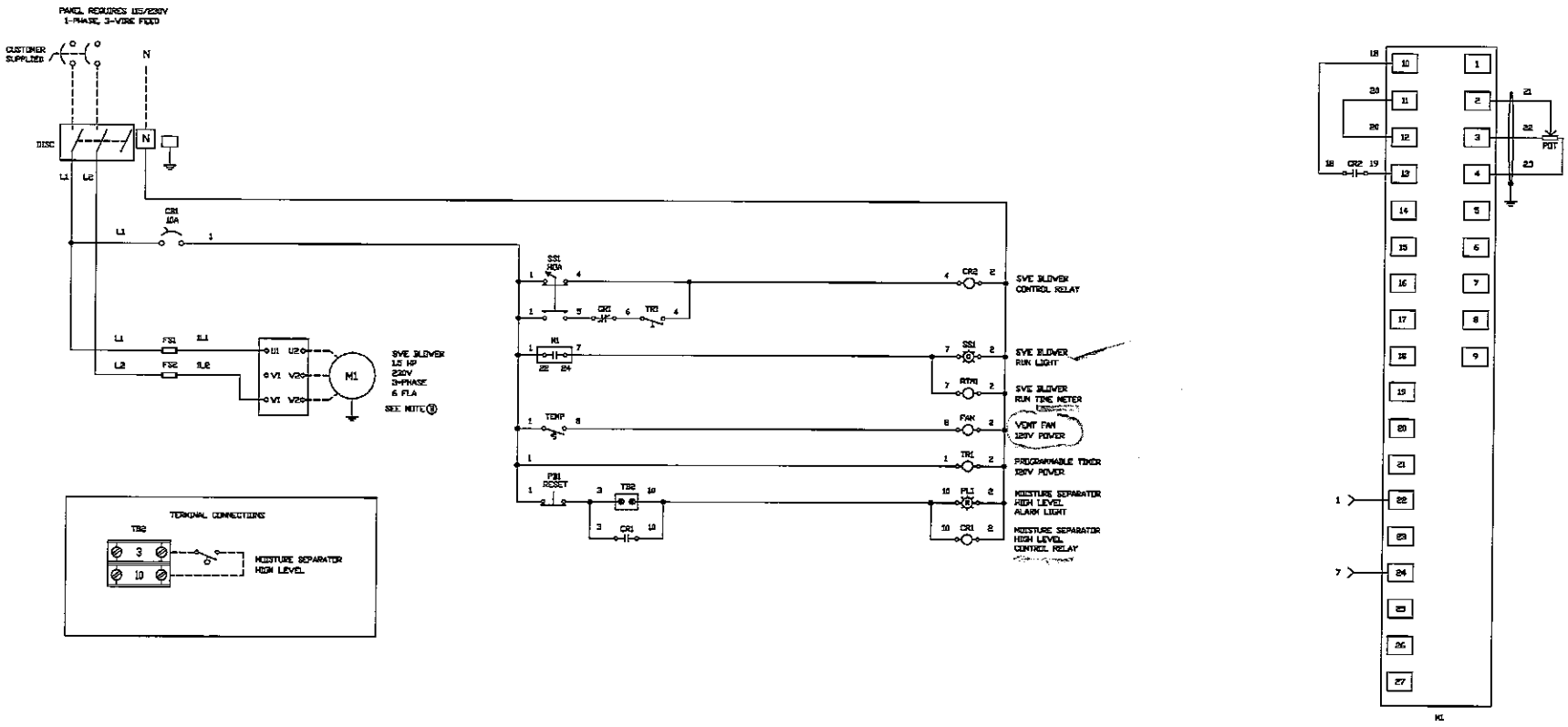
The above items are all shipped loose. Price does not include installation, piping, wiring or any other item not shown above.

Please find the attached data. Feel free to contact me with any questions.

Best Regards,

Bob Scherfner
scherfner@gartnerequipment.com
www:gartnerequipment.com
mna

attach.



NOTE ① BASED ON THE NEC
ACTUAL RATINGS MAY VARY
SET OVERLOAD RELAYS ACCORDINGLY

UL508A LISTED

REV.	DESCRIPTION	DATE	APPR.
	REVISIONS		

DRWN BY	SDH
DATE	1/5/12
CHK BY	
DATE	
APPR BY	
DATE	

Air Energy, Inc.

TITLE: CONTROL PANEL

Air Energy, Inc.
So. Easton, MA

JOB NO. 21989

SCALE	SIZE	DWG NO.	SHEET	REV
N/A	B	21989RBS	1 OF 2	PRELIM

APPENDIX K

OIL RECOVERY SYSTEM INSPECTION CHECKLIST

OIL RECOVERY SYSTEM
INSPECTION CHECKLIST
2802 – 2810 Lodi Street
City of Syracuse, Onondaga County, New York

Name of Inspector: _____ Date: _____

Company Identification: _____

INDOOR INSPECTION ITEMS:

Blower motor run timer reading (hours): _____

Hand – Off – Auto Switch Setting (should be on auto): _____

Is system on 24-hour cycle timer? _____ If yes, note settings: _____

Blower Operating Vacuum and Pressure Readings:

Vac #1: _____
Vac #2: _____
Vac #3: _____
PSI #1: _____
PSI #2: _____

Blower noise and vibration check: _____

Condition of particulate filter: _____

PID readings: influent _____and effluent _____air stream (if carbon treatment is still be provided) or of air discharge if no carbon treatment is provided_____

List of Wells Online: _____

_____

Vacuum readings on each of the wells on-line (at manifold):

_____

_____

_____

Check for water in the separation tank: _____

Any piping leaks: _____

Record any modifications to the system; attach photos and any invoices:

_____

_____

_____

Maintenance activities conducted if any:

_____

_____

_____

_____

_____

OUTDOOR INSPECTION ITEMS:

Confirm building and fence enclosures are secured (locked):

_____

Any deficiencies with the building:

_____

_____

Condition of the well ahead vaults, note any deficiencies:

_____

_____

_____

Condition and proper installation of inner caps on the wells:

_____

_____

_____

Vacuum readings at each wellhead:

Note any recommendations for building or system component maintenance:

APPENDIX L

GENERAL OIL STORAGE AND DISPOSAL PROCEDURES

GENERAL OIL STORAGE AND DISPOSAL PROCEDURES

GENERAL

Testing of the oil present at the Site has identified polychlorinated biphenyls (PCBs) exceeding 50 parts per million (ppm). Therefore, the oil recovered from the system is to be handled and disposed of as hazardous PCB waste. New York waste code for the material is B002. Disposal from the Site is to be arranged periodically, such that no more than two 55-gallon drums of oil is stored at the Site. Drums used are to be new steel containers meeting Department of Transportation (DOT) specifications for transport. At all times, the drums are to be stored inside the equipment shed with plugs in place and tightened, the equipment shed locked and the security perimeter fence locked. Only personnel with the appropriate HAZWHOPPER training are allowed to handle the oil wastes.

DISPOSAL

The following procedures are required to arrange disposal of the oil:

1. Indentify a disposal/reclamation facility permitted for such waste with the New York State Department of Environmental Conservation (DEC) and that will accept the material. Obtain the appropriate testing requirements and profile application form from the receiving facility. An environmental contractor experienced in waste disposal can be contracted to handle the disposal logistics.

2. Arrange for the sampling and complete the appropriate analytical testing required by the receiving facility.

3. Forward the required test results and facility profile application to the receiving facility for approval. The profile forms require an identification of the generator of the waste and

signing of the forms by the generator or the generators authorized agent. The generator is Quanta Resources / Syracuse PRP Group. The generator identification number is NYD980592448.

4. A hauler for the material with an approved transportation permit for the waste will be required to manifest and transport the waste to the designated facility.

5. Copies of the profile application, transport manifest and receipt of disposal from the receiving facility is to be retained for all waste removed from the site and kept on file for DEC inspection if requested and inclusion in future reports, as required.

Identified disposal facility: CWM Chemical Services, Inc.
1550 Balmer Road
Model City, New York

APPENDIX M

ENVIRONMENTAL EASEMENT

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this _____day of _____, 20__, between Owner(s) Quanta Resources Corporation, having an office at 229 South State Street, County of Kent, State of Delaware (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor, is the owner of real property located at the address of 2802-10 Lodi Street in the City of Syracuse, County of Onondaga and State of New York, known and designated on the tax map of the County Clerk of Onondaga as tax map parcel numbers: Section 002 Block 01 Lot 8, being the same as that property conveyed to Grantor by deed dated July 29, 1980 and recorded in the Onondaga County Clerk's Office in Liber and Page Liber 2812 page 107 and Liber 2838 page 5. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately .413 +/- acres, and is hereinafter more fully described in the Land Title Survey dated October 31, 2012 and revised on June 11, 2013, June 19, 2013, August 13, 2013, October 31, 2013 and November 5, 2013 prepared by Douglas J. Reith, which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation

established for the Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Order on Consent Index Number: D7-0001-07-07, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement")

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP.

(4) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(5) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(6) All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

(7) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP.

(8) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP.

(9) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential, Restricted Residential or Commercial purposes as defined in 6NYCRR 375-1.8(g)(i), (ii) and (iii), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall annually, or such time as NYSDEC may allow, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved b the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5 the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be

defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:

Site Number: 734013
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the

recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Quanta Resources Corporation:

By: _____

Print Name: _____

Title:_____ Date:_____

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF)

On the _____ day of _____, in the year 20 __, before me, the undersigned, personally appeared _____, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

_____
Notary Public - State of New York

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: _____
Robert W. Schick, Acting Director
Division of Environmental Remediation

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the _____ day of _____, in the year 20__, before me, the undersigned, personally appeared Robert Schick, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

_____
Notary Public - State of New York

SCHEDULE "A" PROPERTY DESCRIPTION

PARCEL A:

ALL THAT TRACT OR PARCEL OF LAND, situate in the City of Syracuse, County of Onondaga and State of New York and being part of Lot Number Nine in Block Number Twelve of the former Village of Salina, now City of Syracuse, bounded and described as follows: Beginning on Lodi Street at a point ninety-nine (99) feet westerly from the corner of Wolf and Lodi Streets; thence easterly along Lodi Street fifty-one and two-thirds (51-2/3) feet; thence northerly parallel with Wolf Street forty-five and one-fourth (45 ¼) feet; thence westerly parallel with Lodi Street fifty-one and two-thirds (51-2/3) feet thence southerly parallel with Wolf Street to the place of beginning.

EXCEPTING that part thereof sold for railroad purposes and described as follows: Beginning on the division line between lands formerly owned by Patrick Maloney, Anna Burgess and other mentioned at Abstract 8 of a certain search and Abstract of Title of said premises and those formerly owned by Elizur Clark on the east and twenty-four feet northerly from the northerly line of Lodi Street measured on said division line; thence north thirty-four degrees (34°) E. twenty-six (26) feet to corner; thence N. fifty-six degrees (56°) W. forty-one and one-half feet; thence S. twenty degrees thirty minutes (20° 30') E to the place of beginning.

PARCEL B:

ALL THAT TRACT OR PARCEL OF LAND situate in the City of Syracuse, County of Onondaga and State of New York, being designated as Parcel No. NYF-20C-096 on Railroad Valuation Map No. 500-1220-0-4B-4 and being more particularly bounded and described as follows:

Beginning at a point in the northerly line of Lodi Street, distant 99 feet measured along the northerly line of Lodi Street from the intersection of the northerly line of Lodi Street with the westerly line of Wolf Street; thence North 61° 46' 30" West, a distance of 53.00 feet along the northerly line of Lodi Street to a point on the easterly line of property conveyed to the City of Syracuse as recorded in the Onondaga County Clerk's Office in Book of Deeds 537 at Page 163, said easterly property line being the former Oswego Canal "Blue Line"; thence North 22° 35' 41" West, a distance of 4.20 feet along said easterly line of property of the City of Syracuse and former Oswego Canal "Blue Line" to a point therein; thence North 13° 16' 38" West, a distance of 59.15 feet along aforesaid former "Blue Line" to an angle point therein; thence North 12° 34' 23" West, a distance of 61.85 feet along aforesaid former "Blue Line" to an angle point therein; thence North 5° 58' 18" West, a distance of 125.60 feet along aforesaid former "Blue Line" to the northerly boundary of said Lot No. 1, Block 12; thence South 61° 46' 10" East along the northerly boundary of said Lot No. 1 of Block 12, a distance of 74.93 feet to a point on a curve, said point being distant 15 feet measured southwesterly and radially from the centerline of the near westerly railroad track; thence southerly along a curve to the left having a radius of 342.65 feet, an arc distance of 84.48 feet to a point of compound curvature; thence southerly along a curve to the left having a radius of 1512.65 feet, an arc distance of 122.81 feet to the northerly boundary of lands conveyed by Portland Holding Corporation to Quanta Resources Corporation by deed dated July 29, 1980 and recorded in the Onondaga County Clerk's Office August 1, 1980 in Book 2812 of Deeds at Page 107, said point being 15 feet distant southwesterly and radially from the centerline of the near westerly railroad tract; thence North 61° 46' 30" West along the northerly boundary of lands conveyed to Quanta Resources Corporation, a distance of 7.59 feet to the northwesterly corner thereof; thence South 28° 15' 30" West along the westerly boundary of lands of Quanta Resources Corporation, a distance of 45.25 feet to the point of beginning.

PARCEL C:

ALL THAT TRACT OR PARCEL OF LAND, situate in the City of Syracuse, County of Onondaga and State of New York, and being part of Lot 9 of Block 12 in the City of Syracuse, being designated as Parcel No. NYF-20C-096 on Railroad Valuation Map No, 500-1220-0-4B-4 and being more particularly bounded and described as follows:

BEGINNING at a point in the northerly street line of Lodi Street, said point being located North 61° 46’ 30” West, a distance of 37.70 feet as measured along the northerly line of Lodi Street from the intersection of the northerly street line of Lodi Street with the westerly street line of Wolf Street, said point of beginning also being 15 feet distant measured southwesterly and radially from the centerline of the near westerly railroad track; thence North 61° 46’ 30” West along the northerly line of Lodi Street, a distance of 9.64 feet to the southeasterly corner of said lands conveyed to Quanta Resources Corporation; thence North 28 ° 15’ 30” East, along the easterly boundary of said lands, a distance of 7.81 feet to a point on a curve, said point being 15 feet distant as measured southwesterly and radially from the

centerline of the near westerly railroad track; thence southerly along a curve to the left having a radius of 1512.65 feet for a distance of 12.40 feet to the point of beginning.

The above described parcels are more recently described by the following perimeter description:

ALL THAT TRACT OR PARCEL OF LAND situate in the City of Syracuse, County of Onondaga, State of New York, being part of Lots 1 and 9, Block 12 in said city and being more particularly described as follows:

Beginning at an iron rod with cap found in the northerly line of Lodi Street, said iron rod with cap being N.61º46'30"W., 37.68 feet from the intersection of the northerly line of said Lodi Street with the westerly line of Wolf Street, said point also being the intersection of the common line between lands now or formerly owned by Quanta Resource Corporation as recorded in the Onondaga County Clerk's Office in Liber of Deeds #2838, Page #06 and lands now or formerly owned by Fred Raynor as recorded in Onondaga County Clerk's Office in Liber of Deeds #4940, Page #33 with the northerly line of said Lodi Street;
Thence N.61º46'30"W., along the northerly line of said Lodi Street a distance of 114.32 feet to an iron rod with cap found for corner in the easterly line of lands now or formerly owned by the City of Syracuse;
Thence N.22º35'41"W., along the easterly line of said City of Syracuse property a distance of 4.20 feet to an iron rod with cap found for corner;
Thence N.13º16'38"W., continuing along the easterly line of said City of Syracuse property a distance of 59.15 feet to an iron rod with cap set for corner;
Thence N.12º34'23"W., continuing along the easterly line of said City of Syracuse property a distance of 61.85 feet to an iron rod with cap found for corner;
Thence N.05º58'18"W., along the easterly line of said City of Syracuse property a distance of 125.60 feet to a point for corner in the southerly line of lands now or formerly owned by Fred Raynor as recorded in the Onondaga County Clerk's Office in Liber of Deeds #4940, Page #33;
Thence S.61º46'10"E., along the southerly line of said Raynor property, a distance of 74.93 feet to an iron rod with cap found for corner in the curving westerly line of said Raynor property, said curve being to the left and having a central angle of 14º07'34", a radius of 342.65 feet and a chord bearing and distance of S.08º36'17"E., 84.27 feet;
Thence along said curve to the left and the westerly line of said Raynor property an arc distance of 84.48 feet to an iron rod with cap set for the beginning of a compound curve to the left having a central angle of 04º39'07", a radius of 1512.65 feet and a chord bearing and distance of S.17º59'38"E., 122.78 feet;
Thence along said curve to the left and the westerly line of said Raynor property an arc distance of 122.82 feet to an iron rod with cap set for corner;
Thence N.61º46'30"W., a distance of 7.61 feet to an iron rod with cap set for corner;
Thence S.39º25'10"E., along the westerly line of said Raynor property, a distance of 55.86 feet to an iron rod with cap found for corner;
Thence S.28º17'38"W., continuing along the westerly line of said Raynor property a distance of 16.18 feet to an iron rod with cap found in the curving westerly line of said Raynor property, said curve being to the left and having a central angle of 00º28'15", a radius of 1512.65 feet and a chord bearing and distance of S.22º44'39"E., 12.43 feet;
Thence along said curve to the left and the westerly line of said Raynor property, an arc distance of 12.43 feet to the point of beginning.