# Penetrex Processing Company Site
# State Superfund Project
**NASSAU, NEW YORK**

# Site Management Plan

**NYSDEC Site Number: 130034**

**Prepared for:**
Glenwood Realty LLC
P.O. Box 1356
Roslyn Heights, NY 11577

**Prepared by:**
P.W. Grosser Consulting, Inc.
630 Johnson Avenue, Suite 7
Bohemia, NY 11716
(631) 589-6353

**Revisions to Final Approved Site Management Plan:**

| Revision # | Submitted Date | Summary of Revision | DEC Approval Date |
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# SITE MANAGEMENT PLAN

## 1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

### 1.1 INTRODUCTION

This document is required as an element of the remedial program at the Penetrex Processing Company Site (hereinafter referred to as the "Site") under the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program administered by New York State Department of Environmental Conservation (NYSDEC). The Site was remediated in accordance with Order on Consent Index # W1-1157-06, Site # 130034, which was executed on May 7, 2012.

#### 1.1.1 General

Glenwood Realty LLC entered into an Order on Consent with the NYSDEC to remediate an approximately one-acre property located in Glenwood Landing, Nassau, New York. This Order on Consent required the Remedial Party, Glenwood Landing LLC, to investigate and remediate contaminated media at the Site. A map showing the Site location is provided in **Figure 1**. A Site plan showing boundaries of this approximately one-acre "Site" is provided in **Figure 2**. The boundaries of the Site are more fully described in the metes and bounds Site description that is part of the Environmental Easement.

After completion of the remedial work described in the Interim Remedial Measure 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 P.W. Grosser Consulting, Inc. (PWGC) on behalf of Glenwood Realty LLC 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. The Environmental Easement is included as **Appendix B**.

### 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 Nassau 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 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 (Site #130034) 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 Hamlet of Glenwood Landing, County of Nassau, New York and is identified as Section 20, Block K, and Lots 10, 11, and 12 on the Nassau County Tax Map. The Site is an approximately one-acre area bounded by an oil tank facility to the north, residential property to the south, West Street to the east, and Shore Road to the west (see **Figure 2**). The boundaries of the Site are more fully described in **Appendix C** – Metes and Bounds.

### 1.2.2 Site History

A former dry cleaning business, known as Penetrex Processing, Inc. (Penetrex), is reported to have operated at the Site for several years prior to abandoning the facility in 1984. During its operation at the Site, Penetrex is reported to have discharged dry cleaning chemicals to an on-Site sanitary system and/or drywells at the property. A manufacturer of adhesive nameplates known as the Nameplate Corporation also formerly occupied the Site.

In 1984, the Nassau County Department of Health (NCDH) sampled an on-Site drywell associated with the former Penetrex facility and determined that constituents of dry-cleaning solvents, trichloroethene (TCE) and tetrachloroethene (PCE), were present in soils at the base of the structure. The impacted drywell was subsequently remediated in 1985 under a summary abatement order, completed by K&W Associates (property owner).

Additional testing and Site characterization, which included the installation of six (6) soil borings and four (4) monitoring wells, soil and groundwater sampling, and air monitoring, were performed at the property in 1989 and 1990 by Blasland and Bouck Engineers under purview of the NYSDEC as part of a PRP (potentially responsible party) Study.

In 1993, Lawler, Matusky and Skelly Engineers (LMS) installed two additional monitoring wells at the Site (at the direction of the NYSDEC) and performed additional

groundwater sampling at the facility in an effort to confirm the direction of groundwater flow underlying the property and the extent of dissolved volatile organic compounds (VOCs) in on-Site groundwater. LMS had concluded in their 1993 NYSDEC Inactive Hazardous Waste Site (IHWS) report for the Penetrex Processing Site that "an ongoing discharge or continued release from residual waste in the soils . . . from several contaminant source locations on the Site . . . appear to remain as a continuing source of groundwater contamination."

### 1.2.3 Geologic Conditions

The on-Site geology consists of aquifers (mostly sand) and confining units (clay layers). The shallowest aquifer, the Upper Glacial, is approximately 100 feet thick and is underlain by the Port Washington confining unit. The Port Washington Aquifer, Raritan Clay, and Lloyd Aquifer are also present beneath the Site to a depth of approximately 475 feet. Beneath the aquifers and confining layers there is relatively impermeable bedrock. The groundwater at the Site is between 11 and 18 feet below grade (the Site ground surface is sloped, with the higher elevation to the east of the Site) and flows to the west toward Hempstead Harbor, which is approximately 300 feet to the west.

## 1.3 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

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

- *Remedial Investigation Report, 1 Shore Road, Glenwood Landing*, PWGC, August 2002
- *Interim Groundwater Investigation Report, 1 Shore Road, Glenwood Landing*, PWGC, March 2004 (Addendum, August 2004)
- *Final Groundwater Investigation / Soil Gas Sampling Report, 1 Shore Road, Glenwood Landing*, PWGC, April 2005 (Revised October 2005)
- *Sub-Slab Vapor & Indoor Air Investigation Report, 1 Shore Road, Glenwood Landing*, PWGC, November 2005
- *Indoor Air Sampling Report, 1 Shore Road, Glenwood Landing*, PWGC, June 2006

- *Subsurface Investigation Report, 1 Shore Road, Glenwood Landing*, PWGC, November 2006
- *Sub-Slab Depressurization System Testing and As Built Drawing, 1 Shore Road, Glenwood Landing*, PWGC, August 2007

Generally, the RI determined that concentrations of several VOCs, including PCE and TCE, exceeded NYSDEC Ambient Water Quality Standards in the Site's groundwater which is apparently the result of the improper discharge of dry cleaning chemicals to sanitary leaching pool DW-5 and/or storm water drywell DW-1 located in the eastern portion of the Site, and that these VOCs had created a potential soil vapor intrusion condition in the Site's buildings.

Below is a summary of Site conditions when the RI was performed in 2001 through 2009:

Soil

As part of the Remedial Investigation, soil borings were performed at the Site in October 2006, subsurface soil samples were collected to a depth of 30 feet below ground surface to determine the nature and extent of the subsurface soil contamination. PCE or cis-1,2-dichloroethene were detected in five of the submitted soil samples at concentrations exceeding the Unrestricted Use Soil Cleanup Objectives (SCOs) set forth in 6 NYCRR Part 375-3.6 at depths ranging between 12 feet and 25 feet below ground surface. **Figure 4** indicates the soil borings performed during the remedial investigation. Soil boring analytical results are summarized on **Table 1**.

Site-Related Groundwater

Groundwater samples were collected to determine the nature and extent of the groundwater contamination. Permanent groundwater monitoring wells and temporary groundwater probes were installed throughout the Site to locate the groundwater contamination. The sample collection events located the source and extent of the contamination. VOCs are the contaminant of concern from this Site. Other contaminants, such as semi-volatile organic compounds (SVOCs), were ruled out as contaminants of concern in the historical investigations based upon the low concentrations of those contaminants discovered in the samples collected. The source of

the contamination is from the disposal of VOCs to sanitary leaching pool DW-5 and/or storm water drywell DW-1. The extent of the groundwater contamination has been determined to be limited to the on-Site groundwater. A baseline groundwater contamination contour map is included as **Figure 5**. Baseline groundwater analytical results are summarized on **Table 2**.

Site-Related Soil Vapor Intrusion

Soil vapor intrusion sampling was conducted to evaluate the potential for soil vapor intrusion into on-Site structures and to determine if there was substantial soil vapor contamination from the disposal of hazardous wastes. Sub-slab vapor samples were collected from beneath the on-Site structures. Soil vapor contamination was detected under the on-Site structures.

Indoor air samples were collected from the on-Site structures. Detected concentrations of VOCs were within the Air Guideline Values specified in the *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, dated October 2006.

Sub-slab vapor and indoor air VOC concentrations are summarized on **Table 3**. Sampling locations are indicated on **Figure 6**.

Underground Storage Tanks

Underground storage tanks (USTs) have not been detected at the subject Site.

## 1.4 SUMMARY OF REMEDIAL ACTIONS

The Site was remediated in accordance with the NYSDEC-approved Interim Remedial Measure Work Plan dated May 2008.

The following is a summary of the Remedial Actions performed at the Site:

1. Site Execution and recording of an Environmental Easement to restrict land use and prevent future exposure to any contamination remaining at the Site.
2. Design and installation of two sub-slab depressurization systems (one for the commercial structure and one for the residential structure) to mitigate the potential for soil vapor intrusion.

3. Implementation of an in-situ chemical injection program to treat chlorinated VOCs in groundwater.

4. 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 January 2009.

### 1.4.2 Site-Related Treatment

In order to treat the VOC impacted groundwater at the Site, an in-situ chemical injection program was implemented at the Site. A chemical solution of potassium permanganate was injected through temporary points in the delineated area of contamination in the eastern portion of the Site's parking area. The injection program followed the scope of work specified in the NYSDEC-approved *IRM Work Plan* prepared by PWGC. The intent of the chemical oxidant injection was to significantly reduce the mass of contamination in the subsurface through the oxidation of VOCs in the high concentration area. The injection points are shown on **Figure 8**.

### 1.4.3 Remaining Contamination

As part of the Remedial Investigation, soil borings were performed at the Site in October 2006, subsurface soil samples were collected to a depth of 30 feet below ground surface to determine the nature and extent of the subsurface soil contamination. PCE or cis-1,2-dichloroethene were detected in five of the submitted soil samples at concentrations exceeding the Unrestricted Use Soil Cleanup Objectives (SCOs) at depths ranging between 12 feet and 25 feet below ground surface. However, detected concentrations were within Restricted Residential SCOs. **Figure 4** indicates the soil borings performed during the remedial investigation. A soil cross-section is included as **Figure 4A**. Soil boring analytical results are summarized on **Table 1**.

Semi-annual groundwater monitoring has been conducted at the site since October 2010, prior to which the groundwater was monitored on a quarterly basis. Groundwater

Monitoring is conducted in accordance with PWGC's *IRM Work Plan*, May 2008. Monitoring includes the collection of groundwater samples from each of the twelve (12) monitoring wells**.** The analytical results for the latest (April 2011) sampling round are presented in **Figure 8**, and historical groundwater sampling results are summarized in **Table 2**. A cross-section indicating groundwater conditions is included as **Figure 8A**.

Analytical results indicate that the most elevated concentrations of VOCs remain in the shallow groundwater in the eastern area of the Site, centered around stormwater drywell DW-1 and sanitary leaching pool DW-5. Results from down-gradient monitoring wells have indicated low concentrations of dichloroethene and vinyl chloride, which are breakdown products of PCE and TCE. The occurrence of these compounds indicates the reductive dechlorination of PCE and TCE.

# 2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

## 2.1 INTRODUCTION

### 2.1.1 General

Since remaining contaminated groundwater and 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 Soil Cover

Exposure to remaining contamination in soil/fill at the Site is prevented by a soil cover. This cover system is comprised of a minimum of 12 inches of clean soil, asphalt pavement, concrete-covered sidewalks, and concrete building slabs. The Excavation Work Plan that appears in Appendix A 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. On-site soils will be handled in accordance with DER-10 Chapter 5.4(e).

2.2.1.2 Sub-slab Depressurization Systems

Due to the presence of elevated sub-slab VOCs, two sub-slab depressurization systems (SSDS) are in operation at the Site to mitigate the potential for exposure. One SSDS was installed in the residential building in April 2007 and one SSDS was installed in the commercial building in June 2007. Both SSDS are active single loop systems with perforated piping located beneath the concrete slabs of the buildings. Riser pipes connect the systems to fans which draw out sub-slab vapors through the discharge vents above the rooflines of the respective buildings, and create a negative pressure beneath the slabs. The locations of the SSDS are indicated on **Figure 7** and As-Built drawings are included in **Appendix D**. The fans run continuously to sustain a negative pressure beneath the slabs and mitigate the potential for vapor intrusion into the buildings. Communication tests performed for each system confirmed the effectiveness of the systems, that a negative pressure was created to draw out vapors from beneath the slabs of the structures. Based on the tests, the operation of the SSDS effectively mitigates the potential for soil vapor intrusion.

Procedures for operating, maintaining, and monitoring the SSDS are documented in the Operation and Maintenance Plan (Section 4 of this SMP). The Monitoring Plan

(Section 3) addresses severe condition inspections in the event that a severe condition, which may affect controls at the Site, occurs.

2.2.1.2 In-Situ Chemical Treatment

In situ chemical treatment was conducted to reduce groundwater contamination at the Site. The injection of potassium permanganate was performed in December 2008 and January 2009 through 17 temporary injection points installed throughout the source. Injection locations are indicated on **Figure 8**. The in-situ chemical treatment of the Site is documented in the *IRM Report*.

On a semi-annual basis the groundwater data will be evaluated relative to the need for additional injections. If additional injections are required, an evaluation to determine an appropriate amount of solution and number and location of injection points would be made based upon the most recent analytical results.

### 2.2.2 Criteria for Completion of Remediation/Termination of Mitigation 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 6.4 of NYSDEC DER-10.

2.2.2.1 Sub-slab Depressurization Systems (SSDS)

The active SSD system will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the SSD system is no longer required, a proposal to discontinue the SSD system will be submitted by the property owner to the NYSDEC and NYSDOH.

2.2.2.2 In-Situ Chemical Oxidant Injections

On a semi-annual basis the groundwater data will be evaluated relative to the need for additional ISCO injections. Specifically, the data will be reviewed and inspected for evidence that VOC levels have stabilized, or nearly stabilized (i.e., reached asymptotic levels). If stabilized levels are greater than five times the respective standard (e.g., >25 µg/L for PCE, using the PCE standard of 5 µg/L), or it appears that the levels will stabilize at or above this level, then an additional round of ISCO injections will be

planned. The NYSDEC reserves the right to direct the performance of additional ISCO injections if, in the NYSDEC's judgment, sufficient progress toward remediation is not occurring. Alternatively, if stabilized PCE levels are below 25 μg/L, or it appears that the levels will stabilize below 25 μg/L, then a petition may be made to NYSDEC to forego additional ISCO injections. If individual monitoring wells exhibit contaminant concentrations below the NYSDEC groundwater standards for two consecutive rounds, a petition may be made to remove them from future sampling events. The rationale for recommending the discontinuation of monitoring will depend on whether SCGs are achieved at all sampling points for two consecutive monitoring rounds. Any modifications or discontinuance of these monitoring activities will only occur after approval of such changes 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 Restricted Residential 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.
- Groundwater, soil vapor and other environmental or public health monitoring 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 Restricted Residential use provided that the long-term Engineering and Institutional Controls included in this SMP are employed.
- The property may not be used for unrestricted use without additional remediation and amendment of the Environmental Easement, as approved by the NYSDEC;
- 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 in the area noted on **Figure 2**, 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 residential use. Any future intrusive work that will penetrate the soil cover or cap, or encounter or disturb the remaining contamination, including any modifications or repairs to the existing cover system will be performed in compliance with the Excavation Work Plan (EWP) that is attached as Appendix A 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 E** to this SMP that is in current compliance with DER-10, and 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 (See 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 located over areas that contain remaining contamination and the potential for soil vapor intrusion (SVI) has been identified (see **Figure 2**), an 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. If any indoor air test results exceed NYSDOH guidelines, relevant NYSDOH fact sheets will be provided to all tenants and occupants of the property within 15 days of receipt of validated data.

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 property owner 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, the IRM Report, the IRM Work Plan, the Subsurface Investigation Report, the Indoor Air Sampling Report, the Sub-Slab Vapor and Indoor Air Sampling Report, the Revised Groundwater Investigation / Soil Gas Sampling Report, the Interim Groundwater Investigation Report, the Remedial Investigation Report and 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. Prompt contact should also be made to PWGC. These emergency contact lists must be maintained in an easily accessible location at the Site.

**Table 4: Emergency Contact Numbers**

| | |
|---|---|
| Medical, Fire, and Police: | 911 |
| One Call Center: | (800) 272-4480<br>(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 |

**Table 5: Contact Numbers**

| | |
|---|---|
| P.W. Grosser Consulting, Inc.: | (631) 589-6353 |
| Glenwood Realty | (516) 484-1234 |
| | |
| | |
| | |

* Note: Contact numbers subject to change and should be updated as necessary

### 2.5.2 Map and Directions to Nearest Health Facility

Site Location: 1 Shore Road, Glenwood Landing, New York 11547

Nearest Hospital Name: St. Francis Hospital

Hospital Location: 100 Port Washington Blvd., Roslyn, New York 11576

Hospital Telephone: (516) 562-6000

Directions to the Hospital:

1. Turn left (south) on Shore Road
2. Shore Road becomes Scudders Lane
3. Turn right onto Glenwood Road
4. Turn right onto Bryant Avenue
5. Turn left onto Witte Lane
6. Take ramp right and follow signs for RT-25A West
7. Bear right onto RT-25A / Northern Boulevard
8. Turn right onto RT-101 / Port Washington Boulevard

Total Distance: 3.7 miles

Total Estimated Time: 10 minutes

**Map Showing Route from the Site to the Hospital:**

See **Figure 9**

### 2.5.3 Response Procedures

As appropriate, the fire department and other emergency response groups will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (**Table 4**). The list will also be posted prominently at the Site and made readily available to all personnel at all times.

The potential exists for spills of chemical oxidants during injection events. Such spills will be immediately recovered by injection personnel following procedures and utilizing equipment specified by the manufacturer of the chemical oxidant. Injection personnel will be trained on such procedures and on the use of such equipment prior to the implementation of the injection event.

If a condition exists at the Site which requires evacuation (i.e. fire), the site will be immediately evacuated and emergency services will be contacted by telephone.

Proposed amendments to the contingency plan will be submitted to the NYSDEC for approval prior to implementation.

# 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. 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:

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

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

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

- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Semi-annual monitoring of the performance of the remedy and overall reduction in contamination on-Site will be conducted for the first year. The frequency thereafter will be determined by NYSDEC. Trends in contaminant levels in groundwater in the affected areas will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in **Table 6.** Groundwater monitoring and SSDS inspections are outlined in detail in Sections 3.2 and 3.3. Indoor and outdoor air sampling are detailed in Section 4.3.

**Table 6: Monitoring/Inspection Schedule**

| Monitoring Program | Frequency* | Matrix | Analysis |
|---|---|---|---|
| Groundwater Monitoring | Semi-Annual | Groundwater | VOCs by USEPA Method 8260 |
| SSDS Inspection | Annual | Equipment | Visual Inspection |
| Indoor Air Sampling | Annual | Air | VOCs by USEPA Method TO-15 |
| Outdoor Air Sampling | Annual | Air | VOCs by USEPA Method TO-15 |

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

## 3.2 MEDIA MONITORING PROGRAM

### 3.2.1 Groundwater Monitoring

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

The network of monitoring wells has been installed to monitor both up-gradient and down-gradient groundwater conditions at the Site. The network of on-Site wells and the off-Site well has been designed based on the following criteria:

The locations of the monitoring wells are indicated on **Figure 3**. Monitoring well MW-1 was installed to monitor groundwater quality at the water table at an up-gradient location in order to measure up-gradient background water quality. Monitoring wells MW-2 through MW-5 are located down-gradient of the impacted area to determine if impacted groundwater has migrated toward the Site boundary. Monitoring well MW-6 is located off-Site across Shore Road to determine if impacted groundwater has migrated off-Site in the northwest direction. Monitoring well MW-7 was installed in the location where the most impacted groundwater was detected during the October 2003 groundwater investigation. However, based upon additional investigation, MW-7 is actually located cross gradient to the most impacted area. Monitoring well MW-8 was located in the most impacted area. Monitoring well MW-8D is located adjacent to MW-8, but is screened at 40 to 50 feet bgs to monitor groundwater quality at greater depth. Monitoring well MW-9 was located down-gradient of the center of impact to measure near down-gradient water quality. Monitoring well MW-9D is located adjacent to MW-9 but is screened at 40 to 50 feet bgs to monitor deeper groundwater quality. Monitoring well MW-10 was located cross-gradient to the south of the center of impact. Each of the wells was screened at the water table with the exception of MW-8D and MW-9D.

Monitoring well construction logs are included in **Appendix F**.

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

Deliverables for the groundwater monitoring program are specified below.

On a semi-annual basis the groundwater data will be evaluated relative to the need for additional ISCO injections. Specifically, the data will be reviewed and inspected for evidence that VOC levels have stabilized, or nearly stabilized (i.e., reached asymptotic levels). If stabilized levels are greater than five times the respective standard (e.g., >25 µg/L for PCE, using the PCE standard of 5 µg/L), or it appears that the levels will

stabilize at or above this level, then an additional round of ISCO injections will be planned. Additional ISCO injections would be performed following the IRM Work Plan procedures.

Alternatively, if stabilized PCE levels are below 25 µg/L, or it appears that the levels will stabilize below 25 µg/L, then a petition may be made to NYSDEC to forego additional ISCO injections. If individual monitoring wells exhibit contaminant concentrations below the NYSDEC groundwater standards for two consecutive rounds, a petition may be made to remove them from future sampling events. The rationale for recommending the discontinuation of monitoring will depend on whether SCGs are achieved at all sampling points for two consecutive monitoring rounds. The NYSDEC reserved the right to direct the performance of additional ISCO injections if, in the NYSDEC's judgment, sufficient progress toward remediation is not occurring. Any modifications or discontinuance of these monitoring activities will only occur after approval of such changes by the NYSDEC.

#### 3.2.1.1 Sampling Protocol

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

The monitoring wells will be sampled by a low stress (low flow) method to collect representative samples while producing a minimal amount of purge water. Sampling will be performed with dedicated instruments to prevent cross-contamination between well locations. Purging of each well will continue until the turbidity is less than or equal to 50 Nephelometric Turbidity Units (NTUs), and when pH, temperature, and conductivity measurements stabilize. Stabilization will be considered achieved when three consecutive readings within five percent of each other are collected in five minutes. Portable field instruments will be used to collect measurements. If turbidity cannot be reduced to 50 NTUs, but other parameters stabilize, the well will be considered

developed. Samples will be collected directly from the polyethylene tubing into laboratory-supplied glassware upon stabilization of field parameters.

During the sampling event, depth to bottom and depth to water measurements will be collected at each monitoring well. Water level measurements will be obtained with an electronic water level probe relative to the marked measuring point. Measurements will be recorded in a dedicated bound project field notebook along with the time collected. Measuring equipment will be decontaminated between wells using a laboratory-grade detergent and water solution and tap water rinse.

Collected groundwater samples will be placed in pre-cleaned laboratory supplied glassware, and placed in a cooler packed with ice for transport to the laboratory. Sample analysis will be provided by an ELAP-certified environmental laboratory and will consist of volatile organic compounds (VOCs) by EPA Method 8260 and metals by EPA Method 6010.

#### 3.2.1.2 Monitoring Well Repairs, Replacement And Decommissioning

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

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

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that

are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

### 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**). The form will compile 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 requirements of the Quality Assurance Project Plan (QAPP) prepared for the Site (**Appendix J**). Main Components of the QAPP include:

- QA/QC Objectives for Data Measurement;
- Sampling Program:
    - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.

    - Sample holding times will be in accordance with the NYSDEC ASP requirements.
    - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody;
- Calibration Procedures:
    - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
    - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;
- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.
- Internal QC and Checks;
- QA Performance and System Audits;
- Preventative Maintenance Procedures and Schedules;
- Corrective Action Measures.

## 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 will be reported to NYSDEC following each event and on a periodic basis in the Periodic Review Report. A letter report will also be prepared, subsequent to each sampling event. The report will include, at a minimum:

- Date of event;
- Personnel conducting sampling;
- Description of the activities performed;
- Type of samples collected (e.g., groundwater);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (o be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether groundwater conditions have changed since the last reporting event.

Data will be reported in hard copy or digital format as determined by NYSDEC. A summary of the monitoring program deliverables are summarized in **Table 7** below.

**Table 7: Schedule of Monitoring/Inspection Reports**

| Task | Reporting Frequency* |
|---|---|
| Groundwater Sampling | Semi-Annual |
| Indoor and Outdoor Air Sampling | Annual |

* The frequency of events will be conducted as specified until otherwise approved 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 remedy selected for the Site. This Operation and Maintenance Plan:

- Includes the steps necessary to allow individuals unfamiliar with the Site to operate and maintain the sub-slab depressurization systems (SSDS);
- Includes an operation and maintenance contingency plan; and,
- Will be updated periodically to reflect changes in Site conditions or the manner in which the SSDS are operated and maintained.

Information on non-mechanical Engineering Controls is provided in Section 3 - Engineering and Institutional Control Plan. 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 Sub-Slab Depressurization Systems

#### 4.2.1.1 Scope

The SSDS were installed in the Site's commercial and residential buildings to mitigate the potential for sub-slab VOC vapor intrusion. The SSDS create a sustained negative pressure beneath the building slabs which prevents vapors from entering the buildings.

The SSDS consist of rings of 4-inch high density polyethylene (HDPE) corrugated smooth interior pipe beneath the building slab. The piping lines are connected to exhaust piping to the roof and are completed with Infiltec high-flow, in-line fans (Model RP 265

for the commercial building and Model RP 145 for the residential building**).** Detailed specifications and as-built drawings of the SSDS are shown in **Appendix D**.

#### 4.2.1.2 System Start-Up and Testing

The residential SSDS was activated in April 2007 and the commercial SSDS was activated in June 2007. Communication tests were performed on both systems to confirm that both systems were functioning as intended. The communication tests consisted of the measurement of the pressure difference between the sub-slab vapor and the indoor air of the respective buildings. Measurements indicated that the SSDS created negative pressure beneath the buildings and, therefore, were functioning as intended. The SSDS are equipped with Infiltec WVM-93C low-pressure alarms which sound if the systems stop functioning.

The system testing described above will be conducted if, in the course of the SSDS lifetime, significant changes are made to the system, and the system must be restarted.

Additionally, indoor air sampling will be performed in the Site's buildings on an annual basis to confirm that the systems are functioning as intended.

#### 4.2.1.3 System Operation: Routine Operation Procedures

The SSDS are in constant operation. The alarms present on the SSDS will visually and audibly alert that the fan has stopped operating. The fan should only cease should there be a power outage or blockage in the pipelines. In the event the system failure alarm goes off the owner or owner's representative and the environmental consultant (PWGC) will be contacted for evaluation and repairs.

#### 4.2.1.4 System Operation: Routine Equipment Maintenance

Replacement, rather than maintenance, is recommended by the manufacturer for the fans and alarms. An inspection of the SSDS equipment will be made annually and in the event of an event that disrupts operation of the system and/or failure alarm. The

inspection will include recording the pressure reading on the system gauge and visually inspecting the aboveground piping for leaks. The system pressure will be compared to previous readings. A decreased pressure reading may indicate a loss of fan strength which would warrant further inspection of the fan.

#### 4.2.1.5 System Operation: Non-Routine Equipment Maintenance

Components of the SSDS (piping, fans, gauges, alarms) which are damaged, will be replaced with the same components or an equivalent approved by a Professional Engineer.

## 4.3 ENGINEERING CONTROL SYSTEM PERFORMANCE MONITORING

### 4.3.1 Monitoring Schedule

#### 4.3.1.1 Sub-Slab Depressurization Systems

In order to confirm the effectiveness of the two SSDS, indoor air sampling will be performed at the subject site on an annual basis. Sampling frequency is subject to change with the approval of the NYSDEC. The SSDS have been in operation since 2007. Indoor air sampling was last performed at the Site in May 2006. The analytical results of the May 2006 sampling indicated concentrations of PCE which were within the NYSDOH Air Guideline Value.

The frequency of system inspections is subject to change with the approval of the NYSDEC. Unscheduled inspections and/or sampling may take place when a suspected failure of the SSDS has been reported or an emergency occurs that is deemed likely to affect the operation of the system. Monitoring deliverables for the SSDS are specified later in this Plan.

#### 4.3.1.2 In-situ chemical oxidation treatment

The in-situ chemical oxidation treatment and subsequent treatments will continue to be monitored through groundwater sampling on a semi-annual basis until it is determined that a different frequency is appropriate.

Monitoring frequency is subject to change with the approval of the NYSDEC. Unscheduled sampling may take place when a suspected failure has been reported or an emergency occurs that is deemed likely to affect the operation of the system. Monitoring deliverables are specified later in this Plan.

### 4.3.2 General Equipment Monitoring

#### 4.3.2.1 Sub-Slab Depressurization Systems

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

- Vacuum blower,
- General system piping,

A complete list of components to be checked is provided in the Inspection Checklist, presented in **Appendix I**. 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 are required immediately, and the SSDS restarted.

#### 4.3.2.2 In-situ Chemical Oxidation Treatment

During each groundwater monitoring event, each of the monitoring wells will be inspected for damage. Monitoring well components to be inspected include:

- Manhole covers,
- Well casings,
- Well depths,
- Recharge rates.

### 4.3.3 System Monitoring Devices and Alarms

Each SSDS has a warning device to indicate that the system is not operating properly. In the event that the warning device is activated, applicable maintenance and repairs will be conducted, as specified in the Operation and Maintenance Plan, and the

SSDS restarted. Operational problems will be noted in the subsequent Periodic Review Report.

### 4.3.4 System Monitoring

#### 4.3.4.1 Indoor Air Monitoring

Indoor air monitoring will be performed on a periodic basis within the two site buildings to confirm that the two SSDS are mitigating the potential for vapor intrusion.

Indoor air sampling locations were selected to determine air quality in the main areas of the commercial building's ground floor and the basement of the residential building. Indoor air sampling locations are indicated on **Figure 13**. Additionally, one outdoor air sample will be collected concurrently from an upwind location to be determined at the time of sampling. The purpose of the outdoor air sample will be to determine the contribution of off-site VOC sources on indoor air quality.

On an annual basis the indoor and outdoor air data will be evaluated to determine the effectiveness of the SSDS. The SSDS is designed to prevent sub-slab chlorinated VOCs from entering the indoor air. If indoor air concentrations exceed NYSDOH Indoor Air Guidance Levels for PCE (30 $\mu g/m^3$) or TCE (5 $\mu g/m^3$), the source of the VOCs will need to be determined and measures may need to be implemented to mitigate the air quality. Subsequent to any source elimination or mitigative action, an additional air sample will be collected at each location where elevated VOCs were detected.

Sampling will be performed in accordance with the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, October 2006. All air sampling activities will be recorded in a field book. Recorded information will include weather conditions, starting and ending times, starting and ending pressures, and indoor and outdoor air temperatures. An NYSDOH Indoor Air Quality Questionnaire and chemical inventory and will be completed. The information will be used to determine potential VOC contributors to indoor air quality.

Samples will be collected into Summa® canisters (or equivalent) for a duration of one hour. Collected air samples will be submitted to an ELAP-certified environmental laboratory for analysis of VOCs by EPA Method TO-15.

#### 4.3.4.2 Groundwater Monitoring

To determine the effectiveness of in-situ chemical injections, the twelve monitoring wells will be sampled by a low stress (low flow) method to collect representative samples while producing a minimal amount of purge water. Sampling will be performed with dedicated instruments to prevent cross-contamination between well locations. Purging of each well will continue until the turbidity is less than or equal to 50 Nephelometric Turbidity Units (NTUs), and when pH, temperature, and conductivity measurements stabilize. Stabilization will be considered achieved when three consecutive readings within five percent of each other are collected in five minutes. Portable field instruments will be used to collect measurements. If turbidity cannot be reduced to 50 NTUs, but other parameters stabilize, the well will be considered developed. Samples will be collected directly from the polyethylene tubing into laboratory-supplied glassware upon stabilization of field parameters.

During the sampling event, depth to bottom and depth to water measurements will be collected at each monitoring well. Water level measurements will be obtained with an electronic water level probe relative to the marked measuring point. Measurements will be recorded in a dedicated bound project field notebook along with the time collected. Measuring equipment will be decontaminated between wells using a laboratory-grade detergent and water solution and tap water rinse.

Collected groundwater samples will be placed in pre-cleaned laboratory supplied glassware, and placed in a cooler packed with ice for transport to the laboratory. Sample analysis will be provided by an ELAP-certified environmental laboratory and will consist of volatile organic compounds (VOCs) by EPA Method 8260 and metals by EPA Method 6010.

Purge water derived during sampling events will be containerized in 55-gallon drums pending proper disposal at a licensed disposal facility.

## 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 on-Site. 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 Maintenance Reports

Checklists or forms (see **Appendix I**) will be completed during each routine maintenance event. Checklists/forms will include, but not be limited to the following information:

- Date;
- Name, company, and position of person(s) conducting maintenance activities;
- Maintenance activities conducted;
- 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).

### 4.4.2 Non-Routine Maintenance Reports

During each non-routine maintenance event, a form will be completed which will include, but not be limited to, the following information:

- Date;

- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Presence of leaks;
- Date of leak 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); and,
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/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 Section 3 Monitoring Plan and Section 4 Operation and Maintenance Plan 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 will be recorded on the appropriate forms for their respective system which are contained in Appendix I (SSDS and in-situ chemical treatment). Additionally, a general Site-wide inspection form will be completed during the Site-wide inspection (see **Appendix I**). These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including all media sampling data 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 IRM Work Plan.

## 5.2 CERTIFICATION OF ENGINEERING AND INSTITUTIONAL CONTROLS

After the last inspection of the reporting period, a 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;
- 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 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 P.W.

Grosser Consulting, Inc., 630 Johnson Avenue, Bohemia, New York, am certifying as [Owner or Owner's Designated Site Representative] Site 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 every year, beginning fifteen months after the Certificate of Completion is issued. 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 C (Metes and Bounds). 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 any discharge monitoring data and/or information generated during the reporting period with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;
- A Site evaluation, which includes the following:

- The compliance of the remedy with the requirements of the Site-specific RAWP, ROD or Decision Document;
- The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
- Any new conclusions or observations regarding Site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored;
- Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and
- The overall performance and effectiveness of the remedy.

- 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 format, to the NYSDEC Central Office and Regional Office in which the Site is located, and in electronic format to NYSDEC Central Office, Regional Office and the NYSDOH Bureau of Environmental Exposure Investigation.

## 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

**TABLE 1**

**Soil Boring Analytical Results for Volatile Organic Compounds by EPA Method 8260**
**One Shore Road, Glenwood Landing, New York**

| Compound | Unrestricted Use SCO | Restricted Residential SCO | SB-1 12.5'-15' 8/28/2006 | SB-1 22.5'-25' 8/28/2006 | SB-1 27.5'-30' 8/28/2006 | SB-2 20'-22.5' 8/28/2006 | SB-2 27.5'-30' 8/28/2006 | SB-3 15'-17.5' 8/28/2006 | SB-3 27.5'-30' 8/28/2006 |
|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,1,1,2-Tetrachloroethane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,1,1-Trichloroethane | 680 | 100,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,1,2,2-Tetrachloroethane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,1,2-Trichloroethane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,1-Dichloroethane | 270 | 26,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,1-Dichloroethene | 330 | 100,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,1-Dichloropropene | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,2,3-Trichlorobenzene | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,2,3-Trichloropropane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,2,4-Trichlorobenzene | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,2,4-Trimethylbenzene | 3,600 | 52,000 | < 6.0 | 20 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,2-Dichlorobenzene | 1,100 | 100,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,2-Dichloroethane | 20 | 3,100 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,2-Dichloropropane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,3,5-Trimethylbenzene | 8,400 | 52,000 | < 6.0 | 6.3 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,3-Dichlorobenzene | 2,400 | 49,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,3-Dichloropropane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,4-Dichlorobenzene | 1,800 | 13,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 2,2-Dichloropropane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 2-Chlorotoluene | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 4-Chlorotoluene | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Benzene | 60 | 4,800 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Bromobenzene | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Bromochloromethane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Bromodichloromethane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Bromoform | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Bromomethane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Carbon Tetrachloride | 760 | 2,400 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Chlorobenzene | 1,100 | 100,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Chloroethane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Chloroform | 370 | 49,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Chloromethane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| cis-1,2-Dichloroethene | 250 | 100,000 | < 6.0 | 34 | 10 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| cis-1,3-Dichloropropene | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Dibromochloromethane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Dibromomethane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Ethyl benzene | 1,000 | 41,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Hexachlorobutadiene | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Isopropylbenzene | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| m + p Xylene | 260 | 100,000 | < 6.0 | < 12 | < 12 | < 11 | < 12 | < 10 | < 12 |
| Methyl tertiary butyl ether | 930 | 100,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Methylene Chloride | 50 | 100,000 | < 6.0 | 22 B | < 5.8 | < 5.6 | < 5.9 | < 5.2 | 23 B |
| n-Butylbenzene | 12,000 | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| n-Propylbenzene | 3,900 | 100,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| o Xylene | 260 | 100,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 4-Isopropyltoluene | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| sec-Butylbenzene | 11,000 | 100,000 | < 6.0 | 5.4 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Styrene | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| tert-Butylbenzene | 5,900 | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Tetrachloroethene | 1,300 | 19,000 | 15 | **3,100** | 9.5 | **7,100** | < 5.9 | < 5.2 | < 5.9 |
| Toluene | 700 | 100,000 | < 6.0 | < 6.1 | < 5.8 | 16 | < 5.9 | < 5.2 | < 5.9 |
| trans-1,2-Dichloroethene | 190 | 100,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| trans-1,3-Dichloropropene | NS | 100,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Trichloroethene | 470 | 21,000 | < 6.0 | 210 | < 5.8 | 32 | < 5.9 | < 5.2 | < 5.9 |
| Trichlorofluoromethane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Vinyl chloride | 20 | 900 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 2-propanol | NS | NS | < 60 | < 61 | < 58 | < 56 | < 59 | < 52 | < 59 |
| 1,2-Dibromoethane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 2-Butanone | 120 | 100,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 2-Chloroethyl vinyl ether | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 2-Hexanone | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 4-Methyl-2-pentanone | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Acetone | 50 | 100,000 | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Acrolein | NS | NS | < 30 | < 31 | < 29 | < 28 | < 30 | < 26 | < 30 |
| Acrylonitrile | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Carbon Disulfide | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Chlorodifluoromethane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Diisopropyl ether | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Ethanol | NS | NS | < 30 | < 31 | < 29 | < 28 | < 30 | < 26 | < 30 |
| Ethyl acetate | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Freon-114 | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Isopropyl acetate | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| n-Amyl acetate | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Naphthalene | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| n-Butyl acetate | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| n-Propyl acetate | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| p-Diethylbenzene | NS | NS | < 6.0 | 39 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| p-ethyltoluene | NS | NS | < 6.0 | 13 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| t-Butyl alcohol | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Vinyl acetate | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| Freon-113 | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,2,4,5-tetramethylbenzene | NS | NS | < 6.0 | 30 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |
| 1,2-dibromo-3-chloropropane | NS | NS | < 6.0 | < 6.1 | < 5.8 | < 5.6 | < 5.9 | < 5.2 | < 5.9 |

**Notes:**

1 - NYSDEC Recommended Soil Cleanup Objectives (RSCO), Technical and Administrative Guidance Memo (TAGM) 4046, 12/00.

NS - No RSCO established for this compound.

Bolded text denotes RSCO Exceedance.

* - No specific RSCO established, RSCO of 10,000 µg/kg for total VOCs is used.

All units are µg/kg.

B - Compound detected in the method blank.

MDL - Method Detection Limit.

**TABLE 1 (cont'd)**

**Soil Boring Analytical Results for Volatile Organic Compounds by EPA Method 8260**
**One Shore Road, Glenwood Landing, New York**

| Compound | Unrestricted Use SCO | Restricted Residential SCO | SB-4 12.5'-15' 8/30/2006 | SB-4 27.5'-30' 8/30/2006 | SB-5 12.5'-15' 8/30/2006 | SB-5 27.5'-30' 8/30/2006 | SB-6 12.5'-15' 8/30/2006 | SB-6 27.5'-30' 8/30/2006 | SB-7 17.5'-20' 8/30/2006 | SB-7 27.5'-30' 8/30/2006 | SB-8 13'-15' 8/30/2006 | SB-8 17.5'-20' 8/30/2006 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,1,1,2-Tetrachloroethane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,1,1-Trichloroethane | 680 | 100,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,1,2,2-Tetrachloroethane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,1,2-Trichloroethane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,1-Dichloroethane | 270 | 26,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,1-Dichloroethene | 330 | 100,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,1-Dichloropropene | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,2,3-Trichlorobenzene | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,2,3-Trichloropropane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,2,4-Trichlorobenzene | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,2,4-Trimethylbenzene | 3,600 | 52,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | 39 | < 5.9 | < 6.1 | < 6.2 |
| 1,2-Dichlorobenzene | 1,100 | 100,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,2-Dichloroethane | 20 | 3,100 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,2-Dichloropropane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,3,5-Trimethylbenzene | 8,400 | 52,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,3-Dichlorobenzene | 2,400 | 49,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,3-Dichloropropane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,4-Dichlorobenzene | 1,800 | 13,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 2,2-Dichloropropane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 2-Chlorotoluene | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 4-Chlorotoluene | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Benzene | 60 | 4,800 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Bromobenzene | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Bromochloromethane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Bromodichloromethane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Bromoform | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Bromomethane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Carbon Tetrachloride | 760 | 2,400 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Chlorobenzene | 1,100 | 100,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Chloroethane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Chloroform | 370 | 49,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Chloromethane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| cis-1,2-Dichloroethene | 250 | 100,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | **310** | < 5.9 | < 6.1 | **290** |
| cis-1,3-Dichloropropene | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Dibromochloromethane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Dibromomethane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Ethyl benzene | 1,000 | 41,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | 8.6 | < 5.9 | < 6.1 | < 6.2 |
| Hexachlorobutadiene | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Isopropylbenzene | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| m + p Xylene | 260 | 100,000 | < 10 | < 12 | < 11 | < 12 | < 11 | < 12 | 35 | < 12 | < 12 | 23 |
| Methyl tertiary butyl ether | 930 | 100,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Methylene Chloride | 50 | 100,000 | 4.2 JB | < 6.1 | 7.3 B | 7.0 B | 5.7 JB | 8.2 B | 6.9 B | 7.6 B | 11 B | 9.9 B |
| n-Butylbenzene | 12,000 | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| n-Propylbenzene | 3,900 | 100,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| o Xylene | 260 | 100,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | 18 | < 5.9 | < 6.1 | 16 |
| 4-Isopropyltoluene | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| sec-Butylbenzene | 11,000 | 100,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | 15 | < 5.9 | < 6.1 | < 6.2 |
| Styrene | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| tert-Butylbenzene | 5,900 | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Tetrachloroethene | 1,300 | 19,000 | < 5.2 | < 6.1 | 140 | 26 | **1,600** | < 6.0 | 10 | < 5.9 | < 6.1 | < 6.2 |
| Toluene | 700 | 100,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | 26 | 480 |
| trans-1,2-Dichloroethene | 190 | 100,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| trans-1,3-Dichloropropene | NS | 100,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Trichloroethene | 470 | 21,000 | < 5.2 | < 6.1 | 13 | < 6.1 | 21 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Trichlorofluoromethane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Vinyl chloride | 20 | 900 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 2-propanol | NS | NS | < 52 | < 61 | < 56 | < 61 | < 57 | < 60 | < 60 | < 59 | < 61 | < 62 |
| 1,2-Dibromoethane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 2-Butanone | 120 | 100,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 2-Chloroethyl vinyl ether | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 2-Hexanone | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 4-Methyl-2-pentanone | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Acetone | 50 | 100,000 | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Acrolein | NS | NS | < 26 | < 30 | < 28 | < 30 | < 29 | < 30 | < 30 | < 29 | < 31 | < 31 |
| Acrylonitrile | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Carbon Disulfide | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Chlorodifluoromethane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Diisopropyl ether | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Ethanol | NS | NS | < 26 | < 30 | < 28 | < 30 | < 29 | < 30 | < 30 | < 29 | < 31 | < 31 |
| Ethyl acetate | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Freon-114 | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Isopropyl acetate | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| n-Amyl acetate | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Naphthalene | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| n-Butyl acetate | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| n-Propyl acetate | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| p-Diethylbenzene | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | 28 | < 5.9 | < 6.1 | < 6.2 |
| p-ethyltoluene | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | 27 | < 5.9 | < 6.1 | < 6.2 |
| t-Butyl alcohol | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Vinyl acetate | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| Freon-113 | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |
| 1,2,4,5-tetramethylbenzene | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | 26 | < 5.9 | < 6.1 | < 6.2 |
| 1,2-dibromo-3-chloropropane | NS | NS | < 5.2 | < 6.1 | < 5.6 | < 6.1 | < 5.7 | < 6.0 | < 6.0 | < 5.9 | < 6.1 | < 6.2 |

**Notes:**
All units are µg/kg.
B - Compound detected in Method Blank.

One Shore Road, Glenwood Landing, NY

Table 2a

Historical Groundwater Monitoring Well Analytical Results for VOCs by EPA Method 8260

| Compound | NYSDEC Standards [1] | MW-1 | | | | | | | | | | | MW-2 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 11/13/01 | 1/19/05 | 9/6/06 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 | 11/13/01 | 1/19/05 | 9/6/06 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 |
| Volatile Organic Compounds by EPA Method 8260 in µg/L | | | | | | | | | | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,1-Trichloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.1 | ND | ND |
| 1,1,2,2-Tetrachloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2-Trichloroethane | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloroethene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloropropene | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3-Trichlorobenzene | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3-Trichloropropane | 0.04 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4,5-Tetramethylbenzene | 5 | NA | NA | ND | NA | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | NA | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trichlorobenzene | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trimethylbenzene | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dibromo-3-chloropropane | 0.04 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dibromoethane | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichlorobenzene | 3 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloroethane | 0.6 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloropropane | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3,5-Trimethylbenzene | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichlorobenzene | 3 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichloropropane | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,4-Dichlorobenzene | 3 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,4-Diethylbenzene | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,2-Dichloropropane | 5 | NA | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA | NA | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Chloroethyl vinyl ethe | NS | NA | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA | NA | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Chlorotoluene | 5 | NA | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA | NA | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Hexanone | 50 G | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-propanol | NS | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorotoulene | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acetone | 50 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acrolein | 5 G | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Acrylonitrile | 5 | NA | NA | ND | NA | NA | ND | ND | ND | ND | ND | ND | NA | NA | ND | NA | NA | ND | ND | ND | ND | ND | ND |
| Benzene | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromobenzene | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromochloromethane | NS | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromodichloromethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromoform | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromomethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Carbon Disulfide | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Carbon Tetrachloride | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorodibromomethane | NS | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlorodifluoromethane | NS | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloroform | 7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloromethane | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| cis-1,2-Dichloroethene | 5 | ND | 1 | ND | ND | ND | ND | ND | 0.55 | ND | ND | ND | 11 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| cis-1,3-Dichloropropene | 0.04 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibromochloromethane | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibromomethane | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichlorodifluoromethane | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Diisopropyl ether | NS | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethanol | NS | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethyl acetate | NS | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethyl Benzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Freon 113 | NS | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Freon-114 | NS | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobutadiene | 0.5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Isopropyl acetate | NS | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Isopropylbenzene | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| m + p Xylene | 10 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Ethyl Ketone | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Isobutyl Ketone | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Tertiary Butyl Ethe | 10 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methylene Chloride | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Amyl acetate | NS | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 10 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Butyl acetate | NS | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| n-Butylbenzene | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Propyl acetate | NS | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| n-Propylbenzene | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| o Xylene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| p-Diethylbenzene | NS | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| p-Ethyltoluene | NS | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| p-Isopropyltoluene | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| sec-Butylbenzene | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Styrene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| t-butyl alcoho | NS | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| tert-Butylbenzene | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Tetrachloroethene | 5 | 100 | 83 | 120 | 25 | 62 | 50 | 19 | 12 | 80 | 11 | 18 | 11 | 14 | ND | ND | 5.1 | 6 | 3.7 | 5.2 | 5.0 | 3.6 | 7.5 |
| Toluene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| trans-1,2-Dichloroethene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| trans-1,3-Dichloropropene | 0.04 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Trichloroethene | 5 | 4 | 2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Trichlorofluoromethane | 5 | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vinyl acetate | NS | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vinyl Chloride | 2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

Notes:

1 - NYSDEC Class GA Groundwater Standards, TOGS 1.1.1, June 1998

NS - Not specified.

ND - Not detected.

NA - Not analyzed.

**Bold** / Shaded text denotes concentrations exceeding the Groundwater Standards.

G - Guidance value

One Shore Road, Glenwood Landing, NY

Table 2a

Historical Groundwater Monitoring Well Analytical Results for VOCs by EPA Method 8260

| Compound | NYSDEC Standards [1] | MW-3 | | | | | | | | | | | | MW-4 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 11/13/01 | 1/19/05 | 2/11/05 | 9/6/06 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 | 11/13/01 | 1/19/05 | 9/6/06 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 |
| Volatile Organic Compounds by EPA Method 8260 in . | | | | | | | | | | | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,1-Trichloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2,2-Tetrachloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2-Trichloroethane | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloroethane | 5 | ND | ND | ND | ND | ND | ND | 1 | 1.2 | 0.91 | 0.89 | 0.87 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloroethene | 5 | 3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloropropene | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3-Trichlorobenzene | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3-Trichloropropane | 0.04 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4,5-Tetramethylbenzene | 5 | NA | NA | NA | ND | NA | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | NA | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trichlorobenzene | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trimethylbenzene | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dibromo-3-chloropropane | 0.04 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dibromoethane | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichlorobenzene | 3 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloroethane | 0.6 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloropropane | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3,5-Trimethylbenzene | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichlorobenzene | 3 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichloropropane | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,4-Dichlorobenzene | 3 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,4-Diethylbenzene | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,2-Dichloropropane | 5 | NA | NA | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA | NA | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Chloroethyl vinyl ethe | NS | NA | NA | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA | NA | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Chlorotoluene | 5 | NA | NA | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA | NA | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Hexanone | 50 G | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-propanol | NS | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorotoulene | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acetone | 50 | ND | 43 | 15 | ND | ND | 8.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acrolein | 5 G | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Acrylonitrile | 5 | NA | NA | NA | ND | NA | NA | ND | ND | ND | ND | ND | ND | NA | NA | ND | NA | NA | ND | ND | ND | ND | ND | ND |
| Benzene | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromobenzene | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromochloromethane | NS | NA | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromodichloromethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromoform | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromomethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Carbon Disulfide | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Carbon Tetrachloride | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorodibromomethane | NS | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlorodifluoromethane | NS | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloroform | 7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloromethane | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| cis-1,2-Dichloroethene | 5 | 97 | 14 | ND | ND | 6 | 1.8 | ND | 17 | 18 | 6.9 | 27 | 100 | 3 | ND | ND | ND | 0.77 | ND | 3 | 2 | 0.53 | ND | ND |
| cis-1,3-Dichloropropene | 0.04 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibromochloromethane | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibromomethane | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichlorodifluoromethane | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Diisopropyl ether | NS | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethanol | NS | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethyl acetate | NS | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethyl Benzene | 5 | ND | 79 | 27 | 26 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Freon 113 | NS | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Freon-114 | NS | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobutadiene | 0.5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Isopropyl acetate | NS | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Isopropylbenzene | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| m + p Xylene | 10 | ND | ND | 124 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Ethyl Ketone | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Isobutyl Ketone | NS | ND | ND | 107 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Tertiary Butyl Ethe | 10 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methylene Chloride | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Amyl acetate | NS | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 10 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Butyl acetate | NS | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| n-Butylbenzene | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Propyl acetate | NS | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| n-Propylbenzene | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| o Xylene | 5 | ND | ND | 57 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| p-Diethylbenzene | NS | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| p-Ethyltoluene | NS | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| p-Isopropyltoluene | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| sec-Butylbenzene | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Styrene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| t-butyl alcoho | NS | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| tert-Butylbenzene | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Tetrachloroethene | 5 | 54 | ND | ND | ND | ND | 1.1 | 3.7 | 3.2 | 4.6 | 2.8 | 6.4 | 20 | 65 | ND | ND | ND | 0.82 | 5.6 | 1.8 | 0.98 | 2.2 | 2.2 | 1.2 |
| Toluene | 5 | ND | 11000 | 2310 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 11 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| trans-1,2-Dichloroethene | 5 | ND | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| trans-1,3-Dichloropropene | 0.04 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Trichloroethene | 5 | 9 | 0.7 | ND | ND | ND | 1.2 | 9.1 | 7.4 | 6.5 | 2.2 | 6.0 | 7.1 | 7 | ND | ND | 8 | 1.8 | 12 | 3.9 | 0.52 | 0.54 | 0.64 | ND |
| Trichlorofluoromethane | 5 | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vinyl acetate | NS | NA | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vinyl Chloride | 2 | 5 | ND | ND | ND | ND | ND | 4.6 | 4.3 | 4.0 | 2.2 | 6.2 | 13 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

Notes:

1 - NYSDEC Class GA Groundwater Standards, TOGS 1.1.1, June 1998

NS - Not specified.

ND - Not detected.

NA - Not analyzed.

Bold / Shaded text denotes concentrations exceeding the Groundwater Standards.

G - Guidance value

One Shore Road, Glenwood Landing, NY

Table 2a

Historical Groundwater Monitoring Well Analytical Results for VOCs by EPA Method 8260

| Compound | NYSDEC Standards (1) | MW-5 | | | | | | | | | | MW-6 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1/19/05 | 9/5/06 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 | 1/19/05 | 9/6/06 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 |
| Volatile Organic Compounds by EPA Method 8260 in µ | | | | | | | | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,1-Trichloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2,2-Tetrachloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2-Trichloroethane | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloroethene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloropropene | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3-Trichlorobenzene | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3-Trichloropropane | 0.04 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4,5-Tetramethylbenzene | 5 | NA | ND | NA | ND | ND | ND | ND | ND | ND | ND | NA | ND | NA | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trichlorobenzene | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trimethylbenzene | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dibromo-3-chloropropane | 0.04 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dibromoethane | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichlorobenzene | 3 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloroethane | 0.6 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloropropane | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3,5-Trimethylbenzene | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichlorobenzene | 3 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichloropropane | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,4-Dichlorobenzene | 3 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,4-Diethylbenzene | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,2-Dichloropropane | 5 | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Chloroethyl vinyl ethe | NS | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Chlorotoluene | 5 | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA | NA | ND | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Hexanone | 50 G | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-propanol | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorotoulene | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acetone | 50 | ND | ND | ND | ND | 11 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acrolein | 5 G | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Acrylonitrile | 5 | NA | ND | NA | NA | ND | ND | ND | ND | ND | ND | NA | ND | NA | NA | ND | ND | ND | ND | ND | ND |
| Benzene | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromobenzene | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromochloromethane | NS | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromodichloromethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromoform | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromomethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Carbon Disulfide | NS | ND | ND | ND | ND | 6.9 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Carbon Tetrachloride | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorodibromomethane | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlorodifluoromethane | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloroform | 7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloromethane | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| cis-1,2-Dichloroethene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| cis-1,3-Dichloropropene | 0.04 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibromochloromethane | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibromomethane | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichlorodifluoromethane | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Diisopropyl ether | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethanol | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethyl acetate | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethyl Benzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Freon 113 | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Freon-114 | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobutadiene | 0.5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Isopropyl acetate | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Isopropylbenzene | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| m + p Xylene | 10 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Ethyl Ketone | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Isobutyl Ketone | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Tertiary Butyl Ethe | 10 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methylene Chloride | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Amyl acetate | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 10 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Butyl acetate | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| n-Butylbenzene | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Propyl acetate | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| n-Propylbenzene | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| o Xylene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| p-Diethylbenzene | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| p-Ethyltoluene | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| p-Isopropyltoluene | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| sec-Butylbenzene | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Styrene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| t-butyl alcoho | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| tert-Butylbenzene | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Tetrachloroethene | 5 | 11 | ND | ND | ND | ND | ND | ND | 4.8 | ND | 0.53 | 2 | ND | ND | 2.2 | 2.3 | 2.1 | 4.3 | 6.5 | 2.8 | 15 |
| Toluene | 5 | ND | ND | ND | ND | 2.2 | 1.3 | ND | ND | ND | ND | 4.9 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| trans-1,2-Dichloroethene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| trans-1,3-Dichloropropene | 0.04 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Trichloroethene | 5 | 6 | ND | 6 | 1.1 | ND | 1.1 | ND | 2.5 | 1.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Trichlorofluoromethane | 5 | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vinyl acetate | NS | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vinyl Chloride | 2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

Notes:

1 - NYSDEC Class GA Groundwater Standards, TOGS 1.1.1, June 1998

NS - Not specified.

ND - Not detected.

NA - Not analyzed.

**Bold** / Shaded text denotes concentrations exceeding the Groundwater Standards.

G - Guidance value

One Shore Road, Glenwood Landing, NY

Table 2a

Historical Groundwater Monitoring Well Analytical Results for VOCs by EPA Method 8260

| Compound | NYSDEC Standards [1] | MW-7 | | | | | | | | | | MW-8 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1/19/05 | 9/6/06 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 |
| Volatile Organic Compounds by EPA Method 8260 in | | | | | | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,1-Trichloroethane | 5 | 3 | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2,2-Tetrachloroethane | 5 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2-Trichloroethane | 1 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloroethane | 5 | 3 | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloroethene | 5 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloropropene | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3-Trichlorobenzene | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3-Trichloropropane | 0.04 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4,5-Tetramethylbenzene | 5 | NA | ND | NA | NA | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trichlorobenzene | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trimethylbenzene | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dibromo-3-chloropropane | 0.04 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dibromoethane | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichlorobenzene | 3 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloroethane | 0.6 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloropropane | 1 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3,5-Trimethylbenzene | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichlorobenzene | 3 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichloropropane | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,4-Dichlorobenzene | 3 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,4-Diethylbenzene | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,2-Dichloropropane | 5 | NA | ND | ND | NA | NA | NA | NA | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Chloroethyl vinyl ethe | NS | NA | ND | ND | NA | NA | NA | NA | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Chlorotoluene | 5 | NA | ND | ND | NA | NA | NA | NA | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Hexanone | 50 G | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-propanol | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorotoulene | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acetone | 50 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acrolein | 5 G | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acrylonitrile | 5 | NA | ND | NA | NA | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND |
| Benzene | 1 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromobenzene | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromochloromethane | NS | NA | NA | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromodichloromethane | 5 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromoform | NS | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromomethane | 5 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Carbon Disulfide | NS | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Carbon Tetrachloride | 5 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | 5 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorodibromomethane | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlorodifluoromethane | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloroethane | 5 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloroform | 7 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloromethane | NS | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| cis-1,2-Dichloroethene | 5 | ND | 27 | ND | NA | ND | ND | ND | ND | ND | ND | 1022 | 440 | 210 | 15 | ND | ND | 4.2 | 14 |
| cis-1,3-Dichloropropene | 0.04 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibromochloromethane | NS | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibromomethane | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichlorodifluoromethane | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Diisopropyl ether | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethanol | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethyl acetate | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethyl Benzene | 5 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Freon 113 | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Freon-114 | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobutadiene | 0.5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Isopropyl acetate | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Isopropylbenzene | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| m + p Xylene | 10 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Ethyl Ketone | NS | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Isobutyl Ketone | NS | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Tertiary Butyl Ethe | 10 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methylene Chloride | 5 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Amyl acetate | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 10 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Butyl acetate | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| n-Butylbenzene | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Propyl acetate | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| n-Propylbenzene | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| o Xylene | 5 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| p-Diethylbenzene | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| p-Ethyltoluene | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| p-Isopropyltoluene | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| sec-Butylbenzene | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Styrene | 5 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| t-butyl alcoho | NS | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| tert-Butylbenzene | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Tetrachloroethene | 5 | 267 | 530 | 271 | NA | 240 | 120 | 130 | 400 | 140 | 290 | 5994 | 930 | 700 | 120 | 120 | 240 | 190 | 320 |
| Toluene | 5 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| trans-1,2-Dichloroethene | 5 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| trans-1,3-Dichloropropene | 0.04 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Trichloroethene | 5 | 16.5 | ND | ND | NA | ND | ND | ND | 5.3 | ND | 4.9 | 742 | 92 | 25 | ND | ND | ND | ND | 18 |
| Trichlorofluoromethane | 5 | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vinyl acetate | NS | NA | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vinyl Chloride | 2 | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

Notes:

1 - NYSDEC Class GA Groundwater Standards, TOGS 1.1.1, June 1998

NS - Not specified.

ND - Not detected.

NA - Not analyzed.

Bold / Shaded text denotes concentrations exceeding the Groundwater Standards.

G - Guidance value

One Shore Road, Glenwood Landing, NY

Table 2a

Historical Groundwater Monitoring Well Analytical Results for VOCs by EPA Method 8260

| Compound | NYSDEC Standards (1) | MW-8D | | | | | | | | MW-9 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 |
| Volatile Organic Compounds by EPA Method 8260 in µ | | | | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,1-Trichloroethane | 5 | ND | NA | ND | ND | ND | ND | ND | 1 | ND | ND | ND | ND | ND | 2.8 | ND | 5.2 |
| 1,1,2,2-Tetrachloroethane | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2-Trichloroethane | 1 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloroethane | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloroethene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloropropene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3-Trichlorobenzene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3-Trichloropropane | 0.04 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4,5-Tetramethylbenzene | 5 | NA | NA | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trichlorobenzene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trimethylbenzene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dibromo-3-chloropropane | 0.04 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dibromoethane | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichlorobenzene | 3 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloroethane | 0.6 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloropropane | 1 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3,5-Trimethylbenzene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichlorobenzene | 3 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichloropropane | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,4-Dichlorobenzene | 3 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,4-Diethylbenzene | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,2-Dichloropropane | 5 | ND | NA | NA | NA | NA | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Chloroethyl vinyl ethe | NS | ND | NA | NA | NA | NA | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Chlorotoluene | 5 | ND | NA | NA | NA | NA | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Hexanone | 50 G | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-propanol | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorotoulene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acetone | 50 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acrolein | 5 G | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acrylonitrile | 5 | NA | NA | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND |
| Benzene | 1 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromobenzene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromochloromethane | NS | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromodichloromethane | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromoform | NS | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromomethane | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Carbon Disulfide | NS | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Carbon Tetrachloride | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorodibromomethane | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlorodifluoromethane | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloroethane | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloroform | 7 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloromethane | NS | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| cis-1,2-Dichloroethene | 5 | 18 | NA | ND | ND | ND | ND | ND | ND | 17 | ND | ND | ND | ND | ND | 3.2 | ND |
| cis-1,3-Dichloropropene | 0.04 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibromochloromethane | NS | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibromomethane | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichlorodifluoromethane | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Diisopropyl ether | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethanol | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethyl acetate | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethyl Benzene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Freon 113 | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Freon-114 | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobutadiene | 0.5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Isopropyl acetate | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Isopropylbenzene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| m + p Xylene | 10 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Ethyl Ketone | NS | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Isobutyl Ketone | NS | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Tertiary Butyl Ethe | 10 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methylene Chloride | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Amyl acetate | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 10 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Butyl acetate | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| n-Butylbenzene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Propyl acetate | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| n-Propylbenzene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| o Xylene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| p-Diethylbenzene | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| p-Ethyltoluene | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| p-Isopropyltoluene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| sec-Butylbenzene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Styrene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| t-butyl alcoho | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| tert-Butylbenzene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Tetrachloroethene | 5 | 308 | NA | 4.6 | 6.4 | 5.5 | 12 | 1.3 | 3.6 | 175 | 400 | 280 | 300 | 330 | 210 | 280 | 170 |
| Toluene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| trans-1,2-Dichloroethene | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| trans-1,3-Dichloropropene | 0.04 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Trichloroethene | 5 | 7 | NA | ND | ND | ND | ND | ND | ND | 9 | 12 | 10 | 11 | 16 | 4 | 12 | 22 |
| Trichlorofluoromethane | 5 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vinyl acetate | NS | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vinyl Chloride | 2 | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

Notes:

1 - NYSDEC Class GA Groundwater Standards, TOGS 1.1.1, June 1998

NS - Not specified.

ND - Not detected.

NA - Not analyzed.

**Bold** / Shaded text denotes concentrations exceeding the Groundwater Standards.

G - Guidance value

One Shore Road, Glenwood Landing, NY

Table 2a

Historical Groundwater Monitoring Well Analytical Results for VOCs by EPA Method 8260

| Compound | NYSDEC Standards (1) | MW-9D | | | | | | | | MW-10 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 |
| Volatile Organic Compounds by EPA Method 8260 in µ | | | | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,1-Trichloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | 1 | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2,2-Tetrachloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2-Trichloroethane | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloroethene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-Dichloropropene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3-Trichlorobenzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3-Trichloropropane | 0.04 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4,5-Tetramethylbenzene | 5 | NA | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trichlorobenzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trimethylbenzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dibromo-3-chloropropane | 0.04 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dibromoethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichlorobenzene | 3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloroethane | 0.6 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloropropane | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3,5-Trimethylbenzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichlorobenzene | 3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,3-Dichloropropane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,4-Dichlorobenzene | 3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,4-Diethylbenzene | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,2-Dichloropropane | 5 | ND | ND | NA | NA | NA | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Chloroethyl vinyl ethe | NS | ND | ND | NA | NA | NA | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Chlorotoluene | 5 | ND | ND | NA | NA | NA | NA | NA | NA | ND | ND | NA | NA | NA | NA | NA | NA |
| 2-Hexanone | 50 G | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-propanol | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorotoulene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acetone | 50 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acrolein | 5 G | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acrylonitrile | 5 | NA | NA | ND | ND | ND | ND | ND | ND | NA | NA | ND | ND | ND | ND | ND | ND |
| Benzene | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromobenzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromochloromethane | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromodichloromethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromoform | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bromomethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Carbon Disulfide | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Carbon Tetrachloride | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorodibromomethane | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlorodifluoromethane | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloroform | 7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloromethane | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| cis-1,2-Dichloroethene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.83 | ND | 1.4 | 1.4 | ND | ND | ND |
| cis-1,3-Dichloropropene | 0.04 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibromochloromethane | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibromomethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichlorodifluoromethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Diisopropyl ether | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethanol | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethyl acetate | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethyl Benzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Freon 113 | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Freon-114 | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobutadiene | 0.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Isopropyl acetate | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Isopropylbenzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| m + p Xylene | 10 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Ethyl Ketone | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Isobutyl Ketone | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl Tertiary Butyl Ethe | 10 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methylene Chloride | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Amyl acetate | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 10 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Butyl acetate | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| n-Butylbenzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Propyl acetate | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| n-Propylbenzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| o Xylene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| p-Diethylbenzene | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| p-Ethyltoluene | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| p-Isopropyltoluene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| sec-Butylbenzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Styrene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| t-butyl alcoho | NS | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| tert-Butylbenzene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Tetrachloroethene | 5 | 12 | 1.2 | ND | ND | ND | ND | ND | ND | 121 | 41 | 140 | 17 | 120 | 50 | 69 | 80 |
| Toluene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| trans-1,2-Dichloroethene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| trans-1,3-Dichloropropene | 0.04 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Trichloroethene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.3 | 1.5 | ND | 1.4 | 0.67 | 0.62 | 1.3 |
| Trichlorofluoromethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vinyl acetate | NS | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Vinyl Chloride | 2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

Notes:

1 - NYSDEC Class GA Groundwater Standards, TOGS 1.1.1, June 1998

NS - Not specified.

ND - Not detected.

NA - Not analyzed.

**Bold** / Shaded text denotes concentrations exceeding the Groundwater Standards.

G - Guidance value

TABLE 2b
Historical Groundwater Analytical Results for Metals
One Shore Road
Glenwood Landing, NY

| Compound | NYSDEC Standards** | MW-1 | | | | | | | | MW-2 | | | | | | | | MW-3 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 |
| Metals by EPA Method 6010 - in mg/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aluminum | 0.1 | 0.06 | 0.1 U | 0.14 | 0.23 | 0.16 | 0.130 | 0.25 | 0.1 U | 1.08 | 0.1 U | 0.1 U | 0.1 U | 0.1 | 0.100 U | 0.1 U | 0.1 U | 0.57 | 2.6 | 0.12 | 0.1 U | 0.16 | 0.130 | 0.1 U | 0.15 |
| Antimony | 0.003 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.001 U | 0.001 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.0005 U | 0.001 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.0006 | 0.001 U |
| Arsenic | 0.025 | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 | 0.005 U | 0.005 U |
| Barium | 1 | 1 U | 0.18 | 0.205 | 0.454 | 0.284 | 0.108 | 0.206 | 0.188 | 1 U | 0.01 U | 0.028 | 0.01 U | 0.024 | 0.067 | 0.012 | 0.058 | 1 U | 0.075 | 0.244 | 0.26 | 0.208 | 0.225 | 0.184 | 0.206 |
| Beryllium | 0.003 | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.001 U | 0.0005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.0005 U | 0.0005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.0005 U | 0.0005 U |
| Cadmium | 0.005 | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U |
| Calcium | NS | 73.5 | 75 | 88 | 160 | 120 | 92 | 89 | 94 | 12.6 | 11 | 33 | 10 | 27 | 72 | 16 | 51 | 116 | 40 | 130 | 160 | 130 | 150 | 130 | 140 |
| Chromium | 0.05 | 0.05 U | 0.01 | 0.02 | 0.02 | 0.01 | 0.010 U | 0.01 | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.07 | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U |
| Cobalt | 0.005 | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.02 U | 0.02 U | 0.06 | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.02 U | 0.02 U | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.02 U | 0.02 U |
| Copper | 0.2 | 0.05 U | 0.011 | 0.01 U | 0.071 | 0.047 | 0.022 | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.029 | 0.027 | 0.014 | 0.01 U | 0.01 U | 0.05 U | 0.047 | 0.01 U | 0.021 | 0.038 | 0.035 | 0.01 U | 0.01 U |
| Iron | 0.3 | 0.08 | 0.21 | 0.16 | 0.67 | 0.44 | 0.240 | 0.44 | 0.23 | 1.99 | 0.21 | 0.17 | 0.13 | 0.82 | 0.16 | 0.11 | 0.34 | 5.34 | 7.8 | 8 | 6.4 | 5.2 | 4.8 | 2.3 | 1.8 |
| Lead | 0.025 | 0.005 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.005 | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.007 | 0.043 | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U |
| Magnesium | 35 | 10 | 9.8 | 13 | 19 | 14 | 11 | 10 | 14 | 1.85 | 1.6 | 4.1 | 1.4 | 3.3 | 5.8 | 2.1 | 4 | 11 | 9.8 | 13 | 15 | 13 | 14 | 10 | 13 |
| Manganese | 0.3 | 0.05 U | 0.353 | 0.141 | 0.558 | 0.272 | 0.169 | 0.152 | 0.099 | 0.94 | 0.131 | 0.078 | 0.076 | 0.321 | 0.035 | 0.069 | 0.094 | 0.32 | 1.3 | 0.857 | 0.563 | 0.408 | 1.74 | 0.495 | 1.05 |
| Mercury | 0.0007 | 0.002 U | 0.0002 U | NA | NA | NA | NA | NA | | 0.002 U | 0.0002 U | NA | NA | NA | NA | NA | | 0.002 U | 0.0002 U | NA | NA | NA | NA | NA | |
| Nickel | 0.1 | 0.05 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.05 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.05 U | 0.049 | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U |
| Potassium | NS | 7.88 | 6.8 | 14 | 15 | 9.2 | 5.8 | 7.3 | 6.5 | 1.58 | 2.5 U | 3 | 2.5 | 2.6 | 2.5 U | 2.5 U | 3 | 18.4 | 3.5 | 25 | 18 | 16 | 12 | 13 | 14 |
| Selenium | 0.01 | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U |
| Silver | 0.05 | 0.05 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.05 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.05 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U |
| Sodium | 20 | 274 | 380 | 360 | 720 | 510 | 240 | 370 | 360 | 12.7 | 9 | 14 | 5.1 | 8.4 | 42 | 6.5 | 37 | 138 | 52 | 230 | 250 | 340 | 220 | 220 | 230 |
| Thalium | 0.0005 | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.001 U | 0.0005 U | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.0005 U | 0.005 U | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.0005 U | 0.0005 U |
| Vanadium | NS | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.015 | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U |
| Zinc | 2 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.05 U | 0.05 U | 0.06 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.05 U | 0.05 U | 0.09 | 0.229 | 0.05 U | 0.05 U | 0.07 | 0.105 | 0.05 U | 0.093 |

Notes:

* - Standard from NYSDEC Ambient Water Quality Standards and Guidance Values Division of Water Technical and Operational Series (1.1.1) 6/1998

** - 6 NYCRR Part 703 Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations 8/1999

NS - Not specified.

NA - Not analyzed.

Bold / Shaded text denotes concentrations exceeding the Groundwater Standards.

G - Guidance value.

TABLE 2b
Historical Groundwater Analytical Results for Metals
One Shore Road
Glenwood Landing, NY

| Compound | NYSDEC Standards** | MW-4 | | | | | | | | MW-5 | | | | | | | | MW-6 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 |
| Metals by EPA Method 6010 - in mg/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aluminum | 0.1 | 0.05 U | 0.1 U | 0.1 U | 0.1 U | 0.33 | 0.100 U | 0.1 U | 0.1 U | 0.07 | 0.16 | 0.24 | 0.1 U | 0.1 U | 0.11 | 0.1 U | 0.1 U | 30.8 | 7.5 | 3.2 | 5.8 | 0.82 | 6.2 | 3 | 2.8 |
| Antimony | 0.003 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.0005 U | 0.001 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.0005 U | 0.001 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.0005 | 0.001 U |
| Arsenic | 0.025 | 0.05 U | 0.009 | 0.007 | 0.009 | 0.018 | 0.005 U | 0.005 U | 0.005 U | 0.05 U | 0.006 | 0.007 | 0.006 | 0.006 | 0.005 U | 0.006 | 0.005 | 0.06 | 0.031 | 0.024 | 0.032 | 0.009 | 0.021 | 0.016 | 0.008 |
| Barium | 1 | 1 U | 0.05 | 0.179 | 0.067 | 0.25 | 0.178 | 0.104 | 0.071 | 1 U | 0.032 | 0.069 | 0.033 | 0.024 | 0.024 | 0.032 | 0.026 | 1 U | 0.067 | 0.062 | 0.073 | 0.048 | 0.07 | 0.06 | 0.06 |
| Beryllium | 0.003 | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.0005 U | 0.0005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.0005 U | 0.0005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.0005 U | 0.0005 U |
| Cadmium | 0.005 | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U |
| Calcium | NS | 24 | 41 | 90 | 36 | 82 | 90 | 42 | 33 | 27.2 | 26 | 12 | 14 | 16 | 30 | 20 | 21 | 23.3 | 24 | 26 | 24 | 24 | 25 | 27 | 24 |
| Chromium | 0.05 | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 | 0.02 | 0.01 | 0.02 | 0.01 U | 0.02 | 0.01 | 0.01 U |
| Cobalt | 0.005 | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.02 U | 0.02 U | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.02 U | 0.02 U | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.02 U | 0.02 U |
| Copper | 0.2 | 0.09 | 0.01 U | 0.01 U | 0.018 | 0.014 | 0.021 | 0.01 U | 0.01 U | 0.05 U | 0.09 | 0.085 | 0.01 U | 0.026 | 0.049 | 0.037 | 0.069 | 0.05 | 0.026 | 0.018 | 0.025 | 0.01 U | 0.023 | 0.014 | 0.013 |
| Iron | 0.3 | 2.04 | 4.9 | 3.3 | 4.1 | 9.2 | 0.82 | 1.1 | 1.1 | 3.3 | 1.4 | 9 | 4.3 | 2.3 | 1.4 | 3 | 1.8 | 41.5 | 19 | 16 | 26 | 3.9 | 15 | 11 | 2.1 |
| Lead | 0.025 | 0.005 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.005 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.039 | 0.02 | 0.016 | 0.022 | 0.01 U | 0.017 | 0.012 | 0.012 |
| Magnesium | 35 | 4.11 | 7 | 15 | 5.5 | 9.6 | 12 | 4.6 | 2.7 | 4.67 | 4.9 | 3.2 | 3.6 | 4 | 5.7 | 3.7 | 4.1 | 8.89 | 8.8 | 9 | 9 | 9.4 | 9 | 9.1 | 7.8 |
| Manganese | 0.3 | 0.39 | 0.19 | 0.441 | 0.16 | 0.258 | 0.202 | 0.253 | 0.039 | 0.06 | 0.061 | 0.062 | 0.046 | 0.033 | 0.047 | 0.05 | 0.077 | 0.1 | 0.045 | 0.047 | 0.077 | 0.011 | 0.044 | 0.085 | 1.12 |
| Mercury | 0.0007 | 0.002 U | 0.0002 U | NA | NA | NA | NA | NA | | 0.002 U | 0.0002 U | NA | NA | NA | NA | NA | | 0.002 U | 0.0002 U | NA | NA | NA | NA | NA | |
| Nickel | 0.1 | 0.05 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.05 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.05 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U |
| Potassium | NS | 10.8 | 11 | 26 | 9.4 | 16 | 40 | 9.8 | 7.5 | 12.4 | 11 | 11 | 10 | 10 | 7.8 | 12 | 9.4 | 4.6 | 3.3 | 3.7 | 3.5 | 2.7 | 3.3 | 3.7 | 3.5 |
| Selenium | 0.01 | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U |
| Silver | 0.05 | 0.05 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.05 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.05 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U |
| Sodium | 20 | 37 | 79 | 110 | 31 | 680 | 230 | 55 | 85 | 42.9 | 48 | 42 | 37 | 36 | 51 | 35 | 45 | 28.1 | 32 | 51 | 28 | 31 | 36 | 33 | 27 |
| Thalium | 0.0005 | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.0005 U | 0.0005 U | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.0005 U | 0.0005 U | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.0005 U | 0.0005 U |
| Vanadium | NS | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.34 | 0.136 | 0.13 | 0.198 | 0.034 | 0.106 | 0.08 | 0.016 |
| Zinc | 2 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.05 U | 0.053 | 0.11 | 0.053 | 0.05 U | 0.069 | 0.05 U | 0.050 U | 0.05 U | 0.063 |

Notes:

* - Standard from NYSDEC Ambient Water Quality Standards and Guidance Values Division of Water Technical and Operational Series (1.1.1) 6/1998

** - 6 NYCRR Part 703 Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations 8/1999

NS - Not specified.

NA - Not analyzed.

Bold / Shaded text denotes concentrations exceeding the Groundwater Standards.

G - Guidance value.

TABLE 2b
Historical Groundwater Analytical Results for Metals
One Shore Road
Glenwood Landing, NY

| Compound | NYSDEC Standards** | MW-7 | | | | | | | | MW-8 | | | | | | | | MW-8D | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 |
| Metals by EPA Method 6010 - in mg/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aluminum | 0.1 | 1.22 | 1.3 | 0.4 | 0.1 U | 0.18 | 0.2 | 0.76 | 0.79 | 1.05 | 3.4 | 2.4 | 0.18 | 0.1 U | 0.14 | 0.4 | 0.23 | 1.19 | 0.58 | 1 | 2 | 0.62 | 0.17 | 1.2 | 0.38 |
| Antimony | 0.003 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.0005 U | 0.001 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.0005 U | 0.001 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.0005 | 0.001 U |
| Arsenic | 0.025 | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.05 U | 0.021 | 0.018 | 0.009 | 0.008 | 0.005 U | 0.009 | 0.005 U | 0.05 U | 0.005 U | 0.007 | 0.017 | 0.006 | 0.005 U | 0.006 | 0.005 U |
| Barium | 1 | 1 U | 0.072 | 0.05 | 0.052 | 0.059 | 0.051 | 0.107 | 0.102 | 1 U | 0.05 | 0.049 | 0.034 | 0.045 | 0.062 | 0.056 | 0.1 | 1 U | 0.021 | 0.033 | 0.046 | 0.026 | 0.018 | 0.026 | 0.02 |
| Beryllium | 0.003 | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.0005 U | 0.0005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.0005 U | 0.0005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.0005 U | 0.0005 U |
| Cadmium | 0.005 | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U |
| Calcium | NS | 121 | 80 | 83 | 64 | 92 | 150 | 110 | 120 | 117 | 82 | 89 | 90 | 100 | 21 | 110 | 140 | 18.5 | 9.3 | 18 | 19 | 17 | 18 | 19 | 19 |
| Chromium | 0.05 | 0.05 U | 0.1 | 0.08 | 0.05 | 0.03 | 0.02 | 0.05 | 0.01 U | 0.05 U | 0.03 | 0.01 | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.03 | 0.05 U | 0.5 | 0.32 | 0.27 | 0.18 | 0.14 | 0.18 | 0.11 |
| Cobalt | 0.005 | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.02 U | 0.02 U | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.02 U | 0.02 U | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.02 U | 0.02 U |
| Copper | 0.2 | 0.05 U | 0.013 | 0.01 U | 0.019 | 0.045 | 0.042 | 0.016 | 0.01 U | 0.05 U | 0.018 | 0.013 | 0.011 | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.011 | 0.029 | 0.012 | 0.014 | 0.012 | 0.01 U |
| Iron | 0.3 | 0.46 | 2 | 0.59 | 0.23 | 0.57 | 0.2 | 1.1 | 1.7 | 8.26 | 8.9 | 6.8 | 0.7 | 0.18 | 0.31 | 0.42 | 0.47 | 0.59 | 1.6 | 4 | 9.7 | 2.2 | 0.43 | 4.4 | 0.85 |
| Lead | 0.025 | 0.005 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.005 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.005 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U |
| Magnesium | 35 | 13.3 | 9.2 | 9.2 | 8 | 9.8 | 13 | 11 | 14 | 15.5 | 13 | 12 | 12 | 12 | 2.3 | 12 | 15 | 7.98 | 3.7 | 7.7 | 7.7 | 7.6 | 7.3 | 7.3 | 7.8 |
| Manganese | 0.3 | 0.08 | 42 | 13.3 | 4.64 | 2.22 | 0.821 | 2.09 | 1.15 | 0.32 | 0.23 | 0.166 | 0.145 | 0.058 | 0.017 | 0.051 | 0.035 | 0.05 U | 5.47 | 2.61 | 2.78 | 0.616 | 0.074 | 0.617 | 0.197 |
| Mercury | 0.0007 | 0.002 U | 0.0006 | NA | NA | NA | NA | NA | | 0.002 U | 0.0002 U | NA | NA | NA | NA | NA | | 0.002 U | 0.0002 U | NA | NA | NA | NA | NA | |
| Nickel | 0.1 | 0.05 U | 0.032 | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.05 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.05 U | 0.025 | 0.041 | 0.066 | 0.025 U | 0.025 U | 0.035 | 0.025 U |
| Potassium | NS | 7.63 | 44 | 41 | 16 | 14 | 20 | 11 | 13 | 6.51 | 5.4 | 11 | 7.2 | 7.4 | 30 | 13 | 15 | 1.26 | 41 | 11 | 7.1 | 8.1 | 4.6 | 7 | 4.7 |
| Selenium | 0.01 | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U |
| Silver | 0.05 | 0.05 U | 0.07 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.05 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.05 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U |
| Sodium | 20 | 128 | 120 | 130 | 100 | 140 | 220 | 200 | 170 | 124 | 230 | 200 | 210 | 220 | 74 | 260 | 160 | 16.7 | 15 | 17 | 16 | 15 | 22 | 17 | 21 |
| Thalium | 0.0005 | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.0005 U | 0.0005 U | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.0005 U | 0.0005 U | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.0005 U | 0.0005 U |
| Vanadium | NS | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.066 | 0.062 | 0.023 | 0.027 | 0.010 U | 0.033 | 0.011 | 0.05 U | 0.01 U | 0.012 | 0.031 | 0.01 U | 0.010 U | 0.014 | 0.01 U |
| Zinc | 2 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.068 | 0.050 U | 0.05 U | 0.05 U | 0.05 | 0.06 | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.092 | 0.05 U | 0.050 U | 0.05 U | 0.05 U |

Notes:

* - Standard from NYSDEC Ambient Water Quality Standards and Guidance Values Division of Water Technical and Operational Series (1.1.1) 6/1998

** - 6 NYCRR Part 703 Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations 8/1999

NS - Not specified.

NA - Not analyzed.

Bold / Shaded text denotes concentrations exceeding the Groundwater Standards.

G - Guidance value.

TABLE 2b
Historical Groundwater Analytical Results for Metals
One Shore Road
Glenwood Landing, NY

| Compound | NYSDEC Standards** | MW-9 | | | | | | | | MW-9D | | | | | | | | MW-10 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 | 9/17/08 | 4/6/09 | 7/7/09 | 10/7/09 | 1/20/10 | 4/8/10 | 10/13/10 | 4/20/11 |
| Metals by EPA Method 6010 - in mg/L | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aluminum | 0.1 | 0.9 | 1.2 | 0.24 | 0.44 | 0.24 | 0.29 | 0.1 U | 0.27 | 0.55 | 2.1 | 0.27 | 1.1 | 0.1 U | 0.15 | 0.22 | 0.14 | 0.65 | 0.63 | 0.32 | 0.18 | 0.12 | 0.24 | 0.3 | 0.91 |
| Antimony | 0.003 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.0005 U | 0.001 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.0005 | 0.001 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.0006 | 0.001 U |
| Arsenic | 0.025 | 0.05 U | 0.005 U | 0.005 U | 0.005 | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.05 U | 0.012 | 0.005 U | 0.009 | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U |
| Barium | 1 | 1 U | 0.067 | 0.062 | 0.12 | 0.08 | 0.058 | 0.071 | 0.055 | 1 U | 0.051 | 0.031 | 0.047 | 0.03 | 0.027 | 0.031 | 0.03 | 1 U | 0.075 | 0.195 | 0.142 | 0.067 | 0.038 | 0.086 | 0.076 |
| Beryllium | 0.003 | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.0005 U | 0.0005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.0005 U | 0.0005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.0005 U | 0.0005 U |
| Cadmium | 0.005 | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.05 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U |
| Calcium | NS | 155 | 150 | 160 | 170 | 140 | 120 | 140 | 110 | 18 | 19 | 19 | 20 | 19 | 17 | 18 | 18 | 55.6 | 56 | 51 | 68 | 28 | 21 | 96 | 38 |
| Chromium | 0.05 | 0.05 U | 0.03 | 0.01 | 0.01 | 0.01 U | 0.02 | 0.01 U | 0.01 | 0.05 U | 0.1 | 0.01 U | 0.07 | 0.01 U | 0.01 | 0.01 U | 0.03 | 0.05 U | 0.01 | 0.03 | 0.03 | 0.01 | 0.01 | 0.03 | 0.01 U |
| Cobalt | 0.005 | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.02 U | 0.02 U | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.02 U | 0.02 U | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.02 U | 0.02 U |
| Copper | 0.2 | 0.05 U | 0.01 | 0.01 U | 0.016 | 0.013 | 0.039 | 0.01 U | 0.01 U | 0.05 U | 0.015 | 0.01 U | 0.012 | 0.01 U | 0.017 | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.011 | 0.012 | 0.01 U | 0.013 | 0.01 U | 0.01 U |
| Iron | 0.3 | 0.46 | 1.9 | 0.17 | 0.61 | 0.24 | 0.41 | 0.08 | 0.48 | 0.34 | 6.3 | 0.34 | 4.1 | 0.35 | 0.32 | 0.32 | 0.5 | 0.29 | 0.59 | 0.52 | 0.54 | 0.24 | 0.36 | 0.37 | 1.3 |
| Lead | 0.025 | 0.005 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.005 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.005 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U |
| Magnesium | 35 | 23.6 | 30 | 29 | 36 | 25 | 19 | 20 | 17 | 8.08 | 8 | 7.8 | 8.5 | 8.5 | 7 | 7.2 | 7.5 | 7.65 | 7.9 | 6.7 | 11 | 4.4 | 3.9 | 11 | 4.2 |
| Manganese | 0.3 | 0.05 U | 1.08 | 1.85 | 2.56 | 1.13 | 8 | 0.274 | 0.831 | 0.05 U | 0.556 | 0.055 | 0.566 | 0.128 | 0.047 | 0.16 | 0.089 | 0.05 U | 0.512 | 0.147 | 0.277 | 0.088 | 0.043 | 0.046 | 0.224 |
| Mercury | 0.0007 | 0.002 U | 0.0002 U | NA | NA | NA | NA | NA | | 0.002 U | 0.0002 U | NA | NA | NA | NA | NA | | 0.002 U | 0.0002 U | NA | NA | NA | NA | NA | |
| Nickel | 0.1 | 0.05 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.05 U | 0.066 | 0.025 U | 0.044 | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.05 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U |
| Potassium | NS | 16.9 | 25 | 29 | 19 | 16 | 30 | 18 | 10 | 1.14 | 2.5 U | 2.5 U | 2.5 U | 2.5 U | 2.5 U | 2.5 U | 2.5 U | 3.2 | 43 | 220 | 11 | 30 | 24 | 6 | 23 |
| Selenium | 0.01 | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U |
| Silver | 0.05 | 0.05 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.05 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.05 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U | 0.007 U |
| Sodium | 20 | 189 | 210 | 190 | 210 | 150 | 170 | 180 | 99 | 18.5 | 18 | 20 | 18 | 19 | 16 | 16 | 17 | 78.6 | 170 | 170 | 140 | 57 | 29 | 230 | 65 |
| Thalium | 0.0005 | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.0005 U | 0.0005 U | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.0005 U | 0.0005 U | 0.05 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.020 U | 0.0005 U | 0.0005 U |
| Vanadium | NS | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.021 | 0.01 U | 0.014 | 0.01 U | 0.010 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.010 U | 0.01 U | 0.01 U |
| Zinc | 2 | 0.06 | 0.05 U | 0.05 U | 0.111 | 0.094 | 0.073 | 0.052 | 0.053 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.050 U | 0.05 U | 0.05 U |

Notes:

* - Standard from NYSDEC Ambient Water Quality Standards and Guidance Values Division of Water Technical and Operational Series (1.1.1) 6/1998

** - 6 NYCRR Part 703 Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations 8/1999

NS - Not specified.

NA - Not analyzed.

**Bold** / Shaded text denotes concentrations exceeding the Groundwater Standards.

G - Guidance value.

1 SHORE ROAD
GLENWOOD LANDING, NEW YORK

TABLE 3a

SOIL GAS ANALYTICAL RESULTS FOR VOLATILE ORGANIC COMPOUNDS
METHOD TO-15

| Compound | Target Soil Gas Concentrations (1) | SG-1 (4'-5') | SG-2 (9'-10') | SG-3 (6.5'-7.5') | SG-4 (9.5'-10.5') |
|---|---|---|---|---|---|
| | | 12/20/2004 | 12/20/2004 | 12/20/2004 | 12/28/2004 |
| Dichlorodifluoromethane | 400 | <100 | <25 | <200 | <20 |
| Chloromethane | 120 | <100 | <25 | <200 | <20 |
| Vinyl Chloride | 11 | <40 | <10 | <80 | <8.0 |
| Bromomethane | 13 | <40 | <10 | <80 | <8.0 |
| Chloroethane | 38,000 | <40 | 17 | <80 | <8.0 |
| Trichlorofluoromethane | 1,200 | <40 | <10 | <80 | <8.0 |
| Freon TF | 39,000 | 180 | 50 | <80 | <8.0 |
| 1,1-Dichloroethene | 500 | <40 | <10 | <80 | <8.0 |
| Methylene Chloride | 150 | <100 | <25 | <200 | <20 |
| 1,1-Dichloroethane | 1,200 | <40 | 14 | <80 | <8.0 |
| cis-1,2-Dichloroethene | 88 | 72 | 32 | <80 | <8.0 |
| Chloroform | 2.2 | <40 | <10 | <80 | <8.0 |
| 1,1,1-Trichloroethane | 4,000 | 180 | <10 | <80 | <8.0 |
| Carbon Tetrachloride | 2.6 | <40 | <10 | <80 | <8.0 |
| Benzene | 9.8 | <40 | <10 | <80 | <8.0 |
| 1,2-Dichloroethane | 2.3 | <40 | <10 | <80 | <8.0 |
| Trichloroethene | 41 | **1,100** | 32 | **150** | <8.0 |
| 1,2-Dichloropropane | 8.7 | <40 | <10 | <80 | <8.0 |
| cis-1,3-Dichloropropene | 6.5 | <40 | <10 | <80 | <8.0 |
| Toluene | 1,100 | 60 | 25 | <80 | 26 |
| trans-1,3-Dichloropropene | 6.5 | <40 | <10 | <80 | <8.0 |
| 1,1,2-Trichloroethane | 2.8 | <40 | <10 | <80 | <8.0 |
| Tetrachloroethene | 12 | **4,400** | **970** | **8,600** | **1,200** |
| Chlorobenzene | 130 | <40 | <10 | <80 | <8.0 |
| Ethylbenzene | 51 | <40 | <10 | <80 | <8.0 |
| Xylene (m,p) | 32,000 | <40 | <10 | <80 | 10 |
| Styrene | 2,300 | <40 | <10 | <80 | <8.0 |
| Xylene (o) | 16,000 | <40 | <10 | <80 | <8.0 |
| 1,1,2,2-Tetrachloroethane | 61 | <40 | <10 | <80 | <8.0 |
| 1,3-Dichlorobenzene | 170 | <40 | <10 | <80 | <8.0 |
| 1,4-Dichlorobenzene | 1,300 | <40 | <10 | <80 | <8.0 |
| 1,2-Dichlorobenzene | 330 | <40 | <10 | <80 | <8.0 |
| 1,2,4-Trichlorobenzene | 270 | <100 | <25 | <200 | <20 |
| Hexachlorobutadiene | 1.0 | <40 | <10 | <80 | <8.0 |
| 1,3,5-Trimethylbenzene | 12 | <40 | <10 | <80 | <8.0 |
| 1,2,4-Trimethylbenzene | 12 | <40 | <10 | <80 | <8.0 |
| 1,2-Dichlorotetrafluoroethane | NS | <40 | <10 | <80 | <8.0 |
| 1,2-Dibromoethane | 14 | <40 | <10 | <80 | <8.0 |
| 1,3-Butadiene | 39 | <40 | <10 | <80 | <8.0 |
| Carbon Disulfide | 2,200 | 140 | <25 | 270 | 27 |
| Acetone | 1,500 | <1,000 | <250 | <2,000 | <200 |
| Isopropyl Alcohol | NS | <1,000 | <250 | 3,100 | <200 |
| Methyl tert-Butyl Ether | 8,300 | <100 | <25 | <200 | <20 |
| Cyclohexane | NS | 58 | <10 | <80 | <8.0 |

1 SHORE ROAD
GLENWOOD LANDING, NEW YORK

TABLE 3a

SOIL GAS ANALYTICAL RESULTS FOR VOLATILE ORGANIC COMPOUNDS
METHOD TO-15

| Compound | Target Soil Gas Concentrations (1) | SG-1 (4'-5') | SG-2 (9'-10') | SG-3 (6.5'-7.5') | SG-4 (9.5'-10.5') |
|---|---|---|---|---|---|
| | | 12/20/2004 | 12/20/2004 | 12/20/2004 | 12/28/2004 |
| Dibromochloromethane | 1.2 | <40 | <10 | <80 | <8.0 |
| Methyl Ethyl Ketone | 3,400 | <100 | <25 | <200 | <20 |
| 1,4-Dioxane | NS | <1,000 | <250 | <2,000 | <200 |
| Methyl Isobutyl Ketone | 200 | <100 | <25 | <200 | <20 |
| Methyl Butyl Ketone | NS | <100 | <25 | <200 | <20 |
| Bromoform | 21 | <40 | <10 | <80 | <8.0 |
| Bromodichloromethane | 2.1 | <40 | <10 | <80 | <8.0 |
| trans-1,2-Dichloroethene | 180 | <40 | <10 | <80 | <8.0 |
| 4-Ethyltoluene | NS | <40 | <10 | <80 | <8.0 |
| 3-Chloropropene | NS | <40 | <10 | <80 | <8.0 |
| 2,2,4-Trimethylpentane | NS | <40 | <10 | <80 | <8.0 |
| Bromoethene | NS | <40 | <10 | <80 | <8.0 |
| 2-Chlorotoluene | NS | <40 | <10 | <80 | <8.0 |
| n-Hexane | 570 | 190 | 13 | <80 | 16 |
| Tetrahydrofuran | NS | <1,000 | <250 | <2,000 | <200 |
| n-Heptane | NS | 47 | <10 | <80 | <8.0 |
| 1,2-Dichloroethene (total) | 268 | 72 | 32 | <80 | <8.0 |
| Xylene (total) | 48,000 | <40 | <10 | <80 | 10 |
| tert-Butyl Alcohol | NS | <1,000 | <250 | <2,000 | <200 |

Notes:
USEPA Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil (Subsurface Vapor Intrusion Guidance) Table 2b Risk = $1 \times 10^{-5}$
NS - No Standard
All units are ppbv
**Bold** text denotes exceedance of standard

1 SHORE ROAD
GLENWOOD LANDING, NEW YORK

TABLE 3b

SUB-SLAB VAPOR AND
INDOOR AIR ANALYTICAL RESULTS

| | Landing Wholesale (Office) | | | | Landing Wholesale (Warehouse) | | | | Sunnyside Up Parties | | | | Parabit Manufacturing | | | | Residence | | | | Church | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Compound** | **SS-1** | **Q** | **IA-1** | **Q** | **SS-2** | **Q** | **IA-2** | **Q** | **SS-3** | **Q** | **IA-3** | **Q** | **SS-4** | **Q** | **IA-4** | **Q** | **SS-5** | **Q** | **IA-5** | **Q** | **IA-6** | **Q** |
| Dichlorodifluoromethane | 4.9 | U | 5.9 | | 250 | U | 13 | | 640 | U | 2.5 | U | 4.9 | U | 2.5 | U | 25 | U | 2.5 | | 2.5 | |
| Chloromethane | 2.1 | U | 1.1 | | 100 | U | 1.0 | U | 270 | U | 2.1 | | 2.1 | U | 1.1 | | 10 | U | 1.0 | U | 1.3 | |
| Vinyl Chloride | 1.0 | U | 0.51 | U | 51 | U | 0.51 | U | 130 | U | 0.51 | U | 1.0 | U | 0.51 | U | 5.1 | U | 0.51 | U | 0.51 | U |
| Bromomethane | 1.6 | U | 0.78 | U | 78 | U | 0.78 | U | 190 | U | 0.78 | U | 1.6 | U | 0.78 | U | 7.8 | U | 0.78 | U | 0.78 | U |
| Chloroethane | 1.1 | U | 0.53 | U | 53 | U | 0.53 | U | 130 | U | 0.53 | U | 1.1 | U | 0.53 | U | 5.3 | U | 0.53 | U | 0.53 | U |
| Trichlorofluoromethane | 2.6 | | 3.7 | | 110 | U | 6.7 | | 280 | U | 1.6 | | 2.2 | U | 2.2 | | 11 | U | 2.6 | | 1.9 | |
| Freon TF | 450 | | 1.5 | U | 410 | | 1.5 | U | 380 | U | 1.5 | U | 24 | | 1.5 | U | 15 | U | 1.5 | U | 1.5 | U |
| 1,1-Dichloroethene | 1.6 | U | 0.79 | U | 79 | U | 0.79 | U | 200 | U | 0.79 | U | 1.6 | U | 0.79 | U | 7.9 | U | 0.79 | U | 0.79 | U |
| Methylene Chloride | 17 | | 170 | D | 170 | U | 110 | | 450 | U | 6.3 | | 1,300 | D | 800 | D | 17 | U | 1.7 | U | 73 | |
| 1,1-Dichloroethane | 1.6 | U | 0.81 | U | 81 | U | 0.81 | U | 200 | U | 0.81 | U | 1.6 | U | 0.81 | U | 8.1 | U | 0.81 | U | 0.81 | U |
| cis-1,2-Dichloroethene | 1.6 | U | 0.79 | U | 79 | U | 0.79 | U | 200 | U | 0.79 | U | 1.6 | U | 0.79 | U | 7.9 | U | 0.79 | U | 0.79 | U |
| Chloroform | 2.0 | U | 0.98 | U | 98 | U | 0.98 | U | 240 | U | 0.98 | U | 2.3 | | 0.98 | U | 9.8 | U | 0.98 | U | 0.98 | U |
| 1,1,1-Trichloroethane | 10 | | 1.1 | U | 120 | | 1.1 | U | 270 | U | 1.1 | U | 15 | | 1.1 | U | 11 | U | 1.1 | U | 1.1 | U |
| Carbon Tetrachloride | 2.5 | U | 1.3 | U | 130 | U | 1.3 | U | 310 | U | 1.3 | U | 2.5 | U | 1.3 | U | 13 | U | 1.3 | U | 1.3 | U |
| Benzene | 1.4 | | 1.4 | | 64 | U | 1.3 | | 160 | U | 0.83 | | 3.5 | | 0.86 | | 6.4 | U | 0.89 | | 1.8 | |
| 1,2-Dichloroethane | 1.6 | U | 0.81 | U | 81 | U | 0.81 | U | 200 | U | 0.81 | U | 1.6 | U | 0.81 | U | 8.1 | U | 0.81 | U | 0.81 | U |
| Trichloroethene | 52 | | 1.5 | | 520 | | 1.1 | U | 280 | | 1.1 | U | 16 | | 1.1 | U | 30 | | 1.1 | U | 1.1 | U |
| 1,2-Dichloropropane | 1.8 | U | 0.92 | U | 92 | U | 0.92 | U | 230 | U | 0.92 | U | 1.8 | U | 0.92 | U | 9.2 | U | 0.92 | U | 0.92 | U |
| cis-1,3-Dichloropropene | 1.8 | U | 0.91 | U | 91 | U | 0.91 | U | 230 | U | 0.91 | U | 1.8 | U | 0.91 | U | 9.1 | U | 0.91 | U | 0.91 | U |
| Toluene | 110 | | 26 | | 750 | | 31 | | 2,600 | | 27 | | 230 | | 34 | | 570 | | 9.0 | | 3.8 | |
| trans-1,3-Dichloropropene | 1.8 | U | 0.91 | U | 91 | U | 0.91 | U | 230 | U | 0.91 | U | 1.8 | U | 0.91 | U | 9.1 | U | 0.91 | U | 0.91 | U |
| 1,1,2-Trichloroethane | 2.2 | U | 1.1 | U | 110 | U | 1.1 | U | 270 | U | 1.1 | U | 2.2 | U | 1.1 | U | 11 | U | 1.1 | U | 1.1 | U |
| Tetrachloroethene | 1,000 | D | 7.5 | | 16,000 | | 9.5 | | 50,000 | | 55 | | 37 | | 14 | | 6,200 | D | 11 | | 15 | |
| Chlorobenzene | 1.8 | U | 0.92 | U | 92 | U | 0.92 | U | 230 | U | 0.92 | U | 1.8 | U | 0.92 | U | 9.2 | U | 0.92 | U | 0.92 | U |
| Ethylbenzene | 6.5 | | 2.7 | | 87 | U | 2.3 | | 220 | U | 2.3 | | 7.4 | | 2.0 | | 32 | | 96 | | 0.87 | U |
| Xylene (m,p) | 29 | | 8.7 | | 96 | | 7.4 | | 220 | | 7.4 | | 28 | | 5.6 | | 130 | | 270 | | 0.87 | U |
| Styrene | 25 | | 3.4 | | 160 | | 2.6 | | 210 | U | 6.0 | | 12 | | 6.4 | | 8.5 | U | 0.85 | U | 0.85 | U |
| Xylene (o) | 10 | | 3.2 | | 87 | U | 2.6 | | 220 | U | 2.6 | | 9.6 | | 2.0 | | 41 | | 65 | | 0.87 | U |
| 1,1,2,2-Tetrachloroethane | 2.7 | U | 1.4 | U | 140 | U | 1.4 | U | 340 | U | 1.4 | U | 2.7 | U | 1.4 | U | 14 | U | 1.4 | U | 1.4 | U |
| 1,3-Dichlorobenzene | 2.4 | U | 1.2 | U | 120 | U | 1.2 | U | 300 | U | 1.2 | U | 2.4 | U | 1.2 | U | 12 | U | 1.2 | U | 1.2 | U |
| 1,4-Dichlorobenzene | 2.4 | U | 1.2 | U | 120 | U | 1.2 | U | 300 | U | 1.2 | U | 2.4 | U | 1.2 | U | 12 | U | 1.2 | U | 1.2 | U |
| 1,2-Dichlorobenzene | 2.4 | U | 1.2 | U | 120 | U | 1.2 | U | 300 | U | 1.2 | U | 2.4 | U | 1.2 | U | 12 | U | 1.2 | U | 1.2 | U |
| 1,2,4-Trichlorobenzene | 7.4 | U | 3.7 | U | 370 | U | 3.7 | U | 960 | U | 3.7 | U | 7.4 | U | 3.7 | U | 37 | U | 3.7 | U | 3.7 | U |
| Hexachlorobutadiene | 4.3 | U | 2.1 | U | 210 | U | 2.1 | U | 530 | U | 2.1 | U | 4.3 | U | 2.1 | U | 21 | U | 2.1 | U | 2.1 | U |
| 1,3,5-Trimethylbenzene | 4.9 | | 0.98 | U | 98 | U | 0.98 | U | 250 | U | 1.3 | | 4.3 | | 0.98 | U | 15 | | 7.4 | | 0.98 | U |
| 1,2,4-Trimethylbenzene | 19 | | 2.9 | | 98 | U | 3.1 | | 250 | U | 3.4 | | 16 | | 1.9 | | 54 | | 27 | | 0.98 | U |
| 1,2-Dichlorotetrafluoroethane | 2.8 | U | 1.4 | U | 140 | U | 1.4 | U | 350 | U | 1.4 | U | 2.8 | U | 1.4 | U | 14 | U | 1.4 | U | 1.4 | U |
| 1,2-Dibromoethane | 3.1 | U | 1.5 | U | 150 | U | 1.5 | U | 380 | U | 1.5 | U | 3.1 | U | 1.5 | U | 15 | U | 1.5 | U | 1.5 | U |
| 1,3-Butadiene | 0.88 | U | 0.44 | U | 44 | U | 0.44 | U | 110 | U | 0.44 | U | 0.88 | U | 0.44 | U | 4.4 | U | 0.44 | U | 0.44 | U |
| Carbon Disulfide | 3.1 | U | 1.6 | U | 160 | U | 1.6 | U | 470 | | 2.0 | | 3.1 | U | 1.6 | U | 16 | U | 1.6 | U | 1.6 | U |
| Acetone | 88 | | 120 | D | 1,200 | U | 100 | D | 3,100 | U | 50 | | 380 | D | 86 | | 120 | U | 16 | | 55 | |
| Isopropyl Alcohol | 25 | U | 59 | | 1,200 | U | 37 | | 3,200 | U | 12 | U | 91 | | 23 | | 420 | | 12 | U | 29 | |
| Methyl tert-Butyl Ether | 3.6 | U | 1.8 | U | 180 | U | 1.8 | U | 470 | U | 1.8 | U | 3.6 | U | 1.8 | U | 21 | | 1.8 | U | 1.8 | U |
| Cyclohexane | 1.4 | U | 0.69 | | 190 | | 0.86 | | 890 | | 0.69 | U | 2.3 | | 0.69 | U | 6.9 | U | 0.69 | U | 1.5 | |
| Dibromochloromethane | 3.4 | U | 1.7 | U | 170 | U | 1.7 | U | 430 | U | 1.7 | U | 3.4 | U | 1.7 | U | 17 | U | 1.7 | U | 1.7 | U |
| Methyl Ethyl Ketone | 9.4 | | 12 | | 180 | | 9.4 | | 530 | | 7.1 | | 29 | | 14 | | 15 | U | 2.9 | | 22 | |
| 1,4-Dioxane | 36 | U | 18 | U | 1,800 | U | 18 | U | 4,700 | U | 18 | U | 36 | U | 18 | U | 180 | U | 18 | U | 18 | U |
| Methyl Isobutyl Ketone | 4.9 | | 2.1 | | 200 | U | 5.3 | | 530 | U | 4.9 | | 17 | | 4.0 | | 20 | U | 5.7 | | 2.0 | U |
| Methyl Butyl Ketone | 4.1 | U | 2.0 | U | 200 | U | 2.0 | U | 530 | U | 2.0 | U | 4.1 | U | 2.0 | U | 20 | U | 2.0 | U | 2.0 | U |
| Bromoform | 4.1 | U | 2.1 | U | 210 | U | 2.1 | U | 520 | U | 2.1 | U | 4.1 | U | 2.1 | U | 21 | U | 2.1 | U | 2.1 | U |
| Bromodichloromethane | 2.7 | U | 1.3 | U | 130 | U | 1.3 | U | 340 | U | 1.3 | U | 2.7 | U | 1.3 | U | 13 | U | 1.3 | U | 1.3 | U |
| trans-1,2-Dichloroethene | 1.6 | U | 0.79 | U | 79 | U | 0.79 | U | 200 | U | 0.79 | U | 1.6 | U | 0.79 | U | 7.9 | U | 0.79 | U | 0.79 | U |
| 4-Ethyltoluene | 12 | | 2.2 | | 98 | U | 2.2 | | 250 | U | 2.5 | | 9.8 | | 1.5 | | 42 | | 16 | | 0.98 | U |
| 3-Chloropropene | 1.3 | U | 0.63 | U | 63 | U | 0.63 | U | 160 | U | 0.63 | U | 1.3 | U | 0.63 | U | 6.3 | U | 0.63 | U | 0.63 | U |
| 2,2,4-Trimethylpentane | 1.9 | U | 3.0 | | 93 | U | 3.3 | | 230 | U | 1.1 | | 2.7 | | 1.3 | | 9.3 | U | 1.0 | | 1.3 | |
| Bromoethene | 1.7 | U | 0.87 | U | 87 | U | 0.87 | U | 220 | U | 0.87 | U | 1.7 | U | 0.87 | U | 8.7 | U | 0.87 | U | 0.87 | U |
| 2-Chlorotoluene | 2.1 | U | 1.0 | U | 100 | U | 1.0 | U | 260 | U | 1.0 | U | 2.1 | U | 1.0 | U | 10 | U | 1.0 | U | 1.0 | U |
| n-Hexane | 9.5 | | 2.8 | | 99 | | 3.3 | | 260 | | 1.2 | | 9.2 | | 1.7 | | 15 | | 1.2 | | 4.6 | |
| Tetrahydrofuran | 29 | U | 15 | U | 1,500 | U | 15 | U | 3,800 | U | 15 | U | 29 | U | 15 | U | 150 | U | 15 | U | 15 | U |
| n-Heptane | 1.7 | | 2.0 | | 82 | U | 1.8 | | 200 | U | 1.5 | | 13 | | 4.5 | | 8.2 | U | 1.8 | | 2.2 | |
| 1,2-Dichloroethene (total) | 1.6 | U | 0.79 | U | 79 | U | 0.79 | U | 200 | U | 0.79 | U | 1.6 | U | 0.79 | U | 7.9 | U | 0.79 | U | 0.79 | U |
| Xylene (total) | 40 | | 12 | | 96 | | 10 | | 230 | | 10 | | 38 | | 7.8 | | 170 | | 340 | | 0.87 | U |
| tert-Butyl Alcohol | 30 | U | 15 | U | 1,500 | | 15 | U | 3,900 | U | 15 | U | 39 | | 15 | U | 150 | U | 15 | U | 15 | U |

Notes:

U - Compound not detected at a concentration above the reporting limit.
D - Concentrations identified from analysis of the sample at a secondary dilution.
All units are µg/m³

1 SHORE ROAD
GLENWOOD LANDING, NEW YORK

TABLE 3c

INDOOR AIR ANALYTICAL RESULTS

| Compound | Landing Wholesale (Office) | | | | Landing Wholesale (Warehouse) | | | | Sunnyside Up Parties | | | | Former Parabit Manufacturing | | | | Residence | | | | Church | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | IA-1 | | IA-1 | | IA-2 | | IA-2 | | IA-3 | | IA-3 | | IA-4 | | IA-4 | | IA-5 | | IA-5 | | IA-6 | | IA-6 | |
| **Date of Sample** | **(8/05)** | **Q** | **(5/06)** | **Q** | **(8/05)** | **Q** | **(5/06)** | **Q** | **(8/05)** | **Q** | **(5/06)** | **Q** | **(8/05)** | **Q** | **(5/06)** | **Q** | **(8/05)** | **Q** | **(5/06)** | **Q** | **(8/05)** | **Q** | **(5/06)** | **Q** |
| Dichlorodifluoromethane | 5.9 | | 1.70 | U | 13 | | 1.70 | U | 2.5 | U | 9.39 | U | 2.5 | U | 1.78 | U | 2.5 | | 1.81 | U | 2.5 | | 1.70 | U |
| Chloromethane | 1.1 | | 0.706 | U | 1.0 | U | 0.706 | U | 2.1 | | 3.91 | U | 1.1 | U | 0.739 | U | 1.0 | U | 0.752 | U | 1.3 | | 0.706 | U |
| Vinyl Chloride | 0.51 | U | 0.874 | U | 0.51 | U | 0.874 | U | 0.51 | U | 4.84 | U | 0.51 | U | 0.915 | U | 0.51 | U | 0.931 | U | 0.51 | U | 0.874 | U |
| Bromomethane | 0.78 | U | 1.33 | U | 0.78 | U | 1.33 | U | 0.78 | U | 7.35 | U | 0.78 | U | 1.39 | U | 0.78 | U | 1.41 | U | 0.78 | U | 1.33 | U |
| Chloroethane | 0.53 | U | 0.907 | U | 0.53 | U | 0.907 | U | 0.53 | U | 5.02 | U | 0.53 | U | 0.950 | U | 0.53 | U | 0.967 | U | 0.53 | U | 0.907 | U |
| Trichlorofluoromethane | 3.7 | | 1.92 | U | 6.7 | | 1.92 | U | 1.6 | | 10.6 | U | 2.2 | | 2.01 | U | 2.6 | | 2.04 | U | 1.9 | | 1.92 | U |
| Bromoethene | 0.87 | U | NS | | 0.87 | U | NS | | 0.87 | U | NS | | 0.87 | U | NS | | 0.87 | U | NS | | 0.87 | U | NS | |
| Freon TF | 1.5 | U | 2.62 | U | 1.5 | U | 2.62 | U | 1.5 | U | 14.5 | U | 1.5 | U | 2.75 | U | 1.5 | U | 2.79 | U | 1.5 | U | 2.62 | U |
| 1,1-Dichloroethene | 0.79 | U | 1.36 | U | 0.79 | U | 1.36 | U | 0.79 | U | 7.53 | U | 0.79 | U | 1.43 | U | 0.79 | U | 1.45 | U | 0.79 | U | 1.36 | U |
| Methylene Chloride | 170 | D | 1.19 | U | 110 | | 1.19 | U | 6.3 | | 6.60 | U | 800 | D | 1.25 | U | 1.7 | U | 1.27 | U | 73 | | 1.19 | U |
| 1,1-Dichloroethane | 0.81 | U | 1.38 | U | 0.81 | U | 1.38 | U | 0.81 | U | 7.63 | U | 0.81 | U | 1.44 | U | 0.81 | U | 1.47 | U | 0.81 | U | 1.38 | U |
| cis-1,2-Dichloroethene | 0.79 | U | 1.36 | U | 0.79 | U | 1.36 | U | 0.79 | U | 7.53 | U | 0.79 | U | 1.43 | U | 0.79 | U | 1.45 | U | 0.79 | U | 1.36 | U |
| Chloroform | 0.98 | U | 1.24 | U | 0.98 | U | 1.24 | U | 0.98 | U | 6.88 | U | 0.98 | U | 1.30 | U | 0.98 | U | 1.32 | U | 0.98 | U | 1.24 | U |
| 1,1,1-Trichloroethane | 1.1 | U | 1.39 | U | 1.1 | U | 1.39 | U | 1.1 | U | 7.72 | U | 1.1 | U | 1.46 | U | 1.1 | U | 1.49 | U | 1.1 | U | 1.39 | U |
| Carbon Tetrachloride | 1.3 | U | 1.61 | U | 1.3 | U | 1.61 | U | 1.3 | U | 8.93 | U | 1.3 | U | 1.69 | U | 1.3 | U | 1.72 | U | 1.3 | U | 1.61 | U |
| Benzene | 1.4 | | 0.823 | U | 1.3 | | 0.823 | U | 0.83 | | 4.56 | U | 0.86 | | 0.0862 | U | 0.89 | | 7.15 | | 1.8 | | 3.57 | |
| 1,2-Dichloroethane | 0.81 | U | 1.04 | U | 0.81 | U | 1.04 | U | 0.81 | U | 5.77 | U | 0.81 | U | 1.09 | U | 0.81 | U | 1.11 | U | 0.81 | U | 1.04 | U |
| Trichloroethene | 1.5 | | 1.38 | U | 1.1 | U | 1.38 | U | 1.1 | U | 7.63 | U | 1.1 | U | 1.44 | U | 1.1 | U | 1.47 | U | 1.1 | U | 1.38 | U |
| 1,2-Dichloropropane | 0.92 | U | 1.19 | U | 0.92 | U | 1.19 | U | 0.92 | U | 6.60 | U | 0.92 | U | 1.25 | U | 0.92 | U | 1.27 | U | 0.92 | U | 1.19 | U |
| cis-1,3-Dichloropropene | 0.91 | U | 1.16 | U | 0.91 | U | 1.16 | U | 0.91 | U | 6.42 | U | 0.91 | U | 1.21 | U | 0.91 | U | 1.24 | U | 0.91 | U | 1.16 | U |
| Toluene | 26 | | 8.43 | | 31 | | 5.75 | | 27 | | 11.1 | | 34 | | 6.90 | | 9.0 | | 38.3 | | 3.8 | | 19.6 | |
| trans-1,3-Dichloropropene | 0.91 | U | 1.16 | U | 0.91 | U | 1.16 | U | 0.91 | U | 6.42 | U | 0.91 | U | 1.21 | U | 0.91 | U | 1.24 | U | 0.91 | U | 1.16 | U |
| 1,1,2-Trichloroethane | 1.1 | U | 1.39 | U | 1.1 | U | 1.39 | U | 1.1 | U | 7.72 | U | 1.1 | U | 1.46 | U | 1.1 | U | 1.49 | U | 1.1 | U | 1.39 | U |
| Tetrachloroethene | 7.5 | | 4.83 | | 9.5 | | 6.90 | | 55 | | 28.3 | | 14 | | 6.90 | | 11 | | 10.4 | | 15 | | 11.7 | |
| Chlorobenzene | 0.92 | U | 1.18 | U | 0.92 | U | 1.18 | U | 0.92 | U | 6.51 | U | 0.92 | U | 1.23 | U | 0.92 | U | 1.25 | U | 0.92 | U | 1.18 | U |
| Ethylbenzene | 2.7 | | 1.11 | U | 2.3 | | 1.77 | | 2.3 | | 6.14 | U | 2.0 | | 1.16 | U | 96 | | 7.95 | | 0.87 | U | 3.97 | |
| Xylene (m,p) | 8.7 | | 1.77 | | 7.4 | | 3.97 | | 7.4 | | 6.14 | U | 5.6 | | 3.09 | | 270 | | 16.3 | U | 0.87 | U | 7.95 | U |
| Styrene | 3.4 | | 1.09 | U | 2.6 | | 1.09 | U | 6.0 | | 6.05 | U | 6.4 | | 1.14 | U | 0.85 | U | 1.16 | U | 0.85 | U | 1.73 | |
| Xylene (o) | 3.2 | | 1.11 | U | 2.6 | | 2.21 | | 2.6 | | 6.14 | U | 2.0 | | 2.21 | | 65 | | 12.4 | | 0.87 | U | 5.74 | |
| 1,1,2,2-Tetrachloroethane | 1.4 | U | 1.76 | U | 1.4 | U | 1.76 | U | 1.4 | U | 9.77 | U | 1.4 | U | 1.85 | U | 1.4 | U | 1.88 | U | 1.4 | U | 1.76 | U |
| 1,3-Dichlorobenzene | 1.2 | U | 1.55 | U | 1.2 | U | 1.55 | U | 1.2 | U | 8.56 | U | 1.2 | U | 1.62 | U | 1.2 | U | 1.65 | U | 1.2 | U | 1.55 | U |
| 1,4-Dichlorobenzene | 1.2 | U | 1.55 | U | 1.2 | U | 1.55 | U | 1.2 | U | 8.56 | U | 1.2 | U | 1.62 | U | 1.2 | U | 1.65 | U | 1.2 | U | 1.55 | U |
| 1,2-Dichlorobenzene | 1.2 | U | 1.55 | U | 1.2 | U | 1.55 | U | 1.2 | U | 8.56 | U | 1.2 | U | 1.62 | U | 1.2 | U | 1.65 | U | 1.2 | U | 1.55 | U |
| 1,2,4-Trichlorobenzene | 3.7 | U | 1.73 | U | 3.7 | U | 1.73 | U | 3.7 | U | 9.58 | U | 3.7 | U | 1.81 | U | 3.7 | U | 1.84 | U | 3.7 | U | 1.73 | U |
| Hexachlorobutadiene | 2.1 | U | 1.92 | U | 2.1 | U | 1.92 | U | 2.1 | U | 10.6 | U | 2.1 | U | 2.01 | U | 2.1 | U | 2.04 | U | 2.1 | U | 1.92 | U |
| 1,3,5-Trimethylbenzene | 0.98 | U | 2.00 | | 0.98 | U | 1.26 | U | 1.3 | | 6.98 | U | 0.98 | U | 2.50 | | 7.4 | | 3.50 | | 0.98 | U | 3.00 | |
| 1,2,4-Trimethylbenzene | 2.9 | | 4.50 | | 3.1 | | 3.50 | | 3.4 | | 6.98 | U | 1.9 | | 6.50 | | 27 | | 13.5 | | 0.98 | U | 8.00 | |
| 1,2-Dichlorotetrafluoroethane | 1.4 | U | 1.68 | U | 1.4 | U | 1.68 | U | 1.4 | U | 9.30 | U | 1.4 | U | 1.76 | U | 1.4 | U | 1.79 | U | 1.4 | U | 1.68 | U |
| 1,2-Dibromoethane | 1.5 | U | 1.97 | U | 1.5 | U | 1.97 | U | 1.5 | U | 10.9 | U | 1.5 | U | 2.06 | U | 1.5 | U | 2.09 | U | 1.5 | U | 1.97 | U |
| 1,3-Butadiene | 0.44 | U | 0.571 | U | 0.44 | U | 0.571 | U | 0.44 | U | 3.16 | U | 0.44 | U | 0.598 | U | 0.44 | U | 0.609 | U | 0.44 | U | 0.571 | U |
| Carbon Disulfide | 1.6 | U | 0.806 | U | 1.6 | U | 0.806 | U | 2.0 | | 4.46 | U | 1.6 | U | 0.845 | U | 1.6 | U | 0.859 | U | 1.6 | U | 0.806 | U |
| Acetone | 120 | D | 43.5 | | 100 | D | 21.0 | | 50 | | 338 | | 86 | | 33.8 | | 16 | | 29.0 | | 55 | | 77.3 | |
| Isopropyl Alcohol | 59 | | 0.622 | U | 37 | | 0.622 | U | 12 | U | 3.44 | U | 23 | | 0.651 | U | 12 | U | 0.662 | U | 29 | | 0.622 | U |
| Methyl tert-Butyl Ether | 1.8 | U | 0.924 | U | 1.8 | U | 0.924 | U | 1.8 | U | 5.12 | U | 1.8 | U | 0.968 | U | 1.8 | U | 0.984 | U | 1.8 | U | 0.924 | U |
| Cyclohexane | 0.69 | | 0.890 | U | 0.86 | | 0.890 | U | 0.69 | U | 4.93 | U | 0.69 | U | 0.933 | U | 0.69 | U | 0.949 | U | 1.5 | | 0.890 | U |
| Dibromochloromethane | 1.7 | U | 2.18 | U | 1.7 | U | 2.18 | U | 1.7 | U | 12.1 | U | 1.7 | U | 2.29 | U | 1.7 | U | 2.33 | U | 1.7 | U | 2.18 | U |
| Methyl Ethyl Ketone | 12 | | 0.756 | U | 9.4 | | 0.756 | U | 7.1 | | 4.18 | U | 14 | | 0.792 | U | 2.9 | | 0.805 | U | 22 | | 0.756 | U |
| 1,4-Dioxane | 18 | U | 0.924 | U | 18 | U | 0.924 | U | 18 | U | 5.12 | U | 18 | U | 0.968 | U | 18 | U | 0.984 | U | 18 | U | 0.924 | U |
| Methyl Isobutyl Ketone | 2.1 | | 1.06 | U | 5.3 | | 1.06 | U | 4.9 | | 5.86 | U | 4.0 | | 1.11 | U | 5.7 | | 1.13 | U | 2.0 | U | 1.06 | U |
| Methyl Butyl Ketone | 2.0 | U | 1.04 | U | 2.0 | U | 1.04 | U | 2.0 | U | 5.77 | U | 2.0 | U | 1.09 | U | 2.0 | U | 1.11 | U | 2.0 | U | 1.04 | U |
| Bromoform | 2.1 | U | 2.65 | U | 2.1 | U | 2.65 | U | 2.1 | U | 14.7 | U | 2.1 | U | 2.78 | U | 2.1 | U | 2.83 | U | 2.1 | U | 2.65 | U |
| Bromodichloromethane | 1.3 | U | 1.71 | U | 1.3 | U | 1.71 | U | 1.3 | U | 9.49 | U | 1.3 | U | 1.80 | U | 1.3 | U | 1.83 | U | 1.3 | U | 1.71 | U |
| trans-1,2-Dichloroethene | 0.79 | U | 1.01 | U | 0.79 | U | 1.01 | U | 0.79 | U | 5.58 | U | 0.79 | U | 1.06 | U | 0.79 | U | 1.07 | Y | 0.79 | U | 1.01 | U |
| 4-Ethyltoluene | 2.2 | | 1.26 | U | 2.2 | | 3.99 | | 2.5 | | 6.98 | U | 1.5 | | 4.99 | | 16 | | 17.5 | | 0.98 | U | 8.49 | |
| 3-Chloropropene | 0.63 | U | NS | | 0.63 | U | NS | U | 0.63 | U | NS | | 0.63 | U | NS | | 0.63 | U | NS | | 0.63 | U | NS | |
| 2,2,4-Trimethylpentane | 3.0 | | 1.19 | U | 3.3 | | 1.19 | U | 1.1 | | 6.60 | U | 1.3 | | 1.25 | U | 1.0 | | 5.23 | | 1.3 | | 1.19 | U |
| 2-Chlorotoluene | 1.0 | U | NS | | 1.0 | U | NS | | 1.0 | U | NS | | 1.0 | U | NS | | 1.0 | U | NS | | 1.0 | U | NS | |
| n-Hexane | 2.8 | | 0.907 | U | 3.3 | | 0.907 | U | 1.2 | | 5.02 | U | 1.7 | | 0.950 | U | 1.2 | | 7.51 | | 4.6 | | 4.65 | |
| Tetrahydrofuran | 15 | U | 0.756 | U | 15 | U | 0.756 | U | 15 | U | 4.18 | U | 15 | U | 0.792 | U | 15 | U | 0.805 | U | 15 | U | 0.756 | U |
| n-Heptane | 2.0 | | 1.04 | U | 1.8 | | 1.04 | U | 1.5 | | 5.77 | U | 4.5 | | 1.09 | U | 1.8 | | 11.7 | | 2.2 | | 1.04 | U |
| tert-Butyl Alcohol | 15 | U | NS | U | 15 | U | NS | | 15 | U | NS | | 15 | | NS | | 15 | U | NS | | 15 | U | NS | |
| 1,2-Dichloroethene (total) | 0.79 | U | NS | | 0.79 | U | NS | | 0.79 | U | NS | | 0.79 | U | NS | | 0.79 | U | NS | | 0.79 | U | NS | |
| Xylene (total) | 12 | | NS | | 10 | | NS | | 10 | | NS | | 7.8 | | NS | | 340 | | NS | | 0.87 | U | NS | |
| Vinyl acetate | NS | | 0.907 | U | NS | | 0.907 | U | NS | | 5.02 | U | NS | | 0.950 | U | NS | | 0.967 | U | NS | | 0.907 | U |
| Vinyl Bromide | NS | | 1.13 | U | NS | | 1.13 | U | NS | | 6.23 | U | NS | | 1.18 | U | NS | | 1.20 | U | NS | | 1.13 | U |
| Allyl Chloride | NS | | 0.806 | U | NS | | 0.806 | U | NS | | 4.46 | U | NS | | 0.845 | U | NS | | 0.589 | U | NS | | 0.806 | U |
| Benzyl Chloride | NS | | 1.70 | U | NS | | 1.70 | U | NS | | 9.39 | U | NS | | 1.78 | U | NS | | 1.81 | U | NS | | 1.70 | U |
| Ethyl acetate | NS | | 0.941 | U | NS | | 0.941 | U | NS | | 5.21 | U | NS | | 0.986 | U | NS | | 1.00 | U | NS | | 0.941 | U |
| Propylene | NS | | 0.437 | U | NS | | 0.437 | U | NS | | 2.42 | U | NS | | 0.458 | U | NS | | 0.465 | U | NS | | 0.437 | U |

Notes:

U - Compound not detected at a concentration above the reporting limit.
D - Concentrations identified from analysis of the sample at a secondary dilution.
All units are $\mu g/m^3$
NS - not sampled

**Table 8a**
Criteria for Imported Soils

Volatile Organic Compounds
Former Darby Drugs Distribution Center

| SAMPLE ID<br>LAB SAMPLE ID<br>SAMPLING DATE<br>SAMPLE DEPTH (ft.)<br>SAMPLE TYPE | Unrestricted Use SCO [1] | Restricted Residential SCO [1] |
|---|---|---|
| Volatile Organics by EPA 8260B in µg/kg | | |
| 1,1,1,2-Tetrachloroethane | NS | NS |
| 1,1,1-Trichloroethane | 680 | 100,000 |
| 1,1,2,2-Tetrachloroethane | NS | NS |
| 1,1,2-Trichloroethane | NS | NS |
| 1,1-Dichloroethane | 270 | 26,000 |
| 1,1-Dichloroethene | 330 | 100,000 |
| 1,1-Dichloropropene | NS | NS |
| 1,2,3-Trichlorobenzene | NS | NS |
| 1,2,3-Trichloropropane | NS | NS |
| 1,2,4,5-Tetramethylbenzene | NS | NS |
| 1,2,4-Trichlorobenzene | NS | NS |
| 1,2,4-Trimethylbenzene | 3,600 | 52,000 |
| 1,2-Dibromo-3-chloropropane | NS | NS |
| 1,2-Dibromoethane | NS | NS |
| 1,2-Dichlorobenzene | 1,100 | 100,000 |
| 1,2-Dichloroethane | 20 | 3,100 |
| 1,2-Dicholoroethene (total) | NS | NS |
| 1,2-Dichloropropane | NS | NS |
| 1,3,5-Trimethylbenzene | 8,400 | 52,000 |
| 1,3-Dichlorobenzene | 2,400 | 49,000 |
| 1,3-Dichloropropane | NS | NS |
| 1,4-Dichlorobenzene | 1,800 | 13,000 |
| 1,4-Diethylbenzene | NS | NS |
| 2,2-Dichloropropane | NS | NS |
| 2-Butanone | 120 | 100,000 |
| 2-Hexanone | NS | NS |
| 4-Ethyltoluene | NS | NS |
| 4-Methyl-2-pentanone | NS | NS |
| Acetone | 50 | 100,000 |
| Acrylonitrile | NS | NS |
| Benzene | 60 | 4,800 |
| Bromobenzene | NS | NS |
| Bromochloromethane | NS | NS |
| Bromodichloromethane | NS | NS |
| Bromoform | NS | NS |
| Bromomethane | NS | NS |
| Carbon disulfide | NS | NS |
| Carbon tetrachloride | 760 | 2,400 |
| Chlorobenzene | 1,100 | 100,000 |
| Chloroethane | NS | NS |
| Chloroform | 370 | 49,000 |
| Chloromethane | NS | NS |
| cis-1,2-Dichloroethene | 250 | 100,000 |
| cis-1,3-Dichloropropene | NS | NS |
| Dibromochloromethane | NS | NS |
| Dibromomethane | NS | NS |
| Dichlorodifluoromethane | NS | NS |
| Ethyl ether | NS | NS |
| Ethylbenzene | 1,000 | 41,000 |
| Hexachlorobutadiene | NS | NS |
| Isopropylbenzene | NS | NS |
| Methyl tert butyl ether | 930 | 100,000 |
| Methylene chloride | 50 | 100,000 |
| Naphthalene | NS | NS |
| n-Butylbenzene | 12,000 | NS |
| n-Propylbenzene | 3,900 | 100,000 |
| o-Chlorotoluene | NS | NS |
| o-Xylene | 260 | 100,000 |
| p/m-Xylene | 260 | 100,000 |
| p-Chlorotoluene | NS | NS |
| p-Isopropyltoluene | NS | NS |
| sec-Butylbenzene | 11,000 | 100,000 |
| Styrene | NS | NS |
| tert-Butylbenzene | 5,900 | NS |
| Tetrachloroethene | 1,300 | 19,000 |
| Toluene | 700 | 100,000 |
| trans-1,2-Dichloroethene | 190 | 100,000 |
| trans-1,3-Dichloropropene | NS | 100,000 |
| trans-1,4-Dichloro-2-butene | NS | NS |
| Trichloroethene | 470 | 21,000 |
| Trichlorofluoromethane | NS | NS |
| Vinyl acetate | NS | NS |
| Vinyl chloride | 20 | 900 |
| Xylenes (total) | 260 | 100,000 |

Notes:

[1]Unrestriced Use Soil Cleanup Objectives (SCO) 6 NYCRR Part 375, Environmental Remediation Programs, December 2006

[2]Resticted-Residential Soil Cleanup Objectives (SCO) 6 NYCRR Part 375, Environmental Remediation Programs, December 2006

**Table 8b**
Criteria for Imported Soils

Semi-Volatile Organic Compounds
Former Darby Drugs Distribution Center

| SAMPLE ID<br>LAB SAMPLE ID<br>SAMPLING DATE<br>SAMPLE DEPTH (ft.)<br>SAMPLE TYPE | Unrestricted Use SCO [1] | Restricted Residential SCO [1] |
|---|---|---|
| Semivolatile Organics by EPA 8270C in µg/kg | | |
| 1,2,4,5-Tetrachlorobenzene | NS | NS |
| 1,2,4-Trichlorobenzene | NS | NS |
| 1,2-Dichlorobenzene | NS | NS |
| 1,3-Dichlorobenzene | NS | NS |
| 1,4-Dichlorobenzene | NS | NS |
| 2,4,5-Trichlorophenol | NS | NS |
| 2,4,6-Trichlorophenol | NS | NS |
| 2,4-Dichlorophenol | NS | NS |
| 2,4-Dimethylphenol | NS | NS |
| 2,4-Dinitrophenol | NS | NS |
| 2,4-Dinitrotoluene | NS | NS |
| 2,6-Dinitrotoluene | NS | NS |
| 2-Chloronaphthalene | NS | NS |
| 2-Chlorophenol | NS | NS |
| 2-Methylnaphthalene | NS | NS |
| 2-Methylphenol | NS | NS |
| 2-Nitroaniline | NS | NS |
| 2-Nitrophenol | NS | NS |
| 3,3'-Dichlorobenzidine | NS | NS |
| 3-Methylphenol/4-Methylphenol | NS | NS |
| 3-Nitroaniline | NS | NS |
| 4,6-Dinitro-o-cresol | NS | NS |
| 4-Bromophenyl phenyl ether | NS | NS |
| 4-Chloroaniline | NS | NS |
| 4-Chlorophenyl phenyl ether | NS | NS |
| 4-Nitroaniline | NS | NS |
| 4-Nitrophenol | NS | NS |
| Acenaphthene | 20,000 | 100,000 |
| Acenaphthylene | 100,000 | 100,000 |
| Acetophenone | NS | NS |
| Anthracene | 100,000 | 100,000 |
| Benzo(a)anthracene | 1,000 | 1,000 |
| Benzo(a)pyrene | 1,000 | 1,000 |
| Benzo(b)fluoranthene | 1,000 | 1,000 |
| Benzo(ghi)perylene | 100,000 | 100,000 |
| Benzo(k)fluoranthene | 800 | 3,900 |
| Benzoic Acid | NS | NS |
| Benzyl Alcohol | NS | NS |
| Biphenyl | NS | NS |
| Bis(2-chloroethoxy)methane | NS | NS |
| Bis(2-chloroethyl)ether | NS | NS |
| Bis(2-chloroisopropyl)ether | NS | NS |
| Bis(2-Ethylhexyl)phthalate | NS | NS |
| Butyl benzyl phthalate | NS | NS |
| Carbazole | NS | NS |
| Chrysene | 1,000 | 3,900 |
| Dibenzo(a,h)anthracene | 3,300 | 330 |
| Dibenzofuran | NS | NS |
| Diethyl phthalate | NS | 330 |
| Dimethyl phthalate | NS | NS |
| Di-n-butylphthalate | NS | NS |
| Di-n-octylphthalate | NS | NS |
| Fluoranthene | 100,000 | 100,000 |
| Fluorene | 30,000 | 100,000 |
| Hexachlorobenzene | NS | NS |
| Hexachlorobutadiene | NS | NS |
| Hexachlorocyclopentadiene | NS | NS |
| Hexachloroethane | NS | NS |
| Indeno(1,2,3-cd)Pyrene | 500 | 500 |
| Isophorone | NS | NS |
| Naphthalene | 12,000 | 100,000 |
| Nitrobenzene | NS | 100,000 |
| NitrosoDiPhenylAmine(NDPA)/DPA | NS | NS |
| n-Nitrosodi-n-propylamine | NS | NS |
| P-Chloro-M-Cresol | NS | NS |
| Pentachlorophenol | 800 | 6,700 |
| Phenanthrene | 100,000 | 100,000 |
| Phenol | 330 | 100,000 |
| Pyrene | 100,000 | 100,000 |
| Semivolatile Organics by EPA 8270C-SIM in µg/kg | | |
| 2-Chloronaphthalene | NS | NS |
| 2-Methylnaphthalene | NS | NS |
| Acenaphthene | 20,000 | 100,000 |
| Acenaphthylene | 100,000 | 100,000 |
| Anthracene | 100,000 | 100,000 |
| Benzo(a)anthracene | 1,000 | 1,000 |
| Benzo(a)pyrene | 1,000 | 1,000 |
| Benzo(b)fluoranthene | 1,000 | 1,000 |
| Benzo(ghi)perylene | 100,000 | 100,000 |
| Benzo(k)fluoranthene | 800 | 3,900 |
| Chrysene | 1,000 | 3,900 |
| Dibenzo(a,h)anthracene | 3,300 | 330 |
| Fluoranthene | 100,000 | 100,000 |
| Fluorene | 30,000 | 100,000 |
| Hexachlorobenzene | NS | NS |
| Hexachlorobutadiene | NS | NS |
| Hexachloroethane | NS | NS |
| Indeno(1,2,3-cd)Pyrene | 500 | 500 |
| Naphthalene | 12,000 | 100,000 |
| Pentachlorophenol | 800 | 6,700 |
| Phenanthrene | 100,000 | 100,000 |
| Pyrene | 100,000 | 100,000 |

Notes:

[1]Unrestriced Use Soil Cleanup Objectives (SCO) 6 NYCRR Part 375, Environmental Remediation Programs, December 2006

[2]Resticted-Residential Soil Cleanup Objectives (SCO) 6 NYCRR Part 375, Environmental Remediation Programs, December 2006

**Table 8c**
Criteria for Imported Soils

Pesticides, PCBs, and Metals
Former Darby Drugs Distribution Center

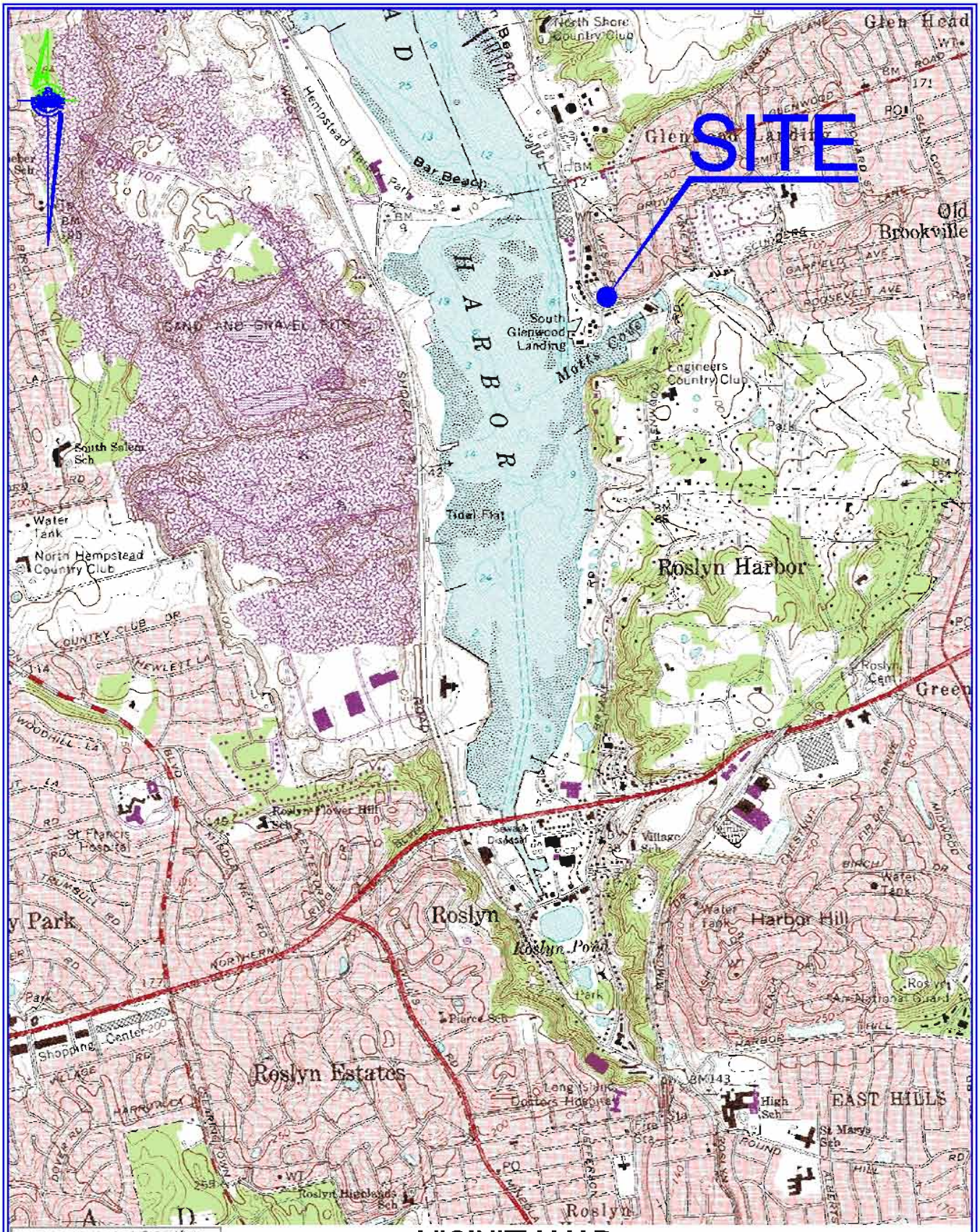
| SAMPLE ID<br>LAB SAMPLE ID<br>SAMPLING DATE<br>SAMPLE DEPTH (ft.)<br>SAMPLE TYPE | Unrestricted Use SCO [1] | Restricted Residential SCO [1] |
|---|---|---|
| Organochlorine Pesticides by EPA 8081A in µg/kg | | |
| 4,4'-DDD | 3.3 | 13000 |
| 4,4'-DDE | 3.3 | 8900 |
| 4,4'-DDT | 3.3 | 7900 |
| Aldrin | 5 | 97 |
| Alpha-BHC | 20 | 480 |
| Beta-BHC | 36 | 360 |
| Chlordane | 94 | 4200 |
| Chlorobenzilate | NS | NS |
| DBCP | NS | NS |
| Delta-BHC | 40 | 100000 |
| Dieldrin | 5 | 200 |
| Endosulfan I | 2400 | 24000 |
| Endosulfan II | 2400 | 24000 |
| Endosulfan sulfate | 2400 | 24000 |
| Endrin | 14 | 11000 |
| Endrin Aldehyde | NS | NS |
| Endrin ketone | NS | NS |
| Heptachlor | 42 | 2100 |
| Heptachlor epoxide | NS | NS |
| Hexachlorobenzene | NS | NS |
| Hexachlorocyclopentadiene | NS | NS |
| Lindane | 100 | 1300 |
| Methoxychlor | NS | NS |
| Toxaphene | NS | NS |
| trans-Chlordane | NS | NS |
| Polychlorinated Biphenyls by EPA 8082 in µg/kg | | |
| Aroclor 1016 | 100 | 1000 |
| Aroclor 1221 | 100 | 1000 |
| Aroclor 1232 | 100 | 1000 |
| Aroclor 1242 | 100 | 1000 |
| Aroclor 1248 | 100 | 1000 |
| Aroclor 1254 | 100 | 1000 |
| Aroclor 1260 | 100 | 1000 |
| Total Metals in mg/kg | | |
| Aluminum | NS | NS |
| Antimony | NS | NS |
| Arsenic | 13 | 16 |
| Barium | 350 | 400 |
| Beryllium | 7.2 | 72 |
| Cadmium | 2.5 | 4.3 |
| Calcium | NS | NS |
| Chromium | 30 | 180 |
| Cobalt | NS | NS |
| Copper | 50 | 270 |
| Iron | NS | NS |
| Lead | 63 | 400 |
| Magnesium | NS | NS |
| Manganese | 1600 | 2000 |
| Mercury | 0.18 | 0.81 |
| Nickel | 30 | 310 |
| Potassium | NS | NS |
| Selenium | 3.9 | 180 |
| Silver | 2 | 180 |
| Sodium | NS | NS |
| Thallium | NS | NS |
| Vanadium | NS | NS |
| Zinc | 109 | 10000 |

Notes:

[1]Unrestriced Use Soil Cleanup Objectives (SCO) 6 NYCRR Part 375, Environmental Remediation Programs, December 2006

[2]Resticted-Residential Soil Cleanup Objectives (SCO) 6 NYCRR Part 375, Environmental Remediation Programs, December 2006

# FIGURES




Mapped, edited, and published by the Geological Survey
Revised in cooperation with New York
Department of Transportation
Control by USGS, USC&GS, and New Jersey Geodetic Survey

J:\Projects_M-R\Pen – Penatrex\CADD\Vicinity Map.dwg

# VICINITY MAP

SCALE: 1:24,000

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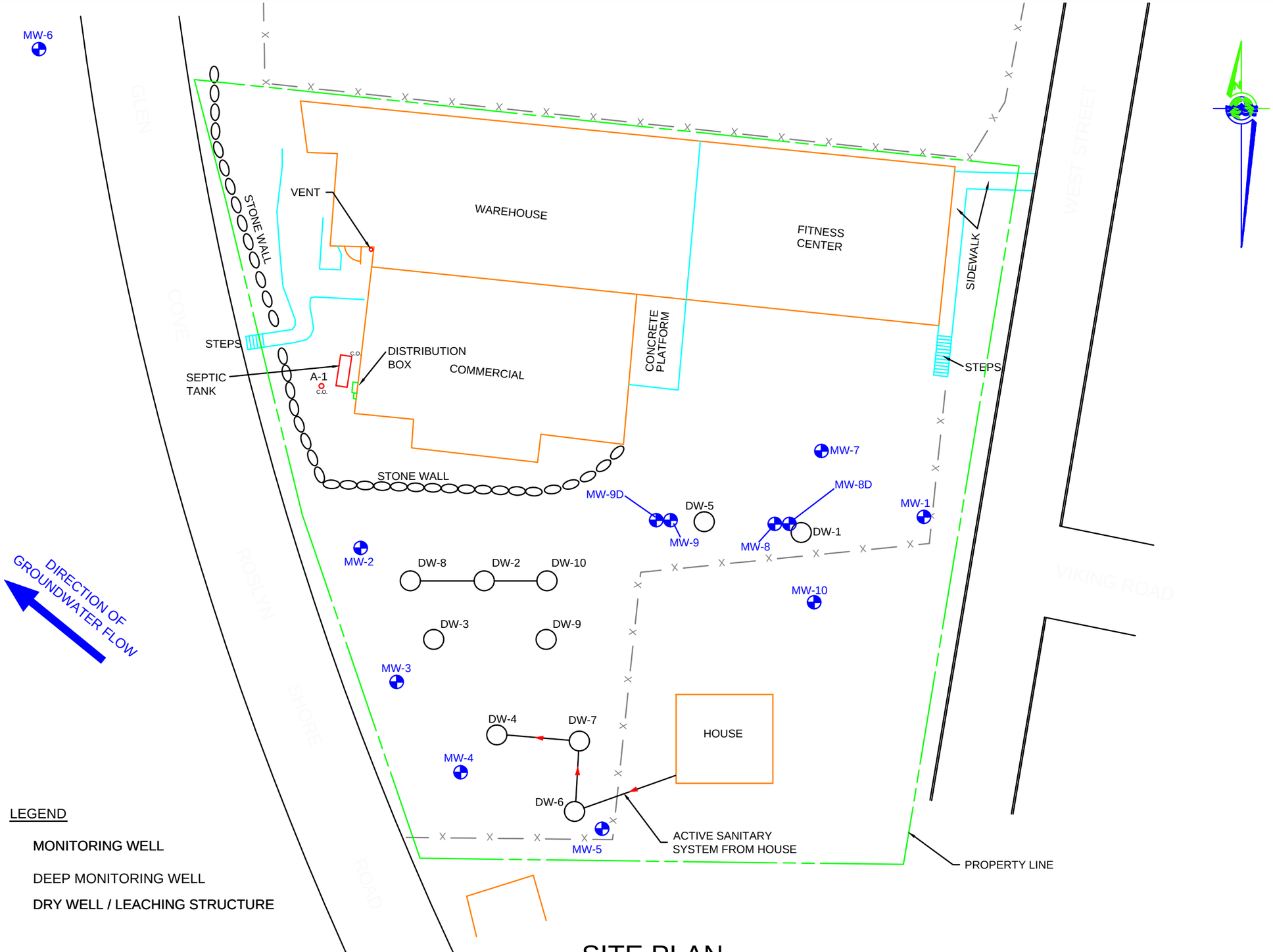
1 SHORE ROAD
GLENWOOD LANDING, NY

| | |
|---|---|
| Project PEN0001 | Figure No. 1 |
| Drawn By DE | |
| Checked By PWG | |
| Approved By LLG | Date 5/27/09 |




LEGEND

MW-8 — MONITORING WELL

MW-9D — DEEP MONITORING WELL

O — DRY WELL / LEACHING STRUCTURE

BASE MAP PROVIDED BY:
YEC, INC.
SURVEY MAP: JULY 10, 1992

# SITE PLAN

SCALE: 1" = 30'

0 30 60

SCALE: 1" = 30'

J:\Projects M-R\Pen - Penetrex\CADD\2009 CAD\Fig 2 - 1/19/15.dwg

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| DESIGNED BY: | JL | DATE: | 1/19/15 |
| DRAWN BY: | LLG | SCALE: | AS SHOWN |

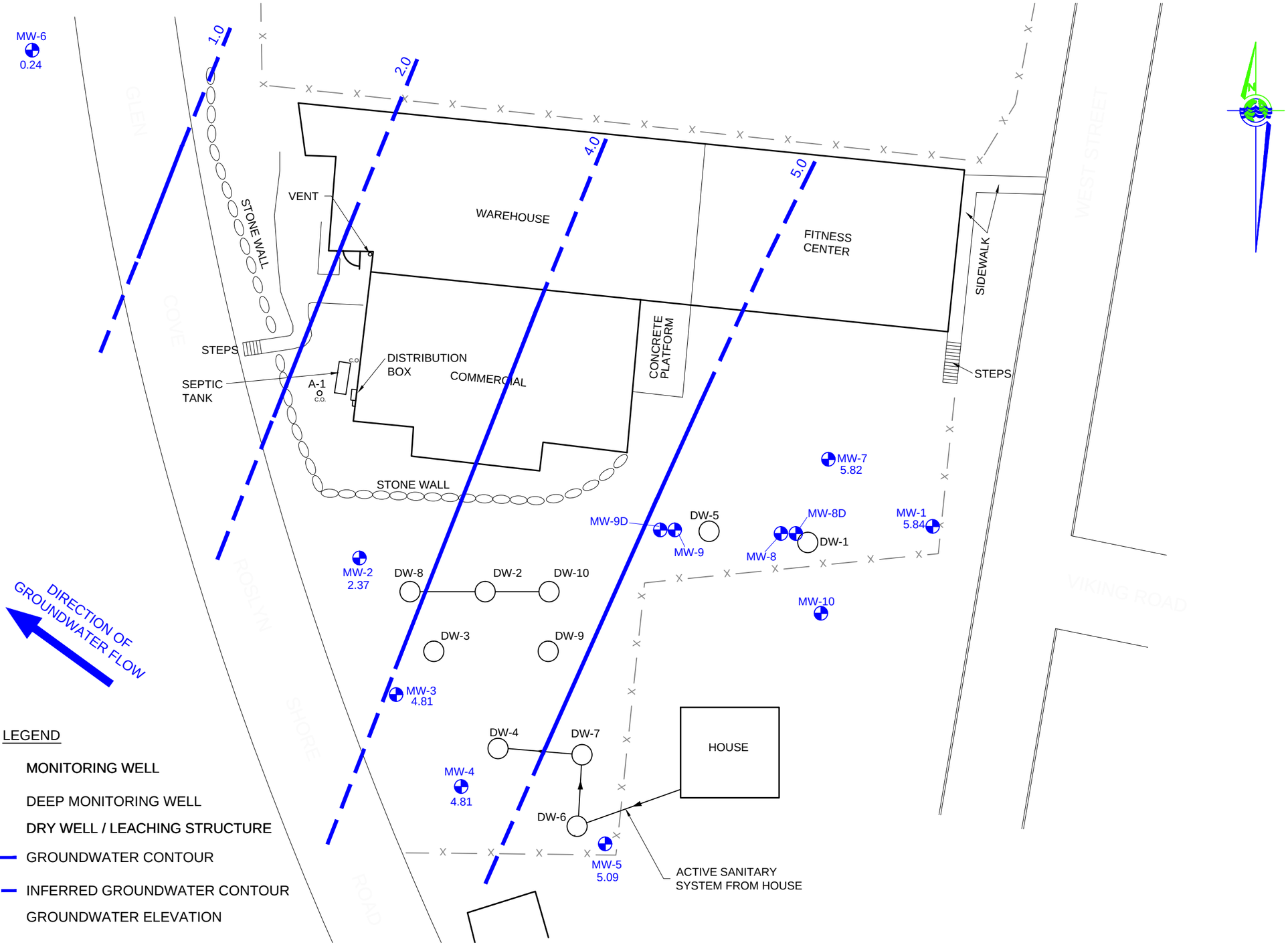
SHEET TITLE

SITE PLAN

FORMER PENETREX PROSESSING NYSDEC I.D. No. 130034

FIGURE NO 2

SHEET - OF -




# GROUNDWATER CONTOUR MAP

SCALE: 1" = 30'

BASE MAP PROVIDED BY:
YEC, INC.
SURVEY MAP: JULY 10, 1992

J:\Projects M-R\PEN-PENETREX\SMP\SMP Figures\FIGURE 3.dwg (11x17H) Sep 28,2011-3:28pm By: mccabe

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| DESIGNED BY: | DE | DATE: | 7/16/09 |
| DRAWN BY: | LLG | SCALE: | AS SHOWN |

SHEET TITLE

GROUNDWATER CONTOUR MAP

FORMER PENETREX PROSESSING NYSDEC I.D. No. 130034

FIGURE NO 3

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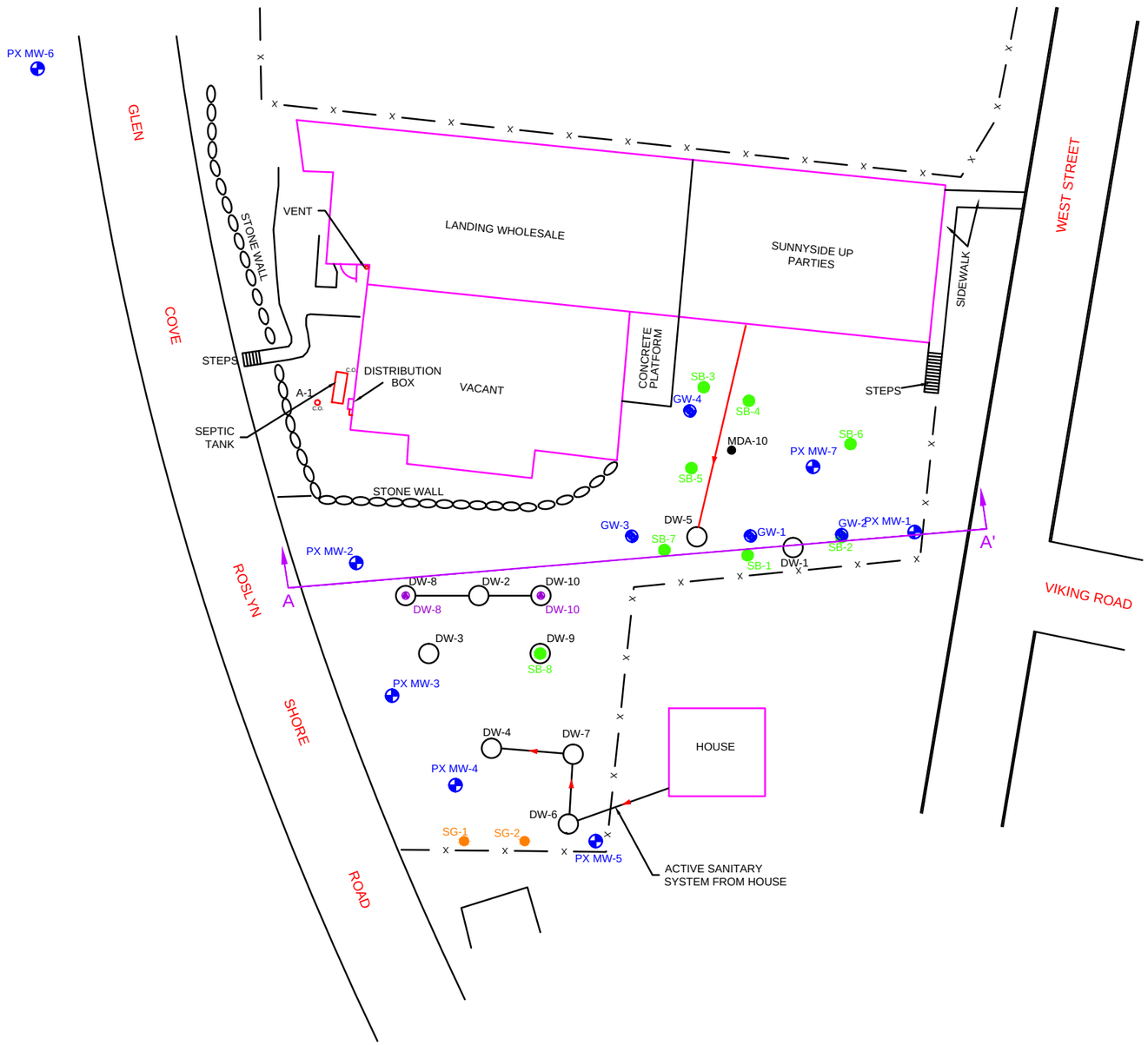


LEGEND

- MONITORING WELL
- DRY WELL / LEACHING STRUCTURE
- GW-3 — GROUNDWATER PROFILE LOCATION
- SB-1 — SOIL BORING LOCATION
- SG-1 — SOIL GAS LOCATION
- MDA-10 — TEST PIT LOCATION
- LEACHING STRUCTURE SAMPLE

0 40 80

SCALE: 1" = 40'

SOURCE: YEC, INC., SURVEY MAP 10, JULY 1992

# PROPOSED SOIL BORING LOCATIONS
# FORMER PENETREX PROCESSING NYSDEC
I.D. No. 130034

P.W. GROSSER CONSULTING
ENGINEER & HYDROGEOLOGIST, P.C.
630 Johnson Ave. Suite 7
Bohemia, N.Y. 11716-2618
Ph: (631)589-6353 Fx: (631)589-8705
E-mail: info@pwgrosser.com

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| PEN0001 | JPR | 4 |
| CADD Operator: LLG | Approved By: JPR | Date: 1/19/15 |



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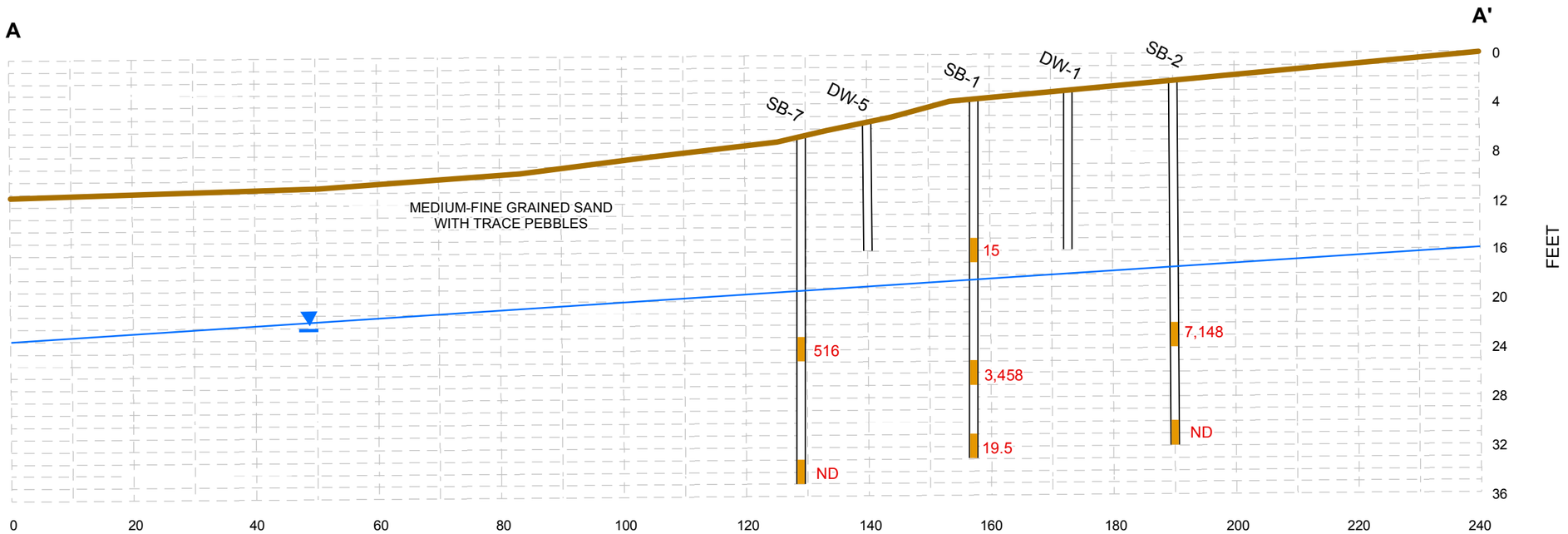


516 Total VOCs (µg/kg)

Groundwater Level

Surface

0 25 50 75 100 Feet

Document Path: Z:\GIS\Projects\M-R\PEN\mapfiles\FIG4A_SoilCrossSectionA.mxd


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| Project: | PEN1101 | Designed by: | JE |
| Date: | 2/4/2015 | Drawn by: | JCG |
| Scale: | AS SHOWN | Approved by: | JE |

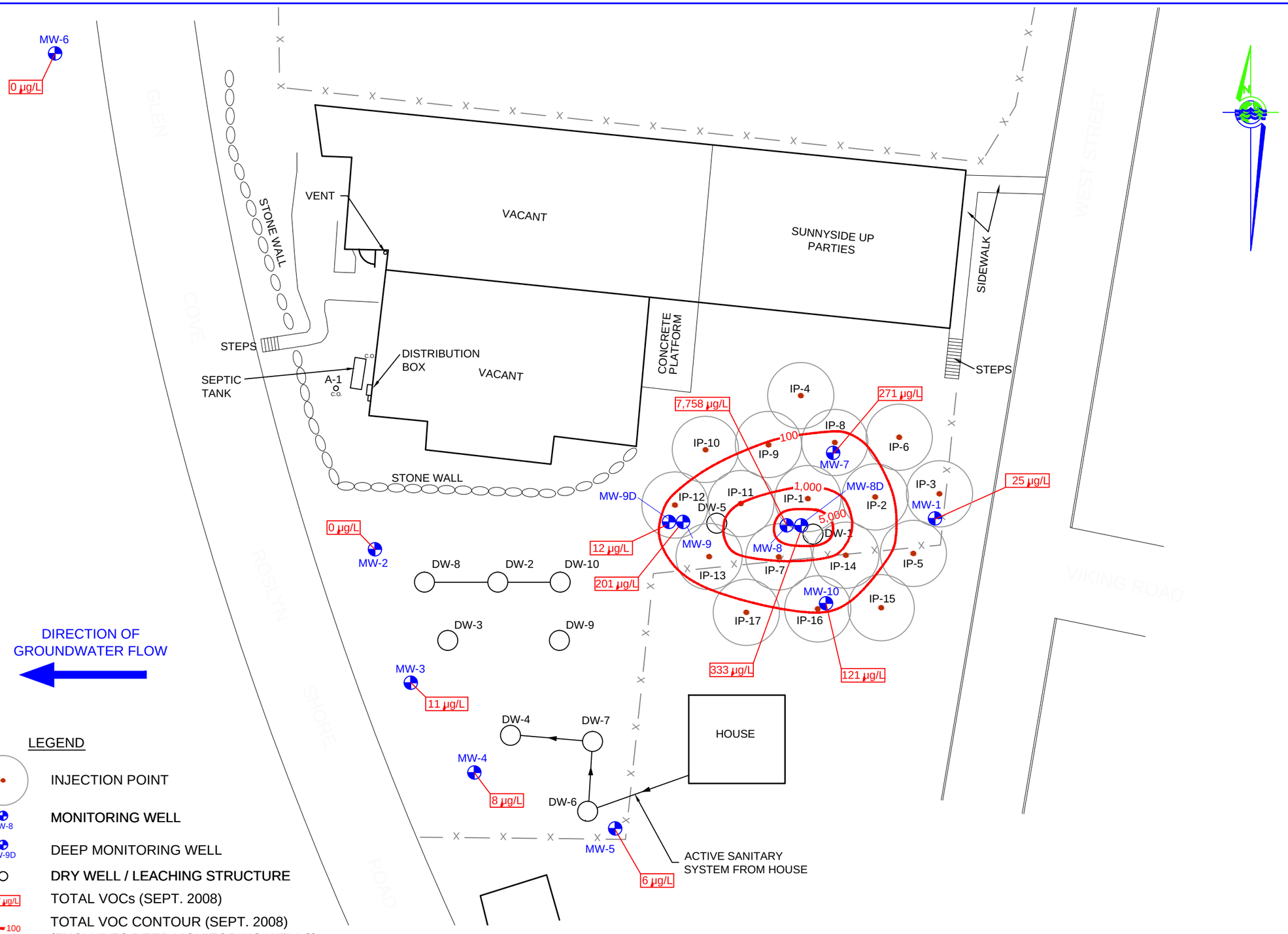
# SOIL CROSS SECTION A - A'

1 SHORE ROAD
GLENWOOD LANDING, NY

FIGURE NO:

4A

SHEET:




DIRECTION OF GROUNDWATER FLOW

LEGEND

- INJECTION POINT
- MW-8 — MONITORING WELL
- MW-9D — DEEP MONITORING WELL
- DRY WELL / LEACHING STRUCTURE
- 6.7 µg/L — TOTAL VOCs (SEPT. 2008)
- 100 — TOTAL VOC CONTOUR (SEPT. 2008) (EXCLUDES DEEP MONITORING WELLS)

BASE MAP PROVIDED BY:
YEC, INC.
SURVEY MAP: JULY 10, 1992

# SITE PLAN

SCALE: 1" = 30'

0 30 60

SCALE: 1" = 30'

J:\Projects M-R\Pen - Penetrex\CADD\209 CAD\VOC Contour Map SEPT 2008.dwg

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630 JOHNSON AVE. • SUITE 7
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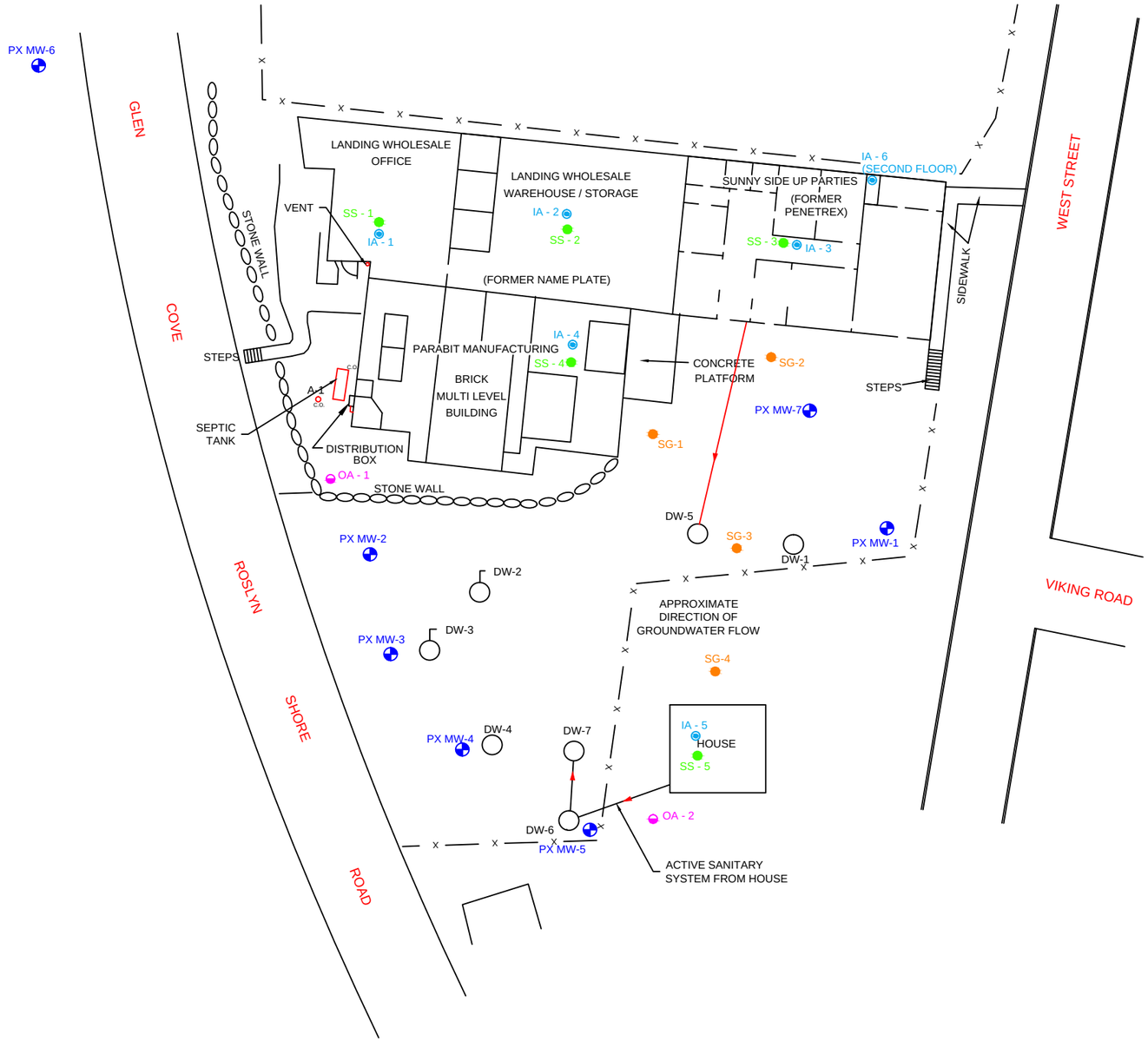
| DESIGNED BY: | JL | DATE: | 1/7/09 |
| DRAWN BY: | LLG | SCALE: | AS SHOWN |

SHEET TITLE

BASELINE TOTAL VOC CONTOURS AT WATER TABLE
SEPTEMBER 2008
FORMER PENETREX PROSESSING NYSDEC
I.D. No. 130034

FIGURE NO 5

SHEET - OF -




LEGEND

- MONITORING WELL
- DRY WELL / LEACHING STRUCTURE
- GW-7 VERTICAL PROFILE LOCATION
- PREVIOUS SOIL GAS LOCATION
- SS-2 SUB-SLAB VAPOR LOCATION
- IA-3 INDOOR AIR LOCATION
- OA-1 OUTDOOR AIR LOCATION

SOURCE: YEC, INC., SURVEY MAP 10, JULY 1992

SITE PLAN
1 SHORE ROAD
GLENWOOD LANDING
FORMER PENETREX PROCESSING
NYSDEC I.D. No. 130034

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ENGINEER & HYDROGEOLOGIST, P.C.
630 Johnson Ave. Suite 7
Bohemia, N.Y. 11716-2618
Ph: (631)589-6353 Fx: (631)589-8705
E-mail: info@pwgrosser.com

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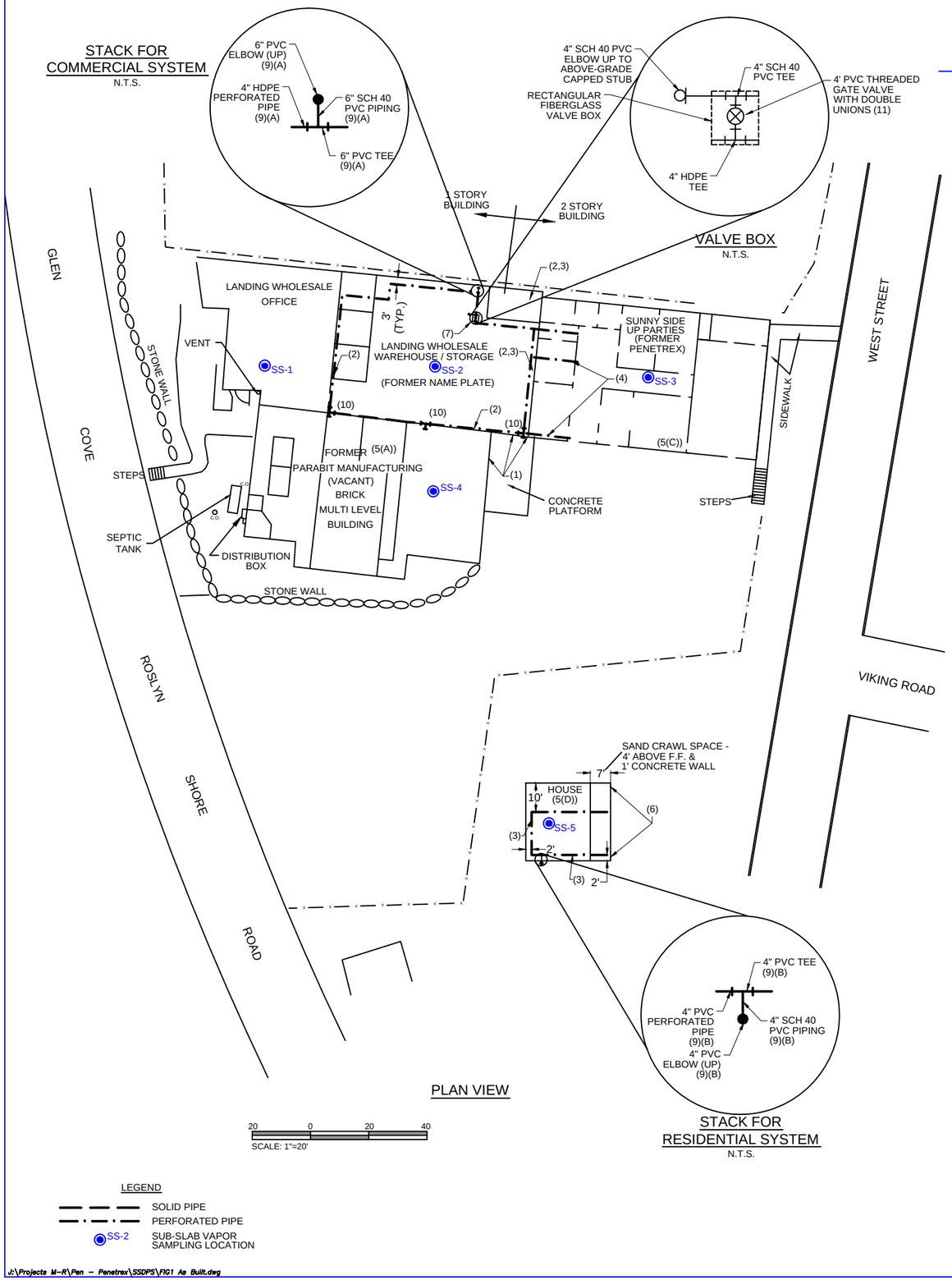
| CADD Operator: TC\TEB | Approved By: PWG | Date: 10/20/05 |

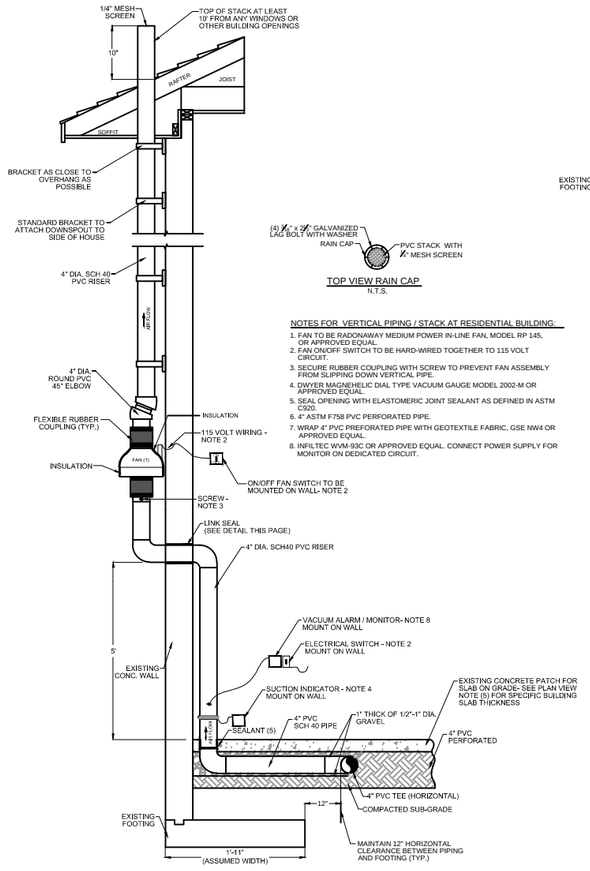


J:\Projects M-R\Pen - Penetrex\CADD\10-18-05\FIGURE 2 10-20-05.dwg




NOTES:

1. THE LAND WHOLESALE WAREHOUSE, SUNNY SIDE UP PARTIES, AND PARABIT MANUFACTURING BUILDINGS ARE ASSUMED TO HAVE SEPARATE FOUNDATIONS.
2. INSTALL HDPE PERFORATED PIPING 3' FROM INTERIOR WALL. THIS ASSUMES FOOTINGS ARE 2' WIDE, FROM THE INTERIOR WALLS, AND THEREFORE THE PIPING IS 12" INSIDE OF THE FOOTINGS.
3. INSTALL 4" DIA. SCH 40 PVC SOLID PIPE IN SAME TRENCH AS HDPE PERFORATED PIPE W/ 12" OF CLEARANCE FROM FOUNDATION WALL.
4. INSTALL 3-15' SECTIONS OF 4" PVC PERFORATED PIPE W/ CAPPED ENDS. REFER TO CONSTRUCTION DETAILS (THIS SHEET). REMOVE CYLINDRICAL SECTIONS OF SOIL WITH HIGH PRESSURE AIR TO INSTALL PIPE.
5. (A) 10" THICK EXIST. CONCRETE SLAB WITH VAPOR BARRIER.
   (B) 11" THICK EXIST. CONCRETE SLAB WITH VAPOR BARRIER.
   (C) 11" THICK EXIST. CONCRETE SLAB WITH VAPOR BARRIER.
   (D) 4" THICK EXIST. CONCRETE SLAB.
6. INSTALL 2-8' SECTIONS OF 4" PVC PERFORATED PIPE. REFER TO (4) ABOVE FOR INSTALLATION DETAILS.
7. INSTALL CAPPED STUB OF 4" PVC SOLID PIPE 4' ABOVE F.F. FOR POSSIBLE FUTURE CONNECTION TO STACK & FAN. FAN & STACK WILL BE INSTALLED IF CONTAMINANT CONCENTRATIONS BENEATH THE SUNNY SIDE SLAB ARE NOT REDUCED WITHIN THE TIME INDICATED BY THE SAMPLING PLAN. AT THAT TIME, THE GATE VALVE WHICH ALLOWS FLOW FROM THE SUNNY SIDE SYSTEM INTO THE LANDING SYSTEM WILL BE CLOSED, ISOLATING THE TWO SYSTEMS.
8. INSTALL 4' CAPPED STUB FOR POSSIBLE FUTURE EXPANSION ON SOUTH SIDE OF BUILDING.
9. (A) FOR DETAILS OF THE 6" PVC TEE, CONNECTING HORIZONTAL PIPING, VERTICAL PIPING, ABOVE GRADE EQUIPMENT & THE EXHAUST STACK, REFER TO SUB-SLAB DE-PRESSURIZATION SYSTEM DETAIL FOR COMMERCIAL BUILDINGS (THIS SHEET).
   (B) FOR DETAILS OF THE 4" PVC TEE, CONNECTING HORIZONTAL PIPING, VERTICAL PIPING, ABOVE GRADE EQUIPMENT & THE EXHAUST STACK, REFER TO SUB-SLAB DE-PRESSURIZATION SYSTEM-DETAIL FOR RESIDENTIAL BUILDING (THIS SHEET).
10. INSTALL 4" HDPE TEES FOR POSSIBLE FUTURE EXPANSION OF SYSTEM.
11. INFILTEC WVM-93C OR APPROVED EQUAL. CONNECT POWER SUPPLY FOR MONITOR ON DEDICATED CIRCUIT.



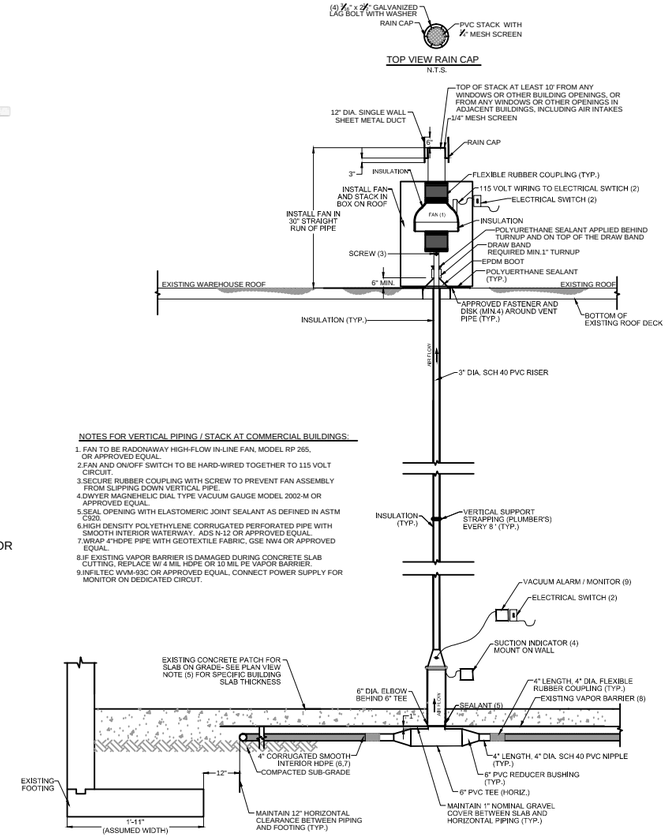

SUB-SLAB DE-PRESSURIZATION SYSTEM
DETAIL FOR RESIDENTIAL BUILDING
N.T.S.



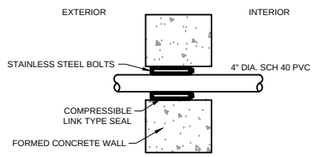

TOP VIEW RAIN CAP
N.T.S.

NOTES FOR VERTICAL PIPING / STACK AT RESIDENTIAL BUILDING:

1. FAN TO BE RADONAWAY MEDIUM POWER IN-LINE FAN, MODEL RP 145, OR APPROVED EQUAL.
2. FAN ON/OFF SWITCH TO BE HARD-WIRED TOGETHER TO 115 VOLT CIRCUIT.
3. SECURE RUBBER COUPLING WITH SCREW TO PREVENT FAN ASSEMBLY FROM SLIPPING DOWN VERTICAL PIPE.
4. DWYER MAGNEHELIC DIAL TYPE VACUUM GAUGE MODEL 2002-M OR APPROVED EQUAL.
5. SEAL OPENING WITH ELASTOMERIC JOINT SEALANT AS DEFINED IN ASTM C920.
6. 4" ASTM F758 PVC PERFORATED PIPE.
7. WRAP 4" PVC PREFORATED PIPE WITH GEOTEXTILE FABRIC, GSE NW4 OR APPROVED EQUAL.
8. INFILTEC WVM-93C OR APPROVED EQUAL. CONNECT POWER SUPPLY FOR MONITOR ON DEDICATED CIRCUIT.




SUB-SLAB DE-PRESSURIZATION SYSTEM
DETAIL FOR COMMERCIAL BUILDINGS
N.T.S.




LINK TYPE SEAL DETAIL
N.T.S.

| REVISIONS | DATE | INITIAL | COMMENTS |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

AS-BUILT SITE PLAN AND DETAILS
1 SHORE ROAD
GLENWOOD LANDING
FORMER PENETREX PROCESSING
NYSDEC I.D. No. 130034

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Strategic Environmental & Engineering Solutions
630 Johnson Ave. Suite 7 Bohemia, N.Y. 11716-2618
Ph: 631 589-6353 Fx: 631 589-8705 E-mail: info@pwgrosser.com

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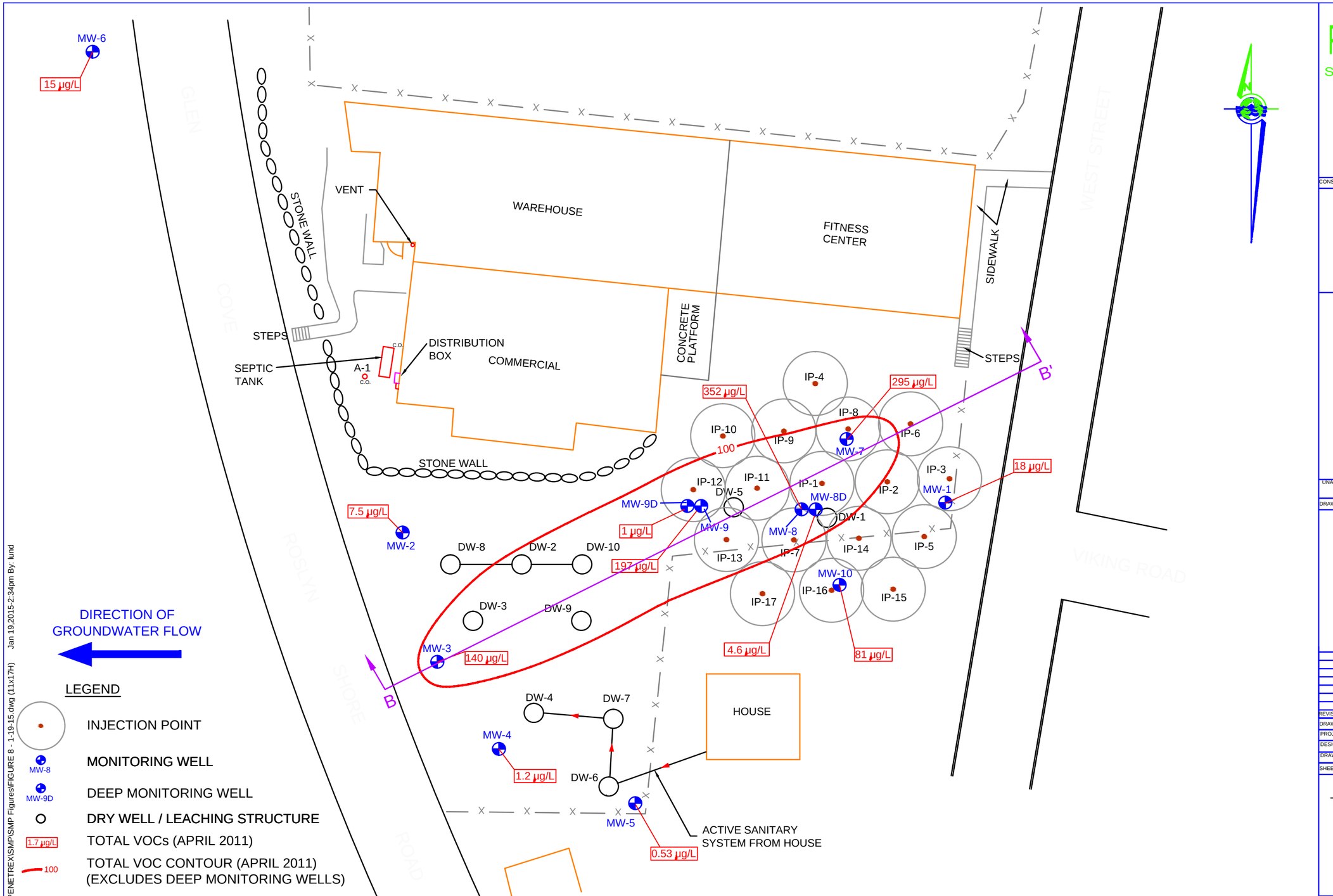
|---|---|---|
| Designed By: DD | Date: 8/15/07 | |
| Drawn By: TC/LLG | Scale: AS SHOWN | |



J:\Projects M-R\Pen - Penetrex\SSDPS\FIG1 As Built.dwg




DIRECTION OF GROUNDWATER FLOW

LEGEND

- INJECTION POINT
- MW-8 — MONITORING WELL
- MW-9D — DEEP MONITORING WELL
- O — DRY WELL / LEACHING STRUCTURE
- 1.7 µg/L — TOTAL VOCs (APRIL 2011)
- 100 — TOTAL VOC CONTOUR (APRIL 2011) (EXCLUDES DEEP MONITORING WELLS)
- ND — NOT DETECTED

BASE MAP PROVIDED BY:
YEC, INC.
SURVEY MAP: JULY 10, 1992

# TVOC CONTOUR MAP

SCALE: 1" = 30'

0 30 60

SCALE: 1" = 30'

J:\Projects M-R\PEN-PENETREX\SMP\SMP Figures\FIGURE 8 - 1-19-15.dwg (11x17H) Jan 19,2015-2:34pm By: lund

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630 JOHNSON AVE. • SUITE 7
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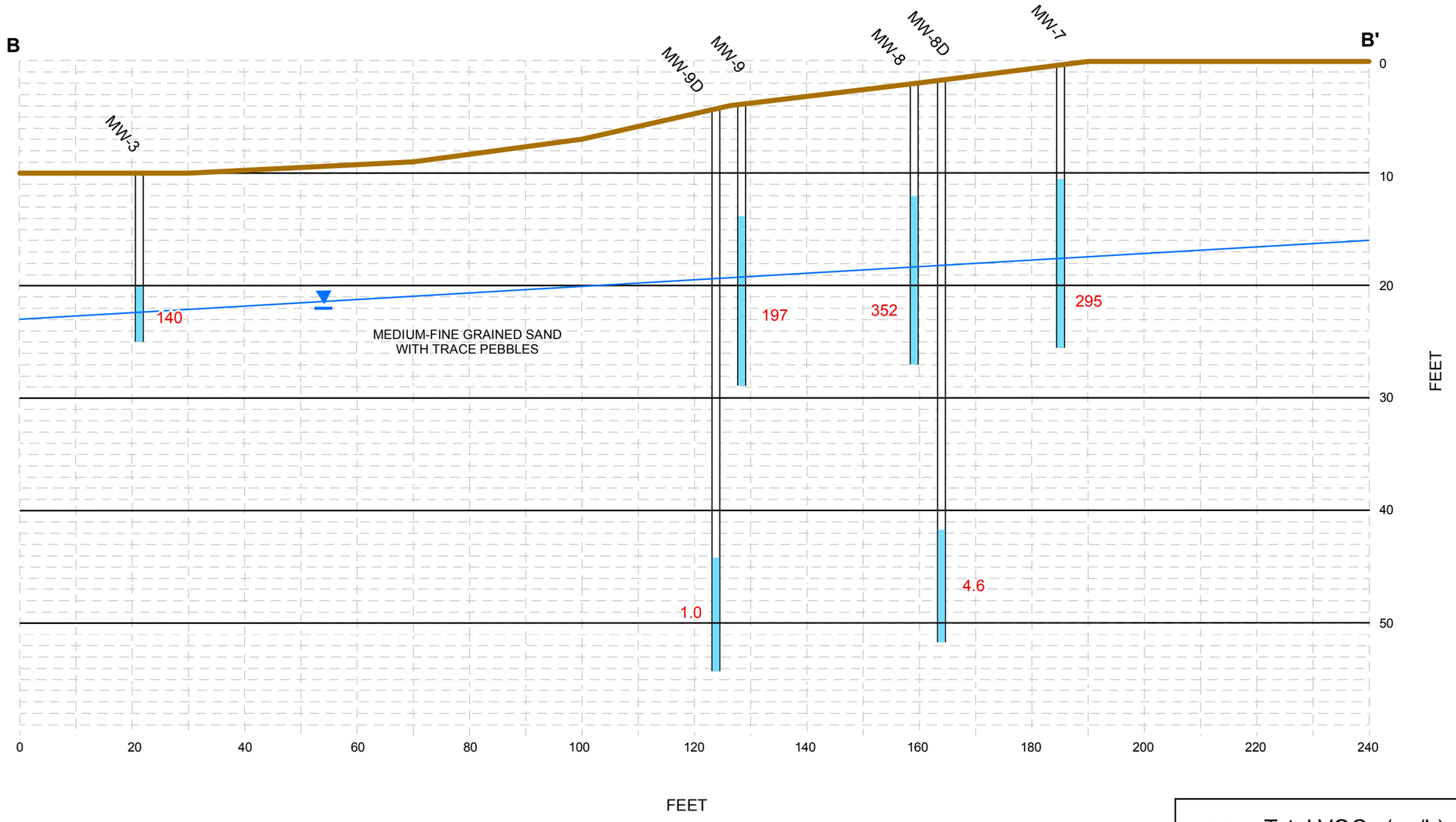
| DESIGNED BY: | JE | DATE: | 10/26/10 |
| DRAWN BY: | LLG | SCALE: | AS SHOWN |

SHEET TITLE

POST-INJECTION
TOTAL VOC CONTOURS
AT WATER TABLE
APRIL 2011
FORMER PENETREX
PROSESSING NYSDEC
I.D. No. 130034

FIGURE NO
8

SHEET - OF -




352 Total VOCs (µg/L)

Groundwater Level

Surface

0 25 50 75 100 Feet

Document Path: Z:\GIS\Projects\MARVPEN\mapfiles\FIG8A_GWCrossSection8.mxd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| Date: | 2/4/2015 | Drawn by: | JCG |
| Scale: | AS SHOWN | Approved by: | JE |

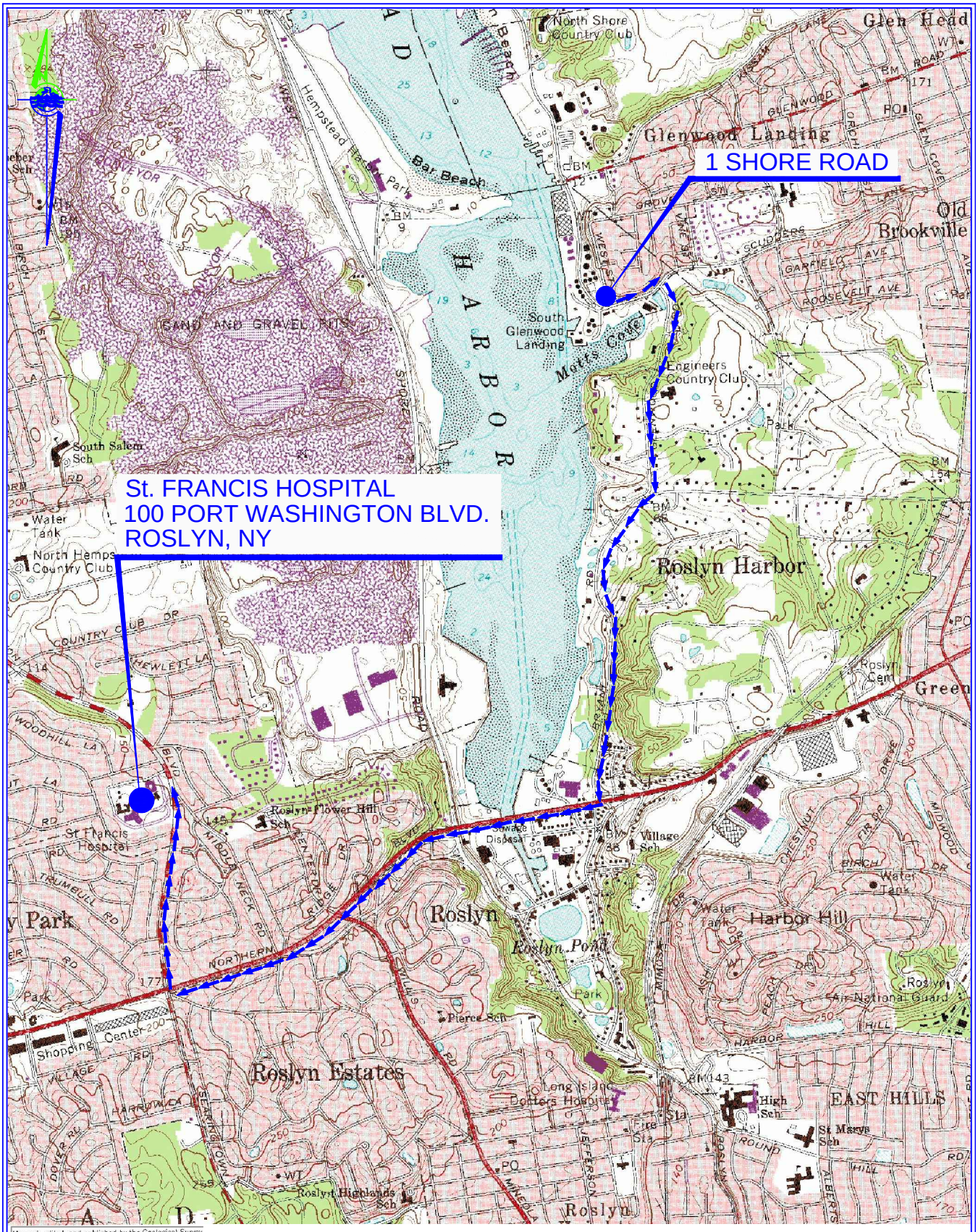
# GROUNDWATER CROSS SECTION B - B'

1 SHORE ROAD
GLENWOOD LANDING, NY

FIGURE NO:

8A

SHEET:




# HOSPITAL ROUTE MAP

SCALE: 1:24,000

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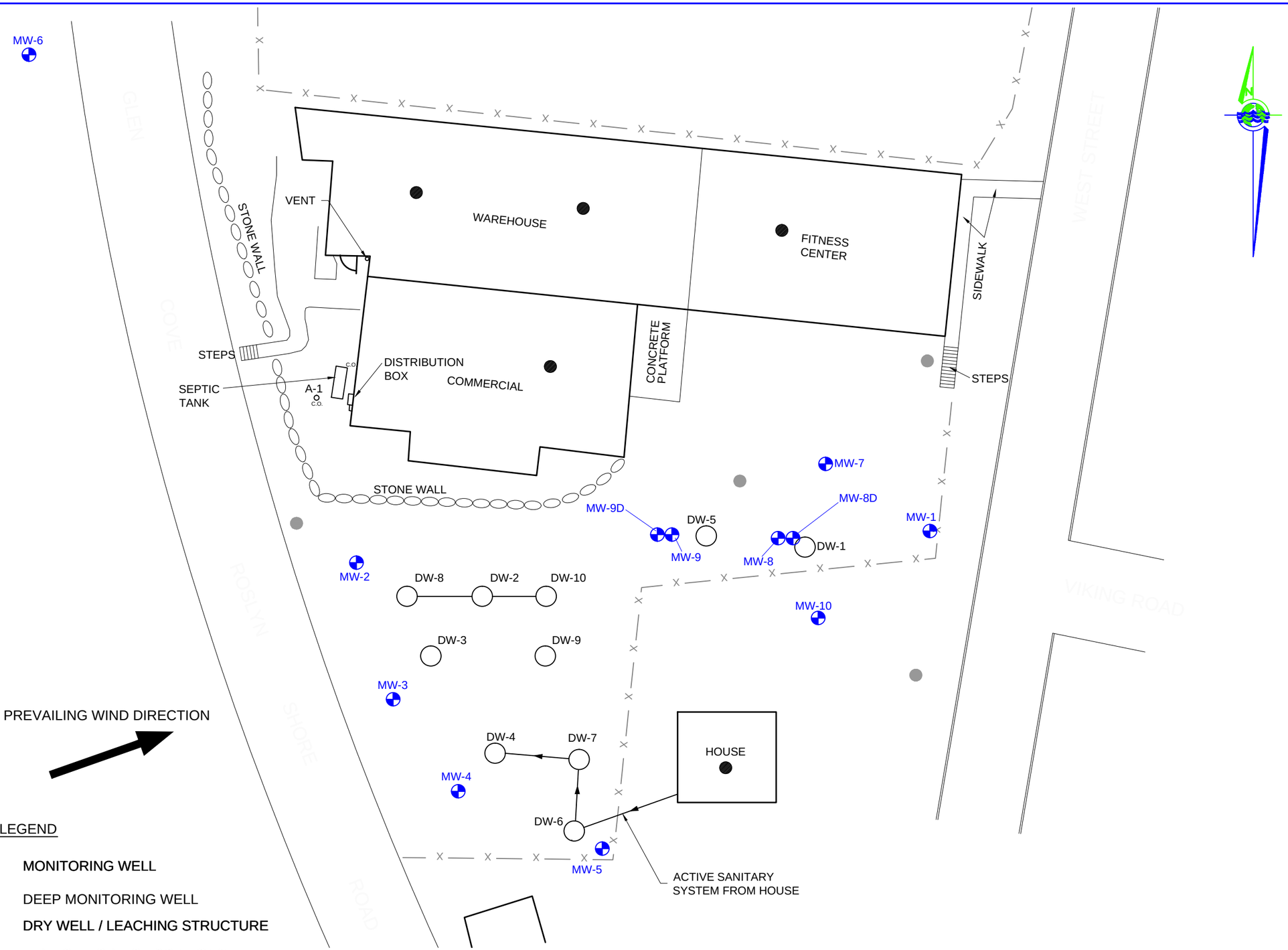
1 SHORE ROAD TO
St. FRANCIS HOSPITAL
100 PORT WASHINGTON BLVD, ROSLYN, NY

| | |
|---|---|
| Project: | PEN0001 |
| Designed by: | DE |
| Approved By: | PWG |
| Drawn By: | LLG |
| Figure No: | 9 |
| Date: | 10/18/07 |




# SITE PLAN

SCALE: 1" = 30'

BASE MAP PROVIDED BY:
YEC, INC.
SURVEY MAP: JULY 10, 1992

J:\Projects M-R\Pen - Penetrex\CADD\2009 CAD\Fig 2.dwg

PWGC
Strategic Environmental & Engineering Solutions
630 JOHNSON AVE. • SUITE 7
BOHEMIA • NY • 11716-2618
PH: (631)589-6353 • FX: (631)589-8705
E-MAIL: INFO@PWGROSSER.COM

CONSULTANTS



DRAWINGS PREPARED FOR

| REVISION | DATE | INITIAL | COMMENTS |
|---|---|---|---|

DRAWING INFORMATION

| | | | |
|---|---|---|---|
| PROJECT: | PEN0001 | APPROVED BY: | PWG |
| DESIGNED BY: | JL | DATE: | 6/9/09 |
| DRAWN BY: | LLG | SCALE: | AS SHOWN |

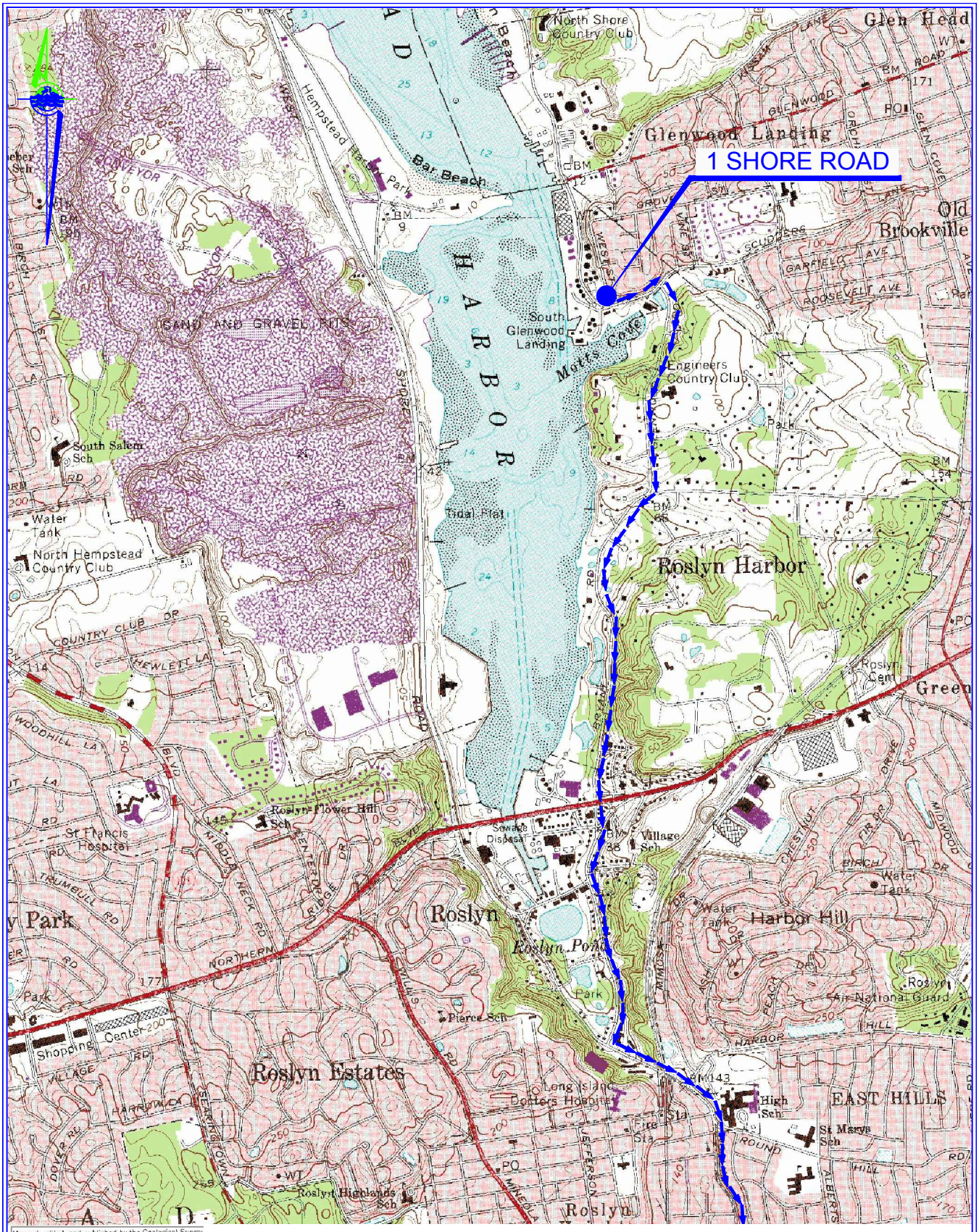
SHEET TITLE

CAMP

FORMER PENETREX PROSESSING NYSDEC I.D. No. 130034

FIGURE NO 11

SHEET - OF -




Mapped, edited, and published by the Geological Survey
Revised in cooperation with New York Department of Transportation
Control by USGS, USC&GS, and New Jersey Geodetic Survey

J:\Projects M-R\Pen – Penetrex\CADD\Hospital Route Map 10-18-07.dwg

# TRUCK ROUTE MAP

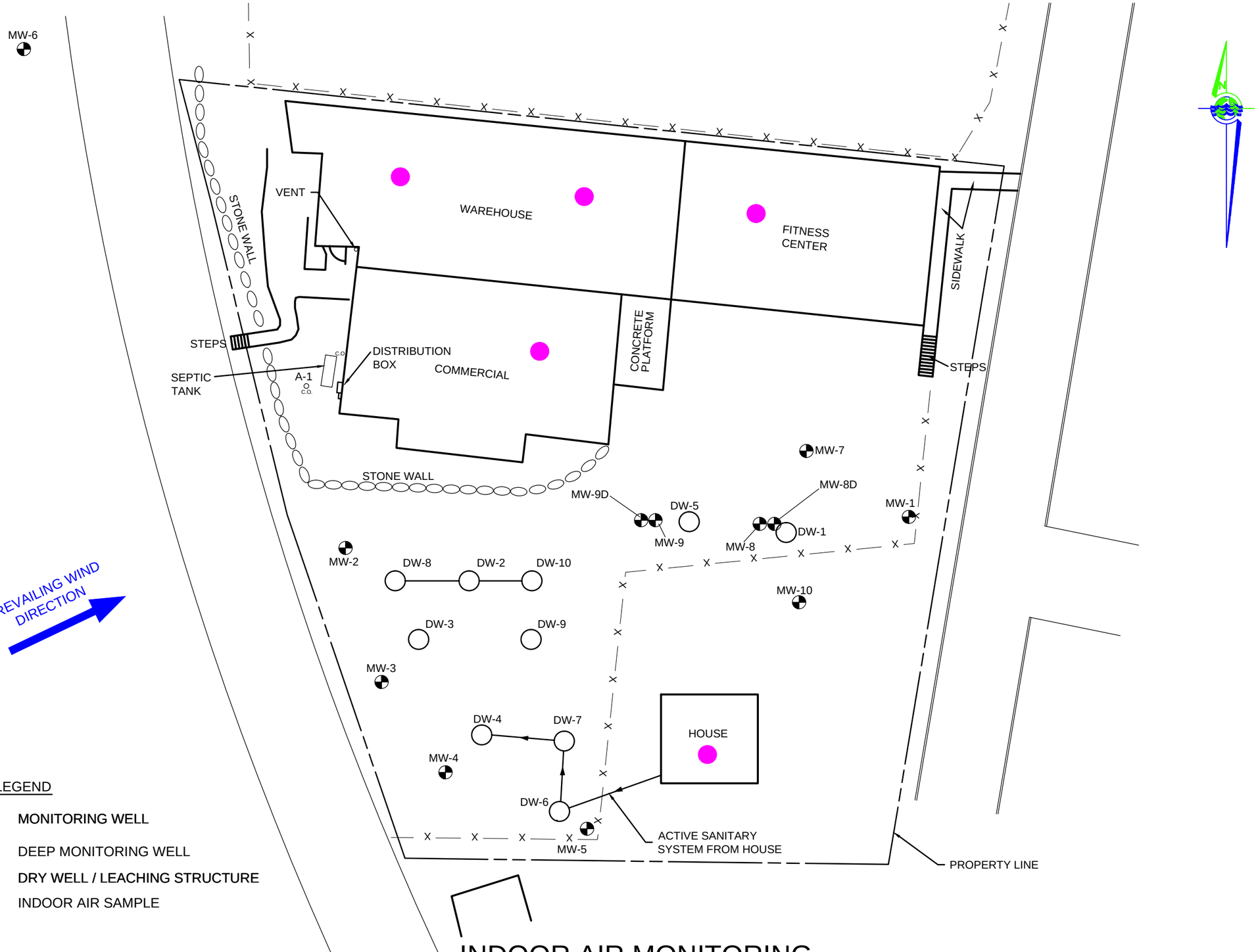
SCALE: 1:24,000

PWGC
Strategic Environmental & Engineering Solutions
630 Johnson Ave. Suite 7 Bohemia, N.Y. 11716-2618
Ph: 631 589-6353 Fx: 631 589-8705 E-mail: info@pwgroesser.com

1 SHORE ROAD

GLENWOOD LANDING, NY

| Project: | Figure No: |
|---|---|
| PEN0001 | 12 |
| Designed by: DE | |
| Approved By: PWG | |
| Drawn By: LLG | Date: 10/18/07 |




J:\Projects M-R\Pen - Penetrex\CADD\2009 CAD\Fig 13 - 2/3/15.dwg

PWGC
Strategic Environmental & Engineering Solutions
630 JOHNSON AVE. • SUITE 7
BOHEMIA • NY • 11716-2618
PH: (631)589-6353 • FX: (631)589-8705
E-MAIL: INFO@PWGROSSER.COM

CONSULTANTS



DRAWINGS PREPARED FOR

| REVISION | DATE | INITIAL | COMMENTS |
|---|---|---|---|

DRAWING INFORMATION

| | | | |
|---|---|---|---|
| PROJECT: | PEN1101 | APPROVED BY: | PWG |
| DESIGNED BY: | JL | DATE: | 2/3/15 |
| DRAWN BY: | LLG | SCALE: | AS SHOWN |

SHEET TITLE

INDOOR AIR MONITORING

FORMER PENETREX PROSESSING NYSDEC I.D. No. 130034

FIGURE NO 13

SHEET - OF -

# APPENDIX A

# EXCAVATION WORK PLAN

# APPENDIX A – EXCAVATION WORK PLAN

## A-1 NOTIFICATION

At least 15 days prior to the start of any excavation, the Site owner or their representative will notify the Department. Currently, this notification will be made to:

DEC Region 1 – Walter Parish Regional Hazardous Waste Remediation Engineer

NYSDEC

SUNY at Stony Brook

50 Circle Road

Stony Brook, New York 11790

This notification will include:

- A detailed 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 and 29 CFR 1910.120,
- A copy of the contractor's health and safety plan, in electronic format, if it differs from the HASP provided in **Appendix E** of this document,
- Identification of disposal facilities for potential waste streams,

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

## A-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based soil screening will be performed by a qualified environmental professional during all remedial and development excavations. 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.

On-site soils will be handled in accordance with DER-10 Chapter 5.4(e). 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.

## A-3 STOCKPILE METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC.

## A-4 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 by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the Site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-Site. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the Site 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.

## A-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials from the Site 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. Truck wash waters will be collected and disposed of off-Site in an appropriate manner.

Truck transport routes are as follows: Depart south on Shore Road; Shore Road becomes Scudders Lane; Turn right onto Glenwood Road; turn right onto Bryant Avenue; Bryant Avenue becomes Old Northern Boulevard; Keep straight onto East Broadway;

Turn left onto Main Street; Road name changes to Roslyn Road; Turn right onto Powerhouse Road; Bear left onto North Service Road; Take ramp left onto the Long Island Expressway. Then continue on major roadways to the disposal/reuse facility. The truck transport route is indicated on **Figure 12**.All trucks loaded with Site materials will exit the vicinity of the Site using approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive Sites; (b) use of city mapped truck routes; (c) prohibiting off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site.

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

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

## A-6 MATERIALS DISPOSAL OFF-SITE

All soil/fill/solid waste excavated and removed from the Site at a depth of 12 feet below grade or deeper 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 plan will be made to the NYSDEC. Unregulated off-Site management of materials from a depth of 12 feet below grade or deeper at 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.

Non-hazardous historic fill and contaminated soils taken off-Site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

## A-7 MATERIALS REUSE ON-SITE

Chemical criteria for on-Site reuse of material have been approved by NYSDEC and are listed in **Table 8**. On-site soils will be handled in accordance with DER-10 Chapter 5.4(e). The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-Site. Contaminated on-Site material, including historic fill and contaminated soil, that is acceptable for re-use on-Site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Any demolition material proposed for reuse on-Site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. 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.

## A-8 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.

## A-9 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 Record of Decision. A demarcation layer, consisting of orange snow fencing material or equivalent material will be installed to provide a visual reference to the top of the 'Remaining Contamination Zone', the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this Site Management Plan. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the Remaining Contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in any updates to the Site Management Plan.

## A-10 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 this SMP prior to receipt at the Site.

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 **Table 8**. Soils that meet 'exempt' fill requirements under 6 NYCRR 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. Solid waste will not be imported onto the Site.

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.

## A-11 STORMWATER POLLUTION PREVENTION

Although it is not anticipated based upon the current development details and the level of remediation that has already been completed at the Site, if excavations or soil disturbance of an area exceeding 1 acre is required for future remedial work or redevelopment, a Stormwater Pollution Prevention Plan (SWPPP) that conforms to the requirements of NYSDEC Division of Water guidelines and NYS regulations will be prepared in advance of the field effort. Some of the activities to be detailed in the plan are summarized below:

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

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.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. 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

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

## A-12 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 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.

## A-13 COMMUNITY AIR MONITORING PLAN

The Community Air Monitoring Plan (CAMP) provides measures for protection for on-Site workers and the downwind community (i.e., off-Site receptors including residences, businesses, and on-Site workers not directly involved in subsurface activities) from potential airborne contaminant releases resulting from subsurface activities at the Site.

The CAMP was established in accordance with the following requirements:

- 29 CFR 1910.120(h): This regulation specifies that air shall be monitored to identify and quantify levels of airborne hazardous substances and health hazards, and to determine the appropriate level of protection for workers.
- New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan: This guidance specifies that a community air-monitoring program shall be implemented to protect the surrounding community and to confirm that the work does not spread contamination off-Site through the air.

Fugitive respirable dust will be monitored using a MiniRam Model PDM-3 aerosol monitor or equivalent. Air will be monitored for VOCs with a portable Photovac MicroTip photoionization detector (PID), or equivalent. **Table 9** lists the Real-Time Air

Monitoring Action Levels to be used in work areas. Air monitoring data shall be documented in a Site log book by the designated Site safety officer. PWGC's Site safety officer or delegate shall calibrate and maintain air monitoring instruments in accordance with manufacturer's specifications. Instruments shall be zeroed daily and checked for accuracy and a daily log shall be kept.

**Table 9 - Air Monitoring Action Levels**

| AIR MONITORING INSTRUMENT | MONITORING LOCATION | ACTION LEVEL | SITE ACTION | REASON |
|---|---|---|---|---|
| PID | Breathing Zone | 0-25 ppm, non-transient | None | Exposure below established exposure limits |
| PID | Breathing Zone | 25-100 ppm, non-transient | Don APR | Based on potential exposure to VOCs |
| PID | Breathing Zone | >100 ppm, non-transient | Don ASR or SCBA, Institute vapor/odor suppression measures, Notify HSM. | Increased exposure to Site contaminants, potential for vapor release to public areas. |
| PID | Work Area Perimeter | < 5 ppm | None | Exposure below established exposure limits. |
| PID | Work Area Perimeter | > 5 ppm | Stop work and implement vapor release response plan until readings return to acceptable levels, Notify HSM. | Increased exposure to Site contaminants, potential for vapor release to public areas |
| Aerosol Monitor | Work Area Perimeter | >100 but < 150 $\mu g/m^3$ for 15 minutes | Institute dust suppression measures, Notify HSM. | Work to continue if particulate concentrations remain below 150 $\mu g/m^3$ |
| Aerosol Monitor | Work Area Perimeter | >150 $\mu g/m^3$ | Don ASR or SCBA, Institute dust suppression measures, Notify HSM. | Stop work and implement dust suppression techniques until readings return to acceptable levels, Notify HSM. |

A figure showing the location of air sampling stations based on generally prevailing wind conditions is shown in **Figure 12**. 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.

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

## A-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-Site and on-Site. 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; and (c) using foams to cover exposed odorous soils.If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

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.

## A-15 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.

- Clearing and grubbing of larger Sites 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.

## A-16 OTHER NUISANCES

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

# APPENDIX B

# ENVIRONMENTAL EASEMENT

NASSAU COUNTY CLERK'S OFFICE

ENDORSEMENT COVER PAGE

Recorded Date: 10-10-2014
Recorded Time: 03:23:10 p

Liber Book: D 13132
Pages From: 778
To: 788

Control Number: 4179
Ref #: RE 005081
Doc Type: D02 EASEMENT

| Location: | Section | Block | Lot | Unit |
|---|---|---|---|---|
| N. HEMPSTEAD (2822) | 0020 | 0000K-00 | 00010 | |
| N. HEMPSTEAD (2822) | 0020 | 0000K-00 | 00011 | |
| N. HEMPSTEAD (2822) | 0020 | 0000K-00 | 00012 | |

| | |
|---|---|
| Taxes Total | .00 |
| Recording Totals | 245.00 |
| Total Payment | 245.00 |

DMF001

THIS PAGE IS NOW PART OF THE INSTRUMENT AND SHOULD NOT BE REMOVED.
MAUREEN O'CONNELL
County Clerk

## ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

**THIS INDENTURE** made this 25th day of August, 2014 between Owner(s) Glenwood Realty LLC, having an office at 99 Mineola Avenue, P.O. Box 1356, Roslyn Heights, County of Nassau, State of New York (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

Sec: 20

Blk: K

Lot: 10-12

**WHEREAS,** Grantor, is the owner of real property located at the address of 1 Shore Road, Glenwood Landing in the Town of Hempstead, County of Nassau and State of New York, known and designated on the tax map of the County Clerk of Nassau as tax map parcel numbers: Section 20 Block K Lot 10, 11 and 12, being the same as that property conveyed to Grantor by deed dated January 2, 1999 and recorded in the Nassau County Clerk's Office in Liber and Page 11018 and 0762-0765. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 1.0 +/- acres, and is hereinafter more fully described in the Land Title Survey dated June 2, 2014 prepared by A. Agujo Surveying, Inc., 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: W1-1157-11-06, 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:

**Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and 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) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Nassau County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) 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;

(7) All future activities on the property that will disturb remaining

contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) 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 purposes as defined in 6NYCRR 375-1.8(g)(2)(i), 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, at such time as NYSDEC may require, 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: 130034
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.

Glenwood Realty LLC:

By: _____

Print Name: LAWRENCE WEINBERGER

Title: MGR + Co-Trustee of Member Date: 8/13/14

**Grantor's Acknowledgment**

STATE OF NEW YORK )
) ss:
COUNTY OF Nassau )

On the 13th day of August, in the year 20 14, before me, the undersigned, personally appeared Lawrence Weinberger, 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.

Kerry Viviani
Notary Public - State of New York

KERRY VIVIANI
Notary Public, State of New York
No. 30-4891813
Qualified in Nassau County
Commission Expires May 11, 2015

**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, Director
Division of Environmental Remediation

**Grantee's Acknowledgment**

STATE OF NEW YORK )
) ss:
COUNTY OF ALBANY )

On the 25th day of August, in the year 2014, before me, the undersigned, personally appeared Robert W. 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

David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2018

## SCHEDULE "A" PROPERTY DESCRIPTION

*TAX LOT 10*
*ALL THAT CERTAIN PLOT PEICE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN GLENWOOD LANDING, TOWN OF NORTH HEMPSTEAD, NASSAU COUNTY, AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:*
*BEGINNING AT A POINT ON THE NORTHWEST CORNER OF THE PROPERTY TO BE CONVEYED, WHICH POINT IS ALSO THE SOUTHWEST CORNER OF THE PROPERTY OF HINKLE AND FINLAYSON;*
*RUNNING THENCE FROM SAID POINT OF BEGINNING NORTH 73 DEGREES 01 MINUTES 44 SECONDS EAST, 193.65 FEET;*
*THENCE SOUTH 12 DEGREES 44 MINUTES 27 SECONDS EAST, 130.55 FEET (DEED) 130.62 FEET (CALC.) TO A POINT IN THE NORTHERLY LINE OF PROPERTY NOW OR FORMERLY OF PONTIFEX;*
*THENCE SOUTH 72 DEGREES 36 MINUTES 00 SECONDS WEST, 126.65 FEET TO THE EASTERLY LINE OFSHORE ROAD;*
*THENCE ALONG THE EASTERLY SIDE OF SHORE ROAD NORTH 41 DEGREES 58 MINUTES 40 SECONDS WEST, 101.05 FEET;*
*THENCE ALONG A CURVE TO THE RIGHT HAVING A RADIUS OF 261.51 FEET A CHORD LENGTH OF 42.24 FEET AND A BEARING OF NORTH 37 DEGREES 30 MINUTES 20 MINUTES WEST TO THE POINT OR PLACE OFBEGINNING.*
*LOT AREA = 21,136.64 sq. ft. = 0.485 acres*

*TAX LOT 11*
*ALL THAT CERTAIN PLOT PEICE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN GLENWOOD LANDING, TOWN OF NORTH HEMPSTEAD, NASSAU COUNTY, AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:*
*BEGINNING AT A POINT ON THE WESTERLY SID OF WEST STREET, (HIGHWAY FROM ROSLYN TO GLENWOODLANDING) AT A POINT DISTANT 173.25 FEET NORTHERLY FROM THE NORTHERLY SIDE OF LAND LATE OF WILLIAM UNDERHILL WHERE IT INTERSECTS THE WESTERLY SIDE OF WEST STREET;*
*RUNNING THENCE ALONG THE WESTERLY SIDE OF WEST STREET NORTH 12 DEGREES 18 MINUTES 58 SECONDS WEST (DEED) NORTH 12 DEGREES 44 MINUTES 27 SECONDS EAST(CALC.), 130.06 FEET TO LAND FORMERLY OF WILLIAM DOWSE NOW OR FORMERLY OF HINCKLE & FINLAYSON;*
*THENCE ALONG THE LAST MENTIONED LAND SOUTH 73 DEGREES 01 MINUTES 44 SECONDS WEST 75 FEETTO LAND OF WALTER RERAT;*
*THENCE ALONG THE LAST MENTIONED LAND SOUTH 12 DEGREES 44 MINUTES 27 SECONDS EAST, 130.55 FEET (DEED) 130.62 FEET (CALC.) TO LAND FORMERLY OF EDWARD BEDELL OR CUMMINGS;*
*THENCE ALONG THE SAID LAST MENTIONED LAND NORTH 72 DEGREES 36 MINUTES 00 SECONDS EAST, 75 FEET (DEED) 75.04 FEET (CALC.) TO THE WESTERLY SIDE OF WEST STREET THE POINT OR PLACE OF BEGINNING.*
*LOT AREA = 9749.14 sq. ft. = 0.224 acres*

*TAX LOT 12*
*ALL THAT CERTAIN PLOT PEICE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN GLENWOOD LANDING, TOWN OF NORTH HEMPSTEAD, NASSAU COUNTY, AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:*
*BEGINNING AT A POINT ON THE WESTERLY SIDE OF WEST STREET, THE ROAD LEADING FROM GLENWOOD TO ROSLYN AND DISTANT 331.34 FEET(DEED) 330.70'*

***FEET (CALC.) SOUTHERLY FROM THE LAND NOW OR FORMERLY OF JOHN GALLAGHER;***
***RUNNING THENCE SOUTH 14 DEGREES 07 MINUTES 50 SECONDS EAST ALONG THE WESTERLY SIDE OF WEST STREET, 110 FEET TO A POINT THEREON DISTANT 153.64 FEET IN A GENERAL NORTHERLY DIRECTION FROM THE CORNER FORMED BY THE INTERSECTION OF THE WESTERLY SIDE OF WEST STREET AND THE NEW NORTHERLY SIDE OF GLEN COVE ROSLYN SHORE ROAD (AFTER WIDENING THEREOF);***
***THENCE SOUTH 72 DEGREES 36 MINUTES 00 SECONDS WEST, 139.01 FEET TO THE NEW EASTERLY SIDE OF GLEN COVE ROSLYN SHORE ROAD (AFTER WIDENING THEREOF);***
***THENCE ALONG THE SAID SIDE OF SAID GLEN COVE ROSLYN SHORE ROAD, THE FOLLOWING TWO COURSES AND DISTANCES:***
***(1) NORTH 42 DEGREES 03 MINUTES 16 SECONDS WEST, 114.32 FEET;***
***(2) NORTHWESTERLY ALONG THE ARC OF A CURVE BEARING TO THE LEFT HAVING A RADIUS OF 538.69 FEET AND WHICH CURVE IS SUBTENDED BY A CHORD BEARING NORTH 41 DEGREES 47 MINUTES 16 SECONDS WEST, A CHORD DISTANCE OF 6.58 FEET TO A POINT;***
***THENCE NORTH 72 DEGREES 36 MINUTES 00 SECONDS EAST, 195.84 FEET TO THE WESTERLY SIDE OF WEST STREET, AT A POINT OR PLACE OF BEGINNING.***
***LOT AREA = 19,089.09 sq. ft. = 0.438 acres***

# APPENDIX C

# METES AND BOUNDS

AS TO TAX LOT 10

ALL that certain piece, plot or parcel of land, situate, lying and being at Glenwood Landing, Town of North Hempstead, Nassau County, New York, more particularly bounded and described as follows:

BEGINNING at the Northwest corner of the property to be conveyed, which point is also the Southwest corner of property of Hinkle and Finlayson;

running thence from said point of beginning North 73 degrees 1 minute 44 seconds East, 193.65 feet;

thence South 12 degrees 44 minutes 27 seconds East, 130.55 feet to a point in the Northerly line of property now or formerly of Pontifex;

thence South 72 degrees 36 minutes West, 126.65 feet to the Easterly line of Shore Road;

thence along the Easterly side of Shore Road North 41 degrees 58 minutes 40 seconds West, 101.05 feet;

thence along a curve to the right having a radius of 261.51 feet a chord length of 42.24 feet and a bearing of North 37 degrees 30 minutes 20 seconds West to the point or place of BEGINNING.

AS TO TAX LOT 11

ALL that certain plot, piece or parcel of land, situate, lying and being at Glenwood Landing, in the Town of North Hempstead, Nassau County, New York, bounded and described as follows:

BEGINNING at a point on the Westerly side of West Street, (highway from Roslyn to Glenwood Landing) at a point distant 173.25 feet Northerly from the Northerly side of land late of William Underhill where it intersects the Westerly side of said highway;

running thence along the Westerly side of West Street North 12 degrees 18 minutes 58 seconds West, 130.06 feet to land formerly of William Dowse now or formerly of Hinkle & Finlayson;

thence along the last mentioned land South 73 degrees 01 minute 44 seconds West 75 feet to land of Walter Rerat;

thence along the last mentioned land South 12 degrees 44 minutes 27 seconds East, 130.55 feet to land formerly of Edward Bedell or Cummings;

thence along the said last mentioned land North 72 degrees 36 minutes 00 seconds East, 75 feet to the Westerly side of West Street the point or place of BEGINNING.

# SCHEDULE A

AS TO TAX LOT 11



ALL that certain plot, piece or parcel of land, situate, lying and being at Glenwood Landing, in the Town of North Hempstead, Nassau County, New York, bounded and described as follows:

BEGINNING at a point on the Westerly side of West Street, (highway from Roslyn to Glenwood Landing) at a point distant 173.25 feet Northerly from the Northerly side of land late of William Underhill where it intersects the Westerly side of said highway;

running thence along the Westerly side of West Street North 12 degrees 18 minutes 58 seconds West, 130.06 feet to land formerly of William Dowse now or formerly of Hinkle & Finlayson;

thence along the last mentioned land South 73 degrees 01 minute 44 seconds West 75 feet to land of Walter Rerat;

thence along the last mentioned land South 12 degrees 44 minutes 27 seconds East, 130.55 feet to land formerly of Edward Bedell or Cummings;

thence along the said last mentioned land North 72 degrees 36 minutes 00 seconds East, 75 feet to the Westerly side of West Street the point or place of BEGINNING.

AS TO TAX LOT 12

ALL that certain plot, piece or parcel of land, with the buildings thereon erected, located in Glenwood Landing, in the Town of North Hempsted, Nassau County, State of New York, more particularly bounded and described as follows:

BEGINNING at a point on the Westerly side of West Street, the road leading from Glenwood to Roslyn and distant 331.34 feet Southerly from the land now or formerly of John Gallagher;

running thence South 14 degrees 07 minutes 50 seconds East along the Westerly side of West Street, 110 feet to a point thereon distant 153.64 feet in a general Northerly direction from the corner formed by the intersection of the Westerly side of West Street and the new Northerly side of Glen Cove Roslyn Shore Road (after widening thereof);

thence South 72 degrees 36 minutes 00 seconds West, 139.009 feet to the new Easterly side of Glen Cove Roslyn Shore Road (after widening thereof);

thence along the said side of said Glen Cove Roslyn Shore Road, the following two courses and distances:
1) North 42 degrees 03 minutes 16 seconds West, 114.317 feet;
2) Northwesterly along the arc of a curve bearing to the left having a radius of 538.69 feet and which curve is subtended by a chord bearing North 41 degrees 47 minutes 16 seconds West, a chord distance of 6.584 feet to a point;

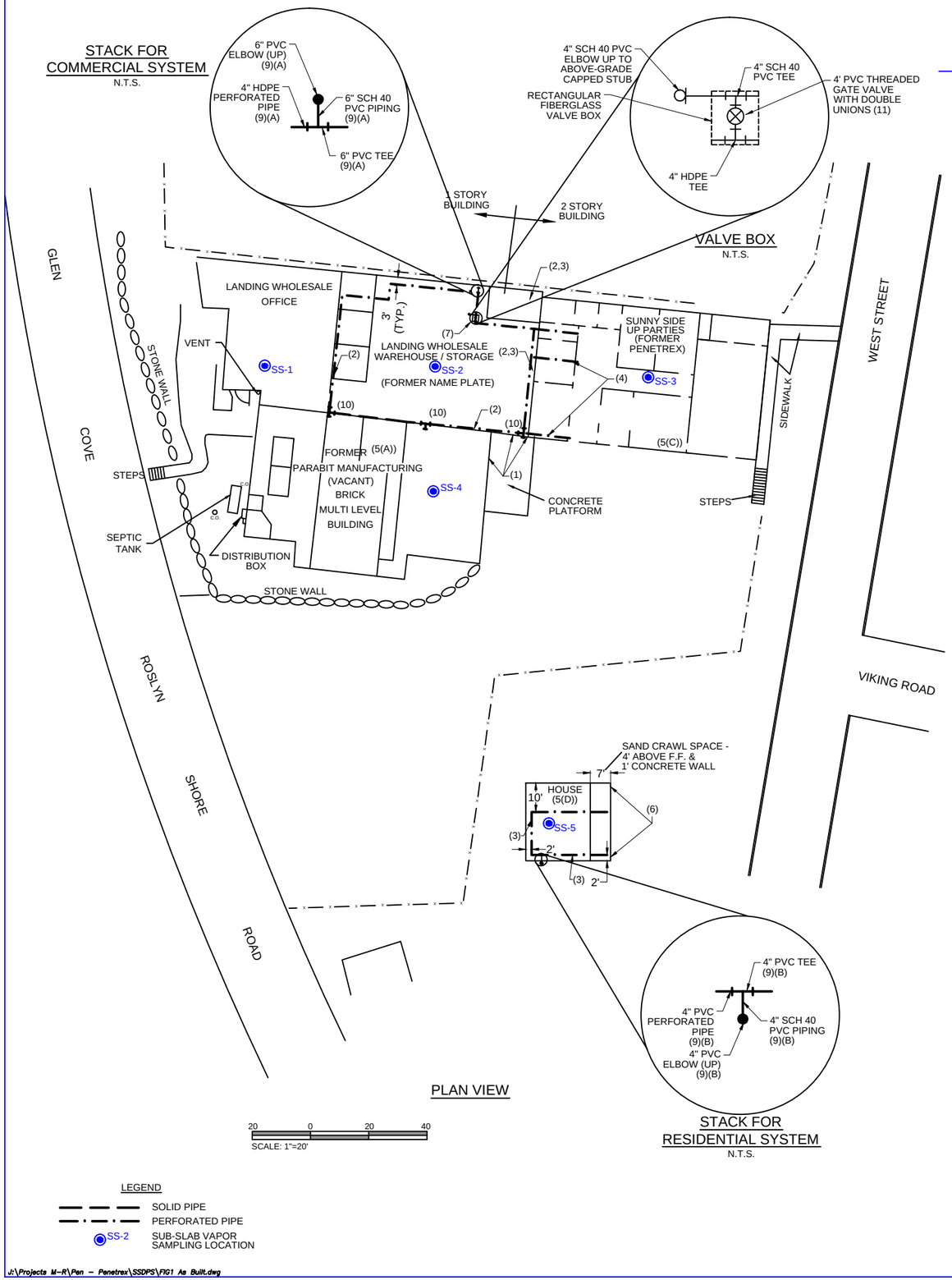
thence North 72 dgrees 36 minutes 00 seconds East, 195.839 feet to the Westerly side of West Street, at the point or place of BEGINNING.

Said premises being and intended to be the same premises conveyed to the Grantor herein by deed dated January 7, 1982 from Saul Weinberger and Ray Kaiser.

AND the party of the first part covenants as follows: that said party of the first part is seized of the said premises in fee simple, and has good right to convey the same; that the party of the second part shall quietly enjoy the said premises; that the said premises are free from incumbrances, except as aforesaid; that the

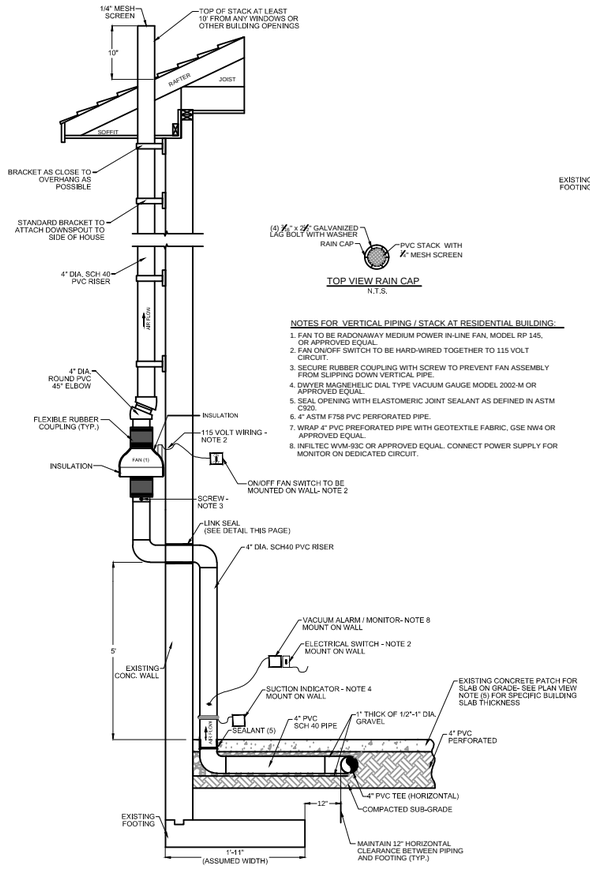
# APPENDIX D

# SSDS AS-BUILT DRAWINGS




NOTES:

1. THE LAND WHOLESALE WAREHOUSE, SUNNY SIDE UP PARTIES, AND PARABIT MANUFACTURING BUILDINGS ARE ASSUMED TO HAVE SEPARATE FOUNDATIONS.
2. INSTALL HDPE PERFORATED PIPING 3' FROM INTERIOR WALL. THIS ASSUMES FOOTINGS ARE 2' WIDE, FROM THE INTERIOR WALLS, AND THEREFORE THE PIPING IS 12" INSIDE OF THE FOOTINGS.
3. INSTALL 4" DIA. SCH 40 PVC SOLID PIPE IN SAME TRENCH AS HDPE PERFORATED PIPE W/ 12" OF CLEARANCE FROM FOUNDATION WALL.
4. INSTALL 3-15' SECTIONS OF 4" PVC PERFORATED PIPE W/ CAPPED ENDS. REFER TO CONSTRUCTION DETAILS (THIS SHEET). REMOVE CYLINDRICAL SECTIONS OF SOIL WITH HIGH PRESSURE AIR TO INSTALL PIPE.
5. (A) 10" THICK EXIST. CONCRETE SLAB WITH VAPOR BARRIER.
   (B) 11" THICK EXIST. CONCRETE SLAB WITH VAPOR BARRIER.
   (C) 11" THICK EXIST. CONCRETE SLAB WITH VAPOR BARRIER.
   (D) 4" THICK EXIST. CONCRETE SLAB.
6. INSTALL 2-8' SECTIONS OF 4" PVC PERFORATED PIPE. REFER TO (4) ABOVE FOR INSTALLATION DETAILS.
7. INSTALL CAPPED STUB OF 4" PVC SOLID PIPE 4' ABOVE F.F. FOR POSSIBLE FUTURE CONNECTION TO STACK & FAN. FAN & STACK WILL BE INSTALLED IF CONTAMINANT CONCENTRATIONS BENEATH THE SUNNY SIDE SLAB ARE NOT REDUCED WITHIN THE TIME INDICATED BY THE SAMPLING PLAN. AT THAT TIME, THE GATE VALVE WHICH ALLOWS FLOW FROM THE SUNNY SIDE SYSTEM INTO THE LANDING SYSTEM WILL BE CLOSED, ISOLATING THE TWO SYSTEMS.
8. INSTALL 4' CAPPED STUB FOR POSSIBLE FUTURE EXPANSION ON SOUTH SIDE OF BUILDING.
9. (A) FOR DETAILS OF THE 6" PVC TEE, CONNECTING HORIZONTAL PIPING, VERTICAL PIPING, ABOVE GRADE EQUIPMENT & THE EXHAUST STACK, REFER TO SUB-SLAB DE-PRESSURIZATION SYSTEM DETAIL FOR COMMERCIAL BUILDINGS (THIS SHEET).
   (B) FOR DETAILS OF THE 4" PVC TEE, CONNECTING HORIZONTAL PIPING, VERTICAL PIPING, ABOVE GRADE EQUIPMENT & THE EXHAUST STACK, REFER TO SUB-SLAB DE-PRESSURIZATION SYSTEM-DETAIL FOR RESIDENTIAL BUILDING (THIS SHEET).
10. INSTALL 4" HDPE TEES FOR POSSIBLE FUTURE EXPANSION OF SYSTEM.
11. INFILTEC WVM-93C OR APPROVED EQUAL. CONNECT POWER SUPPLY FOR MONITOR ON DEDICATED CIRCUIT.



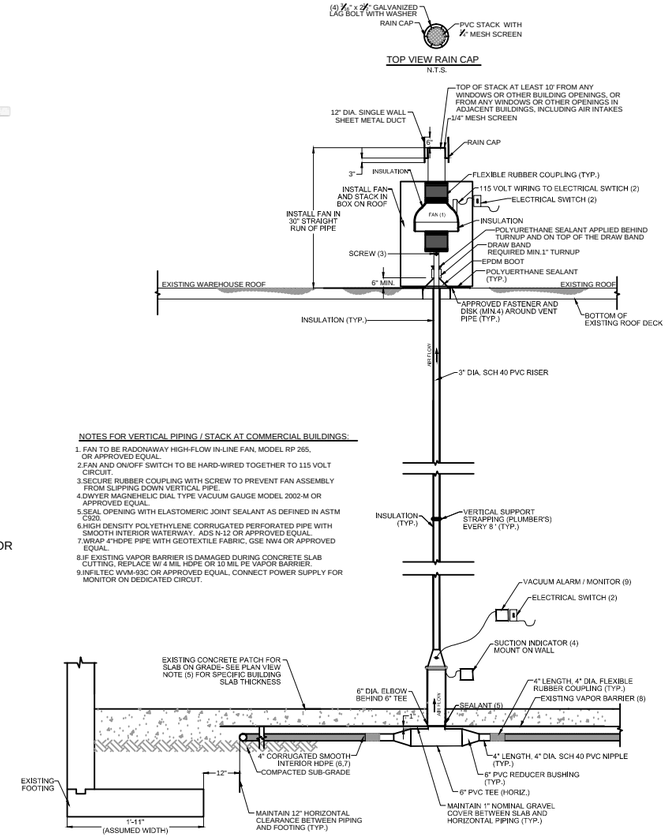

SUB-SLAB DE-PRESSURIZATION SYSTEM
DETAIL FOR RESIDENTIAL BUILDING
N.T.S.



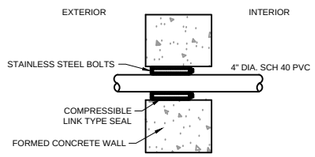

TOP VIEW RAIN CAP
N.T.S.

NOTES FOR VERTICAL PIPING / STACK AT RESIDENTIAL BUILDING:

1. FAN TO BE RADONAWAY MEDIUM POWER IN-LINE FAN, MODEL RP 145, OR APPROVED EQUAL.
2. FAN ON/OFF SWITCH TO BE HARD-WIRED TOGETHER TO 115 VOLT CIRCUIT.
3. SECURE RUBBER COUPLING WITH SCREW TO PREVENT FAN ASSEMBLY FROM SLIPPING DOWN VERTICAL PIPE.
4. DWYER MAGNEHELIC DIAL TYPE VACUUM GAUGE MODEL 2002-M OR APPROVED EQUAL.
5. SEAL OPENING WITH ELASTOMERIC JOINT SEALANT AS DEFINED IN ASTM C920.
6. 4" ASTM F758 PVC PERFORATED PIPE.
7. WRAP 4" PVC PREFORATED PIPE WITH GEOTEXTILE FABRIC, GSE NW4 OR APPROVED EQUAL.
8. INFILTEC WVM-93C OR APPROVED EQUAL. CONNECT POWER SUPPLY FOR MONITOR ON DEDICATED CIRCUIT.




SUB-SLAB DE-PRESSURIZATION SYSTEM
DETAIL FOR COMMERCIAL BUILDINGS
N.T.S.




LINK TYPE SEAL DETAIL
N.T.S.

| REVISIONS | DATE | INITIAL | COMMENTS |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

AS-BUILT SITE PLAN AND DETAILS
1 SHORE ROAD
GLENWOOD LANDING
FORMER PENETREX PROCESSING
NYSDEC I.D. No. 130034

PWGC
Strategic Environmental & Engineering Solutions
630 Johnson Ave. Suite 7 Bohemia, N.Y. 11716-2618
Ph: 631 589-6353 Fx: 631 589-8705 E-mail: info@pwgrosser.com

| Project: PEN0001 | Approved By: PWG | Figure No: 7 |
|---|---|---|
| Designed By: DD | Date: 8/15/07 | |
| Drawn By: TC/LLG | Scale: AS SHOWN | |



J:\Projects M-R\Pen - Penetrex\SSDPS\FIG1 As Built.dwg

# APPENDIX E

# HASP AND CAMP

# PENETREX PROCESSING
# 1 SHORE ROAD
# GLENWOOD LANDING, NEW YORK
# NYSDEC SITE NUMBER: 130034

# SITE MANAGEMENT PLAN
# HEALTH AND SAFETY PLAN

**Submitted To:**

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7015

**Prepared For:**

Glenwood Realty
P.O. Box 1356
Roslyn Heights, New York 11577

**Prepared By:**

P.W. Grosser Consulting, Inc.
630 Johnson Avenue, Suite 7
Bohemia, New York 11716
Phone: 631-589-6353
Fax: 631-589-8705

PWGC Project Number: PEN 1101

**FEBRUARY 2015**

# TABLE OF CONTENTS

## Penetrex Processing Facility

## 1 Shore Road, Glenwood Landing, New York

**Page**

## FIGURES



## APPENDICES

# STATEMENT OF COMMITMENT

On-site employees may be exposed to risks from hazardous conditions related to the implementation of the Interim Remedial Measure (IRM) to be performed on the Former Penetrex Processing project site. P.W. Grosser Consulting Inc.'s (PWGC's) policy is to minimize the possibility of work-related injury through awareness and qualified supervision, health and safety training, medical monitoring, use of appropriate personal protective equipment, and the following activity specific safety protocols contained in this Health and Safety Plan (HASP). PWGC has established a guidance program to implement this policy in a manner that protects personnel to the maximum reasonable extent.

This HASP, which applies to PWGC personnel actually or potentially exposed to safety or health hazards, describes emergency response procedures for actual and potential physical and chemical hazards. This HASP is also intended to inform and guide personnel entering the work area or exclusion zone. Persons are to acknowledge that they understand the potential hazards and the contents of this Health and Safety policy by signing off on receipt of their individual copy of the document. Contractors and suppliers are retained as independent contractors and are responsible for ensuring the health and safety of their own employees.

PWGC may require that its personnel take certain precautions in accordance with this HASP, and PWGC requests that others protect their personnel in a manner that they deem necessary or sufficient.

# 1.0 INTRODUCTION AND SITE ENTRY REQUIREMENTS

This document describes the health and safety guidelines developed by P.W. Grosser Consulting, Inc. (PWGC) for the Interim Remedial Measure (IRM) to be performed at the Penetrex Processing Facility at 1 Shore Road in Glenwood Landing, New York, to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes. In accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120 Hazardous Waste Operations and Emergency Response Final rule, this HASP, including the attachments, addresses safety and health hazards relating to each phase of site operations and is based on the best information available. The HASP may be revised by PWGC at the request of the New York State Department of Environmental Conservation (NYSDEC) upon receipt of new information regarding site conditions. Changes will be documented by written amendments signed by P.W. Grosser's project manager, site safety officer and/or the PWGC health and safety consultant.

## 1.1 Training Requirements

Personnel entering the exclusion zone or decontamination zone must meet the training requirements for hazardous waste site operations and emergency response operations in accordance with OSHA 29 CFR 1910.120(e). PWGC's health and safety training records are kept on file.

Each subcontractor and supplier working on the job must provide the site safety officer with training documentation for its personnel. This documentation will be reviewed by the site safety officer to ensure compliance with site-specific health and safety rules. The site safety officer may require modifications to the subcontractor or suppliers safety training documentation if it does not conform to site-specific requirements.

## 1.2 Medical Monitoring Requirements

Personnel and visitors entering the exclusion zone or decontamination zone must have completed appropriate medical monitoring required under OSHA 29 CFR 1910.120(f). Medical monitoring enables a physician to monitor each employee's health, physical condition, and his fitness to wear respiratory protective equipment and carry out on-site tasks.

Evidence of compliance with additional medical monitoring requirements for this site must also be included. Subcontractors and suppliers working on the job must provide the site safety officer with documentation on their medical monitoring programs.

## 1.3 Fit-Testing Requirements

Personnel and visitors entering the exclusion zone or decontamination zone using a negative pressure air purifying respirator (APR) must have successfully passed a qualitative respirator fit test in accordance with OSHA 29 CFR 1910.134 or the American National Standards Institute (ANSI).

Fit testing documentation is the responsibility of each subcontractor. Documentation of PWGC's personnel fit-testing is maintained on file.

## 1.4 Site Safety Plan Acceptance, Acknowledgment and Amendments

The project manager and the site safety officer are responsible for informing personnel (P.W. Grosser employees and/or owner or owners representatives) entering the work area of the contents of this plan and ensuring that each person signs the safety plan acknowledging the on-site hazards and procedures required to minimize exposure to adverse effects of these hazards. A copy of the Acknowledgement Form is included in Appendix A.

Site conditions may warrant an amendment to the HASP. Amendments to the HASP are acknowledged by completing forms included in Appendix B.

## 1.5 Daily Safety Meetings

Each day before work begins, the site safety officer will hold safety (tailgate or tool box) meetings to ensure that on-site personnel understand the site conditions and operating procedures and to address safety questions and concerns. Meeting minutes and attendance will be recorded. Personnel eligible to enter the exclusion and decontamination zones must attend the meetings. Project staff will discuss and remedy health and safety issues at these meetings.

## 1.6 Key Personnel - Roles and Responsibilities

The following PWGC key personnel are planned for this project:

- PWGC Project Director — Mr. James P. Rhodes
- PWGC Project Manager — Mr. John D. Eichler
- PWGC Site Safety Officer — Ms. Jennifer Lewis

The PWGC project manager is responsible for overall project administration and, with guidance from the PWGC site safety officer, for supervising the implementation of this HASP. The site safety officer will conduct daily (tail gate or tool box) safety meetings at the project site and oversee daily safety issues. Each subcontractor and supplier (defined as an OSHA employer) is also responsible for the health and safety of its employees. If there is any dispute about health and safety or project activities, on-site personnel will attempt to resolve the issue. If the issue cannot be resolved at the site, then the project manager will be consulted.

The PWGC site safety officer is also responsible for coordinating and enforcing health and safety activities on-site. The site safety officer must meet the emergency response and hazardous materials training requirements of OSHA 29 CFR Part 1910.120; must have

completed OSHA supervisor training, 29 CFR 1910.120 (e) 4; and must have appropriate experience to the related site work. The site safety officer is authorized to suspend the site work based on safety concerns, and is responsible for the following:

1. Educating personnel about information in this HASP and other safety requirements to be observed during site operations, including, but not limited to, decontamination procedures, designation of work zones and levels of protection, air monitoring, fit testing, and emergency procedures dealing with fire and first aid.

2. Coordinating site safety decisions with the project manager.

3. Designating exclusion, decontamination and support zones on a daily basis.

4. Monitoring the condition and status of known on-site hazards and maintaining and implementing the air quality monitoring program specified in this HASP.

5. Maintaining the exclusion zone entry/exit log and site entry/exit log.

6. Maintaining records of safety problems, corrective measures and documentation of chemical exposures or physical injuries (the site safety officer will document these conditions in a bound notebook and maintain a copy of the notebook on-site).

The person who observes safety concerns and potential hazards that have not been addressed in the daily safety meetings should immediately report their observations/concerns to the site safety officer or appropriate key personnel.

## 2.0 SITE BACKGROUND AND SCOPE OF WORK

This Health and Safety Plan (HASP) has been prepared by PWGC, on behalf of Glenwood Realty of Roslyn, New York, for the property located at 1 Shore Road, Glenwood Landing, New York.

Dry-cleaning solvents above guidance levels and/or standards were identified in soil and groundwater during the Remedial Investigation performed at the site. The dry-cleaning related contaminants were believed to have been released sometime during the operation of the site as a dry-cleaning chemical manufacturing facility up till its abandonment in 1984.

The field work portion of the RI was largely completed by PWGC from November 2001 through September 2006, in accordance with the protocols and methods as established by the New York State Department of Environmental Conservation (NYSDEC).

The Remedial Investigation concluded that residual volatile organic compounds (VOCs) in groundwater remain across the site and that VOCs in groundwater are above standards in the subsurface of the eastern portion of the parking area. The proposed Work Plan includes the injection of a chemical oxidant solution into the impacted groundwater area.

The subject site consists of an approximately one-acre parcel located on the east side of Shore Road (a.k.a. Glen Cove Roslyn Shore Road), in the Hamlet of Glenwood Landing, Town of North Hempstead, Nassau County, New York. The property is identified in Nassau County Tax maps as Section 20 - Block K - Lots 10 through 12. The property is improved with a two-story brick industrial building, asphalt parking, communications tower and other ancillary improvements.

The property is bounded to the west by Shore Road and to the east by West Street. The site is generally located north of Scudders Lane and is situated near and adjoining several

major oil storage facilities, coastal terminals and a municipal power station near Hempstead Harbor. Glenwood Oil Terminal Corp. is located northwest, diagonally across the property.

A former dry cleaning business, known as Penetrex Processing, Inc. (Penetrex), is reported to have operated at the site for several years prior to abandoning the facility in 1984. During its operation at the site, Penetrex is reported to have discharged dry cleaning chemicals to an on-site sanitary system and/or drywells at the property. A manufacturer of adhesive nameplates known as the Nameplate Corporation also formerly occupied the site.

# 3.0 HAZARD ASSESSMENT

This section identifies the hazards associated with the proposed scope of work, general site operations which may also be conducted at site, and the standard operating procedures (SOPs) that should be implemented to reduce the hazards; identifies general physical hazards that can be expected at most sites; and presents a summary of documented or potential chemical hazards at the site. Every effort must be made to reduce or eliminate these hazards. Those that cannot be eliminated must be guarded against using engineering controls and/or personal protective equipment.

## 3.1 Activity-Specific Hazards and Standard Operating Procedures

### *3.1.1 Drilling and Probing Operations*

Monitoring well installation and chemical oxidant injection using a Geoprobe™ and a drill rig will be performed as part of the IRM. P.W. Grosser follows the drill rig/Geoprobe™ operation safety protocols described in Appendix C. In addition, PWGC and/or their subcontractor(s) will follow Geoprobe™ operation and sampling procedures.

### *3.1.2 Work in Extreme Temperatures*

Work under extremely hot or cold weather conditions requires special protocols to minimize the chance that employees will be affected by heat or cold stress. P.W. Grosser follows the heat and cold stress safety protocols described in Appendix D.

### *3.1.3 Dust Control and Monitoring*

Dust generated during work activities may contain contaminants associated with the site characteristics. Dust generation is not anticipated during the implementation of the IRM, however, if dust is generated, P.W. Grosser will control the dust by wetting the working surface with water.

## 3.2 Chemical Hazards

Soil sample results obtained during investigations at the site revealed concentrations of volatile organic compounds (VOCs) detected above their respective Recommended Soil Clean-up Objectives (RSCOs) identified in New York State Department of Environmental Conservation Technical and Administrative Guidance Memorandum No. 4046. VOCs reported above their respective RSCOs include the following:

- Tetrachloroethene
- cis-1,2-Dichloroethene

Groundwater sample results obtained during site investigations revealed concentrations of VOCs detected above NYSDEC Groundwater Standards. VOCs reported above their respective Groundwater Standards include the following:

- Tetrachloroethene
- cis-1,2-Dichloroethene
- 1,1,1-Trichloroethane
- 1,1-Dichloroethane
- Toluene
- trans-1,2-Dichloroethene
- Trichloroethene
- Vinyl Chloride

The primary routes of exposure to suspected and identified contaminants in soil are inhalation, ingestion, and absorption.

Appendix E includes information sheets for the known and suspected chemicals that may be encountered at the site.

### *3.2.1 Respirable Dust*

IRM activities are not anticipated to generate particulate dust, however dust may be generated from vehicular traffic and/or other construction activities. If visible observation detects elevated levels of dust, a program of wetting will be employed by the site safety officer. If elevated dust levels persist, the site safety office will employ dust monitoring using a particulate monitor (Miniram or equivalent). If monitoring detects concentrations greater than 150 µg/m3 over daily background, the site safety officer will take corrective actions as defined herein, including the use of water for dust suppression and if this is not effective, requiring workers to wear APRs with efficiency particulate air (HEPA) cartridges.

Absorption pathways for dust and direct contact with soils will be mitigated with the implementation of latex gloves, hand washing and decontamination exercises when necessary.

### *3.2.2 Organic Vapors*

Drilling activities may cause the release of organic vapors to the atmosphere. The site safety officer will monitor organic vapors with a Photoionization Detector (PID) during drilling activities to determine whether organic vapor concentrations exceed action levels shown below.

| PID Response | Action |
|---|---|
| Sustained readings of 5 ppm or greater | Shut down drilling equipment and allow area to vent. Resume when readings return to background |
| Sustained readings of 5 ppm or greater that do not subside after venting | Implement Vapor Release Plan (Section 7.8). Re-evaluate respiratory protection as upgrade may be required. |

## 3.3 General Site Hazards

Applicable OSHA 29 CFR 1910.120(m) standards for illumination shall apply. Work is to be conducted during daylight hours whenever possible.

Electrical power must be provided through a ground fault circuit interrupter. Equipment that will enter an excavation must be suitable and approved (i.e. intrinsically safe) for use in potentially explosive environments. Applicable OSHA 29 CFR 1926 Subpart K standards for use of electricity shall apply.

Work where there is a fall hazard will be performed using appropriate ladders and/or protection (e.g. body harness and lifeline). All work should be conducted at the ground surface or in trench excavations.

In accordance with 29 CFR 1910.151(c), workers involved in operations where there is the risk of eye injury, (chemical splash, etc.), must have ready access to an approved eye wash unit. Protective eye wear shall be donned in Level D, when directed by the site safety officer.

Operations where there is a potential for fire will be conducted in a manner that minimizes risk. Non-sparking tools and fire extinguishers shall be used or available as directed by the site safety officer when work is in potentially explosive atmospheres. Ignition sources shall be removed from work areas. Explosion-proof instruments and/or bonding and grounding will be used to prevent fire or explosion when the site safety officer directs their use.

Overhead and underground utilities shall be identified and/or inspected and appropriate safety precautions taken before conducting operations where there is potential for contact or interference.

# 4.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) shall be selected in accordance with the site air monitoring program, OSHA 29 CFR 1910.120(c), (g), and 1910.132. Protective equipment shall be NIOSH-approved and respiratory protection shall conform to OSHA 29 CFR Part 1910.133 and 1910.134 specifications; head protection shall conform to 1910.135; eye and face protection shall conform to 1910.133; and foot protection shall conform to 1910.136. The only true difference among the levels of protection from D thru B is the addition of the type of respiratory protection. It is anticipated that work performed under the SMP would be conducted in Level D PPE.

## 4.1 Level D

Level D PPE shall be donned when the atmosphere contains no known hazards and work functions preclude splashes, immersion, or the potential for inhalation of, or contact with, hazardous concentrations of harmful chemicals. Level D PPE consists of:

- standard work uniform, coveralls, or tyvek, as needed;
- steel toe and steel shank work boots;
- hard hat;
- gloves, as needed;
- safety glasses;
- hearing protection;
- equipment replacements are available as needed.

## 4.2 Level C

Level C PPE shall be donned when the concentrations of measured total organic vapors in the breathing zone exceed background concentrations (using a portable OVA, or equivalent), but are less than 5 ppm. The specifications on the APR filters used must be

appropriate for contaminants identified or expected to be encountered. Level C PPE shall be donned when the identified contaminants have adequate warning properties and criteria for using APR have been met. Level C PPE consists of:

- chemical resistant or coated tyvek coveralls;
- steel-toe and steel-shank workboots;
- chemical resistant overboots or disposable boot covers;
- disposable inner gloves (surgical gloves);
- disposable outer gloves;
- full-face APR fitted with organic vapor/dust and mist filters or filters appropriate for the identified or expected contaminants;
- hard hat;
- splash shield, as needed; and,
- ankles/wrists taped with duct tape.

The site safety officer will verify if Level C is appropriate by checking organic vapor concentrations using compound and/or class-specific detector tubes.

## 4.3 Level B

Level B PPE shall be donned when the contaminants have not been identified and/or the concentrations of unknown measured total organic vapors in the breathing zone exceed 5 ppm (using a portable OVA, or equivalent). Level B PPE shall be donned if the IDLH of a known contaminant is exceeded. If a contaminant is identified or is expected to be encountered for which NIOSH and/or OSHA recommend the use of a positive pressure self-contained breathing apparatus (SCBA) when that contaminant is present, Level B PPE shall be donned even though the total organic vapors in the breathing zone may not exceed 5 ppm. Level B shall be donned for confined space entry, and when the atmosphere is oxygen deficient (oxygen less than 19.5%) or potentially oxygen deficient. If Level B PPE is required for a task, at least three people shall be donned in Level B at

any one time during that task. PPE shall only be donned at the direction of the site safety officer. Level B PPE consists of:

- supplied air SCBA or air line system with five minute egress system;
- chemical resistant coveralls;
- steel-toe and steel-shank workboots;
- chemical resistant overboots or disposable boot covers;
- disposable inner gloves;
- disposable outer gloves;
- hard hat; and,
- ankles/wrists taped.

The exact PPE ensemble is decided on a site-by-site basis by the PWGC Health and Safety Officer with the intent to provide the most protective and efficient worker PPE.

## 4.4 Activity-Specific Levels of Personal Protection

The required level of PPE is activity-specific and is based on air monitoring results (Section 4.0) and properties of identified or expected contaminants. **It is expected that all site work will be performed in Level D**. If air monitoring results indicate the necessity to upgrade the level of protection engineering controls (i.e. Facing equipment away from the wind and placing site personnel upwind of excavations, active venting, etc.) will be implemented before requiring the use of respiratory protection.

# 5.0 SITE CONTROL

## 5.1 Work Zones

The primary purpose of site controls is to establish the perimeter of a hazardous area, to reduce the migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by unauthorized persons. When operations are to take place involving hazardous materials, the site safety officer will establish an exclusion zone, a decontamination zone, and a support zone. These zones "float" (move around the site) depending on the tasks being performed on any given day. The site safety officer will outline these locations before work begins and when zones change. The site safety officer records this information in the site log book.

Tasks requiring OSHA 40-hour Hazardous Waste Operations and Emergency Response Operations training are carried out in the exclusion zone. The exclusion zone is defined by the site safety officer but will typically be a 50-foot area around work activities. Gross decontamination (as determined by the site Health and Safety Officer) is conducted in the exclusion zone, all other decontamination is performed in the decontamination zone or trailer.

Protective equipment is removed in the decontamination zone. Disposable protective equipment is stored in receptacles staged in the decontamination zone, and non-disposable equipment is decontaminated according to the procedures outlined in Section 8.0. All personnel and equipment exit the exclusion zone through the decontamination zone. If a decontamination trailer is provided the first aid equipment, an eye wash unit, and drinking water are kept in the decontamination trailer.

The support zone is used for vehicle parking, daily safety meetings, and supply storage. Eating, drinking, and smoking are permitted only in the support zone. When a decontamination trailer is not provided, the eye wash unit, first aid equipment, and drinking

water are kept at a central location designated by the site safety officer.

## 5.2 General Field Safety and Standard Operating Procedures

P.W. Grosser's policy is to control hazards at all site areas by limiting entrance to exclusion zones to essential personnel and by implementing the following rules:

- Non-essential (as judged by the site safety officer) personnel and unauthorized persons will not enter the exclusion or decontamination zone.

- Before entering the exclusion or decontamination zones, all personnel must be familiar with emergency response procedures (Section 7.0), site safety locations, first aid and communication equipment, and the location of the map to the hospital and the list of emergency telephone numbers.

- The buddy system will be used at all times by field personnel in the exclusion zone; no one is to perform work within the exclusion zone alone. When in Level D or C, visual contact or radio contact shall be maintained at all times.

- Contact with contaminated and potentially contaminated surfaces should be avoided. Walk around (not through) puddles and discolored surfaces. Do not kneel on the ground or place equipment on the ground. Protect equipment from contamination.

- Eating, drinking, or smoking is permitted only in designated areas in the support zone.

- Each worker must be supplied with and maintain his/her own personal protective equipment.

# 6.0 CONFINED SPACE

OSHA published a Final Rule on permit-required confined spaces on January 14, 1993, for General Industry at 29 CFR 1910.146 et seq., with an implementation date of April 15, 1993. The rule specifically excludes agriculture, construction, or shipyard employment. Confined space entry and work within confined spaces is not anticipated to be performed under the proposed scope of work. However, if confined space work is conducted it will be performed in accordance with the applicable OSHA regulations. OSHA defines confined space as:

1. is large enough and so configured that an employee can bodily enter and perform assigned work;
2. has limited or restricted areas for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited entry); and
3. is not designed for continuous worker occupancy.

OSHA further requires that an "entry supervisor" (the site designated safety officer) decides at the time of entry whether the space is permit-required or non-permit required space. The site safety officer will monitor the space two hours prior to entry and continuously during work to ensure that the atmosphere is not hazardous. OSHA defines as hazardous atmosphere as:

1. Flammable gas, vapor, or mist in excess of 10 percent of its lower explosive limit (LEL);

2. Airborne combustible dust at a concentration that meets or exceeds its LEL; NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.

3. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
4. Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z. Toxic and Hazardous Substances, of this part and which could result in employee exposure in excess of its dose or permissible exposure limit;

5. Any other atmospheric condition that is immediately dangerous to life or health.

A space is non-permit required if none of the above defined hazardous conditions are present. OSHA requires that an attendant (e.g., an individual stationed outside one or more spaces who monitors the entrants and who performs air monitoring of the space(s)) be assigned to each space. The attendant is not allowed to perform any direct rescue related duties, but is there to communicate with the entrant and call for rescue procedures if required.

The following protocol applies when P.W. Grosser employees must enter a confined space:

- The site safety officer evaluates the space and site conditions to determine whether the space must be considered "confined".

- If so, the site safety officer monitors the space for hazardous atmospheres prior to entry and fills out a pre-entry checklist (Appendix F) to determine whether an entry-permit is required.

- If there is no hazardous atmosphere, the space will be continuously monitored during the entry to assure that the atmosphere remains non-hazardous.

- If the space contains a hazardous atmosphere, an entry permit (Appendix F) will be prepared and the space will only be entered in accordance with 29 CFR 1910.146.

# 7.0 EMERGENCY RESPONSE PLAN

Site personnel must be prepared in the event of an emergency. Emergencies can take many forms: illnesses, injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather.

Emergency telephone numbers and a map to the hospital will be posted in the command post. Site personnel should be familiar with the emergency procedures, and the locations of site safety, first aid, and communication equipment. These will be outlined in the site specific HASP.

## 7.1 Emergency Equipment On-site

| | |
|---|---|
| Private telephones: | Site personnel. |
| Two-way radios: | Site personnel where necessary. |
| Emergency Alarms: | On-site vehicle horns*. |
| First aid kits: | On-site in vehicles. |
| Fire extinguisher: | On-site or on equipment. |

* Horns: Air horns will be supplied to personnel at the discretion of the project superintendent or site safety officer.

## 7.2 Emergency Telephone Numbers

| | |
|---|---|
| General Emergencies | 911 |
| Nassau County Police | 911 |
| NYSDEC Spills Division | 1-800-457-7362 |
| NYSDEC Hazardous Waste Division | 1-718-482-4994 |
| Glenwood Landing Fire Department | 911 |
| National Response Center | 1-800-424-8802 |

| | |
|---|---|
| Poison Control | 1-212-340-4494 |
| Health and Safety Officer | 1-631-589-6353 |
| Alternate Health and Safety Officer | 1-631-589-6353 |

A copy of this page shall be posted in the office and a copy is provided in Appendix G.

## 7.3 Personnel Responsibilities During an Emergency

The project manager is primarily responsible for responding to and correcting any emergency situations. However, in the absence of the project manager, the site safety officer shall act as the project manager's on-site designee and perform the following tasks:

- Take appropriate measures to protect personnel including: withdrawal from the exclusion zone, evacuate and secure the site, or upgrade/downgrade the level of protective clothing and respiratory protection;

- Ensure that appropriate federal, state, and local agencies are informed and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be summoned immediately. If toxic materials are released to the air, the local authorities should be informed in order to assess the need for evacuation;

- Ensure appropriate decontamination, treatment, or testing for exposed or injured personnel;

- Determine the cause of incidents and make recommendations to prevent recurrence; and,

- Ensure that all required reports have been prepared.

The following PWGC key personnel are planned for this project:

- PWGC Project Director — Mr. James P. Rhodes
- PWGC Project Manager — Mr. John D. Eichler
- PWGC Site Safety Officer — Ms. Jennifer Lewis

## 7.4 Medical Emergencies

A person who becomes ill or injured in the exclusion zone will be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination will be completed and first aid administered prior to transport. First aid will be administered while waiting for an ambulance or paramedics. A Field Accident Report (Appendix G) must be filled out for any injury.

A person transporting an injured/exposed person to a clinic or hospital for treatment will take the directions to the hospital and information on the chemical(s) to which they may have been exposed (Appendix G).

## 7.5 Fire or Explosion

In the event of a fire or explosion, the local fire department will be summoned immediately. The site safety officer or his designated alternate will advise the fire commander of the location, nature and identification of the hazardous materials on-site. If it is safe to do so, site personnel may:

- use fire fighting equipment available on site; or,
- remove or isolate flammable or other hazardous materials that may contribute to the fire.

## 7.6 Evacuation Routes

Evacuation routes established by work area locations for each site will be reviewed prior to commencing site operations. As the work areas change, the evacuation routes will be altered accordingly, and the new route will be reviewed.

Under extreme emergency conditions, evacuation is to be immediate without regard for equipment. The evacuation signal will be a continuous blast of a vehicle horn, if possible, and/or by verbal/radio communication. When evacuating the site, personnel will follow these instructions:

- Keep upwind of smoke, vapors, or spill location.
- Exit through the decontamination corridor if possible.
- If evacuation through the decontamination corridor is not possible, personnel should remove contaminated clothing once they are in a safe location and leave it near the exclusion zone or in a safe place.
- The site safety officer will conduct a head count to ensure that all personnel have been evacuated safely. The head count will be correlated to the site and/or exclusion zone entry/exit log.
- If emergency site evacuation is necessary, all personnel are to escape the emergency situation and decontaminate to the maximum extent practical.

## 7.7 Spill Control Procedures

Spills associated with site activities may be attributed to project specific heavy equipment and include gasoline, diesel and hydraulic oil. In the event of a leak or a release, site personnel will inform their supervisor immediately, locate the source of spillage and stop

the flow if it can be done safely. A spill containment kit including absorbent pads, booms and/or granulated speedy dry absorbent material will be available to site personnel to facilitate the immediate recovery of the spilled material. Daily inspections of site equipment components including hydraulic lines, fuel tanks, etc. will be performed by their respective operators as a preventative measure for equipment leaks and to ensure equipment soundness. In the event of a spill, site personnel will immediately notify the NYSDEC (1-800-457-7362), and a spill number will be generated.

## 7.8 Vapor Release Plan

If work zone organic vapor (excluding methane) exceeds 5 ppm, then a downwind reading will be made either 200 feet from the work zone or at the property line, whichever is closer. If readings at this location exceed 5 ppm over background, the work will be stopped.

If 5 ppm of volatile organics are recorded over background on a PID at the property line, then an off-site reading will be taken within 20 feet of the nearest residential or commercial property, whichever is closer. If efforts to mitigate the emission source are unsuccessful for 30 minutes, then the designated site safety officer will:

- contact the local police;
- continue to monitor air every 30 minutes, 20 feet from the closest off-site property. If two successive readings are below 5 ppm (non-methane), off-site air monitoring will be halted.
- property line and off-site air monitoring locations and results associated with vapor releases will be recorded in the site safety log book.

# APPENDIX A

## SITE SAFETY ACKNOWLEDGEMENT FORM

PWGC
Strategic Environmental Engineering Solutions

# SITE SAFETY PLAN ACKNOWLEDGEMENT FORM

I have been informed and understand the procedures set forth in the health and safety plan and amendments:

| Printed Name | Signature | Representing | Date |
|---|---|---|---|
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P.W. Grosser Consulting, Inc • P.W. Grosser Consulting Engineer & Hydrogeologist, PC
630 Johnson Avenue, Suite 7 • Bohemia, NY 11716 • Branch Location - Seattle, WA
PH 631.589.6353 • FX 631.589.8705 • www.pwgrosser.com

# APPENDIX B

## SITE SAFETY PLAN AMENDMENTS

PWGC
Strategic Environmental Engineering Solutions

# SITE SAFETY PLAN AMENDMENT FORM

SITE SAFETY PLAN AMENDMENT # _____: _____

SITE NAME: _____

REASON FOR AMENDMENT: _____

_____

_____

ALTERNATIVE PROCEDURES: _____

_____

_____

REQUIRED CHANGES IN PPE: _____

_____

_____

_____ _____
PROJECT SUPERINTENDENT DATE

_____ _____
HEALTH & SAFETY CONSULTANT DATE

_____ _____
SITE SAFETY OFFICER DATE

P.W. Grosser Consulting, Inc • P.W. Grosser Consulting Engineer & Hydrogeologist, PC
630 Johnson Avenue, Suite 7 • Bohemia, NY 11716 • Branch Location - Seattle, WA
PH 631.589.6353 • FX 631.589.8705 • www.pwgrosser.com

# APPENDIX C

## DRILLING/GEOPROBE™ PROTOCOLS

**SAFETY PROCEDURES DURING THE OPERATION OF DRILLING/PROBING MACHINES INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:**

- All site personnel should know the location of the rig emergency shut-off switch prior to beginning operations.
- The rig should be inspected prior to operation to ensure that it is in proper working condition and that all safety devices are functioning.
- Each rig should have a first-aid kit and fire extinguisher which should be inspected to ensure that they are adequate.
- All operators should wear, at a minimum, hard hats, steel-toe safety shoes or boots, gloves and safety glasses. Additional clothing and protective equipment may be required at sites where hazardous conditions are likely. Clothing must be close fitting, without loose ends, straps, draw strings or belts or other unfastened parts that might catch on moving machinery.
- Work areas should be kept free of materials, debris and obstruction, and substances such as grease or oil that could cause a surface to become slick or otherwise hazardous.
- Prior to drilling, the site must be checked to determine whether it can accommodate the rig and supplies and provide a safe working area.
- The drill rig mast (derrick) must be lowered prior to moving between drilling locations.
- The drill rig masts should not be raised if the rig will not be at least 20 feet away from overhead utilities.
- The location of underground utilities should be determined prior to erecting the rig.
- The drill rigs must be properly erected, leveled and stabilized prior to drilling.
- The operator must shut down the vehicle engine before leaving the vicinity of the machine.
- All personnel not directly involved in operating the rig or in sampling should remain clear of the drilling equipment when it is in operation.
- All unattended boreholes must be adequately covered or otherwise protected to prevent trip and fall hazards. All open boreholes should be covered, protected or backfilled as specified in local or state regulations.
- When climbing to or working on a derrick platform that is higher than 20 feet, a safety climbing device should be used.
- The user of wire line hoists, wire rope and hoisting hardware should be as stipulated by the American Iron and Steel Institute Wire Rope Users Manual.
- The rig should be operated in a manner which is consistent with the manufacturers' ratings of speed, force, torque, pressure, flow, etc. The rig and tools should be used for the purposes for which they were intended.

# APPENDIX D

## HEAT/COLD STRESS PROTOCOLS

# HEAT STRESS

## Heat Stress (Hyperthermia)

Heat stress is the body's inability to regulate the core temperature. A worker's susceptibility to heat stress can vary according to his/her physical fitness, degree of acclimation to heat, humidity, age and diet.

1. Prior to site activity, the field team leader may make arrangements for heat stress monitoring (i.e., monitoring heart rate, body temperature, and body water loss) during actual site work if conditions warrant. In addition, the FTL is to ensure that each team member has been acclimatized to the prevailing environmental conditions, that personnel are aware of the signs and symptoms of heat sickness, that they have been adequately trained in first aid procedures, and that there are enough personnel on-site to rotate work assignments and schedule work during hours of reduced temperatures. Personnel should not consume alcoholic or caffeinated beverages but rather drink moderate levels of an electrolyte solution and eat well prior to commencing site work.

2. Although there is no specific test given during a baseline physical that would identify a person's intolerance to heat, some indicators are tobacco or medication use, dietary habits, body weight, and chronic conditions such as high blood pressure or diabetes.

3. *Heat cramps*, caused by profuse perspiration with inadequate fluid intake and salt replacement, most often afflict people in good physical condition who work in high temperature and humidity. Heat cramps usually come on suddenly during vigorous activity. Untreated, heat cramps may progress rapidly to heat exhaustion or heat stroke. First aid treatment: remove victim to a cool place and replace lost fluids with water.

4. Thirst is not an adequate indicator of heat exposure. Drinking fluid by itself does not indicate sufficient water replacement during heat exposure. A general rule, the amount of water administered should replace the amount of water lost, and it should be administered at regular intervals throughout the day. For every half pound of water lost, 8 ounces of water should be ingested. Water should be replaced by drinking 2 – 4 ounce servings during every rest period. A recommended alternative to water is an electrolyte drink split 50/50 with water.

5. *Heat exhaustion* results from salt and water loss along with peripheral pooling of blood. Like heat cramps, heat exhaustion tends to occur in persons in good physical health who are working in high temperatures and humidity. Heat exhaustion may come on suddenly as dizziness and collapse. Untreated, heat exhaustion may progress to heat stroke.

6. *Treatment for heat exhaustion*: Move the victim to a cool environment (e.g. air-conditioned room/car), lay victim down and fan him/her. If the air-conditioning is not available, remove the victim to a shaded area, remove shirt, and fan. If symptoms do not subside within an hour, notify 911 to transport to hospital.

7. *Heat stroke* results from the body's inability to dissipate excess heat. A true medical emergency that requires immediate care, it usually occurs when one ignores the signs of heat exhaustion and continues strenuous activities. Working when the relative humidity exceeds 60% is a particular problem. Workers in the early phase of heat stress may not be coherent of they will be confused, delirious or comatose. Changes in behavior, irritability and combativeness are useful early signs of heat stroke.

8. *Treatment of heat stroke*: Move the victim to a cool, air-conditioned environment. Place victim in a semi-reclined position with head elevated and strip to underclothing. Cool victim as rapidly as possible, applying ice packs to the arms and legs and massaging the neck and torso. Spray victim with tepid water and constantly fan to promote evaporation. Notify 911 to transport to hospital as soon as possible.

# TABLE 1

## SYMPTOMS OF HEAT STRESS

*Heat cramps* are caused by heavy sweating with inadequate fluid intake. Symptoms include;

- Muscle cramps
- Cramps in the hands, legs, feet and abdomen

*Heat exhaustion* occurs when body organs attempt to keep the body cool. Symptoms include;

- Pale, cool moist skin
- Core temperature elevated 1-2$^{o}$
- Thirst
- Anxiety
- Rapid heart rate
- Heavy sweating
- Dizziness
- Nausea

*Heat stroke* is the most serious form of heat stress. Immediate action must be taken to cool the body before serious injury and death occur. Symptoms are;

- Red, hot, dry skin
- Lack of perspiration
- Seizures
- Dizziness and confusion
- Strong, rapid pulse
- Core temperature of 104$^{o}$ or above
- Coma

**TABLE 2**

HEAT STRESS INDICATORS

| Heat stress indicator | When to measure | If Exceeds… | Action |
|---|---|---|---|
| Heart rate (pulse) | Beginning of rest period | 110 beats per minute | Shorten next work period by 33% |
| Oral temperature | Beginning of rest period | 99°F (after thermometer is under tongue for 3 minutes)<br><br>100.6°F | Shorten next work period by 33%<br><br>Prohibit work in impermeable clothing |
| Body weight | 1. Before workday begins (a.m.)<br>2. After workday ends (p.m.) | | Increase fluid intake |

# COLD STRESS

## Cold stress (Hypothermia)

In hypothermia the core body temperature drops below 95°F. Hypothermia can be attributed to a decrease in heat production, increased heat loss or both.

## Prevention

Institute the following steps to prevent overexposure of workers to cold:

1. Maintain body core temperature at 98.6°F or above by encouraging workers to drink warm liquids during breaks (preferably not coffee) and wear several layers of clothing that can keep the body warm even when the clothing is wet.
2. Avoid frostbite by adequately covering hands, feet and other extremities. Clothing such as insulated gloves or mittens, earmuffs and hat liners should be worn. To prevent contact frostbite (from touching metal and cold surfaces below 20°F), workers should wear gloves. Tool handles should be covered with insulating material.
3. Adjust work schedules to provide adequate rest periods. When feasible, rotate personnel and perform work during the warmer hours of the day.
4. Provide heated shelter. Workers should remove their outer layer(s) of clothing while in the shelter to allow sweat to evaporate.
5. In the event that wind barriers are constructed around an intrusive operation (such as drilling), the enclosure must be properly vented to prevent the buildup of toxic or explosive gases or vapors. Care must be taken to keep a heat source away from flammable substances.
6. Using a wind chill chart such as the one in Table 3, obtain the equivalent chill temperature (ECT) based on actual wind speed and temperature. Refer to the ECT when setting up work warm-up schedules, planning appropriate clothing, etc. Workers should use warming shelters at regular intervals at or below an ECT of 20°F. For exposed skin, continuous exposure should not be permitted at or below an ECT of -25°F.

Frostbite

Personnel should be aware of symptoms of frostbite/hypothermia. If the following symptoms are noticed in any worker, he/she should immediately go to a warm shelter.

| Condition | Skin Surface | Tissue Under Skin | Skin Color |
|---|---|---|---|
| Frostnip | Soft | Soft | Initially red, then white |
| Frostbite | Hard | Soft | White and waxy |
| Freezing | Hard | Hard | Blotchy, white to yellow-gray to gray |

1. *Frostnip* is the incipient stage of frostbite, brought about by direct contact with a cold object or exposure of a body part to cool/cold air. Wind chill or cold water also can be major factors. This condition is not serious. Tissue damage is minor and the response to care is good. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostnip.

2. *Treatment of frostnip*: Care for frostnip by warming affected areas. Usually the worker can apply warmth from his/her bare hands, blow warm air on the site, or, if the fingers are involved, hold them in the armpits. During recovery, the worker may complain of tingling or burning sensation, which is normal. If the condition does not respond to this simple care, begin treatment for frostbite.

3. *Frostbite*: The skin and subcutaneous layers become involved. If frostnip goes untreated, it becomes superficial frostbite. This condition is serious. Tissue damage may be serious. The worker must be transported to a medical facility for evaluation. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostbite. The affected area will feel frozen, but only on the surface. The tissue below the surface must still be soft and have normal response to touch. *DO NOT* squeeze or poke the tissue. The condition of the deeper tissues can be determined by gently palpating the affected area. The skin will turn mottled or blotchy. It may also be white and then turn grayish-yellow.

4. *Treatment of frostbite*: When practical, transport victim as soon as possible. Get the worker inside and keep him/her warm. Do not allow any smoking or alcohol consumption. Thaw frozen parts by immersion, re-warming in a 100$^{o}$F to 106$^{o}$F water bath. Water temperature will

drop rapidly, requiring additional warm water throughout the process. Cover the thawed part with a dry sterile dressing. Do not puncture or drain any blisters.

**NOTE**: Never listen to myths and folk tales about the care of frostbite. *Never* rub a frostbitten or frozen area. *Never* rub snow on a frostbitten or frozen area. Rubbing the area may cause serious damage to already injured tissues. Do not attempt to thaw a frozen area if there is any chance it will be re-frozen.

5. *General cooling/Hypothermia*: General cooling of the body is known as systemic hypothermia. This condition is not a common problem unless workers are exposed to cold for prolonged periods of time without any shelter.

| Body Temperature | °C | Symptoms |
|---|---|---|
| 99-96 | 37-35.5 | Intense, uncontrollable shivering |
| 95-91 | 35.5-32.7 | Violent shivering persists. If victim is conscious, he has difficulty speaking. |
| 90-86 | 32-30 | Shivering decreases and is replaced by strong muscular rigidity. Muscle coordination is affected. Erratic or jerkey movements are produced. Thinking is less clear. General comprehension is dulled. There may be total amnesia. The worker is generally still able to maintain the appearance of psychological contact with his surroundings. |
| 85-81 | 29.4-27.2 | Victim becomes irrational, loses contact with his environment, and drifts into a stuporous state. Muscular rigidity continues. Pulse and respirations are slow and the worker may develop cardiac arrhythmias. |
| 80-78 | 26.6-18.5 | Victim becomes unconscious. He does not respond to the spoken word. Most reflexes cease to function. Heartbeat becomes erratic |
| Below 78 | 25.5 | Cardiac and respiratory centers of the brain fail. Ventricular fibrillation occurs; probably edema and hemorrhage in the lungs; death. |

6. *Treatment of hypothermia*: Keep worker dry. Remove any wet clothing and replace with dry clothes, or wrap person in dry blankets. Keep person at rest. Do not allow him/her to move around. Transport the victim to a medical facility as soon as possible.

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# TABLE 3[(1)]
## COOLING POWER OF WIND ON EXPOSED FLESH EXPRESSED AS AN EQUIVALENT TEMPERATURE (UNDER CALM CONDITIONS)

| Estimated wind Speed (in mph) | Actual Temperature Reading ($^{o}$F)P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 50 | 40 | 30 | 20 | 10 | 0 | 10 | 20 | 30 | 40 | 50 | 60 |
| | Equivalent Chill Temperature ($^{o}$F) | | | | | | | | | | | |
| Calm | 50 | 40 | 30 | 20 | 10 | 0 | -10 | -20 | -30 | -40 | -50 | -60 |
| 5 | 48 | 37 | 27 | 16 | 6 | -5 | -15 | -26 | -36 | -47 | -57 | -68 |
| 10 | 40 | 28 | 15 | 4 | -9 | -24 | -33 | -46 | -58 | -70 | -83 | -95 |
| 15 | 36 | 22 | 9 | -5 | -18 | -32 | -45 | -58 | -72 | -85 | -99 | -112 |
| 20 | 32 | 18 | 4 | -10 | -25 | -39 | -53 | -67 | -82 | -96 | -110 | -121 |
| 25 | 30 | 16 | 0 | -15 | -29 | -44 | -59 | -74 | -88 | -104 | -118 | -133 |
| 30 | 28 | 13 | -2 | -18 | -33 | -48 | -63 | -79 | -94 | -109 | -125 | -140 |
| 35 | 27 | 11 | -4 | -20 | -35 | -51 | -67 | -82 | -98 | -113 | -129 | -145 |
| 40 | 26 | 10 | -6 | -21 | -37 | -53 | -69 | -85 | -100 | -116 | -132 | -146 |
| (Wind speeds greater than 40 mph have little additional effect.) | LITTLE DANGER<br>in < hr with dry skin. Maximum danger of false sense of security. | | | | INCREASING DANGER<br>Danger from freezing of exposed flesh within one minute | | | GREAT DANGER<br>Flesh may freeze within 30 seconds. | | | | |
| | Trench foot and imersion foot may occur at any point on this chart | | | | | | | | | | | |

Developed by U.S. Army Research Institute of Environmental Medicine, Natick, MA.

(1) Reproduced from American Conference of Governmental Industrial Hygienists, Threshold Limit Values and Biological Exposure Indices for 1985-1986, p.01.

# APPENDIX E

# CHEMICAL HAZARDS

# TRICHLOROETHYLENE

**0081**
October 2000

**CAS No: 79-01-6**
RTECS No: KX4550000
UN No: 1710
EC No: 602-027-00-9

1,1,2-Trichloroethylene
Trichloroethene
Ethylene trichloride
Acetylene trichloride
$C_2HCl_3$ / $ClCH=CCl_2$
Molecular mass: 131.4

| TYPES OF HAZARD/ EXPOSURE | ACUTE HAZARDS/SYMPTOMS | PREVENTION | FIRST AID/FIRE FIGHTING |
|---|---|---|---|
| **FIRE** | Combustible under specific conditions. See Notes. | | In case of fire in the surroundings: all extinguishing agents allowed. |
| **EXPLOSION** | | Prevent build-up of electrostatic charges (e.g., by grounding). | In case of fire: keep drums, etc., cool by spraying with water. |
| **EXPOSURE** | | **PREVENT GENERATION OF MISTS! STRICT HYGIENE!** | |
| **Inhalation** | Dizziness. Drowsiness. Headache. Weakness. Nausea. Unconsciousness. | Ventilation, local exhaust, or breathing protection. | Fresh air, rest. Artificial respiration may be needed. Refer for medical attention. |
| **Skin** | Dry skin. Redness. | Protective gloves. | Remove contaminated clothes. Rinse and then wash skin with water and soap. |
| **Eyes** | Redness. Pain. | Safety spectacles, or eye protection in combination with breathing protection. | First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor. |
| **Ingestion** | Abdominal pain. (Further see Inhalation). | Do not eat, drink, or smoke during work. | Rinse mouth. Do NOT induce vomiting. Give plenty of water to drink. Rest. |

| SPILLAGE DISPOSAL | PACKAGING & LABELLING | |
|---|---|---|
| Ventilation. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Personal protection: filter respirator for organic gases and vapours. Do NOT let this chemical enter the environment. | T Symbol<br>R: 45-36/38-52/53-67<br>S: 53-45-61<br>UN Hazard Class: 6.1<br>UN Pack Group: III | Do not transport with food and feedstuffs. Marine pollutant. |

| EMERGENCY RESPONSE | SAFE STORAGE |
|---|---|
| Transport Emergency Card: TEC (R)-61S1710<br>NFPA Code: H2; F1; R0 | Separated from metals (see Chemical Dangers), strong bases, food and feedstuffs. Dry. Keep in the dark. Ventilation along the floor. |

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## IMPORTANT DATA

**Physical State; Appearance**
COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.

**Physical dangers**
The vapour is heavier than air. As a result of flow, agitation, etc., electrostatic charges can be generated.

**Chemical dangers**
On contact with hot surfaces or flames this substance decomposes forming toxic and corrosive fumes (phosgene, hydrogen chloride). The substance decomposes on contact with strong alkali producing dichloroacetylene, which increases fire hazard. Reacts violently with metal powders such as magnesium, aluminium, titanium, and barium. Slowly decomposed by light in presence of moisture, with formation of corrosive hydrochloric acid.

**Occupational exposure limits**
TLV: 50 ppm as TWA; 100 ppm as STEL; A5; BEI issued; (ACGIH 2004).
MAK: Carcinogen category: 1; Germ cell mutagen group: 3B; (DFG 2004).

**Routes of exposure**
The substance can be absorbed into the body by inhalation and by ingestion.

**Inhalation risk**
A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20/C.

**Effects of short-term exposure**
The substance is irritating to the eyes and the skin. Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. The substance may cause effects on the central nervous system, resulting in respiratory failure. Exposure could cause lowering of consciousness.

**Effects of long-term or repeated exposure**
Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the central nervous system, resulting in loss of memory. The substance may have effects on the liver and kidneys (see Notes). This substance is probably carcinogenic to humans.

## PHYSICAL PROPERTIES

Boiling point: 87/C
Melting point: -73/C
Relative density (water = 1): 1.5
Solubility in water, g/100 ml at 20/C: 0.1
Vapour pressure, kPa at 20/C: 7.8
Relative vapour density (air = 1): 4.5
Relative density of the vapour/air-mixture at 20/C (air = 1): 1.3
Auto-ignition temperature: 410/C
Explosive limits, vol% in air: 8-10.5
Octanol/water partition coefficient as log Pow: 2.42

## ENVIRONMENTAL DATA

The substance is harmful to aquatic organisms. The substance may cause long-term effects in the aquatic environment.

## NOTES

Combustible vapour/air mixtures difficult to ignite, may be developed under certain conditions.
Use of alcoholic beverages enhances the harmful effect.
Depending on the degree of exposure, periodic medical examination is suggested.
The odour warning when the exposure limit value is exceeded is insufficient.
Do NOT use in the vicinity of a fire or a hot surface, or during welding.
An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert.
Card has been partly updated in October 2004. See sections Occupational Exposure Limits, EU classification, Emergency Response.

## ADDITIONAL INFORMATION

# TETRACHLOROETHYLENE

**0076**
April 2000

**CAS No: 127-18-4**
RTECS No: KX3850000
UN No: 1897
EC No: 602-028-00-4

1,1,2,2-Tetrachloroethylene
Perchloroethylene
Tetrachloroethene
$C_2Cl_4$ / $Cl_2C=CCl_2$
Molecular mass: 165.8

| TYPES OF HAZARD/ EXPOSURE | ACUTE HAZARDS/SYMPTOMS | PREVENTION | FIRST AID/FIRE FIGHTING |
|---|---|---|---|
| **FIRE** | Not combustible. Gives off irritating or toxic fumes (or gases) in a fire. | | In case of fire in the surroundings: use appropriate extinguishing media. |
| **EXPLOSION** | | | |

| **EXPOSURE** | | **STRICT HYGIENE! PREVENT GENERATION OF MISTS!** | |
|---|---|---|---|
| **Inhalation** | Dizziness. Drowsiness. Headache. Nausea. Weakness. Unconsciousness. | Ventilation, local exhaust, or breathing protection. | Fresh air, rest. Artificial respiration may be needed. Refer for medical attention. |
| **Skin** | Dry skin. Redness. | Protective gloves. Protective clothing. | Remove contaminated clothes. Rinse and then wash skin with water and soap. |
| **Eyes** | Redness. Pain. | Safety goggles, face shield. | First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor. |
| **Ingestion** | Abdominal pain. (Further see Inhalation). | Do not eat, drink, or smoke during work. | Rinse mouth. Do NOT induce vomiting. Give plenty of water to drink. Rest. |

| **SPILLAGE DISPOSAL** | **PACKAGING & LABELLING** | |
|---|---|---|
| Ventilation. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. Personal protection: filter respirator for organic gases and vapours. | Xn Symbol<br>N Symbol<br>R: 40-51/53<br>S: (2-)23-36/37-61<br>UN Hazard Class: 6.1<br>UN Pack Group: III | Do not transport with food and feedstuffs. Marine pollutant. |

| **EMERGENCY RESPONSE** | **SAFE STORAGE** |
|---|---|
| Transport Emergency Card: TEC (R)-61S1897<br>NFPA Code: H2; F0; R0 | Separated from metals, (see Chemical Dangers), food and feedstuffs. Keep in the dark. Ventilation along the floor. |

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**SEE IMPORTANT INFORMATION ON THE BACK.**

## IMPORTANT DATA

**Physical State; Appearance**
COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.

**Physical dangers**
The vapour is heavier than air.

**Chemical dangers**
On contact with hot surfaces or flames this substance decomposes forming toxic and corrosive fumes (hydrogen chloride, phosgene, chlorine). The substance decomposes slowly on contact with moisture producing trichloroacetic acid and hydrochloric acid. Reacts with metals such as aluminium, lithium, barium, beryllium.

**Occupational exposure limits**
TLV: 25 ppm as TWA, 100 ppm as STEL; A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued; (ACGIH 2004).
MAK: skin absorption (H); Carcinogen category: 3B; (DFG 2004).

**Routes of exposure**
The substance can be absorbed into the body by inhalation and by ingestion.

**Inhalation risk**
A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20/C.

**Effects of short-term exposure**
The substance is irritating to the eyes, the skin and the respiratory tract. If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. The substance may cause effects on the central nervous system. Exposure at high levels may result in unconsciousness.

**Effects of long-term or repeated exposure**
Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the liver and kidneys. This substance is probably carcinogenic to humans.

## PHYSICAL PROPERTIES

Boiling point: 121/C
Melting point: -22/C
Relative density (water = 1): 1.6
Solubility in water, g/100 ml at 20/C: 0.015
Vapour pressure, kPa at 20/C: 1.9
Relative vapour density (air = 1): 5.8
Relative density of the vapour/air-mixture at 20/C (air = 1): 1.09
Octanol/water partition coefficient as log Pow: 2.9

## ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms. The substance may cause long-term effects in the aquatic environment.

## NOTES

Depending on the degree of exposure, periodic medical examination is suggested.
The odour warning when the exposure limit value is exceeded is insufficient.
Do NOT use in the vicinity of a fire or a hot surface, or during welding.
An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert.
Card has been partly updated in April 2005. See section Occupational Exposure Limits.

## ADDITIONAL INFORMATION

# 1,1,1-TRICHLOROETHANE

**0079**
October 1994

**CAS No: 71-55-6**
RTECS No: KJ2975000
UN No: 2831
EC No: 602-013-00-2

Methyl chloroform
Methyltrichloromethane
alpha-Trichloroethane
$C_2H_3Cl_3$ / $CCl_3CH_3$
Molecular mass: 133.4

| TYPES OF HAZARD/ EXPOSURE | ACUTE HAZARDS/SYMPTOMS | PREVENTION | FIRST AID/FIRE FIGHTING |
|---|---|---|---|
| **FIRE** | Combustible under specific conditions. Heating will cause rise in pressure with risk of bursting. See Notes. Gives off irritating or toxic fumes (or gases) in a fire. | | In case of fire in the surroundings: use appropriate extinguishing media. |
| **EXPLOSION** | | | In case of fire: keep drums, etc., cool by spraying with water. |

| **EXPOSURE** | | **PREVENT GENERATION OF MISTS!** | |
|---|---|---|---|
| **Inhalation** | Headache. Dizziness. Drowsiness. Nausea. Ataxia. Unconsciousness. | Ventilation, local exhaust, or breathing protection. | Fresh air, rest. Artificial respiration may be needed. Refer for medical attention. |
| **Skin** | Dry skin. Redness. | Protective gloves. | Remove contaminated clothes. Rinse and then wash skin with water and soap. |
| **Eyes** | Redness. | Safety goggles or eye protection in combination with breathing protection. | First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor. |
| **Ingestion** | Diarrhoea. Nausea. Vomiting. (Further see Inhalation). | Do not eat, drink, or smoke during work. | Rinse mouth. Give a slurry of activated charcoal in water to drink. Do NOT induce vomiting. Refer for medical attention. |

| **SPILLAGE DISPOSAL** | **PACKAGING & LABELLING** | |
|---|---|---|
| Ventilation. Collect leaking and spilled liquid in sealable, suitable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. Personal protection: self-contained breathing apparatus. | Xn Symbol<br>N Symbol<br>R: 20-59<br>S: (2-)24/25-59-61<br>Note: F<br>UN Hazard Class: 6.1<br>UN Pack Group: III | Do not transport with food and feedstuffs. Marine pollutant. |

| **EMERGENCY RESPONSE** | **SAFE STORAGE** |
|---|---|
| Transport Emergency Card: TEC (R)-61S2831<br>NFPA Code: H2; F1; R0 | Provision to contain effluent from fire extinguishing. Separated from food and feedstuffs and incompatible materials. See Chemical Dangers. Cool. Dry. Ventilation along the floor. |

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## IMPORTANT DATA

**Physical State; Appearance**
COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.

**Physical dangers**
The vapour is heavier than air.

**Chemical dangers**
The substance decomposes on heating or on burning producing toxic and corrosive fumes including phosgene and hydrogen chloride. Reacts violently with aluminium, manganese and their alloys, alkalis, strong oxidants, acetone and zinc. Attacks natural rubber. Mixtures of 1,1,1-trichloroethane with potassium or its alloys are shock sensitive. Reacts slowly with water releasing corrosive hydrochloric acid.

**Occupational exposure limits**
TLV: 350 ppm as TWA, 450 ppm as STEL; A4 (not classifiable as a human carcinogen); BEI issued (ACGIH 2004).
MAK: 200 ppm, 1100 mg/m$^3$; Peak limitation category: II(1); skin absorption (H); Pregnancy risk group: C; (DFG 2004).

**Routes of exposure**
The substance can be absorbed into the body by inhalation of its vapour and by ingestion.

**Inhalation risk**
A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20/C.

**Effects of short-term exposure**
The substance is irritating to the eyes, the skin and the respiratory tract. The substance may cause effects on the heart, central nervous system and liver, resulting in cardiac disorders and respiratory failure. Exposure at high levels may result in death. Medical observation is indicated.

**Effects of long-term or repeated exposure**
The liquid defats the skin. The substance may have effects on the liver.

## PHYSICAL PROPERTIES

Boiling point: 74/C
Melting point: -30/C
Relative density (water = 1): 1.34
Solubility in water: none
Vapour pressure, kPa at 20/C: 13.3
Relative vapour density (air = 1): 4.6
Flash point: see Notes
Auto-ignition temperature: 537/C
Explosive limits, vol% in air: 8-16
Octanol/water partition coefficient as log Pow: 2.49

## ENVIRONMENTAL DATA

The substance is harmful to aquatic organisms. This substance may be hazardous to the environment; special attention should be given to air quality and ground water contamination.

## NOTES

Combustible vapour/air mixtures difficult to ignite, may be developed under certain conditions.
The substance burns only in excess oxygen or if a strong source of ignition is present.
Use of alcoholic beverages enhances the harmful effect.
Depending on the degree of exposure, periodic medical examination is suggested.
An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert.
Do NOT use in the vicinity of a fire or a hot surface, or during welding.
Aerothene, Algylen, Trichloran, Chlorylen, Genklene, Chlorothene NU, Chlorothene VG, and Solvent 111 are trade names.
Card has been partly updated in April 2005. See section Occupational Exposure Limits.

## ADDITIONAL INFORMATION

# Safety (MSDS) data for cis-1,2-dichloroethylene


## General

Synonyms: (Z)-1,2-dichloroethene, cis-1,2-dichloroethene
Molecular formula: $C_2H_2Cl_2$

CAS No: 156-59-2
EC No: 205-859-7

## Physical data

Appearance: colourless liquid
Melting point: -80 C
Boiling point: 60 C
Vapour density:
Vapour pressure: 200 mm Hg at 25 C
Specific gravity: 1.284
Flash point: 4 C
Explosion limits: 9.7 - 12.8 %
Autoignition temperature: 460 C
Water solubility: slight

## Stability

Stable, but may decompose slowly on exposure to light, air or moisture. Incompatible with bases, oxidizing agents, sodium, sodium hydroxide, potassium hydroxide, copper, copper alloys, most metals. Highly flammable.

## Toxicology

Harmful if swallowed, inhaled, or absorbed through skin. Irritant. Narcotic.

Suspected carcinogen.

### Toxicity data

(The meaning of any abbreviations which appear in this section is given here.)
IHL-MUS LCLO 65000 mg/m3/2h
IHL-CAT LCLO 20000 mg/m3/6h

### Risk phrases

(The meaning of any risk phrases which appear in this section is given here.)
R11 R20 R21 R22 R36 R37 R39.

## Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)
Hazard class 3.0. Packing group II. UN No 1150.

## Personal protection

Safety glasses, good ventilation.

### Safety phrases

(The meaning of any safety phrases which appear in this section is given here.)
S16 S26.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

# TOLUENE

**0078**
October 2002

**CAS No: 108-88-3**
RTECS No: XS5250000
UN No: 1294
EC No: 601-021-00-3

Methylbenzene
Toluol
Phenylmethane
$C_6H_5CH_3$ / $C_7H_8$
Molecular mass: 92.1

| TYPES OF HAZARD/ EXPOSURE | ACUTE HAZARDS/SYMPTOMS | PREVENTION | FIRST AID/FIRE FIGHTING |
|---|---|---|---|
| **FIRE** | Highly flammable. | NO open flames, NO sparks, and NO smoking. | Powder, AFFF, foam, carbon dioxide. |
| **EXPLOSION** | Vapour/air mixtures are explosive. | Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding). Do NOT use compressed air for filling, discharging, or handling. Use non-sparking handtools. | In case of fire: keep drums, etc., cool by spraying with water. |
| **EXPOSURE** | | **STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN!** | |
| **Inhalation** | Cough. Sore throat. Dizziness. Drowsiness. Headache. Nausea. Unconsciousness. | Ventilation, local exhaust, or breathing protection. | Fresh air, rest. Refer for medical attention. |
| **Skin** | Dry skin. Redness. | Protective gloves. | Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention. |
| **Eyes** | Redness. Pain. | Safety goggles. | First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor. |
| **Ingestion** | Burning sensation. Abdominal pain. (Further see Inhalation). | Do not eat, drink, or smoke during work. | Rinse mouth. Do NOT induce vomiting. Refer for medical attention. |

| SPILLAGE DISPOSAL | PACKAGING & LABELLING |
|---|---|
| Evacuate danger area in large spill! Consult an expert in large spill! Remove all ignition sources. Ventilation. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Personal protection: self-contained breathing apparatus in large spill. | F Symbol<br>Xn Symbol<br>R: 11-38-48/20-63-65-67<br>S: (2-)36/37-46-62<br>UN Hazard Class: 3<br>UN Pack Group: II |

| EMERGENCY RESPONSE | SAFE STORAGE |
|---|---|
| Transport Emergency Card: TEC (R)-30S1294<br>NFPA Code: H 2; F 3; R 0 | Fireproof. Separated from strong oxidants. |

**IPCS**
International Programme on Chemical Safety

Prepared in the context of cooperation between the International Programme on Chemical Safety and the European Commission 

**SEE IMPORTANT INFORMATION ON THE BACK.**

## IMPORTANT DATA

**Physical State; Appearance**
COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.

**Physical dangers**
The vapour mixes well with air, explosive mixtures are formed easily. As a result of flow, agitation, etc., electrostatic charges can be generated.

**Chemical dangers**
Reacts violently with strong oxidants causing fire and explosion hazard.

**Occupational exposure limits**
TLV: 50 ppm as TWA; (skin); A4; BEI issued; (ACGIH 2004).
MAK: 50 ppm, 190 mg/m$^3$; H; Peak limitation category: II(4); Pregnancy risk group: C; (DFG 2004).

**Routes of exposure**
The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

**Inhalation risk**
A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20/C.

**Effects of short-term exposure**
The substance is irritating to the eyes and the respiratory tract. The substance may cause effects on the central nervous system. If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. Exposure at high levels may result in cardiac dysrhythmia and unconsciousness.

**Effects of long-term or repeated exposure**
The liquid defats the skin. The substance may have effects on the central nervous system. Exposure to the substance may enhance hearing damage caused by exposure to noise. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

## PHYSICAL PROPERTIES

Boiling point: 111/C
Melting point: -95/C
Relative density (water = 1): 0.87
Solubility in water: none
Vapour pressure, kPa at 25/C: 3.8
Relative vapour density (air = 1): 3.1
Relative density of the vapour/air-mixture at 20/C (air = 1): 1.01
Flash point: 4/C c.c.
Auto-ignition temperature: 480/C
Explosive limits, vol% in air: 1.1-7.1
Octanol/water partition coefficient as log Pow: 2.69

## ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms.

## NOTES

Depending on the degree of exposure, periodic medical examination is suggested.
Use of alcoholic beverages enhances the harmful effect.
Card has been partly updated in October 2004. See sections Occupational Exposure Limits, EU classification, Emergency Response.

## ADDITIONAL INFORMATION

# 1,2-DICHLOROETHYLENE

**0436**
May 2003

**CAS No: 540-59-0**
RTECS No: KV9360000
UN No: 1150
EC No: 602-026-00-3

1,2-Dichloroethene
Acetylene dichloride
symmetrical Dichloroethylene
$C_2H_2Cl_2$ / ClCH=CHCl
Molecular mass: 96.95

| TYPES OF HAZARD/ EXPOSURE | ACUTE HAZARDS/SYMPTOMS | PREVENTION | FIRST AID/FIRE FIGHTING |
|---|---|---|---|
| **FIRE** | Highly flammable. Gives off irritating or toxic fumes (or gases) in a fire. | NO open flames, NO sparks, and NO smoking. | Powder, water spray, foam, carbon dioxide. |
| **EXPLOSION** | Vapour/air mixtures are explosive. | Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. | In case of fire: keep drums, etc., cool by spraying with water. |
| **EXPOSURE** | | **STRICT HYGIENE!** | |
| **Inhalation** | Cough. Sore throat. Dizziness. Nausea. Drowsiness. Weakness. Unconsciousness. Vomiting. | Ventilation, local exhaust, or breathing protection. | Fresh air, rest. Refer for medical attention. |
| **Skin** | Dry skin. | Protective gloves. | Remove contaminated clothes. Rinse skin with plenty of water or shower. |
| **Eyes** | Redness. Pain. | Safety spectacles. | First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor. |
| **Ingestion** | Abdominal pain. (Further see Inhalation). | Do not eat, drink, or smoke during work. | Rinse mouth. Give plenty of water to drink. Refer for medical attention. |

| SPILLAGE DISPOSAL | PACKAGING & LABELLING |
|---|---|
| Remove all ignition sources. Ventilation. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in dry sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. (Extra personal protection: complete protective clothing including self-contained breathing apparatus.) | F Symbol<br>Xn Symbol<br>R: 11-20-52/53<br>S: (2-)7-16-29-61<br>Note: C<br>UN Hazard Class: 3<br>UN Pack Group: II |

| EMERGENCY RESPONSE | STORAGE |
|---|---|
| Transport Emergency Card: TEC (R)-30GF1-I+II<br>NFPA Code: H2; F3; R2 | Fireproof. Well closed. See Chemical Dangers. |

**IPCS**
International Programme on Chemical Safety

Prepared in the context of cooperation between the International Programme on Chemical Safety and the European Commission


**SEE IMPORTANT INFORMATION ON THE BACK.**

## IMPORTANT DATA

**Physical State; Appearance**
COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.

**Physical dangers**
The vapour is heavier than air and may travel along the ground; distant ignition possible.

**Chemical dangers**
The substance decomposes on heating or under the influence of air, light and moisture producing toxic and corrosive fumes including hydrogen chloride. Reacts with strong oxidants. Reacts with copper or copper alloys, and bases to produce toxic chloroacetylene which is spontaneously flammable in contact with air. Attacks plastic.

**Occupational exposure limits**
TLV: 200 ppm as TWA; (ACGIH 2003).
MAK: 200 ppm, 800 mg/m$^3$; Peak limitation category: II(2); (DFG 2002).

**Routes of exposure**
The substance can be absorbed into the body by inhalation of its vapour and by ingestion.

**Inhalation risk**
A harmful contamination of the air will be reached quickly on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster.

**Effects of short-term exposure**
The substance is irritating to the eyes and the respiratory tract. The substance may cause effects on the central nervous system at high levels, resulting in lowering of consciousness.

**Effects of long-term or repeated exposure**
The liquid defats the skin. The substance may have effects on the liver.

## PHYSICAL PROPERTIES

Boiling point: 55°C
Relative density (water = 1): 1.28
Solubility in water: poor
Relative vapour density (air = 1): 3.34
Flash point: 2°C c.c.
Auto-ignition temperature: 460°C
Explosive limits, vol% in air: 9.7-12.8
Octanol/water partition coefficient as log Pow: 2

## ENVIRONMENTAL DATA

## NOTES

This compound has two isomers, cis and trans. Data for the isomers: cis-isomer (CAS 156-59-2), trans isomer (CAS 156-60-5), other boiling point 60.3, melting point -81.5°C (cis), -49.4°C (trans); flash point c.c. 6°C (cis), 2-4°C (trans); relative density (water = 1) 1.28 (cis), 1.26 (trans); vapour pressure 24.0 kPa (cis), 35.3 kPa (trans) at 20°C; relative density of the vapour/air-mixture at 20°C (air = 1): 1.6 (cis), 1.8 (trans); octanol/water partition coefficient as log Pow: 1.86 (cis), 2.09 (trans).
Depending on the degree of exposure, periodic medical examination is suggested.

## ADDITIONAL INFORMATION

# APPENDIX F

## CONFINED SPACE ENTRY CHECKLIST/PERMIT

PWGC
Strategic Environmental Engineering Solutions

# CONFINED SPACE ENTRY PERMIT

_____ Confined Space _____ Hazardous Area _____ Non Permit Required

Note: No work will be performed unless the space meets non permit requirements.
Permit valid 8 hours only. All copies of permit will remain at this job site until job is completed.

Site location and description: _____

Purpose of entry: _____

Supervisor(s) in charge of crew: _____

Type of crew: _____ Phone: _____

* BOLD DENOTES MINIMUM REQUIREMENTS TO BE COMPLETED & REVIEWED PRIOR TO ENTRY

| *Requirements Completed* | *Date* | *Time* | | *Requirements Completed* | *Date* | *Time* | |
|---|---|---|---|---|---|---|---|
| Lock Out/De-energize/try-out | | | | Full Body Harness w/"D" Ring | | | |
| Line(s) Broken-capped-blanked | | | | Emergency Escape Retrieval | | | |
| Purged-Flush and Vent | | | | Lifelines | | | |
| Ventilation | | | | Fire Extinguishers | | | |
| Secure Area (Post and Flag) | | | | Lighting (Explosive Proof) | | | |
| Breathing Apparatus | | | | Protective Clothing | | | |
| Resuscitator-Inhalator | | | | Respirator(s) (Air Purifying) | | | |
| Standby Safety Personnel | | | | Burning and Welding Permit | | | |

Note: Items that do not apply enter N/A in the blank

Record Continuous Monitoring Results Every 2 Hours **

| *Continuous Monitoring to Test(s) to be taken* | *Permissible Entry Level* | *Monitoring Results* | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Percent of Oxygen | 19.5% to 23.5% | | | | | | | | | | |
| Lower Flammable Limit | Under 10% | | | | | | | | | | |
| Hydrogen Sulfide | + 10 PPM* 15 PPM | | | | | | | | | | |

Notes: * Short-term exposure time: Employee can work in area up to 15 minutes
+ 8 hour time – Weighted average: Employee can work up to 8 hours (longer if appropriate respiratory protection).
** Record continuous monitoring results every 30 minutes starting ½ hour prior to beginning work.

REMARKS:

| Gas Tester Name & Check # | Instrument(s) Used | Model &/or Type | Serial &/or Unit # |
|---|---|---|---|
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

SAFETY STANDBY PERSON IS REQUIRED FOR ALL CONFINED SPACE WORK

| Safety standby person(s) | Check # | Safety standby person(s) | Check # |
|---|---|---|---|
| _____ | _____ | _____ | _____ |

Supervisor Authorizing Entry: _____

All Above Conditions Satisfied: _____

Emergency Number Posted in Job Trailer.

Note: A single entry permit can be filled out prior to start of daily work.

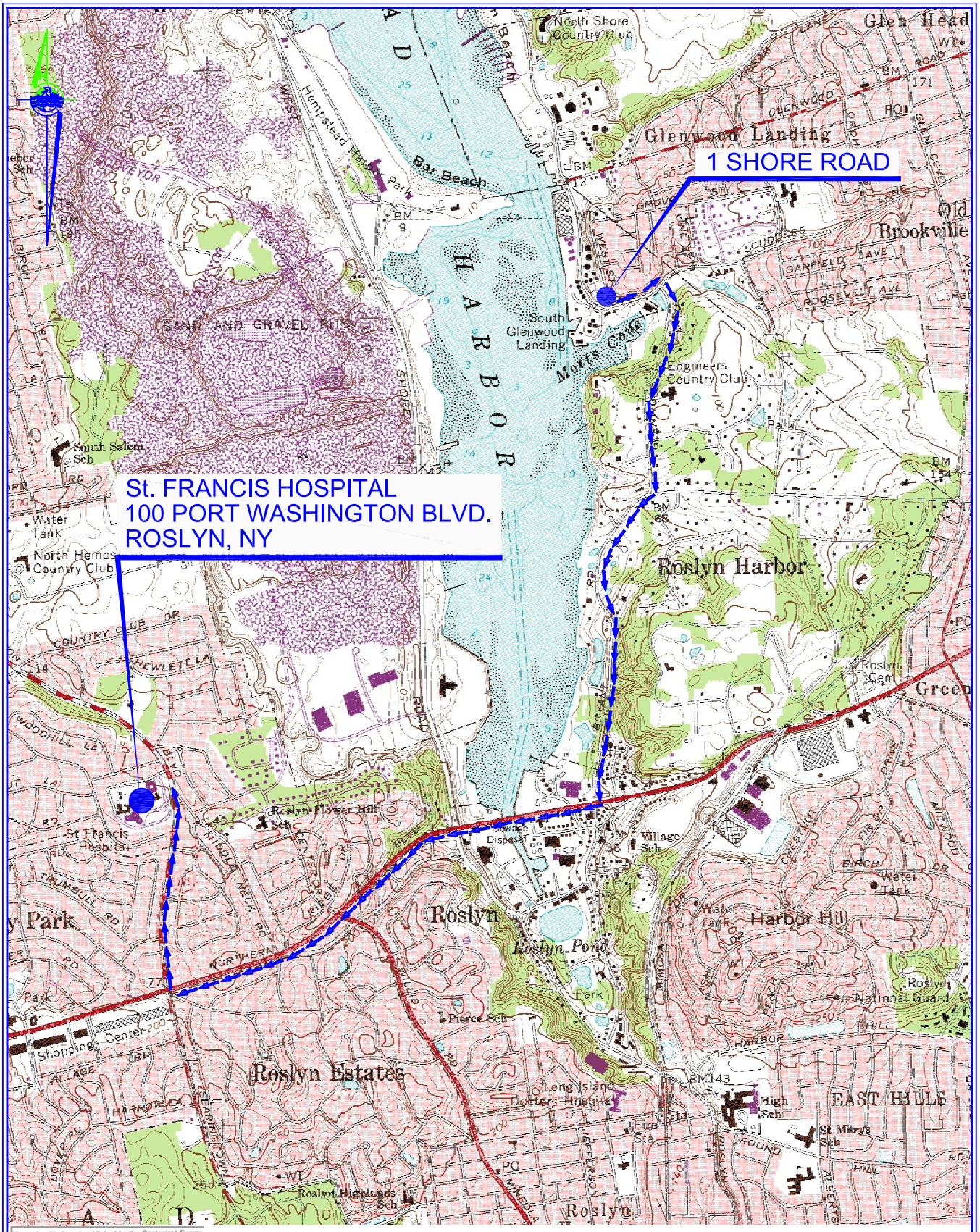
P.W. Grosser Consulting, Inc • P.W. Grosser Consulting Engineer & Hydrogeologist, PC
630 Johnson Avenue, Suite 7 • Bohemia, NY 11716 • Branch Location - Seattle, WA
PH 631.589.6353 • FX 631.589.8705 • www.pwgrosser.com

# APPENDIX G

## EMERGENCY TELEPHONE NUMBERS
## HOSPITAL INFORMATION AND MAP
## FIELD ACCIDENT REPORT

## Emergency Telephone Numbers

| | |
|---|---|
| General Emergencies | 911 |
| Nassau County Police | 911 |
| NYSDEC Spills Division | 1-800-457-7362 |
| NYSDEC Hazardous Waste Division | 1-718-482-4994 |
| Glenwood Landing Fire Department | 911 |
| National Response Center | 1-800-424-8802 |
| Poison Control | 1-212-340-4494 |
| Health and Safety Officer | 1-631-589-6353 |
| Alternate Health and Safety Officer | 1-631-589-6353 |




# HOSPITAL ROUTE MAP

SCALE: 1:24,000

PWGC
Strategic Environmental & Engineering Solutions
630 Johnson Ave. Suite 7 Bohemia, N.Y. 11716-2618
Ph: 631 589-6353 Fx: 631 589-8705 E-mail: info@pwgroesser.com

1 SHORE ROAD TO
St. FRANCIS HOSPITAL
100 PORT WASHINGTON BLVD, ROSLYN, NY

| | |
|---|---|
| Project: PEN0001 | Figure No: 1 |
| Designed by: DE | |
| Approved By: PWG | |
| Drawn By: LLG | Date: 10/18/07 |

PWGC
Strategic Environmental Engineering Solutions

# FIELD ACCIDENT REPORT

This report is to be filled out by the designated Site Safety Officer after EVERY accident.

PROJECT NAME: _____ PROJECT. NO.: _____

Date of Accident: _____ Time: _____ Report By: _____

Type of Accident (Check One):

( ) Vehicular ( ) Personal ( ) Property

Name of Injured: _____ DOB or Age _____

How Long Employed: _____

Names of Witnesses: _____

Description of Accident: _____

_____

_____

Action Taken: _____

_____

_____

Did the Injured Lose Any Time? _____ How Much (Days/Hrs.)? _____

Was Safety Equipment in Use at the Time of the Accident (Hard Hat, Safety Glasses, Gloves, Safety Shoes, etc.)? _____

_____

_____

(If not, it is the EMPLOYEE'S sole responsibility to process his/her claims through his/her Health and Welfare Fund.)

INDICATE STREET NAMES, DESCRIPTION OF VEHICLES, AND NORTH ARROW

_____

_____

_____

P.W. Grosser Consulting, Inc • P.W. Grosser Consulting Engineer & Hydrogeologist, PC
630 Johnson Avenue, Suite 7 • Bohemia, NY 11716 • Branch Location - Seattle, WA
PH 631.589.6353 • FX 631.589.8705 • www.pwgrosser.com

# 1 SHORE ROAD
# GLENWOOD LANDING, NEW YORK

# COMMUNITY AIR MONITORING PLAN

**ON BEHALF OF:**

Glenwood Realty
PO Box 1356
Roslyn Heights, NY 11577

**PREPARED BY:**

P.W. Grosser Consulting, Inc.
630 Johnson Avenue, Suite 7
Bohemia, New York 11716
Phone: 631-589-6353
Fax: 631-589-8705

James P. Rhodes, Senior Vice President JimR@pwgrosser.com
John D. Eichler, Project Manager JohnE@pwgrosser.com

PWGC Project Number: PEN1101

## FEBRUARY 2015

## TABLE OF CONTENTS



## TABLES

## 1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) provides measures for protection for on-site workers and the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in site activity) from potential airborne contaminant releases resulting from site activities at the Penetrex facility in Glenwood Landing, New York.

Action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that the remedial work did not spread contamination off-site through the air.

The primary concerns for this site are VOCs and dust particulates.

### 1.1 Regulatory Requirements

This CAMP was established in accordance with the following requirements:

- 29 CFR 1910.120(h): This regulation specifies that air shall be monitored to identify and quantify levels of airborne hazardous substances and health hazards, and to determine the appropriate level of protection for workers.

- New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan: This guidance specifies that a community air-monitoring program shall be implemented to protect the surrounding community and to confirm that the work does not spread contamination off-site through the air.

- New York State Department of Environmental Conservation (NYSDEC) Technical and Guidance Memorandum (TAGM) #4031 - Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites: This guidance provides a basis for developing and implementing a fugitive dust suppression and particulate monitoring program as an element of a hazardous waste site's health and safety program.

## 2.0 AIR MONITORING

The following sections contain information describing the types, frequency and location of real-time monitoring.

### 2.1 Real-Time Monitoring

This section addresses the real-time monitoring conducted within the work area, and along the site perimeter, during intrusive activities such as drilling, excavation, product recovery, manipulation of soil piles, extraction of sheet piling, etc.

#### *2.1.1 Work Area*

The following instruments shall be used for work area monitoring:

- Photoionization Detector (PID)
- Dust Monitor

**Table 1-1** presents a breakdown of each main activity and provides the instrumentation, frequency and location of the real-time monitoring for the site. **Table 1-2** lists the Real-Time Air Monitoring Action Levels to be used in work areas.

#### *2.1.2 Community Air Monitoring Requirements*

To establish ambient air background concentrations, air quality monitoring shall be performed at several locations around the site perimeter before investigation activities begin. Air monitoring shall be continued periodically in series during work activities.

Fugitive respirable dust will be monitored using a MiniRam Model PDM-3 aerosol monitor or equivalent. Air will be monitored for site-related VOCs with a MiniRae 2000 photoionization detector (PID) with an 10.6 eV lamp. **Table 1-1** presents a breakdown of each main activity and provides the instrumentation, frequency and location of the real-time monitoring for the site. **Table 1-2** lists the Real-Time Air Monitoring Action Levels to be used in work areas. Air monitoring data shall be documented in a site log book by the designated site safety officer. PWGC's site safety officer or delegate shall calibrate and maintain air monitoring instruments in accordance with manufacturer's specifications. Instruments shall be zeroed daily and checked for accuracy and a daily log shall be kept. If additional air monitoring is required, protocols shall be appended to this plan.

**TABLE 1-1**
**FREQUENCY AND LOCATION OF AIR MONITORING**

| ACTIVITY | AIR MONITORING INSTRUMENT | FREQUENCY AND LOCATION |
|---|---|---|
| Drilling, Excavation | PID, Dust Monitor | Continuous in Breathing Zone (BZ) during intrusive activities or if odors become apparent, screening in the BZ every 30 minutes during non-intrusive activities; Continuous at downwind site boundary with a 15 minute running average |

**TABLE 1-2**
**REAL-TIME AIR MONITORING ACTION LEVELS**

| AIR MONITORING INSTRUMENT | MONITORING LOCATION | ACTION LEVEL | SITE ACTION | REASON |
|---|---|---|---|---|
| PID | Breathing Zone | 0-25 ppm, non-transient | None | Exposure below established exposure limits |
| PID | Breathing Zone | 25-100 ppm, non-transient | Don APR | Based on potential exposure to VOCs |
| PID | Breathing Zone | >100 ppm, non-transient | Don ASR or SCBA, Institute vapor/odor suppression measures, Notify HSM. | Increased exposure to site contaminants, potential for vapor release to public areas. |
| PID | Work Area Perimeter | < 5 ppm | None | Exposure below established exposure limits. |
| PID | Work Area Perimeter | > 5 ppm | Stop work and implement vapor release response plan until readings return to acceptable levels, Notify HSM. | Increased exposure to site contaminants, potential for vapor release to public areas |
| Aerosol Monitor | Work Area Perimeter | >100 but < 150 µg/m$^3$ for 15 minutes | Institute dust suppression measures, Notify HSM. | Work to continue if particulate concentrations remain below 150 µg/m$^3$ |
| Aerosol Monitor | Work Area Perimeter | >150 µg/m$^3$ | Don ASR or SCBA, Institute dust suppression measures, Notify HSM. | Stop work and implement dust suppression techniques until readings return to acceptable levels, Notify HSM. |

## 3.0 VAPOR EMISSION RESPONSE PLAN

This section is excerpted from the NYSDOH guidance for Community Air Monitoring Plan - Ground Intrusive Activities.

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the work area, activities shall be halted and monitoring continued. Vapor suppression measures can also be taken at this time. If the organic vapor level decreases below 5 ppm above background, work activities can resume. If organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the perimeter of the work area, activities can resume provided:

- Organic vapor levels 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

If organic vapor levels exceed 25 ppm at the perimeter of the work area, work activities shall be halted. When work is halted, downwind air monitoring as directed by the Site Health & Safety Officer (SHSO) shall be implemented to determine whether vapor emission may impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission Response Plan Section.

## 4.0 MAJOR VAPOR EMISSION RESPONSE PLAN

If organic vapor levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, work activities shall be halted.

If, following the cessation of the work activities, or as the result of an emergency, organic vapor levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, then the air quality shall be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

If efforts to abate the emission source (see Section 5.0) are unsuccessful and if organic vapor levels are approaching 5 ppm above background for more than 30 minutes in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be placed into effect.

However, the Major Vapor Emission Response Plan shall be immediately placed in effect if organic vapor levels are greater than 10 ppm above background.

Upon activation, the following activities shall be undertaken:

1. Emergency Response Contacts, as identified in the Health & Safety Plan, shall go into effect.

2. The local police authorities shall be contacted immediately by the Health & Safety Officer and advised of the situation.

3. Frequent air monitoring shall be conducted at 30-minute intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Health & Safety Officer.

## 5.0 VAPOR SUPPRESSION TECHNIQUES

Vapor suppression techniques shall be employed when action levels warrant their use. Techniques to be implemented for control of VOCs from stockpiled soil or from the open excavation should include one or more of the following:

- cover with plastic
- cover with "clean soil"
- application of hydro-mulch material*
- limit working hours to favorable wind and temperature conditions

*This material is a seedless version of the hydro-seed product commonly used by commercial landscaping contractors to provide stabilization and rapid grow-in of grasses or wild flowers along highways, embankments and other large areas. Hydro-mulch can be sprayed over open excavation areas, temporary stockpile areas and loaded trucks, as necessary. This is a highly effective method for controlling odors, because the release of odors is sealed immediately at the source.

## 6.0 DUST SUPPRESSION TECHNIQUES

Reasonable dust-suppression techniques shall be employed during work that may generate dust, such as excavation, grading, and placement of clean fill. The following techniques were shown to be effective for controlling the generation and migration of dust during remedial activities:

- Wetting equipment and excavation faces;
- Spraying water on buckets during excavation and dumping;
- Hauling materials in properly covered containers; and,
- Restricting vehicle speeds to 10 mph.

Using atomizing sprays should prevent overly wet conditions, conserve water, and offer an effective means of suppressing fugitive dust. It is imperative that utilizing water for suppressing dust not create surface runoff.

## 7.0 DATA QUALITY ASSURANCE

### 7.1 Calibration

Instrument calibration shall be documented in the designated field logbook. Instruments shall be calibrated before each shift. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

### 7.2 Operations

Instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment shall be maintained on-site by the field team leader for reference.

### 7.3 Data Review

The Field Team Leader shall interpret monitoring data based on **Table 1-2** and his/her professional judgment. The field team leader shall review the data with the project manager to evaluate the potential for worker exposure, upgrades/downgrades in level of protection, comparison to direct reading instrumentation and changes in the integrated monitoring strategy.

Monitoring and sampling data, along with sample documentation shall be periodically reviewed by the project manager.

## 8.0 RECORDS AND REPORTING

Readings shall be recorded and available for review by personnel from NYSDEC and NYSDOH. Should any of the action levels be exceeded, the NYSDEC Division of Air Resources shall be notified in writing within five (5) working days.

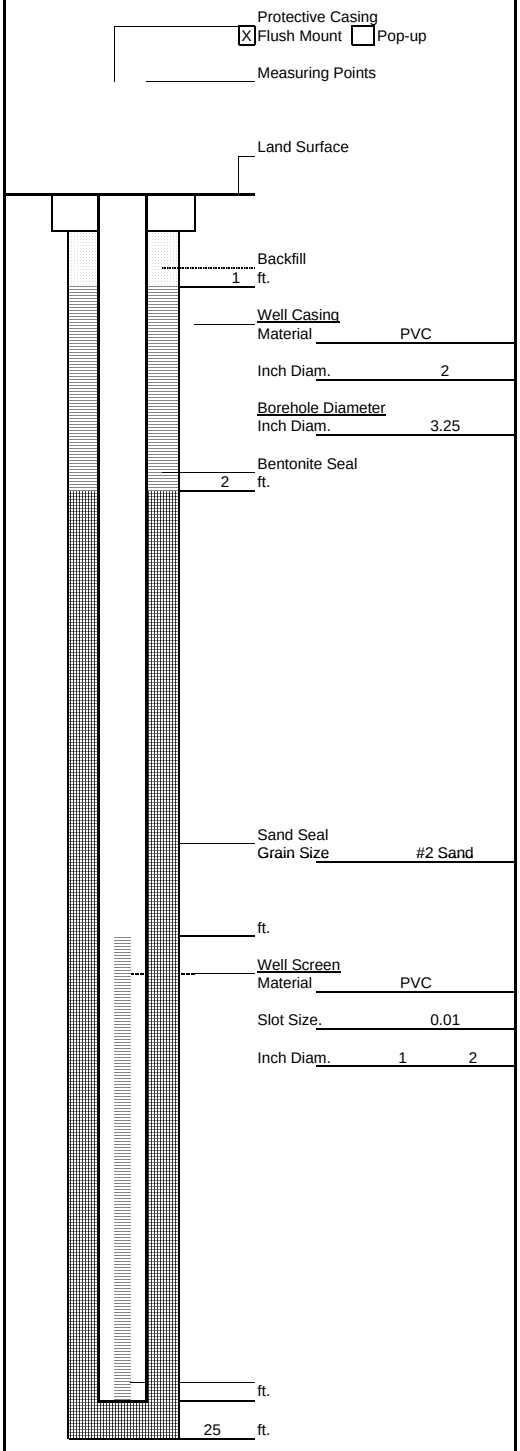
The notification shall include a description of the control measures implemented to prevent further exceedances.

# APPENDIX F

# MONITORING WELL CONSTRUCTION LOGS

# Monitoring Well

# Construction Log

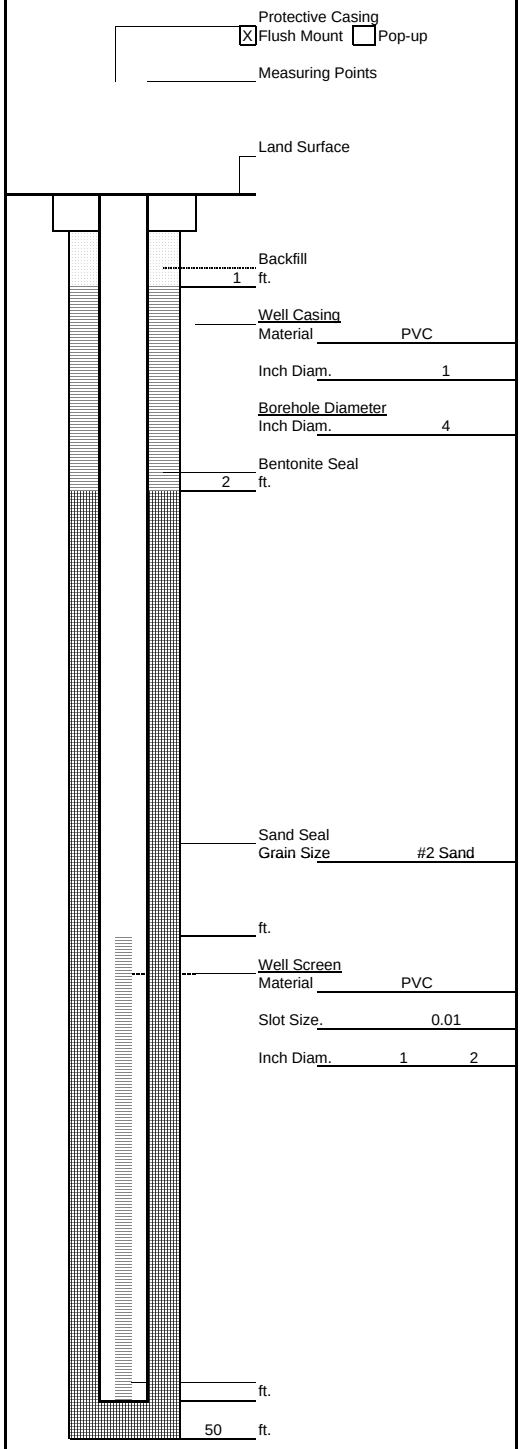



Note: Drawing is not to scale.
Depths are given in feet below land surface.

| | |
|---|---|
| Well No. | MW-8 |
| Project | PEN 0001 |
| Surveyor | |
| Measuring Point Elevation | |
| Installation Date | 8/25/2008 |
| Drilling Contractor | Associated Environmental Services |
| Drilling Method | Geoprobe |
| Drilling Fluid | None |
| Development Technique (s) and Date (s) | |
| Fluid Loss During Drilling | NA Gallons |
| Water Removed During Development | NA Gallons |
| Static Depth to Water/Product | |
| Pumping Depth to Water | |
| Pumping Duration | |
| Well Purpose | Monitoring |
| Hydrogeologist | KER |
| Company Name | P.W. Grosser Consulting Inc. |
| Notes | |

# Monitoring Well

## Construction Log

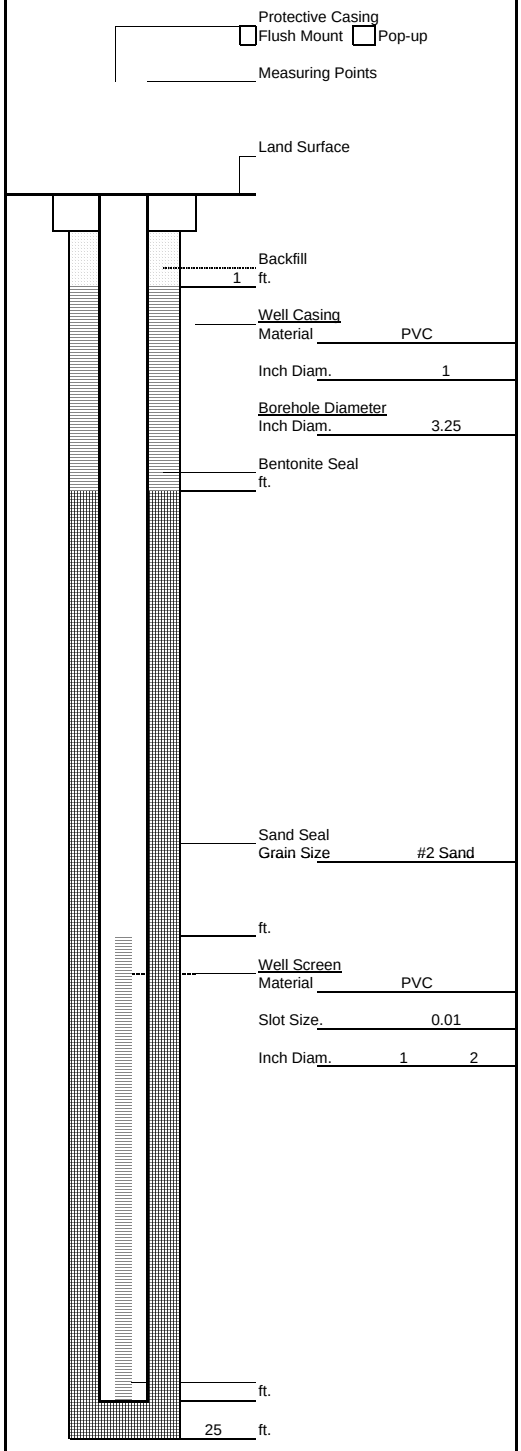



Note: Drawing is not to scale.
Depths are given in feet below land surface.

| | |
|---|---|
| Well No. | MW-8D |
| Project | PEN 0001 |
| Surveyor | |
| Measuring Point Elevation | |
| Installation Date | 8/25/2008 |
| Drilling Contractor | Associated Environmental Services |
| Drilling Method | Hollow Stem Auger |
| Drilling Fluid | None |
| Development Technique (s) and Date (s) | |
| Fluid Loss During Drilling | Gallons |
| Water Removed During Development | Gallons |
| Static Depth to Water/Product | |
| Pumping Depth to Water | |
| Pumping Duration | |
| Well Purpose | Monitoring |
| Hydrogeologist | KER |
| Company Name | P.W. Grosser Consulting Inc. |
| Notes | |

# Monitoring Well

# Construction Log

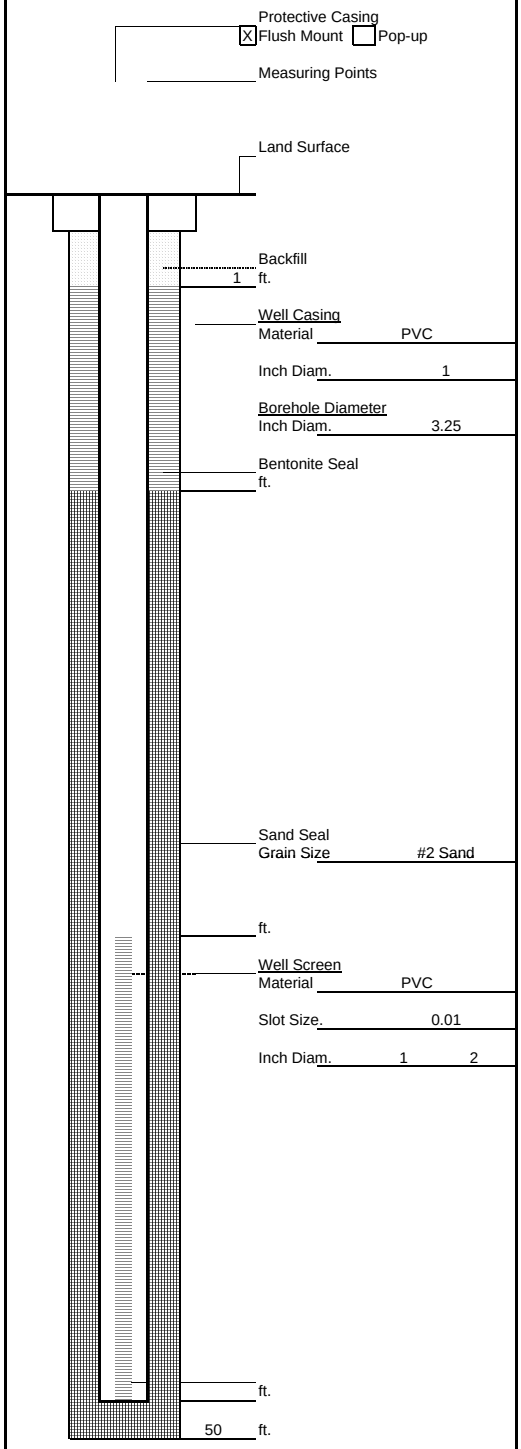



Note: Drawing is not to scale.
Depths are given in feet below land surface.

| | |
|---|---|
| Well No. | MW-9 |
| Project | PEN 0001 |
| Surveyor | |
| Measuring Point Elevation | |
| Installation Date | 8/25/2008 |
| Drilling Contractor | Associated Environmental Services |
| Drilling Method | Geoprobe |
| Drilling Fluid | None |
| Development Technique (s) and Date (s) | |
| Fluid Loss During Drilling | Gallons |
| Water Removed During Development | Gallons |
| Static Depth to Water/Product | |
| Pumping Depth to Water | |
| Pumping Duration | |
| Well Purpose | Monitoring |
| Hydrogeologist | KER |
| Company Name | P.W. Grosser Consulting Inc. |
| Notes | |

# Monitoring Well

## Construction Log

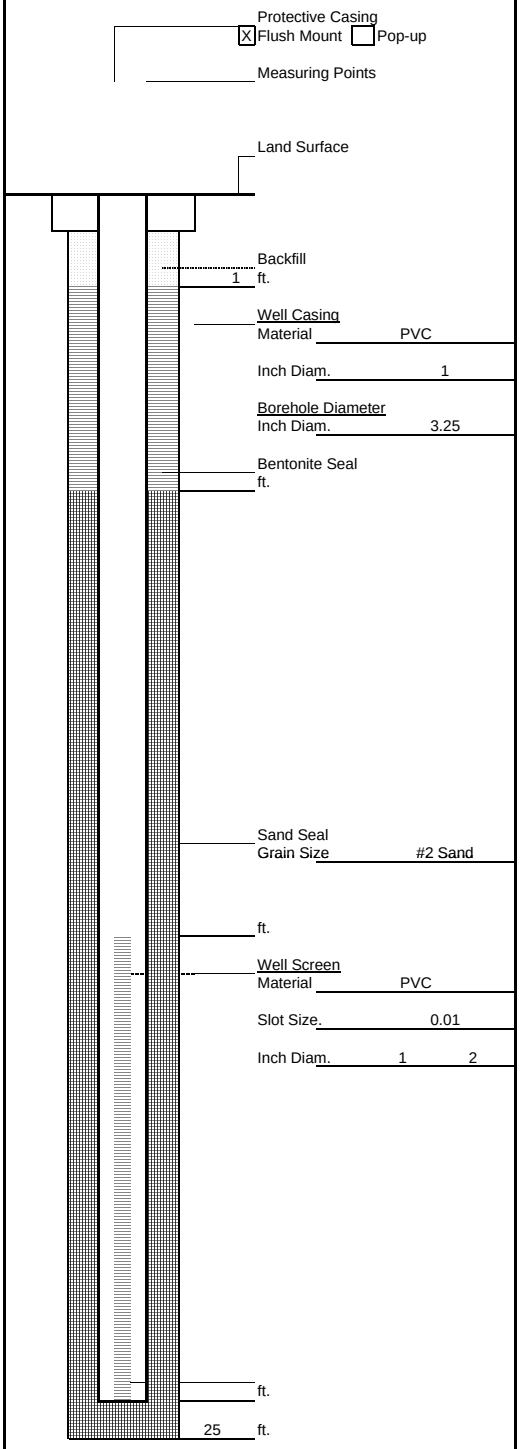



Note: Drawing is not to scale.
Depths are given in feet below land surface.

| | |
|---|---|
| Well No. | MW-9D |
| Project | PEN0001 |
| Surveyor | |
| Measuring Point Elevation | |
| Installation Date | 8/25/2008 |
| Drilling Contractor | Associated Environmental Services |
| Drilling Method | Hollow Stem Auger |
| Drilling Fluid | None |
| Development Technique (s) and Date (s) | |
| Fluid Loss During Drilling | Gallons |
| Water Removed During Development | Gallons |
| Static Depth to Water/Product | |
| Pumping Depth to Water | |
| Pumping Duration | |
| Well Purpose | Monitoring |
| Hydrogeologist | KER |
| Company Name | P.W. Grosser Consulting Inc. |
| Notes | |

# Monitoring Well

# Construction Log




Note: Drawing is not to scale.
Depths are given in feet below land surface.

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|---|---|
| Well No. | MW-10 |
| Project | PEN 0001 |
| Surveyor | |
| Measuring Point Elevation | |
| Installation Date | 8/25/2008 |
| Drilling Contractor | Assocoated Environmental Services |
| Drilling Method | Geoprobe |
| Drilling Fluid | |
| Development Technique (s) and Date (s) | |
| Fluid Loss During Drilling | Gallons |
| Water Removed During Development | Gallons |
| Static Depth to Water/Product | |
| Pumping Depth to Water | |
| Pumping Duration | |
| Well Purpose | Monitoring |
| Hydrogeologist | KER |
| Company Name | P.W. Grosser Consulting Inc. |
| Notes | |

# APPENDIX G

# GROUNDWATER SAMPLING LOG

# Groundwater Monitoring Well Sample Data Sheet

Monitoring Well _____ Depth Interval _____ Date _____

Begin Purging _____ Complete Purging _____ Sample Time _____

Notes: Depth to Water(ft):

| Time | Flow Rate (mL/min) | Temp. (ºC) | pH | Cond. (mS/cm) | ORP (mV) | DO (mg/L) | Turb. (NTU) |
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Notes:

Flow Rate - between 200 - 500 mL/min
pH - ±0.1
Conductivity - ±3%
ORP - ±10 mV
DO - ±10%
Turbidity - ±10%

Groundwater Monitoring Well Sample Data Sheet

| | | | | | |
|---|---|---|---|---|---|
| Monitoring Well | MW-2/MW-X Dupe | Depth Interval | 14.0 - 15.0fbg | Date | 4/20/2011 |
| Begin Purging | 9:20 | Complete Purging | 9:35 | Sample Time | 9:35 |

Notes:

Depth to Water(ft): 10.68

| Time | Flow Rate (mL/min) | Temp. (ºC) | pH | Cond. (mS/cm) | ORP (mV) | DO (mg/L) | Turb. (NTU) |
|---|---|---|---|---|---|---|---|
| 9:20 | 250 | 12.82 | 6.02 | 0.481 | 171 | 3.66 | 77.1 |
| 9:23 | 250 | 13.37 | 6.16 | 0.467 | 158 | 3.31 | 39.9 |
| 9:26 | 250 | 13.42 | 6.20 | 0.464 | 157 | 3.16 | 31.3 |
| 9:29 | 250 | 13.45 | 6.22 | 0.463 | 156 | 3.13 | 30.5 |
| 9:32 | 250 | 13.58 | 6.23 | 0.462 | 154 | 3.07 | 30.0 |
| 9:35 | 250 | 13.24 | 6.27 | 0.462 | 151 | 3.01 | 30.7 |
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Notes:

Flow Rate - between 200 - 500 mL/min

pH - ±0.1

Conductivity - ±3%

ORP - ±10 mV

DO - ±10%

Turbidity - ±10%

# Groundwater Monitoring Well Sample Data Sheet

| | | | | | |
|---|---|---|---|---|---|
| Monitoring Well | MW-3 | Depth Interval | 10-15fbg | Date | 4/20/2011 |
| Begin Purging | 16:56 | Complete Purging | 17:10 | Sample Time | 17:10 |

Notes:

Depth to Water(ft): 8.34

| Time | Flow Rate (mL/min) | Temp. (ºC) | pH | Cond. (mS/cm) | ORP (mV) | DO (mg/L) | Turb. (NTU) |
|---|---|---|---|---|---|---|---|
| 16:59 | 200 | 13.40 | 6.53 | 1.71 | 176 | 6.48 | 157.0 |
| 17:02 | 200 | 13.10 | 6.54 | 1.85 | 184 | 0.22 | 133.0 |
| 17:05 | 200 | 13.69 | 6.49 | 1.85 | 156 | 0.00 | 115.0 |
| 17:08 | 200 | 13.90 | 6.50 | 1.85 | 153 | 0.00 | 107.0 |
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Notes:

Flow Rate - between 200 - 500 mL/min

pH - ±0.1

Conductivity - ±3%

ORP - ±10 mV

DO - ±10%

Turbidity - ±10%

# Groundwater Monitoring Well Sample Data Sheet

| | | | | | |
|---|---|---|---|---|---|
| Monitoring Well | MW-4/MS/MSD | Depth Interval | 10-15fbg | Date | 4/20/2011 |
| Begin Purging | 10:00 | Complete Purging | 10:20 | Sample Time | 10:17 |

Notes:

Depth to Water(ft): 8.78

| Time | Flow Rate (mL/min) | Temp. (ºC) | pH | Cond. (mS/cm) | ORP (mV) | DO (mg/L) | Turb. (NTU) |
|---|---|---|---|---|---|---|---|
| 10:03 | 250 | 11.97 | 6.38 | 0.837 | 152 | 2.28 | 91.9 |
| 10:06 | 250 | 12.87 | 6.42 | 0.750 | 139 | 0.00 | 83.9 |
| 10:09 | 250 | 13.07 | 6.44 | 0.706 | 133 | 0.00 | 81.6 |
| 10:12 | 250 | 12.24 | 6.46 | 0.672 | 129 | 0.00 | 51.9 |
| 10:15 | 250 | 13.52 | 6.50 | 0.607 | 118 | 0.00 | 43.1 |
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Notes:

Flow Rate - between 200 - 500 mL/min

pH - ±0.1

Conductivity - ±3%

ORP - ±10 mV

DO - ±10%

Turbidity - ±10%

# Groundwater Monitoring Well Sample Data Sheet

| | | | | | |
|---|---|---|---|---|---|
| Monitoring Well | MW-5 | Depth Interval | 12-15fbg | Date | 4/20/2011 |
| Begin Purging | 10:40 | Complete Purging | 11:00 | Sample Time | 10:55 |

Notes:

Depth to Water(ft): 9.65

| Time | Flow Rate (mL/min) | Temp. (ºC) | pH | Cond. (mS/cm) | ORP (mV) | DO (mg/L) | Turb. (NTU) |
|---|---|---|---|---|---|---|---|
| 10:42 | 250 | 12.50 | 6.77 | 0.520 | 129 | 6.77 | 282.0 |
| 10:45 | 250 | 12.75 | 5.73 | 0.508 | 163 | 0.16 | 266.0 |
| 10:48 | 250 | 13.29 | 5.56 | 0.510 | 137 | 0.00 | 220.0 |
| 10:51 | 250 | 13.73 | 5.84 | 0.545 | 50 | 0.00 | 62.6 |
| 10:54 | 250 | 13.86 | 5.94 | 0.559 | 50 | 0.00 | 24.1 |
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Notes:

Flow Rate - between 200 - 500 mL/min

pH - ±0.1

Conductivity - ±3%

ORP - ±10 mV

DO - ±10%

Turbidity - ±10%

# P.W. GROSSER CONSULTING, INC.

## WELL SAMPLING LOG

| | | | |
|---|---|---|---|
| CLIENT/PROJECT No. | Glenwood Realty / PEN0001 | | |
| WELL No./OWNER | MW-6 / Glenwood Realty | | |
| SAMPLE I.D. | MW-6 | | |
| SAMPLING POINT | MW-6 | SAMPLED BY | NCJ |
| DATE SAMPLED | 4/20/2011 | TIME SAMPLED | 17:38 |
| WELL USE | Groundwater Monitoring | | |
| STATIC WATER ELEVATION | 11.65 ft | FT. BELOW MEASURING POINT | TOC |
| WELL DIAMETER | 2 Inches | | |
| TOTAL WELL DEPTH | 19.32 ft | FT. BELOW MEASURING POINT | TOC |

### SAMPLING INFORMATION

| | | | |
|---|---|---|---|
| PURGE METHOD | Bailer | SAMPLE METHOD | Bailer |
| PURGE RATE | ----- GPM | PURGE TIME | ----- Min |
| CASING VOLUMES REMOVED | 3 | GALLONS | 4.00 |
| SAMPLE APPEARANCE | Cloudy | ODORS OBSERVED | none |
| LABORATORY | Alpha Woods Hole Labs | DATE SHIPPED | 4/21/2011 |
| ANALYSIS | VOC (Method 8260) / Metals (Method 6010) | | |

### SAMPLING PARAMETERS

| | Initial | 1 Vol | 2 Vol | 3 Vol | Units |
|---|---|---|---|---|---|
| Conductivity | 0.517 | 0.513 | 0.492 | 0.490 | mS |
| Temperature | 16.02 | 15.28 | 15.12 | 15.10 | $^0$C |
| pH | 5.91 | 5.82 | 5.82 | 5.82 | |

Groundwater Monitoring Well Sample Data Sheet

| | | | | | |
|---|---|---|---|---|---|
| Monitoring Well | MW-7 | Depth Interval | 18-22fbg | Date | 4/20/2011 |
| Begin Purging | 14:23 | Complete Purging | 14:44 | Sample Time | 14:46 |

Notes: Purple water

Depth to Water(ft): 17.91

| Time | Flow Rate (mL/min) | Temp. (ºC) | pH | Cond. (mS/cm) | ORP (mV) | DO (mg/L) | Turb. (NTU) |
|---|---|---|---|---|---|---|---|
| 14:23 | 250 | 14.65 | 6.62 | 1.27 | 268 | 3.46 | >1000 |
| 14:26 | 250 | 14.08 | 6.52 | 1.25 | 170 | 2.80 | >1000 |
| 14:29 | 250 | 14.04 | 6.47 | 1.24 | 173 | 2.73 | >1000 |
| 14:32 | 250 | 15.47 | 6.48 | 1.24 | 175 | 3.1 | >1000 |
| 14:35 | 250 | 15.79 | 6.45 | 1.25 | 177 | 2.71 | >1000 |
| 14:38 | 250 | 15.99 | 6.48 | 1.34 | 179 | 3.76 | 759 |
| 14:41 | 250 | 15.80 | 6.45 | 1.38 | 180 | 2.77 | 624 |
| 14:44 | 250 | 15.82 | 6.45 | 1.4 | 181 | 2.71 | 578 |
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Notes:

Flow Rate - between 200 - 500 mL/min

pH - ±0.1

Conductivity - ±3%

ORP - ±10 mV

DO - ±10%

Turbidity - ±10%

Groundwater Monitoring Well Sample Data Sheet

| | | | | | |
|---|---|---|---|---|---|
| Monitoring Well | MW-8 | Depth Interval | 17-20fbg | Date | 4/20/2011 |
| Begin Purging | 13:50 | Complete Purging | 14:09 | Sample Time | 14:09 |

Notes:

Depth to Water(ft): 15.13

| Time | Flow Rate (mL/min) | Temp. (ºC) | pH | Cond. (mS/cm) | ORP (mV) | DO (mg/L) | Turb. (NTU) |
|---|---|---|---|---|---|---|---|
| 13:51 | 275 | 12.49 | 6.52 | 1.48 | 190 | 3.42 | >1000 |
| 13:54 | 275 | 12.70 | 6.43 | 1.35 | 184 | 1.98 | >1000 |
| 13:57 | 275 | 13.88 | 6.41 | 1.37 | 180 | 1.89 | >1000 |
| 14:00 | 275 | 13.98 | 6.42 | 1.48 | 176 | 1.78 | >1000 |
| 14:03 | 275 | 14.00 | 6.51 | 1.47 | 169 | 3.78 | 476 |
| 14:06 | 275 | 13.88 | 6.48 | 1.46 | 164 | 2.71 | 222.0 |
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Notes:

Flow Rate - between 200 - 500 mL/min

pH - ±0.1

Conductivity - ±3%

ORP - ±10 mV

DO - ±10%

Turbidity - ±10%

# Groundwater Monitoring Well Sample Data Sheet

| | | | | | |
|---|---|---|---|---|---|
| Monitoring Well | MW-8D | Depth Interval | 20-30fbg | Date | 4/20/2011 |
| Begin Purging | 11:12 | Complete Purging | 11:55 | Sample Time | 11:52 |

Notes:

Depth to Water(ft): 17.01

| Time | Flow Rate (mL/min) | Temp. (ºC) | pH | Cond. (mS/cm) | ORP (mV) | DO (mg/L) | Turb. (NTU) |
|---|---|---|---|---|---|---|---|
| 11:17 | 275 | 13.99 | 6.73 | 0.132 | 96 | 5.94 | >1000 |
| 11:20 | 275 | 14.23 | 6.01 | 0.271 | 119 | 4.33 | >1000 |
| 11:23 | 275 | 14.34 | 5.90 | 0.303 | 132 | 4.42 | >1000 |
| 11:26 | 275 | 14.38 | 6.96 | 0.306 | 139 | 4.65 | >1000 |
| 11:29 | 275 | 14.46 | 5.89 | 0.307 | 145 | 4.65 | >1000 |
| 11:32 | 275 | 14.53 | 5.88 | 0.307 | 152 | 4.76 | >1000 |
| 11:35 | 275 | 14.52 | 5.87 | 0.308 | 156 | 4.60 | >1000 |
| 11:38 | 250 | 14.52 | 5.90 | 0.300 | 158 | 4.54 | >1000 |
| 11:41 | 250 | 14.54 | 5.94 | 0.308 | 161 | 5.49 | >1000 |
| 11:44 | 250 | 14.82 | 5.90 | 0.306 | 165 | 4.58 | 682 |
| 11:47 | 250 | 14.98 | 5.90 | 0.306 | 167 | 4.60 | 493 |
| 11:50 | 250 | 15.00 | 5.89 | 0.305 | 167 | 4.61 | 449 |
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Notes:

Flow Rate - between 200 - 500 mL/min

pH - ±0.1

Conductivity - ±3%

ORP - ±10 mV

DO - ±10%

Turbidity - ±10%

# Groundwater Monitoring Well Sample Data Sheet

| | | | | | |
|---|---|---|---|---|---|
| Monitoring Well | MW-9 | Depth Interval | 15-20fbg | Date | 4/20/2011 |
| Begin Purging | 16:20 | Complete Purging | 16:38 | Sample Time | 16:40 |

Notes: Pink Water

Depth to Water(ft): 13.47

| Time | Flow Rate (mL/min) | Temp. (ºC) | pH | Cond. (mS/cm) | ORP (mV) | DO (mg/L) | Turb. (NTU) |
|---|---|---|---|---|---|---|---|
| 16:20 | 300 | 14.02 | 6.53 | 1.06 | 188 | 3.12 | >1000 |
| 16:23 | 300 | 13.65 | 6.39 | 1.05 | 187 | 0.4 | >1000 |
| 16:26 | 300 | 14.14 | 6.25 | 1.04 | 197 | 3.33 | >1000 |
| 16:29 | 300 | 14.79 | 6.14 | 1.10 | 199 | 0.61 | >1000 |
| 16:32 | 300 | 14.95 | 6.11 | 1.18 | 201 | 0.14 | >1000 |
| 16:35 | 300 | 15.01 | 6.18 | 1.15 | 198 | 0.2 | 405.0 |
| 16:38 | 300 | 15.07 | 6.21 | 1.13 | 196 | 0.2 | 318.0 |
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Notes:

Flow Rate - between 200 - 500 mL/min

pH - ±0.1

Conductivity - ±3%

ORP - ±10 mV

DO - ±10%

Turbidity - ±10%

# Groundwater Monitoring Well Sample Data Sheet

| | | | | | |
|---|---|---|---|---|---|
| Monitoring Well | MW-9D | Depth Interval | 20-30fbg | Date | 4/20/2011 |
| Begin Purging | 12:14 | Complete Purging | 12:42 | Sample Time | 12:40 |

Notes: Pink Color Noted.

Depth to Water(ft): 13.47

| Time | Flow Rate (mL/min) | Temp. (ºC) | pH | Cond. (mS/cm) | ORP (mV) | DO (mg/L) | Turb. (NTU) |
|---|---|---|---|---|---|---|---|
| 12:15 | 270 | 12.91 | 6.13 | 0.245 | 175 | 7.15 | >1000 |
| 12:18 | 200 | 13.31 | 5.85 | 0.250 | 183 | 5.61 | >1000 |
| 12:21 | 200 | 13.38 | 5.81 | 0.252 | 189 | 7.01 | >1000 |
| 12:24 | 200 | 13.58 | 5.81 | 0.252 | 187 | 5.38 | >1000 |
| 12:27 | 200 | 13.80 | 5.78 | 0.252 | 189 | 5.18 | >1000 |
| 12:30 | 200 | 13.81 | 5.78 | 0.252 | 190 | 5.15 | 805 |
| 12:33 | 200 | 13.85 | 5.79 | 0.253 | 188 | 5.03 | 519 |
| 12:36 | 200 | 13.72 | 5.79 | 0.253 | 185 | 5.17 | 351 |
| 12:39 | 200 | 13.77 | 5.80 | 0.253 | 178 | 5.14 | 257.0 |
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Notes:

Flow Rate - between 200 - 500 mL/min

pH - ±0.1

Conductivity - ±3%

ORP - ±10 mV

DO - ±10%

Turbidity - ±10%

# Groundwater Monitoring Well Sample Data Sheet

| | | | | | |
|---|---|---|---|---|---|
| Monitoring Well | MW-10 | Depth Interval | 15-20fbg | Date | 4/20/2011 |
| Begin Purging | 13:15 | Complete Purging | 13:37 | Sample Time | 13:38 |

Notes:

Depth to Water(ft): 14.25

| Time | Flow Rate (mL/min) | Temp. (ºC) | pH | Cond. (mS/cm) | ORP (mV) | DO (mg/L) | Turb. (NTU) |
|---|---|---|---|---|---|---|---|
| 13:15 | 300 | 12.34 | 6.26 | 0.527 | 181 | 3.94 | >1000 |
| 13:18 | 300 | 13.24 | 6.12 | 0.52 | 193 | 3.14 | >1000 |
| 13:21 | 300 | 13.51 | 6.13 | 0.568 | 195 | 3.47 | >1000 |
| 13:24 | 300 | 13.49 | 6.26 | 0.594 | 192 | 5.07 | >1000 |
| 13:27 | 300 | 13.48 | 6.26 | 0.6 | 194 | 3.90 | >1000 |
| 13:30 | 300 | 13.54 | 6.34 | 0.61 | 192 | 5.08 | >1000 |
| 13:33 | 270 | 13.49 | 6.32 | 0.616 | 193 | 4.08 | 959 |
| 13:36 | 270 | 13.74 | 6.31 | 0.639 | 194 | 4.02 | 774 |
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Notes:

Flow Rate - between 200 - 500 mL/min

pH - ±0.1

Conductivity - ±3%

ORP - ±10 mV

DO - ±10%

Turbidity - ±10%

# APPENDIX I

# INSPECTION AND MAINTENANCE CHECKLIST

# Annual Inspection Checklist

FORMER PENETREX PROCESSING FACILITY

1 SHORE ROAD

GLENWOOD LANDING, NEW YORK

Date/time: _____

Inspector (name/organization): _____

Detail the condition of the first floor concrete slab, make note of any significant penetrations through the concrete slab: _____

_____

_____

_____

Detail the condition of sub-slab depressurization system, including, above grade piping, three blowers, and three pressure alarms: _____

_____

_____

_____

Are any repairs and/or maintenance needed at this time? If so, conduct another inspection following repairs.

_____

_____

_____

_____

Name Signature Date

# APPENDIX J

# QAPP

PWGC
Strategic Environmental Engineering Solutions

# QUALITY ASSURANCE PROJECT PLAN

1 SHORE ROAD
GLENWOOD LANDING, NEW YORK

Prepared For:
Glenwood Realty

Prepared By:
P.W. Grosser Consulting, Inc.
630 Johnson Avenue, Suite 7
Bohemia, New York 11716

CONTENTS Page

## TABLES



## FIGURES



## APPENDICES

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| %R | Percent Recovery |
| ASP | Analytical Sampling Protocol |
| BOD | Biochemical Oxygen Demand |
| COD | Chemical Oxygen Demand |
| DESA | Division of Environmental Science and Assessment |
| DI | Deionized |
| DOT | US Department of Transportation |
| DQO | Data Quality Objective |
| FCR | Field Change Request |
| FID | Flame Ionization Detector |
| FOL | Field Operations Lead |
| FSP | Field Sampling Plan |
| GC | Gas Chromatograph or Gas Chromatography |
| GIS | Geographic Information System |
| GPR | Ground Penetrating Radar |
| HASP | Health and Safety Plan |
| HSO | Health and Safety Officer |
| ICP | Inductively Coupled Plasma |
| ICS | Interference Check Sample |
| LCS | Laboratory Control Sample |
| MDL | Method Detection Limit |
| MRR | Material Received Report |
| MSDS | Material Safety Data Sheet |
| N/A | Not Applicable or Not Available. |
| Non-RAS | Non-Routine Analytical Services |
| NTU | Nephelometric Turbidity Units |
| NYSDEC | New York State Department of Environmental Conservation |
| PARCC | Precision, Accuracy, Representativeness, Completeness, Comparability |
| PID | Photoionization Detector |
| PM | Project Manager |
| QA | Quality Assurance |
| QAPP | Quality Assurance Project Plan |
| QC | Quality Control |
| RAS | Routine Analytical Services |
| RI/FS | Remedial Investigation and Feasibility Study |
| RPD | Relative Percent Difference |
| RSCC | Regional Sample Control Center |
| RSD | Relative Standard Deviation |
| SD | Standard Deviation |
| SMP | Site Management Plan |
| SOP | Standard Operating Procedure |
| SVOC | Semi-Volatile Organic Compound |
| TAL | Target Analyte List |
| TCE | Trichloroethene |
| TCL | Target Compound List |
| TDEMI | Time-Domain Electromagnetic Induction |
| TDS | Total Dissolved Solids |
| TOC | Total Organic Carbon |
| TSS | Total Suspended Solids |
| USEPA | United States Environmental Protection Agency |
| VOA | Volatile Organic Analysis |
| VOC | Volatile Organic Compound |
| VPB | Vertical Profile Boring |
| WAM | Work Assignment Manager |

## 1.0 INTRODUCTION

Presented herein is the Quality Assurance Project Plan (QAPP) for site management activities at the Penetrex Processing Site. Site management activities, as specified in the Site Management Plan for the subject site, will be performed in accordance with the selected remedy for the site. The selected remedy includes:

- The continued operation of the two sub-slab depressurization systems (SSDS) to mitigate potential soil vapor intrusion at the site;
- In-situ chemical treatment
- Groundwater monitoring;
- Indoor air monitoring;
- Implementation of Institutional Controls to protect human health from exposure to the existing contamination;
- Development of a Site Management Plan (SMP) to address groundwater and indoor air at the site and ensure the proper management of all site remedy components.

This QAPP has been prepared to define the quality assurance (QA) and quality control (QC) activities to be implemented, to verify the integrity of the work to be performed at the site, and that the data collected will be of the appropriate type and quality needed for the intended use.

Specifically, this QAPP addresses the following:

- Description of Project
- Organization and Responsibilities of Project Personnel
- Project Objectives, including Quality Assurance Objectives for Data
- Overview of Field Sampling Program and Procedures
- Sample Packaging and Shipping
- Sample Documentation
- Sample Analytical Program
- Quality Assurance/Quality Control Procedures

## 2.0 PROJECT ORGANIZATION AND PERSONNEL RESPONSIBILITIES

PWGC will be responsible for collecting data in accordance with the associated project plans and preparation of monthly and semi-annual monitoring reports. The NYSDEC is the lead regulatory agency overseeing the site activities.

Although QA/QC responsibilities lie principally with the PWGC's Project Director and QA Officer, proper implementation of QA/QC requirements necessitate that the entire project staff be cognizant of all procedures and goals. A field program organization chart is presented as Figure 2-1. PWGC project personnel and respective responsibilities are described below.

The Project Director is responsible for the overall quality of the work performed on this project. The responsibilities generally include technical review, resolution of technical issues and client and agency relations. He monitors the progress of each work assignment to ensure that adequate resources are available and that major quality problems are prevented or minimized. The Project Director implements the program standard of quality for work under the contract and ensures that the Project Manager adheres to that standard. The Project Director's review concentrates on the technical quality, schedule, and cost for all work assignments.

The project manager (PM) has primary responsibility for planning and implementation of site activities, including the overall management of the project team. The PM is accountable for ensuring that the work is conducted in accordance with applicable plans and guidelines. In addition, the PM will communicate all technical, QA and administrative matters to the PWGC Project Director. He will ensure that any deviations from the approved plans are documented and reviewed/approved. The PM has the responsibility for overseeing the preparation of project deliverables to be submitted by PWGC.

The overall management of the activities to ensure the quality of work associated with the project is the responsibility of the Quality Assurance/Data Quality Officer. A site-specific QA Officer will be assigned to the project, to hold responsibility for on-site QA activities, including performance of audits and verification of corrective actions. In addition, the QA Officer will coordinate with the PM and other project staff, as applicable, during the reduction, review and reporting of the analytical data.

The Field Operations Lead (FOL) will be responsible for the management and supervision of the field investigation program, providing consultation and decision-making on day-to-day issues relating to the sampling activities. The FOL shall monitor the sampling to determine that operations are consistent with plans and procedures, and that the data acquired meets the analytical and data quality needs. When necessary, the FOL will document any deviations from the plans and procedures for approval.

The Sample Coordinator is responsible for overseeing the collection, packaging, preservation and shipping procedures for the investigation samples and ensuring that these procedures are performed in accordance with applicable plans and guidelines.

The Site Geologist/Hydrogeologist shall be responsible for the geological and hydrogeological field investigation/monitoring at the site. In addition, the analysis and evaluation of the field data will be the responsibility of the Site Geologist/Hydrogeologist.

The site-specific Health and Safety Officer (HSO) reports to the FOL and PM and is responsible for the implementation of the PWGC Health and Safety Program. The HSO shall advise the project staff on health and safety issues, conduct health and safety training sessions, and monitor the effectiveness of the health and safety program conducted in the field. The HSO, acting for the safety of all site personnel, has the authority to stop work when unsafe work conditions exist during the field activities.

In addition, other technical sampling team members may provide support to the PM and the FOL on an as-needed basis.

The services of several subcontractors (e.g., drilling, surveying, waste management, and laboratory services) may also be necessary for the performance of site activities. The PM, with assistance from the FOL, and the Quality Assurance/Data Quality Officer, will be the liaison between each of the subcontractors.

## 3.0 QUALITY ASSURANCE PROJECT OBJECTIVES

The objective of monitoring activities for the site is to obtain sufficient data at a known quality level to assess the effectiveness of the selected remedy in eliminating, reducing, or controlling risks to human health and the environment.

### 3.1 Data Quality Objective Process

Data quality objectives (DQOs) are qualitative and quantitative statements that specify the quality of the data required to support decisions during remedial activities. DQOs can be defined as what the end user expects to obtain from the analysis results, and are developed through a seven-step process:

- Step 1 State the problem
- Step 2 Identify the decision
- Step 3 Identify inputs to the decision
- Step 4 Define the study boundaries
- Step 5 Develop a decision rule
- Step 6 Specify limits on decision errors
- Step 7 Optimize the decision for obtaining data

For the site, screening data generated by rapid, less precise methods of analysis (PID screening, collection of groundwater field parameters, etc.) will achieve a data use level for site characterization and monitoring. Definitive laboratory analytical data generated during the groundwater, indoor air, SSDS monitoring activities will achieve a data use level to support an assessment of the overall effectiveness of the site remedy.

Specifically, these data will be used to:

- Monitor the extent of residual groundwater contamination both on and off the site, through the comparison of constituent results to applicable criteria and the development of isoconcentration maps (as applicable);
- Monitor indoor air and sub-slab vapor quality to ensure the safety of workers present in the site building and to monitor the effectiveness of active sub-slab depressurization; and

Known contaminants present in samples collected from the site and the nearby vicinity include chlorinated solvents.

### 3.2 Data Quality Categories

DQOs are composed of written expectations for precision, accuracy, representativeness, completeness and comparability of a data set. These aspects will be further defined in Section 3.3. The DQO process provides a logical basis for linking the QA/QC procedures to the intended use of the data, primarily

through the decision maker's acceptable limits on decision error. Two descriptive data categories - screening data and definitive data - will be used for the site.

Screening data are generated by rapid, less precise methods of analysis and are deemed non-critical to project objectives. Portable instruments to be used during this field investigation to collect screening data include:

- Interface probe/water level indicator
- Dissolved oxygen meter
- pH meter
- Specific conductivity meter
- Temperature meter
- Turbidity meter
- Photoionization detector (PID) or Flame ionization detector (FID)

Definitive data are generated using specific analytical methods and guidelines and have satisfied known QA/QC requirements. Analytical data provided by an off-site laboratory shall be definitive data, and are deemed critical to project objectives. QA/QC elements of definitive data include determination and documentation of calibrations, detection limits, method blanks, and matrix spike recoveries. Additional information on analytical QC elements and their acceptance criteria are provided in Section 9.2. For further information on analytical data validation and reporting, see Section 10.0.

### 3.3 QA/QC Characteristics

The overall QA/QC objective for RA monitoring activities is to develop and implement procedures that will provide data of known and documented quality. QA/QC characteristics for data include precision, accuracy, representativeness, completeness, and comparability. Data quality objectives for each of these parameters are determined based on the level of data required. Descriptions of these characteristics are provided below, and specific QA objectives for both screening and definitive data are presented on Table 3-1. Analytical matrices and methods are provided on the table; further information on the monitoring procedures and analytical methodologies are presented in Sections 4.0 and 6.0, respectively.

**TABLE 3-1**
**QA OBJECTIVES FOR FIELD INVESTIGATION DATA**

| *Parameter* | *Measurement* | *Matrix* | *Method* | *Units* | *Precision* | *Accuracy* | *CRQL / MDL* | *Completeness (%)* |
|---|---|---|---|---|---|---|---|---|
| Water Level | Screening | Aqueous | Direct Field Measurement | feet | ± 0.01 feet | N/A | N/A | 90 |
| Dissolved Oxygen | Screening | Aqueous | Direct Field Measurement | $mgO_2/L$ | ± 3% | N/A | N/A | 90 |
| pH | Screening | Aqueous | Direct Field Measurement | Std. Units | ± 0.1 units | N/A | N/A | 90 |
| Specific Conductivity | Screening | Aqueous | Direct Field Measurement | umhos/cm or mS/cm | ± 1% of full scale* | N/A | N/A | 90 |
| Temperature | Screening | Aqueous | Direct Field Measurement | °C | ± 0.1 °C | N/A | N/A | 90 |
| Turbidity | Screening | Aqueous | Direct Field Measurement | NTU | ± 2 NTU | N/A | N/A | 90 |
| VOCs | Screening | Air | Direct Field Measurement | PPM | ± 1% | N/A | N/A | 90 |
| TCL VOCs | Definitive | Aqueous | EPA Method 8260B | ug/kg | ± 25% RPD | 172% R | 1-5 ug/L (aq.) | 90 |
| | | Air/Vapor | EPA Method | $ug/m^3$ | ± 25% RPD | 70-130% R | 5 $ug/m^3$ | 90 |

*Notes*:
Abbreviations include:

%R = Percent Recovery
GC = Gas Chromatography
N/A = Not Applicable
NTU = Nephelometric Turbidity Units
TAL = Target Analyte List
TCL = Target Compound List
CRQL = Contract Required Quantitation Limit
MDL = Method Detection Limit
VOCs = Volatile Organic Compounds
RPD = Relative Percent Difference

* Precision dependent on meter and scale.
· Target VOCs include trichloroethene, 1,1,1-trichloroethane, and tetrachloroethene.
· Water quality parameters include the following: dissolved oxygen, nitrate, sulfide, sulfate, iron II, redox potential, dissolved organic carbon, carbon dioxide, alkalinity and chloride. Methods and detection limits are provided in Table 6-2.

**Precision** is the measurement of agreement in repeated tests of the same or identical samples, under prescribed conditions. Analytical precision can be expressed in terms of Standard Deviation (SD), Relative Standard Deviation (RSD) and/or Relative Percent Difference (RPD). The precision of analytical environmental samples has two components - laboratory precision and sampling precision. Laboratory precision is determined by replicate measurements of laboratory duplicates and by analysis of reference materials. The objectives for laboratory precision are specified in the analytical methodologies and are presented on Table 3-1. The precision of the field sampling effort is determined by the analysis of field duplicate samples; see Section 9.1.5. Field duplicate analysis will be performed at a rate of five percent (i.e., one duplicate collected for every 20 samples). Acceptance criteria for duplicates analyzed by an off-site laboratory shall be an RPD of 25 percent. The precision limits provided in Table 3-1 for the screening measurements are acceptance criteria for duplicate and calibration analyses of field measurement parameters.

**Accuracy** is the degree of agreement of a measured sample result or average of results with an accepted reference or true value. It is the quantitative measurement of the bias of a system, and is expressed in terms of percent recovery (%R). Measurements of accuracy for the laboratory include surrogate spike, laboratory control spike, matrix spike and matrix spike duplicate samples. The laboratory must meet or exceed control limit objectives, as stated in Table 3-1 and the applicable methodologies.

**Representativeness** is the degree to which the results of the analyses accurately and precisely represent a characteristic of a population, a process condition, or an environmental condition. In this case, representativeness is the degree to which the data reflect the contaminants present and their concentration magnitudes in the sampled site areas. Representativeness of data will be ensured through the selection of sampling locations and implementation of approved sampling procedures. Results from environmental field duplicate sample analyses can be used to assess representativeness, in addition to precision.

**Completeness** is defined as the percentage of samples that meet or exceed all the criteria objective levels for accuracy, precision and detection limits within a defined time period or event. It is the measure of the number of data "points" which are judged to be valid, usable results. The objective for completeness for this project is 90 percent, and will be calculated by dividing the number of usable data results (i.e., all results not considered to be "rejected" and all samples able to be analyzed) by the number of possible data results (i.e., the total number of field samples collected), and then multiplying by 100 percent.

**Comparability** is the degree of confidence with which results from two or more data sets, or two or more laboratories, may be compared. To achieve comparability, standard environmental methodologies will be employed in the field and in the laboratory. See Table 3-1 and Section 6.0 for analysis methods and detection limits for this field investigation.

### 3.4 Impact of Failure To Meet Data Quality Objectives

The QA objectives presented in Table 3-1 represent the data quality necessary to meet the project's technical goals. The QA/QC efforts discussed in this QAPP focus on controlling measurement error, and ultimately providing a database for estimating the uncertainty in the measurement data for the project. QA objectives will be evaluated throughout the RA monitoring effort to see if the results for the project meet the stated objectives. If these objectives are not being met, the precision and/or accuracy of the sampling data will be decreased, and corrective actions shall be taken, as documented in Section 13.0.

## 4.0 MONITORING ACTIVITIES

This section provides an overview of the planned monitoring operations by matrix and type of procedures. It also includes activities that may be necessary in the future to supplement the existing groundwater monitoring well network (i.e., site survey; monitoring well installation, etc.). Field monitoring and sampling activities include the following:

- Mobilization and Demobilization
- Monitoring Well Installation and Development (if necessary)
- Monitoring Well Survey (if necessary)
- Water Level Measurements
- Groundwater Field Screening
- Monitoring Well Sampling
- Indoor Air Sampling
- SSDS Monitoring/Sampling
- Decontamination

### 4.1 Remedial Action Monitoring Procedures

Monitoring activities to be performed will be conducted in accordance with established technical guidelines, methods, policies and Standard Operating Procedures (SOPs). The subsections below present an overview of the sampling program procedures; a more detailed discussion of the monitoring activities.

#### *4.1.1 Mobilization and Demobilization*

The mobilization effort will consist of logistical planning, identification of sampling locations, equipment mobilization to the site, and field personnel orientation. The orientation meeting will familiarize the sampling team with a brief history of the site, health and safety requirements, and monitoring procedures. Mobilization and demobilization will take place before and after completion of routine monitoring events. Demobilization will consist of site area clean-up, staging and inventory of monitoring-derived wastes, decontamination and demobilization of field equipment, and organization of monitoring records.

#### *4.1.2 Monitoring Well Installation and Development*

The current site groundwater monitoring well network consists of 12 monitoring wells. These monitoring wells are sampled on a semi-annual basis as part of the groundwater monitoring program for the site. In the event that one of the wells is damaged, a replacement monitoring well will be installed using a rotary drill rig and hollow stem augers. Monitoring wells will be constructed of 2- inch pvc. Wells screened at the water table will have 15 feet of 0.020 inch slotted screen set to intersect the water table interface (5 ft above, 10 ft below). A Morie® # 1 filter pack will be placed to two feet above top of the screen followed by a two-foot thick bentonite pellet seal and cement/bentonite grout to ground surface. Monitoring wells will be developed by pumping and/or surging until turbidity has been eliminated or stabilized.

#### *4.1.3 Monitoring Well Survey*

Any new monitoring wells will be surveyed for horizontal location (nearest 0.1 foot), ground elevation (nearest 0.1 foot), and measuring point elevation (nearest 0.01 foot). The survey will include the elevation

of the top of the monitoring well casing, with the well cap removed, for determination of water table elevations. The survey will be presented in the New York State Plane coordinate system, using the NAD 1983 horizontal datum and NAVD 1988 elevation datum, and will be provided in AutoCAD Version 2008 electronic format.

### *4.1.4 Water Level Measurements*

Static water level measurements will be collected prior to each round of the semi-annual groundwater sampling from each of the wells in the groundwater monitoring well network. A water level indicator will be used to collect measurements in the monitoring wells from surveyed measuring points. Readings will be recorded in a field logbook or on applicable field investigation sheets (see Section 5.3) in increments of 0.01 feet. The water level indicator will be tested prior to the commencement of measurements with a jar of water and the depths will be calibrated on the ground against a steel tape.

### *4.1.5 Groundwater Field Parameter Measurement*

Groundwater field parameters, including temperature, pH, turbidity, specific conductance, and/or dissolved oxygen will be monitored during purging of monitoring wells using an Orion® water quality meter or equivalent. The water quality meter will be calibrated in accordance with the manufacturer's instructions at the start of each day of groundwater sampling. The meter probe will be positioned in the flow-through cell and measurements will be collected every two minutes during well purging. Readings will be recorded in a field logbook or on applicable field investigation sheets (see Section 5.3). The well will be considered stabilized and ready for sample collection when the groundwater field parameters have stabilized for three consecutive measurements as follows:

- +0.1 for pH
- 3 percent for specific conductance
- 10 percent for dissolved oxygen
- 10 percent for turbidity

The water quality meter probe will be decontaminated between wells by rinsing it with distilled or deionized water in accordance with the decontamination procedures specified in Section 4.2.

### *4.1.6 Monitoring Well Sampling*

The site groundwater monitoring network (18 wells) will be sampled on a semi-annual basis. Monitoring wells will be purged and sampled in accordance with Ground Water Sampling Procedure Low Stress (Low Flow) Purging and Sampling (EPA Region II, March 16, 1998) and EPA-ERT SOP#2007, Groundwater Well Sampling (EPA-ERT, January 26, 1995) (Appendix A).

Groundwater samples will be placed into laboratory glassware and a cooler and maintained at 4$^{o}$C while taken under chain of custody to a NYSDOH certified laboratory for analysis. All groundwater samples will be analyzed for VOCs by EPA Method 8260.

#### *4.1.7 Indoor Air Sampling*

One outdoor ambient air sample and five indoor air samples will be collected at the site building on an annual basis. Air samples will be collected using evacuated canisters (SUMMA) in accordance with the procedures outlined in EPA-ERT SOP#1704, Summa Canister Sampling and in NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH, October 2006). The indoor air samples will be collected at locations specified in the SMP. Four samples will be collected from the first floor of the commercial building and one sample will be collected from the basement of the residential building. The samples will be collected during normal operation of both SSDS and taken under chain of custody to a NYSDOH certified laboratory for analysis. Laboratory analysis of air and sub-slab gas samples will be performed in accordance with EPA Method TO-15.

#### *4.1.8 SSDS Monitoring*

Routine O&M of the two SSDS will be conducted on an annual basis and will include assessing the system's current condition and recording gauge readings.

### 4.2 Decontamination Procedures

All non-disposable equipment involved in field sampling activities will be decontaminated prior to and subsequent to sampling. Equipment leaving the site will also be decontaminated.

All drilling equipment will be steam cleaned prior to use and between sample locations. Pressurized steam will be used to remove all visible excess material from augers, rods, drill bits, the back of the drill rig, and other parts of the rig which contact augers and rods. Steam cleaning will be conducted on a decontamination pad, which will be constructed on-site in the event that drilling services are required.

Field instrumentation (such as interface probes, water quality meters, etc.) will be decontaminated between sample locations by rinsing with deionized water. If visible contamination still exists on the equipment after the rinse, an Alconox detergent scrub step will be added, and the probe thoroughly rinsed again.

Decontamination of non-disposable sampling equipment used to collect samples for chemical analyses will be conducted as described below:

1. Alconox detergent and potable water scrub
2. Potable water rinse
3. Rinse with 10 percent nitric acid (ultra pure grade) when sampling for inorganics. Carbon steel split-spoons will be rinsed with a 1 percent nitric acid solution to avoid stripping of metals.
4. Distilled water rinse
5. Air dry
6. Wrap or cover exposed ends of equipment with aluminum foil for transport and handling if not immediately used.

Decontamination of sampling equipment will be kept to a minimum in the field, and wherever possible, dedicated disposable sampling equipment will be used. Decontamination fluids will be stored in US Department of Transportation (DOT)-approved 55-gallon drums or in an on-site storage tank (liquids only) until proper disposal. Personnel directly involved in equipment decontamination will wear protective clothing in accordance with PWGC health and safety procedures.

## 5.0 SAMPLE CUSTODY AND DOCUMENTATION

Identification and documentation of samples are important in maintaining data quality. Strict custody procedures are necessary to ensure the integrity of the environmental samples. The subsections below address sample identification, packaging, shipping, and documentation.

### 5.1 Sample Identification System

The method of identification of a sample depends on the type of measurement or analysis performed. When field screening measurements (e.g., pH, turbidity) are made, data are recorded directly in logbooks or on field investigation forms (see Section 5.3). Identifying information such as project name, sample location and depth, date and time, name of sampler, field observations, remarks, etc. shall be recorded.

Each sample collected for off-site laboratory analysis during the field investigation will be specifically designated by PWGC for unique identification. Samples will be identified using a letter code to indicate sample collection methodology. A letter code (see below) will follow, along with the name and/or number that depicts the specific location. Field equipment blanks will be denoted by the letter code "FB" and trip blanks with TB. Sample collection date and time will be recorded in the field logbook/form, chain of custody as well as the sample label.

Letter code prefixes for monitoring activities are as follows:

- AS Air Sample,
- VS Sub-Slab Vapor Sample,
- MW Monitoring Well Groundwater Sample,
- FB Field Blank Sample, and
- TB Trip Blank Sample

At a minimum, all location and identification information for the samples shall be recorded in the field sampling logbook (see Section 5.3.2), and on the appropriate chain of custody record form for shipment (see Section 5.2.1). In addition, sampling location information may be entered into a computerized database during RA monitoring activities (if possible).

### 5.2 Sample Custody, Packaging and Shipping

Sample custody must be strictly maintained and carefully documented each time the sample material is collected, transported, received, prepared, and analyzed. Custody procedures are necessary to ensure the integrity of the samples, and samples collected during monitoring activities must be traceable from the time the samples are collected until they are disposed of and/or stored, and their derived data are used in the subsequent monitoring report. Sample custody is defined as (1) being in the sampler's possession; (2) being in the sampler's view, after being in the sampler's possession; (3) being locked in a secured container, after being in the sampler's possession; and (4) being placed in a designated secure area. Section 5.2.1 documents the on-site packaging and shipment procedures for sample custody in the field. The analytical

laboratories will maintain custody after arrival of the samples through internal logging procedures, as indicated in Section 5.2.2.

### *5.2.1 Field Custody, Packaging and Shipping Procedures*

Field custody procedures shall be implemented for each sample collected. The field sampler shall be responsible for the care and custody of the samples until they are properly transferred or dispatched. To maintain the integrity of the samples, the samples are to be stored in a designated, secure area and/or be custody sealed in the appropriate containers prior to shipment.

Each environmental sample will be properly identified and individually labeled. Labels will be filled out in indelible ink with at least the following information: sample identification (see Section 5.1), type and matrix of sample, date and time of sample acquisition, name of sampler, analysis required, and preservation (as necessary). The sample label will be securely attached to the sample container.

Environmental samples being analyzed by off-site laboratories will be properly packaged and shipped for analysis. Samples are to be packed with sufficient wet ice to cool the samples to 4°C. Additionally, each cooler will be packed with a cooler temperature blank (see Section 9.1.4). Lastly, the cooler should be filled with adequate cushioning material to minimize the possibility of container breakage. Any modifications to the previous procedures will be documented (see Section 13.0).

A laboratory supplied completed chain of custody form will be included with all sample shipments.

When the samples are being shipped by an overnight delivery service to the laboratory, the chain of custody form and any other paperwork shall be checked against the sample labels and field documentation, and then placed in a waterproof sealable plastic bag and taped securely to the inside lid of the cooler. The cooler must then be secured, with custody seals affixed over the lid opening in at least two locations, and the cooler wrapped with strapping tape (without obscuring the custody seals). Orientation "this end up" arrows shall be drawn or attached on two sides of the cooler, and a completed overnight delivery service shipping label shall be attached to the top of the cooler.

Samples to be shipped by an overnight delivery service shall be shipped within 24 hours of sample collection and arrive at the laboratory within 24 hours of sample shipment. A member of the field team will notify the laboratory of a sample shipment.

### *5.2.2 Laboratory Custody Procedures*

The following generally summarizes laboratory custody procedures; more detailed operations are presented in the laboratory's SOPs.

- A designated sample custodian will accept custody of the shipped samples and will verify that the information on the sample labels matches that on the chain of custody record(s),

- The laboratory custodian will use the sample label number or assign a unique laboratory number to each sample label and will assure that all samples are transferred to the proper analyst or stored in the appropriate secure area; and,
- Laboratory personnel are responsible for the care and custody of samples from the time they are received until the sample is exhausted or returned to the custodian or sample storage area. Internal chain of custody records shall be maintained by the laboratory.

The laboratory shall communicate with PWGC personnel by telephone, Email or facsimile, as necessary, throughout the process of sample scheduling, shipment, analysis and data reporting, to ensure that samples are properly processed. If a problem occurs during sample shipment or receipt (e.g., a sample container arrives broken or with insufficient sample volume, a sample was not preserved correctly, a sample was not listed on the chain of custody, etc.), the laboratory shall immediately notify the appropriate person for resolution. Corrective actions shall be documented and approved before implementation; see Section 13.0.

Samples received by the laboratory will be retained until analyses and QA checks are completed. When sample analyses and necessary QA checks have been completed, the unused portion of the sample and the sample container must be disposed of properly by the laboratory. All identifying tags, data sheets, and laboratory records shall be retained as part of the permanent documentation.

## 5.3 Sample Documentation

### *5.3.1 Sample Logbook*

A cumulative sampling log will be maintained by the FOL or his designee as the monitoring program progresses. All of the samples will be referenced by sampling location in this master log and on a detailed site map. The log data will be maintained as the table of contents for the sample logbook. The sample logbook shall be a loose-leaf notebook containing sample log sheets, as shown in Figure 5-2, or pages of a similar data management format, which includes all the necessary information items. A sample log sheet (or equivalent) must be filled out for each sample from the information recorded in the field notebook (see Section 5.3.2).

### *5.3.2 Site and Field Logbooks*

A bound weatherproof master site logbook will be kept by the FOL or an otherwise designated holder. The site logbook is a controlled document that records all major on-site activities during monitoring activities. At a minimum, the site logbook shall contain an abbreviated version of the notes listed in the team or individual field logbooks, a summary of sampling identifiers and shipment information, visitor's names and arrival/departure times, community contacts, and other site-specific information determined by the FOL to be noteworthy. In addition, prior to field work each day, the personnel on the site, the proposed activities and the weather shall be recorded in the site logbook. Discussions of program activities, field difficulties/problems, and deviations from the SMP, the QAPP and/or other site plans (with justification) must also be included in the logbook record, along with corresponding times.

**FIGURE 5-2**
**SAMPLE LOG SHEET (TYPICAL)**

I. SAMPLE IDENTIFICATION

USEPA WAM: _____ PROJECT MANAGER: _____
SITE: _____
SAMPLE NAME/NUMBER: _____ DATE: _____ TIME: _____ HRS
SAMPLING LOCATION/DEPTH: _____ TYPE: _____ GRAB:_____ COMPOSITE
SAMPLE MATRIX: _____ SURFACE WATER _____ GROUNDWATER _____ SEDIMENT
_____ SOIL _____ WASTE _____OTHER (SPECIFY) _____
SAMPLED BY: _____

I. SAMPLE SOURCE

_____ WELL _____ OUTFALL _____ LEACHATE
_____ DRUM _____ BORING _____ RIVER/STREAM
_____ BLDG/STRUCTURES _____ TANK _____ IMPOUNDMENT
_____ TEST PIT/TRENCH _____ OTHER (SPECIFY)_____
SOURCE DESCRIPTION _____
_____

III. FIELD OBSERVATIONS/MEASUREMENTS

APPEARANCE/COLOR: _____
VOLATILE ORGANIC ANALYSIS (VOA): _____ HNU _____ OVA _____ OTHER
VOA READINGS: OFF SAMPLE _____ RESPIRATORY ZONE _____
LEL/$O_2$/$H_2S$ READINGS: _____
RADIOACTIVITY (mR/hr): _____
pH: _____ CONDUCTIVITY: _____ TEMPERATURE _____
SALINITY: _____ OTHER: _____
OBSERVATIONS: _____

IV. SAMPLE DISPOSITION

PRESERVATION: _____
LABORATORY NAME: _____
LABORATORY LOCATION: _____ ON-SITE _____ OFF-SITE
FORWARDED TO LABORATORY: DATE _____ TIME: _____ HRS
LABORATORY SAMPLE NO.: _____
CHAIN OF CUSTODY NO.: _____ FED EX NO.: _____

### 5.3.3 Additional Remarks

The sampling team or any individual performing a particular monitoring activity shall be required to maintain a field logbook. Each logbook will be controlled and assigned a unique sequential identification (e.g., the second logbook devoted to groundwater monitoring well sampling activities would be designated "Well Sampling Logbook No. 2"). The field logbook shall be a bound weatherproof notebook, and entries to the logbook must be filled out legibly in ink. Pertinent information to be recorded in field logbooks includes all information that is necessary to reconstruct the investigative/sampling operations. Documentation of sample activities in the field logbook shall be completed immediately after sampling at the location of sample collection. Logbook entries shall contain all sample information, including sample number, collection time, location, descriptions, field measurements, and other site- or sample-specific observations. Difficulties with sample recovery and field observations (e.g., odor, visible contamination, etc.) must be noted if encountered.

If photographs are taken as part of the documentation procedure, the name of the photographer, the date, the time, the site name, the site location, and a description of the photo shall be entered sequentially in the field logbook as the photographs are taken. Once developed, the photographic prints shall be numbered in correspondence to the logbook numbers, and the above information shall be placed on the back of the photograph. If an electronic camera is used, photo labels will be attached to the electronic file as well.

Logbook pages (for both the master site logbook and the field logbooks) shall be consecutively numbered, and upon entry of data, the logbook pages require the date and the signature of the responsible project team member at the bottom of each page. Corrections to the logbooks shall consist of a single strike line through the incorrect entry, the new accurate information, the initials of the corrector, and the date of amendment. Any blank spaces/pages in the logbooks shall be crossed out with a single strike mark and signed by the person making the notation.

### 5.3.4 Field Investigation Forms

In addition to field logbooks, field team members will use appropriate forms applicable to the field activities. A well installation sheet shall detail the construction of the monitoring wells should the installation of a replacement new monitoring well be necessary. During development of monitoring wells, a data sheet shall be filled out for each well and field parameters recorded.

Laboratory supplied chain of custody forms shall be used for all sample shipments.

Records of calibration attainment and preventive maintenance shall be kept for all field instrumentation used that require daily calibration. Further information on calibration and maintenance procedures can be found in Section 8.0.

### *5.3.5 On-Site Screening Analysis Records*

Field data for water level measurements, PID screening, dissolved oxygen measurements, pH measurements, conductivity measurements, temperature measurements, and turbidity measurements (see Table 3-1) will be reported by site personnel in field logbooks and/or on field investigation forms associated with the sampling event (see Sections 5.3.2 and 5.3.3).

## 6.0 ANALYTICAL REQUIREMENTS

The analytical program to be undertaken at the site is summarized in Table 6-1. Sample collection and analytical protocol information, which includes the following: sample type, matrix, sampling device, number of samples, analytical parameter, sample container requirements, sample preservation, analytical method, detection limits, and sample holding times, are presented in Table 6-2.

Results from the analyses are to be reported in standard units for the matrix and analysis. For further information on reporting units, see Tables 3-1 and 6-2.

Analytical services will be provided by a NYSDOH ELAP approved laboratory. The laboratory will follow NYSDEC Analytical Sampling Protocol (ASP) and provide data with Category B deliverables (ASP-B). Analyses not available using ASP-B will be provided in results only format.

**Table 6-1**

**Analytical Program**

| Sample Type | Field Screening | VOCs | Water Quality Parameters | Field Meas. |
|---|---|---|---|---|
| GROUNDWATER (SEMI-ANNUAL): | | | | |
| Groundwater | -- | 12 | 12 | 12 |
| Field Blanks | -- | 1 | -- | -- |
| Trip Blanks | -- | 1 | -- | -- |
| INDOOR AIR (ANNUAL): | | | | |
| Air | -- | 5 | -- | -- |
| Sub-Slab Vapor | -- | -- | -- | -- |
| Field Blanks | -- | -- | -- | -- |
| Trip Blanks | -- | -- | -- | -- |

Notes:

1. The table does not include field environmental duplicate samples or laboratory QA/QC samples.
2. Field measurements: dissolved oxygen, pH, conductivity, temperature, and turbidity.
3. QA/QC blanks are estimated on the basis of 1trip blank/day/matrix when VOC samples are collected; and at least 1 field blank/decontamination event/type of sampling equipment, not to exceed one per day/matrix.

**TABLE 6-2**
**SAMPLE COLLECTION AND ANALYSIS PROTOCOLS**

| Sample Type | Matrix | Sampling Device | No. of Samples | Parameter | Sample Container | Sample Preservation | Analytical Method# | CRQL / MDL | Holding Time |
|---|---|---|---|---|---|---|---|---|---|
| Groundwater (Monitoring Wells) | Water | Low Flow Pump or dedicated bailer | 1/two minutes of purging | pH; conductivity; dissolved oxygen; temp.; turbidity | NA | NA | Field measurement | NA | NA |
| Outdoor Air | | | 18/round | VOCs | (4) 40 ml VOA vials w/Teflon lined septum | 1:1 HCl to pH<2; Cool to 4°C | EPA Method 8260B | Compound specific (1-5 ug/L) | 10 days |
| Indoor Air | Air | 6-L SUMMA® canisters | 8/round | VOCs | 6-L SUMMA® canisters | Ambient Temp | EPA Method TO-15 | 5 ug/$m^3$ | 14 days |
| Field Blank (groundwater) | Water | Collected Rinsate Passed Over/ Through Sampling equipment | 3 | VOCs | (4) 40 ml VOA vials w/Teflon lined septum | 1:1 HCl to pH<2; Cool to 4°C | EPA method 8260B | Compound specific (1-5 ug/l) | 10 days |
| MS/MSD (groundwater) | Water | Low Flow Pump or Dedicated bailer | 2/round | VOCs | (8) 40 ml VOA vials w/Teflon lined septum | 1:1 HCl to pH<2; Cool to 4°C | EPA method 8260B | Compound specific (1-5 ug/l) | 10 days |
| Trip Blank | Water | Direct Fill of Sample Bottles | 2/round | TCL Volatile Organic Compounds | (4) 40 ml VOA vials w/Teflon lined septum | 1:1 HCl to pH<2; Cool to 4°C | EPA Method 8260B | Compound specific (1-5 ug/l) | 10 days |

*Notes*:
All holding times listed are from Verified Time of Sample Receipt (VTSR) unless noted otherwise. * Holding time listed is from time of sample collection.
The number in parentheses in the "Sample Container" column denotes the number of containers needed. All bottles will comply with OSWER Directive 9240.0-05A: "Specifications and Guidance for Obtaining Contaminant - Free Sample Containers", EPA 540/R-93/051, December 1992.
Triple volume required when collected MS/MSD samples
The number of field blanks, trip blanks and MS/MSDs are estimated.
(1) Targeted volatile organic compounds include trichloroethene, 1,1,1-trichloroethane, and tetrachloroethene.
CRQL / MDL = Contract Required Quantitation Limit / Method Detection Limit.
NA = Not available or not applicable.

## 7.0 SUPPLIES AND CONSUMABLES

Supplies and consumables necessary for the field investigation will be obtained through appropriate commercial markets and shall meet any supply-specific requirements outlined in the SMP and/or this QAPP. All supplies and consumables will be inspected by PWGC personnel (e.g., the FOL, the Site Geologist) prior to use. Any supplies/consumables that do not meet requirements will be discarded or returned to the supplier.

Supply-specific requirements include the following:

- Sampling equipment shall be manufactured from the procedural-specific material (e.g., teflon lined polyethylene tubing for groundwater sampling, etc.).
- Sample bottle containers will be supplied by the analytical laboratory and will meet all guidelines specified in Specification and Guidance for Obtaining Contaminant-Free Sample Containers (EPA 540/R-93/051) and OSWER Directive 9240.0-05A (EPA, 1992).
- The field QC sample water will be distilled or de-ionized water that is contaminant-free. Certifications from the supplier will be retained in the project files or by analytical laboratory.
- The drilling subcontractor (if drilling services are necessary) may be required to provide a potable water supply for equipment decontamination, depending on availability of water at the site. Any necessary permits or testing will be obtained or reviewed/approved by PWGC. Documentation of the potable water source will be retained in the project files.
- Decontamination chemical supplies shall be of ultra pure grade (nitric acid). Certifications from the supplier will be provided and retained in the project files. In addition, MSDS for the chemicals will be maintained at the site.
- Field screening instrumentation supplies shall be of procedural- and/or manufacturer-specific grade.

Supplies and consumables will be stored, as necessary, in a designated area on the site. The storage area shall be protected from adverse conditions (e.g., weather, heat, etc.) to protect the supplies/consumables from possible outside contamination and breakage.

# 8.0 INSTRUMENT CALIBRATION AND PREVENTIVE MAINTENANCE

## 8.1 Calibration

This section describes the requirements for control, calibration, and adjustment of instrumentation. Instruments shall be calibrated and adjusted (if warranted) at specified, predetermined intervals using known, recognized standards. All instruments shall be calibrated in accordance with manufacturer's instructions.

### *8.1.1 Field Instrumentation*

The FOL or his designee will be responsible for ensuring that instrumentation are of the proper range, type and accuracy for the measurement/test being performed, and that all of the equipment are calibrated at their required frequencies, according to their specific calibration protocols/procedures.

All field measurement instruments must be calibrated according to the manufacturer's instructions prior to the commencement of the day's activities. Exceptions to this requirement shall be permitted only for instruments that have fixed calibrations pre-set by the equipment manufacturer. QC objectives for field measurement parameters are presented in Table 3-1. Calibration information shall be documented on instrument calibration and maintenance log sheets (see Figure 8-1 for a typical form) or in a designated field logbook. Information to be recorded includes the date, the operator, and the calibration standards (concentration, manufacturer, lot number, expiration date, etc.). All project personnel using measuring equipment or instruments in the field shall be trained in the calibration and usage of the equipment (see Section 12.0), and are personally responsible for ensuring that the equipment has been properly calibrated prior to its use.

In addition, all field instruments must undergo response verification checks at the end of the day's activities and at any other time that the user suspects or detects anomalies in the data being generated. The checks consist of exposing the instrument to a known source of analyte (e.g., the calibration solution), and verifying a response. If an unacceptable instrument response is obtained during the check (i.e., not within specifications; see Table 3-1), the data shall be labeled suspect, the problem documented in the site logbook, and appropriate corrective action taken. See Section 13.0 for further information on corrective action procedures.

**FIGURE 8-1**

**EQUIPMENT CALIBRATION AND MAINTENANCE FORM (TYPICAL)**

**Instrument (Name / Model No. / Serial No.):** _____

**Manufacturer:** _____ **Date Purchased or Leased:** _____

***CALIBRATION LOGSHEET***

| Calibration Date | Initial Settings | Standard(s) Used | Procedure | Adjustments Made | Final Settings | Signature of Operator | Comments |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

***MAINTENANCE LOGSHEET***

| Maintenance Date | Reason for Maintenance | Maintenance Performed | Signature of Operator | Comments |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Any equipment found to be out of calibration shall be recalibrated. When instrumentation is found to be out of calibration or damaged, an evaluation shall be made to ascertain the validity of previous test results since the last calibration check. If it is necessary to ensure the acceptability of suspect items, the originally required tests shall be repeated (if possible), using properly calibrated equipment. Any instrument consistently found to be out of calibration shall be repaired or replaced.

#### *8.1.2 Laboratory Instrumentation*

Personnel at the laboratory will be responsible for ensuring that analytical instrumentation are of the proper range, type and accuracy for the test being performed, and that all of the equipment are calibrated at their required frequencies, according to specific protocols/procedures.

Off-site laboratory equipment shall be calibrated using certified/nationally recognized standards and according to the applicable methodologies and the laboratory SOPs. In addition, these methods/procedures specify the appropriate operations to follow during calibration or when any instrument is found to be out of calibration. Information on and frequency for laboratory QC samples are presented in Section 9.2 and/or the specified analytical method procedures.

### 8.2 Preventive Maintenance

#### *8.2.1 Field Instrumentation*

Field equipment shall be maintained at its proper functional status in accordance to manufacturer manual specifications. A check of the equipment shall be performed before field activities begin, and any potential spare parts (e.g., batteries, connectors, etc.) and maintenance tools will be brought on site, to minimize equipment downtime during the field activities. Routine preventive maintenance shall be performed to assure proper operation of the equipment. Any maintenance performed on field equipment will be documented on instrument calibration and maintenance sheets or in the designated field logbook, and shall be undertaken by personnel who have the appropriate skills and/or training in the type of maintenance required (see Section 12.0).

#### *8.2.2 Laboratory Instrumentation*

The laboratory is responsible for the maintenance of their analytical equipment, in accordance with manufacturers' specifications. Analytical personnel will be responsible for ensuring that instrumentation is functioning properly and within specific guidelines/specifications prior to starting any analysis. Maintenance, performed by either laboratory personnel or the manufacturer's service personnel, will be conducted according to manufacturer's recommendations and procedures.

## 9.0 QUALITY ASSURANCE/QUALITY CONTROL SAMPLE REQUIREMENTS

This section will discuss the type and quantities of QA/QC samples to be utilized during implementation of the field programs. The site-specific number and type of QA/QC samples are discussed in Section 6.0.

### 9.1 Field Quality Control Samples

The subsections below present general information and guidance on field QC samples, including definition and frequency of QC blanks. Field QC samples will be labeled and shipped according to the procedures outlined in Section 5.0.

#### *9.1.1 Field Blanks*

A field blank will be collected to evaluate the potential for contamination of environmental samples from inadequate decontamination of field equipment. Field blanks shall be collected by pouring laboratory supplied distilled/de-ionized (DI) water over and/or through decontaminated non-disposable equipment or disposable equipment, and collecting the rinsate (see Section 4.2 for decontamination procedures). Field blanks will be collected at a frequency of one per decontamination event per type of sampling equipment, not to exceed one per day per sample matrix. Preservation and analysis of field blanks will be identical to that of the associated environmental samples (see Table 6-2).

During the groundwater sampling utilizing the low flow sampling and purging method, the field blank will be collected after sampling from the most contaminated well (as per previous data and/or location estimation). This blank will be collected by pumping DI water through the decontaminated low flow sampling apparatus and collecting the rinsate. If dedicated pumps are used, a field blank will not be collected.

#### *9.1.2 Trip Blanks*

A trip blank serves to detect possible cross-contamination of samples resulting from handling, storage and shipment procedures. Trip blanks will accompany VOC glassware in transit through sample collection and shipment to the laboratory. In addition, trip blanks are stored by the laboratory under the same conditions as the environmental samples. A trip blank will accompany each cooler containing samples submitted for VOC analysis, and will be preserved as per the groundwater samples and analyzed identically to the associated environmental samples. VOC samples will be consolidated in one cooler for daily shipment, if possible, to minimize the number of trip blanks required in the field program. It is anticipated that only one trip blank per day will be necessary.

#### *9.1.3 Temperature Blanks*

A temperature blank will be sent with each cooler of samples to verify that the cooler temperature has been maintained at 4 [illegible] preserved VOA vial shall be filled with either potable or DI water, and labeled with "USEPA cooler temperature indicator" and the date. If supplied, the laboratory's temperature blank will be used in place of the VOA vial. The laboratory shall record the temperature of the blank water on the chain of custody immediately upon cooler arrival.

### *9.1.4 Field Environmental Duplicate Samples*

Duplicate environmental samples will be analyzed by the off-site laboratories to evaluate the reproducibility of the sampling procedures. Duplicate samples will be collected at a rate of five percent of the total samples for each specific matrix for each type of analysis (i.e., one duplicate for up to every 20 samples). The duplicate samples will be collected from the same location and at the same time as the original environmental sample; however, the duplicated samples will be "coded" in such a manner that the laboratory will not be able to determine of which original field sample they are duplicated (i.e., "blind" duplicates). For example, the duplicate sample of location MW01 may be "coded" as location MW21, as long as there are not more than twenty groundwater monitoring wells being sampled (i.e., the coded sample name should not be assigned a legitimate sample location identification). An explanation of the duplicate "coding" must be written in the field logbook. Preservation and analysis of duplicate samples will be identical to those for the environmental samples. Precision of field data will be evaluated based on the calculation of Relative Percent Difference (RPD), with acceptance criteria of 25 percent for the off-site laboratory samples. Blind duplicate samples will be collected in the same manner as the environmental samples.

## 9.2 Laboratory Quality Control Samples

General information and guidance on laboratory QC samples are presented in the subsections below. A summary of QC procedures, frequencies, criteria, and corrective actions for the samples, as determined by the applicable method guidelines (see Section 6.0), is provided in Table 9-1.

### *9.2.1 Method Blanks/Preparation Blanks*

A method blank (for organics) or a preparation blank (for inorganics) will be analyzed with every batch of samples to ensure that contamination has not occurred during the analytical process. Method blanks consist of a portion of analyte-free water or solid that is processed through the entire sample procedure the same as an environmental sample.

### *9.2.2 Matrix Spikes/Matrix Spike Duplicates*

Matrix spike/matrix spike duplicate samples (also known as spike/duplicate samples) will be used to assess precision and accuracy of the analytical methods. In this procedure, three aliquots of an actual field sample are collected at a specific location, and two aliquots are “spiked” by the addition of known amounts of an analyte or analytes and these samples are then analyzed identically to the field samples. A comparison of the resulting concentration to the original sample concentration and among the two “spiked” sample concentrations provides information on the ability of the analytical procedure to generate a correct result from the sample. Matrix spike/matrix spike duplicate samples will be collected in the field at a rate of five percent, and will be analyzed on a per batch basis, with up to 20 samples per week constituting a batch. The validity of matrix spike/matrix spike duplicate recovery and relative percent difference values will be determined using the acceptance criteria stated in Table 9-1.

**TABLE 9-1 (Sheet 1 of 4)**
**SUMMARY OF ANALYTICAL QC PROCEDURE CHECKS, FREQUENCIES, ACCEPTANCE CRITERIA, AND CORRECTIVE ACTIONS FOR LABORATORY SAMPLE ANALYSES**

| ***Parameter*** | ***Method*** | ***QC Procedure*** | ***Frequency*** | ***Acceptance Criteria*** | ***Corrective Action*** |
|---|---|---|---|---|---|
| VOCs (aqueous) | EPA Method 8260B | Method Blank | 1 every 12 hours | no constituent > CRQL | suspend analysis until source rectified |
| | | Surrogate Compounds | all samples | 80-120%R | check calculations and instruments, reanalyze affected samples |
| | | Internal Standards | all samples | ± 40%R, ± 20 sec retention time shift | check calculations and instruments, reanalyze affected samples |
| | | Laboratory Control Sample | 1 per ≤ 20 samples | 60-140%R | check calculations and instruments, reanalyze affected samples |
| VOCs (air) | EPA Method TO-15 | Method Blank | 1 per 24 hrs or 20 samples | no constituent > CRQL | suspend analysis until source rectified |
| | | Internal Standards | all samples | ± 40% R, ± 33 sec retention time shift | check calculations and instruments, reanalyze affected samples |
| | | Laboratory Control Sample | 1 per ≤ 20 samples | 70-130%R | check calculations and instruments, reanalyze affected samples |

*Notes:*

Abbreviations include:
VOCs = volatile organic compounds
%R = Percent Recovery
CRQL = Contract Required Quantitation Limit RPD = Relative Percent Difference

### 9.2.3 Laboratory Control Samples

A laboratory control sample (LCS) consists of an analyte-free water or solid phase sample that is spiked with target analytes at a known concentration. The LCS shall be analyzed for every batch of samples (i.e., 1 per 20) to assess the ability of the analytical procedure to generate a correct result without matrix effects/interferences affecting the analysis. The percent recoveries for the LCS compounds will be compared to QC limits stated in the appropriate methods, and are presented in Table 9-1.

### 9.2.4 Surrogate Compounds

Surrogates (also known as System Monitoring Compounds) are compounds of known concentrations added to every organic analysis sample for analytical chromatography methods at the beginning of the sample preparation to monitor their recovery. Surrogate recoveries will be used to assess potential matrix interferences and to monitor any potential effects of sample preparation and analysis on final analyte concentrations. The recovery values will be compared to values established in the applicable methodologies to determine the validity of the data (see Table 9-1).

### 9.2.5 Internal Standards

Internal standards are used to provide instrument correction for variation in instrument performance and injection volumes. Internal standards also establish relative response factors for the analytes.

### 9.2.6 Interference Check Samples

An interference check sample (ICS), which contains target analytes at known concentrations, verifies the laboratory's interelement and background correction factors. Analysis of ICS samples is unique to metals analysis using the inductively coupled plasma (ICP) method.

## 10.0 DATA REDUCTION, VALIDATION AND REPORTING

Standard methods and references will be used as guidelines for data handling, reduction, validation, and reporting. All data for the project will be compiled and summarized with an independent verification at each step in the process to prevent transcription/typographical errors. Any computerized entry of data will also undergo verification review.

### 10.1 Data Reduction

#### *10.1.1 Field Data Reduction*

Field instrumentation data will be reported by site personnel in field logbooks and/or on field investigation forms associated with the monitoring event (see Section 5.3). At the end of each monitoring event, the field screening data results shall be summarized in a computerized database and/or in tabulated form, as warranted.

#### *10.1.2 Laboratory Data Reduction*

All data generated by the off-site laboratory will be reported in a specified format containing all required elements to perform data validation (see Section 10.3.1). Analytical results shall be presented on standard NYSDEC ASP-B forms or equivalents, and include the dates the samples were received and analyzed, and the actual methodology used. Laboratory QA/QC information required by the method protocols will be compiled, including the application of data QA/QC qualifiers as appropriate. In addition, laboratory worksheets, laboratory notebooks, chains-of-custody, instrument logs, standards records, calibration records, and maintenance records, as applicable, will be provided in the laboratory data packages to determine the validity of data. Specifics on internal laboratory data reduction protocols are identified in the laboratory's SOPs.

#### *10.1.3 Project Data Reduction*

Following receipt of the laboratory analytical results by PWGC, the data results will be compiled and presented in an appropriate tabular form. Where appropriate, the impacts of QA/QC qualifiers resulting from laboratory or external validation reviews will be assessed in terms of data usability.

#### *10.1.4 Non-Direct Measurements*

If information necessary for the project has not been measured directly in the field, non-direct measurement data may be obtained from literature files, texts, computer databases, etc. References utilized will be acknowledged sources within the specific discipline. An explanation of the rationale behind using the reference and a description of any concern regarding the use of the referenced data (e.g., uncertainty, conflicting literature, etc.) shall be made within the report. Non-direct measurement data, after usage, will be filed within the project files for the length of the project.

### 10.2 Data Validation

The data results obtained from the laboratories will be sent to a third party to undergo a systematic data validation to provide assurance that the data is adequate for its intended use (i.e., in assessing the effectiveness of site activities). The validation will be performed by personnel who have appropriate training and/or experience in performing data validation for the analyses of interest associated with the project.

Validation will be performed based on an evaluation of method-specific QC information (such as holding times, calibration records, laboratory and field blanks, duplicate precision, and surrogate and matrix spike recovery; see Section 9.0) and the best professional judgment of the validator. Validation will be performed utilizing guidance from the most current updates of the USEPA Region II validation SOPs for SW846 methodologies, if available, and from the USEPA Region II CLP SOPs, modified for the specific methodology, if not.

Deviation from the USEPA Region II Data Validation SOPs will be documented along with a discussion of the appropriateness of the deviation for EPA approval. Deviation from the USEPA Region II Data Validation SOPs will not compromise State or Federal Applicable or Relevant Appropriate Requirements. Qualifiers (as applicable) will be added to the data result tables by manual computer entry. All keyed entries will be verified and signed off as checked by the QA Officer or his designee.

## 10.3 Data Reporting

### *10.3.1 Contents of Laboratory Data Reports*

The laboratories performing analysis work on this project will submit a hardcopy data package and an electronic deliverable.

The hardcopy laboratory report, and any associated electronic deliverable files, will be sent directly to PWGC, and will contain information such as:

- Title and Location of the Project
- Project Identification Number
- Name of the Report
- Date Report was Prepared
- Name, Address and Telephone Number of the Laboratory
- Case Narrative
- Sample Identification Number
- Name and Location of Sample
- Type of Sample (e.g., water, air)
- Analysis performed
- Parameter results
- Any special observations, circumstances or comments which may be relevant for interpretation of the data
- Signature of laboratory manager

The laboratory report will include a written case narrative, which will note any problems encountered in receipt or during analysis of the samples, and the corrective actions utilized (including telephone logs, etc.). Each laboratory report will include supporting documentation, such as copies of chromatograms,

data system printouts, internal sample tracking documentation, sample preparation and analysis logbooks, and standard preparation data, as appropriate. Each constituent tested will include the name of parameter, the CAS number (if applicable), approved testing procedure references, results of analysis, and the units of the reported results.

Non-ASP data will be supplied in "results only" format. At a minimum, results only data sheets will include:

- Title and Location of the Project
- Project Identification Number
- Name of the Report
- Date Report was Prepared
- Name, Address and Telephone Number of the Laboratory
- Sample Identification Number
- Name and Location of Sample
- Type of Sample (e.g., water, air)
- Analysis performed
- Parameter results
- Any special observations, circumstances or comments which may be relevant for interpretation of the data

### *10.3.2 Contents of Reports*

The results of the monitoring and sampling activities will be summarized in a monitoring report, and data tables containing the laboratory results, showing all detects and non-detects, detection limits for non-detects, and data qualifiers, will be included. In addition, results of previous monitoring events will be included in the data table set. Appropriate figures illustrating sample locations will also be included. A qualitative evaluation of the usability of the data, along with justification for excluding any data if warranted, will also be provided in the report.

Comparison of the acquired site data to existing standards and guidelines (e.g., drinking water standards) and site cleanup criteria will be performed to assist in the evaluation of the effectiveness of RA activities. In addition, indoor air sample results will be compared to criteria specified in the SMP to ensure that detected concentrations of VOCs are within limits that may be harmful to on-site workers. Groundwater data will also be presented in potentiometric contour maps and in iso-concentration plume maps within the Report.

The PWGC PM shall review all reports prior to submission to ensure compliance with project requirements.

## 11.0 PERFORMANCE AND SYSTEMS AUDITS

The PWGC PM and/or FOL will conduct a "readiness review" for field activities, prior to the commencement of monitoring program. Equipment and supplies will be inventoried, and field instrumentation will be checked to ensure that all are in working order. Any maintenance activities performed during the "readiness review" are to be documented on instrument maintenance sheets or in a designated field logbook.

Internal systems and performance audits will be conducted by the off-site laboratories in accordance with USEPA analytical methodology requirements and the laboratory SOPs. The laboratories shall cooperate with USEPA or other regulatory agency personnel with Agency-requested internal technical systems and/or performance audits.

Surveillance of field program activities will be conducted by the PM and FOL. The QA Officer and/or a member of the QA/QC staff will accompany sampling personnel into the field for one or two days annually to verify that sampling is being correctly implemented according to the SMP and this QAPP. Additional inspections may be warranted to ensure that corrective actions of major deficiencies/problems identified in an initial inspection have been implemented/addressed.

The audit will be documented and uniquely identified for tracking purposes, and all deficiencies noted during the audit shall be identified, with a recommended corrective action for compliance. The Quality Assurance/Data Quality Officer shall evaluate all audit corrective action responses and inform the PM/subcontractor organization of the closure of any or all of the deficiencies noted during the audit. A log of the audits conducted and responses thereto shall be maintained by the Quality Assurance/Data Quality Officer.

## 12.0 TRAINING OF PROJECT STAFF

PWGC will establish requirements for training and qualification of project personnel to ensure that they are capable of performing all required monitoring activities.

Performance-based testing will be provided to all appropriate personnel performing project activities. Performance-based testing involves the review of the personnel's work products by the PM, FOL, Quality Assurance/Data Quality Manager and/or QA Officer, until the monitored individual reaches the desired level of competence in performing his work tasks. Once a person exhibits the required degree of competence, unannounced periodic monitoring is performed to ensure this level is maintained.

### 12.1 General Personnel Training

Project staff shall receive general training on the project objectives, the DQOs for the site, and the SMP.

### 12.2 Quality Assurance Training

Training will include topics related to Quality Assurance. It will cover, but not be solely limited to:

- QAPP elements, including project-specific QA requirements
- Need for proper documentation and records maintenance
- Responsibilities of project personnel
- Handling and review of field, laboratory and non-direct measurement data

### 12.3 Training Records

PWGC will complete and maintain all training records in the project files. They will include, as appropriate:

- Attendance sheets
- Records of course content, including dates of training and the instructor's name
- Training logs and curricula
- Personnel training record
- Formal qualification/certification records (as applicable)

## 13.0 CORRECTIVE ACTION

Review and implementation of systems and procedures may result in recommendations for corrective action. Any deviations from the specified procedures within approved project plans due to unexpected site-specific conditions shall warrant corrective action. All errors, deficiencies, or other problems shall be brought to the immediate attention of the PWGC PM, who in turn shall contact the Quality Assurance/Data Quality Manager or his designee (if applicable).

Procedures have been established to ensure that conditions adverse to data quality are promptly investigated, evaluated and corrected. These procedures for review and implementation of a change are as follows:

- Define the problem.
- Investigate the cause of the problem.
- Develop a corrective action to eliminate the problem, in consultation with the personnel who defined the problem and who will implement the change.
- Complete the required form describing the change and its rationale (see below for form requirements).
- Obtain all required written approvals.
- Implement the corrective action.
- Verify that the change has eliminated the problem.

During the project, all changes to the monitoring program or SSDS operation will be documented in field logs/sheets and the PWGC PM will be advised.

If any problems occur with the laboratory or analyses, the laboratory must immediately notify PWGC PM, who will consult with other PWGC project staff. All approved corrective actions shall be controlled and documented.

All corrective action documentation shall include an explanation of the problem and a proposed solution which will be maintained in the project file or associated logs. Each report must be approved by the necessary personnel (e.g., the PM) before implementation of the change occurs. The PWGC PM shall be responsible for controlling, tracking, implementing and distributing identified changes.

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