Former Hamilton Reproduction

DUTCHESS COUNTY, NEW YORK

Site Management Plan

NYSDEC Site Number: B-00020-3

Prepared for:

James L. Taylor Manufacturing
108 Parker Avenue
Poughkeepsie, New York

Prepared by:

The Chazen Companies
547 River Street
Troy, New York
518-273-0055

I certify that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER10) and any DER approved modifications.

QEP: Mr. Dan Stone, P.E.

Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date
1	5/13/2010	SSDS clarifications, revised groundwater monitoring schedule and Chazen contact	

MAY 2010

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1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 INTRODUCTION

This document is required as an element of the remedial program at Former Hamilton Reproduction (hereinafter referred to as the "Site") under the New York State (NYS) Environmental Restoration Program (ERP) administered by New York State Department of Environmental Conservation (NYSDEC). The site was remediated in accordance with State Assistance Contract (SAC) #C-301371, Site # B-00020-3, which was executed on March 29, 1999.

1.1.1 General

The City of Poughkeepsie entered into a SAC with the NYSDEC to remediate a 1.96 acre property located in Dutchess County, City of Poughkeepsie, New York. This SAC required the Remedial Party, The City of Poughkeepsie, to investigate and remediate contaminated media at the site. A figure showing the site location is provided in Figure 1. The boundaries of the site are more fully described in the metes and bounds site description that is part of the survey provided Appendix B with the Environmental Easement.

After completion of the remedial work described in the August 1999 Remedial Action Work Plan, some contamination was left in the subsurface at this site, which is hereafter referred to as 'remaining contamination.' This Site Management Plan (SMP) was prepared to manage remaining contamination at the site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, dated November 2009, 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. A copy of the Environmental Easement is included in Appendix B.

This SMP assumes that future use of the site will be for an industrial building with a paved parking lot, and that site water and sewer service will be provided via municipal utilities. It is expected that the current owner (City of Poughkeepsie) will sell the property to James L. Taylor Manufacturing prior to development, which will implement this SMP as part of site development.

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 Dutchess 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 SAC (#C-301371; Site #B-0002-3) for the site, and thereby subject to applicable penalties.

1.1.3 Revisions

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

1.2 SITE BACKGROUND

1.2.1 Site Location and Description

The site is located in the City of Poughkeepsie, County of Dutchess, New York and is identified as Section 6162 Block 54 and Lot 240389 on the Dutchess County Tax Map. The site is an approximately 1.96-acre area bounded by James L. Taylor Manufacturing and residences to the north, Dutchess County Jail to the south, North Hamilton Road to the east, and storage for James L. Taylor Manufacturing to the west (see Figure 1). The boundaries of the site are more fully described in Appendix B which includes the Metes and Bounds survey.

1.2.2 Site History

The site is currently used as an unpaved parking lot. According to James L. Taylor Manufacturing, a pile of soil noted on the survey is excess soil generated during the City's site grading for the parking lot.

According to Sanborn Fire Insurance Maps, the site has been consistently occupied since 1913 by manufacturing and printing facilities. Previous occupants included: Seneca Button Company, which manufactured buttons; Gottlieb Brothers, which manufactured silk garments; Gottlieb Brothers Production Company, which manufactured women's clothing; Daystrom Electronic Corporation Plant (1952) and International Business Machines (IBM) (1958-1982) which manufactured, assembled, and stored electronics; and Hamilton Printing Corp. Site buildings previously included a one-story building with a below-grade crawl space and a structure for the facility heating boiler. These buildings are no longer present at the site.

Previous investigations conducted at the property included a 1995 Phase I Environmental Site Assessment, a 1996 Limited Subsurface Investigation, and a 1998 Site Investigation/Remedial Alternatives Report.

1.2.3 Geologic Conditions

Bedrock underlying the site is the Austin Glen shale and greywacke formation, which was observed exposed in the basement of the main building. The weathered shale bedrock was observed within one foot of the ground surface on the west side of the site in boring HAM-07, and dips to depths greater than 10 feet below grade along the southern side of the property. The thickness of weathered or highly fractured shale at the upper bedrock surface at the site is variable and ranges up to 15 to 20 feet. Soil thickness over the bedrock ranges from 1 foot to 15 feet. Observed soil conditions varied and included areas of silt, gravel and some areas of fill material. A geologic section is shown in Figure 2.

Hydrogeology

An unconfined phreatic aquifer is found in soils deeper than six feet on the site. Local groundwater is towards the south following site and local topography. Off-site, groundwater flow is estimated to become more westerly to flow towards the nearby Fallkill Creek. Groundwater flow direction is shown in Figure 3.

1.3 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

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

- November 1998. Site Investigation/Remedial Alternatives Former Hamilton Reproduction Brownfield Project #B00020-3. Prepared by The Chazen Companies. Includes findings presented in December 1995 Phase I Environmental Site Assessment and November 1996 Limited Subsurface Investigation, that were also prepared by The Chazen Companies.
- March 1999. Environmental Record of Decision Hamilton Reproduction Site City of Poughkeepsie, Dutchess County, Site Number B-00020-3. Prepared by NYSDEC.
- August 16, 2001. Remedial Action Construction Certification Report City of Poughkeepsie Hamilton Reproduction Brownfield Site North Hamilton Street Dutchess County, New York. Prepared by The Chazen Companies.

Generally, the RI determined that chlorinated volatile organic compounds (CVOCs) and semi-volatile organic compounds (SVOCs) were present in soil at the southwest corner of the site near a catch basin. CVOCs were also identified in groundwater and soil gas samples collected near the southwest corner of the building.

Below is a summary of site conditions when the 1995, 1996 and 1998 investigations were performed.

Soil

Soil at the southwestern corner of the main building contained CVOC and SVOC concentrations greater than the NYSDEC's Technical and Administrative Guidance Memorandum (TAGM) #4046 soil cleanup guidance values. Extending from this source area, low levels of CVOCs were also found in a southwesterly direction and in an easterly direction underneath the building. Low levels of CVOCs were also found near doorways along the north side of the building. SVOCs in concentrations greater than soil clean up objectives were found to extend beneath the building in an easterly direction. Figures 4

and 5 show the distribution and concentrations of CVOCs and SVOCs in soil at the site, respectively.

The primary contaminant identified was tetrachlorethene (PCE). A summary of the 1998 analytical data for soil from the 1998 RI Report is provided in Tables 1 through 3.

Site-Related Groundwater

Overburden and bedrock groundwater monitoring wells at the site indicated the presence of CVOCs at concentrations greater than the Water Quality Standards for groundwater and drinking water standards. The primary area of elevated concentrations was near the southwestern corner of the main building. Extending from this source area, low levels of CVOCs were also found in an easterly direction underneath the building. Figure 6 shows the historic distribution and concentrations of CVOCs in groundwater as conditions existed in 1998.

Primary contaminants identified included: 1,1-dichloroethane (1,1-DCA), cis-1,2-dichloroethene (cis-1,2-DCE), 1,1,1-trichlorethane (1,1,1-TCA), trichloroethene (TCE), PCE, and vinyl chloride. Concentrations in the bedrock wells were lower than concentrations in the overburden wells. A summary of 1998 analytical data for groundwater is provided in Tables 4 through 8.

Site-Related Soil Vapor Intrusion

During the 1998 remedial investigation, soil gas was evaluated via gas chromatography headspace analysis of soil samples. Soil gas at the southwestern corner of the main building contained CVOCs. Figure 7 shows the distribution and concentrations of CVOCs in soil at the site.

Primary contaminants identified included: 1,1-dichloroethane (1,1-DCA), cis-1,2-dichloroethene (cis-1,2-DCE), 1,1,1-trichlorethane (1,1,1-TCA), trichloroethene (TCE), PCE, and Freon 113. Summary analytical data for groundwater are provided in Tables 9 through 12.

No soil gas survey was performed during the remedial investigation

Drainage System Sediment and Water

The catch basin located at the southwestern corner of the Main Building is considered the primary source of contamination for this area, and sediment samples were collected from this part of the drainage system. Sediment samples contained PCE, TCE,

benzo(a)anthracene, benzene(b)fluoranthene, indeno(1,2,3-cd)pyrene, and chrysene.

A water sample collected from the sump located in the east end of the Main Building contained DCA, TCA and trichlorofluoromethane concentrations greater than the drinking water standards. The sump was approximately 10 feet below ground surface and was a collection point for stormwater and shallow groundwater drainage throughout the property. Water from this sump was conveyed to the City of Poughkeepsie's combined sanitary/storm sewer system along North Hamilton Street.

Underground Storage Tanks

A 10,000-gallon #2 fuel oil underground storage tank (UST) was removed from the site in 1997. The UST had been located west of the Boiler Building at the western end of the Main Building, and is shown on previously mentioned figures. Petroleum-contaminated soil and groundwater were observed in the excavation and were removed until evidence of remaining soil quality was below cleanup standards. Confirmation soil and groundwater samples did not contain detectable petroleum compound concentrations.

1.4 SUMMARY OF REMEDIAL ACTIONS

The site was remediated in accordance with the NYSDEC-approved Remedial Action Work Plan dated August 1999. The following is a summary of the Remedial Actions performed at the site between November 15, 1999 and February 2, 2000:

1. Asbestos abatement and building demolition with disposal of all the construction and demolition debris.
2. Source removal consisting of 912.41 tons of non-hazardous waste soil and 216.46 tons of hazardous waste soil. This involved excavation of contaminated soil and friable bedrock where VOC contaminant concentrations were greater than the TAGM #4046 soil cleanup objectives.
3. Removal and proper disposal of approximately 50 to 75 containers of flammable and/or combustible inks and paints

On December 22, 2008, an Environmental Easement was executed to restrict land use and prevent future exposure to contamination remaining at the site. The Environmental Easement was recorded on June 2, 2009 and specified that the

property can be used for restricted commercial or industrial use as long as the following long-term engineering controls are employed:

1. the use of the groundwater underlying the property for any purpose, including but not limited to, potable, process or irrigation water, is prohibited without the prior approval of the NYSDEC; and
2. soils on the property must be managed, characterized, and properly disposed of in accordance with the NYSDEC laws and Regulations;
3. the potential for vapor intrusion into any building developed on the site must be evaluated, including provisions for mitigation of any impacts identified;
4. any subslab soil vapor mitigation system installed under any building structure must be inspected, certified, and maintained as required by the NYSDEC; and
5. the owner must provide annual certification as required by NYSDEC that the institutional controls and engineering controls are unchanged.

1.4.1 Removal of Contaminated Materials from the Site

The soil removal excavation measured approximately 2,400 square feet in area with a depth between 8 and 10 feet. A total of 912.41 tons of non-hazardous waste soil and 216.46 tons of hazardous waste soil were removed for off-site disposal. A figure showing areas where excavation was performed and confirmation sample locations is provided as Figure 8. Soil cleanup objectives in TAGM #4046 were used for the site during the 1999/2000 removal actions, and Tables 1 through 3 include a list of the soil cleanup objectives (SCOs) for the primary contaminants of concern (COCs). For reference, Part 375 SCOs for commercial land use is also provided in Tables 1 through 3.

1.4.2 Site-Related Treatment Systems

No long-term treatment systems were installed as part of the site remedy.

1.4.3 Remaining Contamination

Contaminated soil was removed from the site during implementation of remedial action soil excavation activities. The seven soil samples confirmed that remaining soil met the TAGM #4046 soil cleanup objectives, consistent with the NYSDEC-approved Remedial Action Work Plan (except for xylenes in one sample) and all soil samples meet current 6 NYCRR Part 375 commercial use SCOs. Table 13 summarize the results of soil samples remaining at the site after completion of Remedial Action and Figure 8 shows confirmation soil sample locations.

Groundwater samples collected in 2009 from wells in and around the excavated source area show that concentrations of CVOCs in this site area have substantially decreased (by orders of magnitude) since 1998, but still slightly exceed regulatory groundwater standards. Figure 9 shows well locations, and analytical data are summarized in Table 14. Remaining CVOCs in groundwater are 1,1,1-TCA, 1,1-DCA, cis-1,2-DCE, PCE, and TCE. One non-chlorinated VOC constituent (benzene) that was not detected during the 1998 sampling was identified during this current sampling event in the source area well, at a concentration greater than the groundwater standard. Benzene is a principal constituent of gasoline and since this area has been used regularly as a parking lot without a paved surface, it is not unreasonable to assume that some small quantity of gasoline may have been released to this very shallow groundwater table from minor automobile leakage. Based on NYSDEC review of these data, no additional engineering controls (e.g., construction components) are required by the agency.

Soil vapor samples collected in the mid- and late-1990s documented the presence of CVOCs, with higher concentrations in the area where soil removal ultimately occurred. Site development will presume that site soil vapor impacts at low concentrations may exist on the site and appropriate mitigation will be implemented as an engineering control to ensure that vapors do not migrate into new structures on the property.

2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

2.1 INTRODUCTION

2.1.1 General

Since remaining contaminated groundwater and soil vapor exist 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

As soil meets the SCOs for commercial and industrial land uses, no soil cover or cap is warranted.

2.2.1.1 Sub-slab Depressurization (SSD) Systems

An active SSD system will be installed beneath new building(s) constructed on this property to ensure that any VOCs that may be present at low levels above the impacted site groundwater do not migrate into new structures.

Procedures for operating and maintaining the active SSD system will be documented in the Operation and Maintenance Plan (Section 4 of this SMP) after the SSD system is designed, and NYSDEC and NYS Department of Health have reviewed/approved the SSD system design. Procedures for monitoring the system are included in the Monitoring Plan (Section 3 of this SMP). The Monitoring Plan also addresses severe condition inspections in the event that a severe condition, which may affect controls at the site, occurs.

2.2.2 Criteria for Completion of Termination of Remedial Systems

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

2.2.2.1 Sub-slab Depressurization (SSD) System

The active SSD system will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicate 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 Monitored Natural Attenuation

Groundwater monitoring activities to assess natural attenuation will continue, as determined by the NYSDEC, until residual groundwater concentrations are found to be consistently below NYSDEC standards or have become asymptotic at an acceptable level over an extended period. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

The Excavation Work Plan that appears in Appendix A outlines the procedures required to be implemented in the event that construction excavation includes disturbing saturated soil and groundwater. Procedures for the monitoring of this activity are provided in the Monitoring Plan included in Section 4 of this SMP.

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 commercial and/or industrial uses only. Adherence to these Institutional Controls on the site is required by the Environmental Easement and will be implemented under this Site Management Plan. These Institutional Controls are:

- Compliance with the Environmental Easement and this SMP by the Grantor and the Grantor's successors and assigns;
- All Engineering Controls must be operated and maintained as specified in this SMP;
- All Engineering Controls on the Controlled Property must be inspected at a frequency and in a manner defined in the SMP.
- Groundwater 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 commercial or industrial use provided that the long-term Engineering and Institutional Controls included in this SMP are employed.
- The property may not be used for a higher level of use, such as unrestricted or restricted-residential use without additional remediation and amendment of the Environmental Easement, as approved by the NYSDEC;
- The use of groundwater underlying the Controlled Property for any purpose, including but not limited to, potable, process or irrigation water, is prohibited without the prior approval of the New York State Departments of Health and Environmental Conservation; and
- Soils on the Controlled Property must be managed, characterized, and properly disposed of in accordance with the NYSDEC laws and Regulations;
- The potential for vapor intrusion into any buildings developed on the site must be evaluated, including provisions for mitigation of any impacts identified;
- Any subslab soil vapor mitigation system installed under any building structure must be inspected, certified, and maintained as required by the NYSDEC; and
- The owner must provide annual certification as required by NYSDEC that the institutional controls and engineering controls are unchanged. 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 commercial or industrial use. Any future intrusive work that will disturb the remaining groundwater contamination, that may be encountered during typical construction activities, 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) prepared for the site. A sample HASP is attached as Appendix C 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 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 and HASP 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

The SVI mitigation system will be installed as an element of the building foundation without conducting additional SVI investigation. This mitigation system will include a vapor barrier and active sub-slab depressurization.

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 provided in Section 3. 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 6NYCRR Part 375 and/or Environmental Conservation Law.
- 15-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.
- Notice within 48-hours 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, including 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 State Assistance Contract (SAC, and all approved work plans and reports, including this SMP.
- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing.

2.5 CONTINGENCY PLAN

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

If previously unidentified contaminant sources are found during development-related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on impacted media as necessary to determine the nature of the impact and proper disposal method. In this case, a reduced list of analytes, likely to only include site-specific chlorinated solvents, will be proposed to the NYSDEC for approval prior to sampling. Should the newly identified contamination exhibit

characteristics that differ from previously identified site contamination, the list of analytes may be expanded based on the properties of observed media.

Identification of unknown or unexpected contaminated media identified by screening during invasive work will be promptly communicated by phone to NYSDEC's Project Manager.

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 the owner, NYSDEC project manager, and qualified environmental professional, as appropriate. These emergency contact lists must be maintained in an easily accessible location at the site.

Table 15a: Emergency Contact Numbers

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3 day notice required for utility markout)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

Table 15b Contact Numbers

Current Owner: Paul Ackermann Corporation Counsel City of Poughkeepsie	Office: (845) 451-4065
Future Owner: Mr. Michael Burdis James L. Taylor Manufacturing	Office: (845) 452-3780
NYSDEC Project Manager: Mr. Michael A. Mason, P.E.	Office: (518) 402-9814
Qualified environmental professional: Ms. Arlette Meader Senior Environmental Scientist/Project Manager The Chazen Companies	Office: (518) 266-7328

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

2.5.2 Map and Directions to Nearest Health Facility

Site Location:186 North Hamilton Street, Poughkeepsie, NY 12601

Nearest Hospital Name: St. Francis Hospital

Hospital Location: Baker Ave, Poughkeepsie, NY

Hospital Telephone: (845) 483-5000

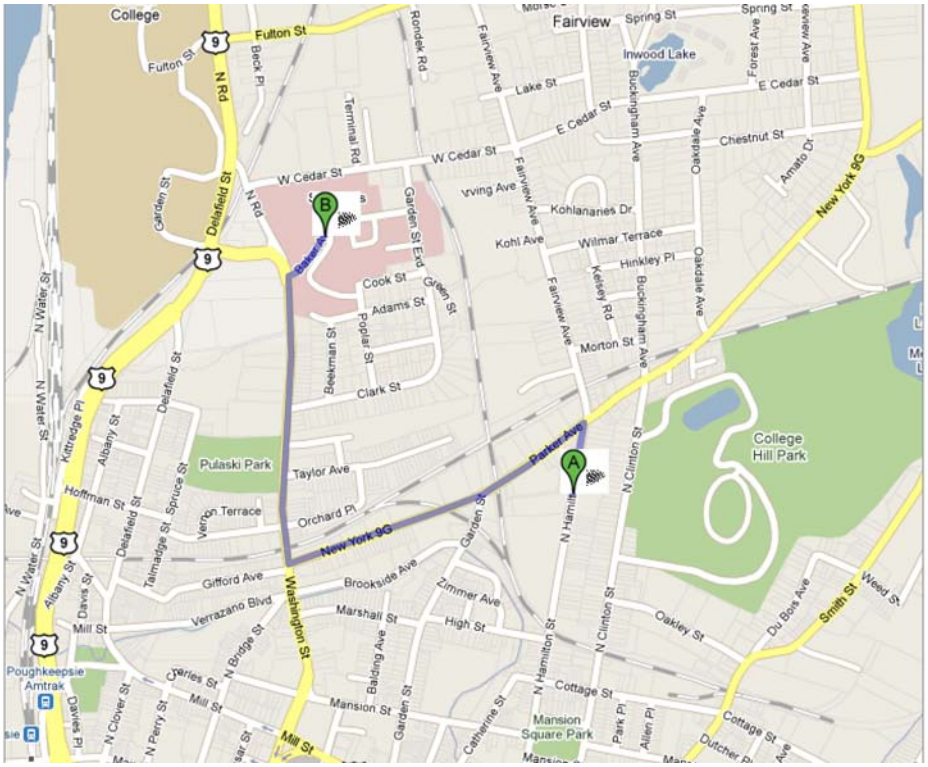
Directions to the Hospital:

1. Turn left to leave site and head north on North Hamilton Street
2. Turn left on New York 9G/Parker Ave
3. Turn right on Washington Ave
4. Turn right on Baker Ave and follow signs for Emergency Room

Total Distance: Approximately 1.5 miles

Total Estimated Time: 3 minutes

Map Showing Route from the site to the Hospital:



A = Site **B = St. Francis Hospital**

2.5.3 Response Procedures

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (Section 2.5.1, Table 15a). The list will also be posted prominently at the site and made readily available to all personnel at all times.

The Emergency Contingency Plan is included in Appendix A as part of the Excavation Work Plan and includes a description of:

- Procedures for spills;
- Evacuation plans;
- Amendments to the contingency plan.

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 implemented remedy and ECs to reduce or mitigate contamination at the site. ECs at the site include an active SSD system. 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 groundwater;
- Assessing compliance with applicable NYSDEC 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.

Monitoring of the performance of reduction in contamination on-site will be conducted every five years for the first five years. The first groundwater sampling event will be conducted in October 2010 and the second event will be in 2015. The continued 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 16 and outlined in detail in Section 3.2 below. If 2015 analytical data confirm that contaminant concentrations are improving, the results will be sufficient to demonstrate natural attenuation and groundwater monitoring will be terminated.

Table 16: Monitoring/Inspection Schedule

Monitoring Program	Frequency*	Matrix	Analysis
Groundwater	Every five (5) years starting in October 2010	Groundwater	Volatile Organic Compounds by EPA Method 8260

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

3.2 GROUNDWATER MONITORING PROGRAM

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

Monitoring wells HR-MW-B1, HR-MW-B2, and HR-MW-B3 have been installed to monitor both groundwater conditions in and near the former source area. The network of on-site wells has been designed to provide information consistent with the NYSDEC-issued ROD to confirm that source removal has eliminated the origin of the contamination and groundwater conditions have improved. 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.

Three overburden monitoring wells were installed on the property on October 2009 (Figure 9). The wells were installed using a direct-push drilling rig, and no soil samples were collected during installation. Well HR-MW-B1, HR-MW-B2, and HR-MW-B3 were installed to depth ranging from 8 to 15 feet bgs. Monitoring well construction details and well logs showing subsurface geology, dimensions and cased intervals for the wells are included as Appendix D.

In 2009, groundwater monitoring wells were installed in and around the former source area to document groundwater quality. The data (see Table 14) show that concentrations of VOCs in this site area have substantially decreased (by orders of magnitude) since 1998, but still slightly exceed regulatory groundwater standards. One constituent (benzene) that was not detected during the 1998 sampling was identified during this current sampling event in the source area well, at a concentration greater than the groundwater standard. Benzene is a principal constituent of gasoline and since this area has been used regularly as a parking lot without a paved surface, it is not unreasonable to assume that some small quantity of gasoline may have been released to this very shallow groundwater table from minor automobile leakage.

Based on groundwater elevations collected in 1998, the groundwater flow in the overburden was confirmed to be towards the south following site and local topography. A contour map was generated from the July 29, 1998 sampling event (Figures 1 and 3).

3.2.1 Sampling Protocol

All monitoring well sampling activities will be recorded in a field book and a groundwater-sampling log presented in Appendix E. 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.

Groundwater sampling is performed as follows:

1) Prior to sampling, water level data are collected using an electronic water level meter to calculate well volumes. Well volumes are calculated by measuring the height of the water column (height of water column = depth to well bottom – depth to water), and then multiplied by a well diameter conversion factor. A single

instrument is used to evaluate all water level measurements. The water level meter is decontaminated between measurements using an Alconox® solution to prevent cross contamination between wells.

2) Prior to well sampling, wells must be purged to ensure that static annular water is removed from the well column.

3) Wells will be purged using a dedicated submersible pump, a portable submersible pump, a bailer, or an inertial lift pump.

4) During purging, routine water quality parameters including pH, temperature, and conductivity will be monitored using portable meters. Turbidity will be assessed visually to assist in determining when groundwater conditions have stabilized. In general, three or more well volumes will be removed before sampling.

5) Samples will be collected from monitoring wells after static water levels recover to not less than ninety percent of the pre-purging levels but not more than 24 hours following purging.

6) Groundwater samples from MW-B1, MW-B2 and MW-B3 will be analyzed for VOCs using USEPA method 8260. Temperature, pH and specific conductance will be measured in the field. Turbidity is visually assessed during sampling. Samples will be transported to the laboratory with ice or ice packs in secure coolers.

7) A trip blank will accompany the sample containers and will be analyzed for VOCs using USEPA method 8260.

3.2.1 Monitoring Well Repairs, Replacement And Decommissioning

Wells will be inspected during each sampling event. Each well will be checked to assure that the well is intact, the well cap is sealed and locked, and the protective well casing is unharmed.

If biofouling or silt accumulation occurs in the 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.

In addition, should site development plans require that a well be relocated or if construction activities damage a well, wells will be replaced as appropriate.

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

3.3 SITE-WIDE INSPECTION

3.3.1 Site-Wide Inspection Schedule and Form

Site-wide inspections will be performed on a regular schedule once a year, starting in October 2010. During these inspections, an inspection form will be completed (Appendix F). 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.

3.3.2 SSD System Monitoring

The active SSD system will be monitored during each annual site-wide inspection. Part 1 of the Site-Wide Inspection form will be completed to document:

- whether the active SSD system is functioning properly;
- if there is foundation damage or defects that reduce or have the potential to reduce the effectiveness of the SSD system; and
- the blower conditions, noting blower operation, vacuum pressure, air flow, and system function.

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

3.5 MONITORING REPORTING REQUIREMENTS

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

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

- Date of event;
- Personnel conducting sampling;
- Description of the activities performed;
- Type of samples collected (e.g., 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 (to 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.

Laboratory analytical reports will be provided in digital format. A summary of the monitoring program deliverables are summarized in Table 17 below.

Table 17: Schedule of Monitoring/Inspection Reports

Task	Reporting Frequency*
Groundwater Monitoring	Every five (5) years (first event October 2010)
Site-Wide Inspection	Annually (first event October 2010)
Periodic Review Report	Every five (5) years (first report following October 2010 groundwater monitoring)

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

4.0 OPERATION AND MAINTENANCE PLAN

4.1 INTRODUCTION

The Operation and Maintenance Plan describes the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the site. After the sub-slab depressurization system is designed the Operation and Maintenance Plan will be prepared and will:

- Include the steps necessary to allow individuals unfamiliar with the site to operate and maintain the SSD system;
- Include an operation and maintenance contingency plan; and,
- Be updated periodically to reflect changes in site conditions or the manner in which the SSD system is operated and maintained.

Information on non-mechanical Engineering Controls (i.e. groundwater monitoring) is provided in Section 3 - Engineering and Institutional Control Plan. A copy of the Operation and Maintenance Plan, along with the complete SMP, will be kept at the site. The Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of the SMP.

4.2 SSDS EFFECTIVENESS TESTING

Following installation of an active SSD system in any new site structure, its effectiveness will be verified by measuring the capture radius via a network of 3/4-inch diameter vacuum monitoring points installed through the floor slab. The location and number of monitoring points necessary to assess the system's effectiveness will ultimately depend on the SSD system design. Per USEPA and NYSDEC vapor intrusion guidance, the SSD system's radius of influence will be defined by areas experiencing a pressure drop of no less than 0.0004 inches water column at the most distant monitoring points with respect to the location of the vacuum well. Post-mitigation pressure testing will be reported to the NYSDEC as part of the first site-wide inspection conducted in October after start-up of the SSD system.

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.

5.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

A general site-wide inspection form will be completed during the site-wide inspection (see Appendix F). The annual site-wide inspection will document: the status/function of the active SSD system (e.g., note that system and blowers are working), any excavation work done during that year (i.e., location and depth of excavation and if any groundwater handling was performed), groundwater monitoring data (if collected that year), and that site activities are consistent with the Environmental Easement (i.e., site water is from a municipal source, there is no groundwater usage on the site, etc). 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 RAWP and FER.

5.2 CERTIFICATION OF ENGINEERING AND INSTITUTIONAL CONTROLS

After the last inspection of the reporting period, a qualified environmental professional 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;
- The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;
- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the site is compliant with the environmental easement;
- The engineering control systems are performing as designed and are effective;
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program; and
- 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, [Insert Name], of [Insert Company/Organization and Address], am certifying as Owner.

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 fifth year, beginning eighteen months after the active SSD system is installed. 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 B (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 ROD;
    - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
    - Any new conclusions or observations regarding 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; and
    - Comments, conclusions, and recommendations based on data evaluation.

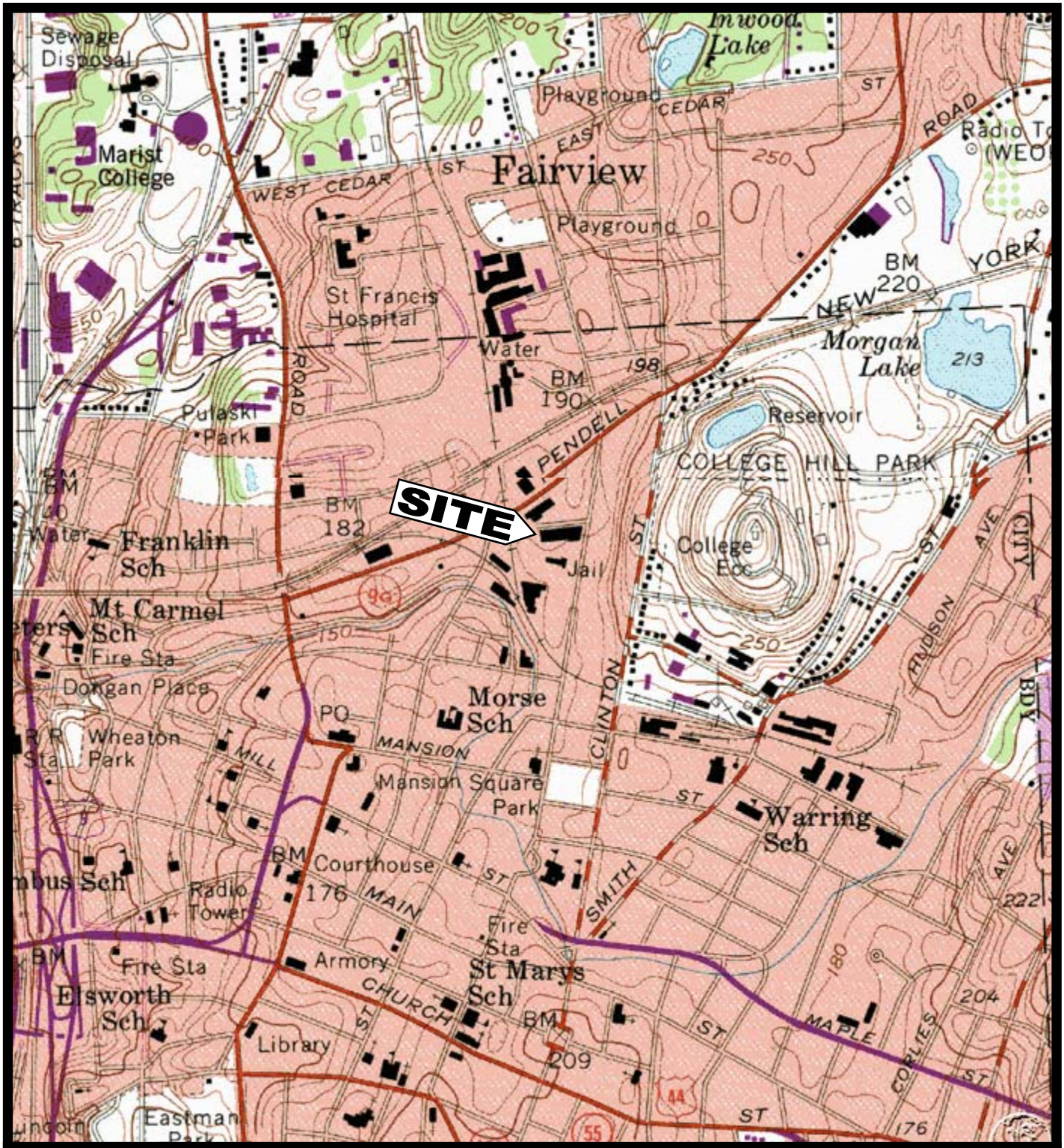
The Periodic Review Report will be signed by a Qualified Environmental Professional and submitted, in hard-copy format, to the NYSDEC Central Office and Regional Office in which the site is located, and in electronic format to NYSDEC Central Office, Regional Office and the NYSDOH Bureau of Environmental 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.

Figures



Source
USGS Quadrangle; Poughkeepsie

Scale in Feet
0 1000 2000 3000

North

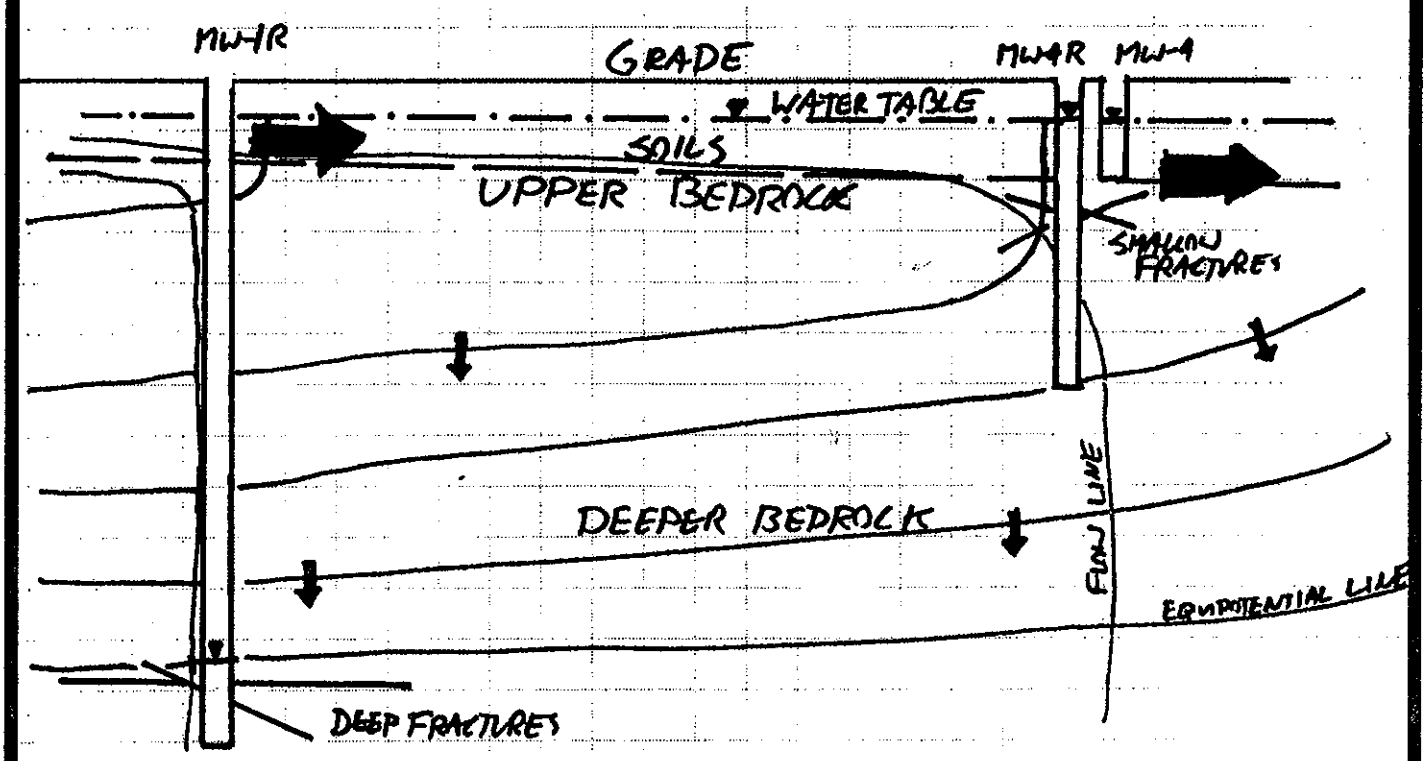
August, 1998

THE Chazen COMPANIES

Figure 1

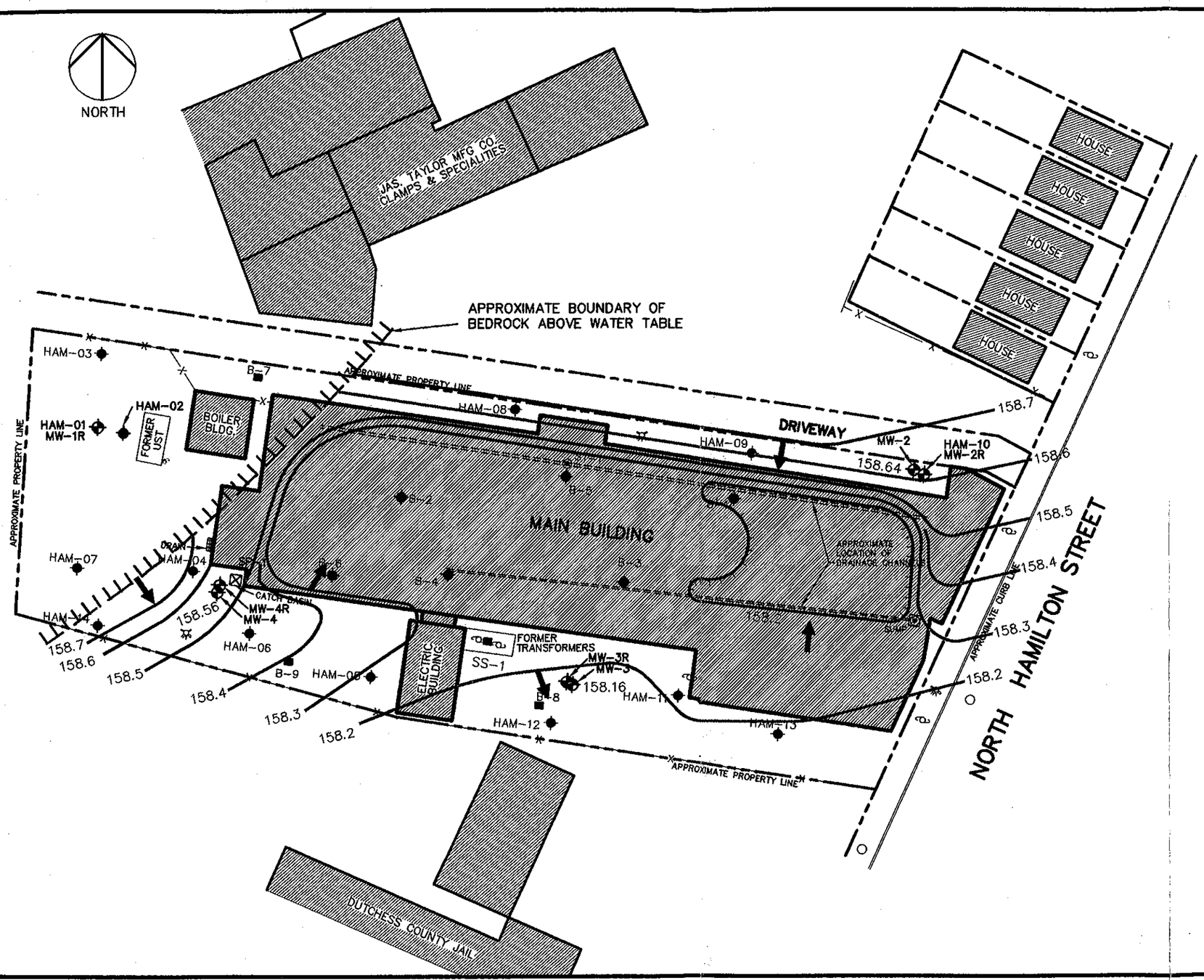
Site Location Map

Former Hamilton Reproduction
166-186 North Hamilton Street
Poughkeepsie, New York



Conceptual flow net showing hydrogeologic equipotential relationships between overburden and bedrock groundwater. Arrow size shows relative groundwater flux volume.

	Source The Chazen Companies, 1998	**Figure** 2
	Scale Scale not available	Geologic Cross Section and Conceptual Flow Net
August, 1998	THE Chazen COMPANIES	**Former Hamilton Reproduction** **166-186 North Hamilton Street** **Poughkeepsie, New York**



LEGEND

HAM-01 ◆	SOIL BORING
MW-2 ◆ 158.16	OVERBURDEN MONITORING WELL & GROUNDWATER ELEVATION
MW-2R ◆	BEDROCK MONITORING WELL
■	SHALLOW SOIL SAMPLE
→	DIRECTION OF SHALLOW GROUNDWATER MIGRATION

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FORMER HAMILTON REPRODUCTION SITE
SI/RA REPORT

Groundwater Flow Figure

SHALLOW GROUNDWATER EQUIPOTENTIALS

JULY 29, 1998

POUGHKEEPSIE, DUTCHESS COUNTY, NEW YORK

sheet no.
FIGURE 3

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drawn	JAS	8/19/98

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project no.
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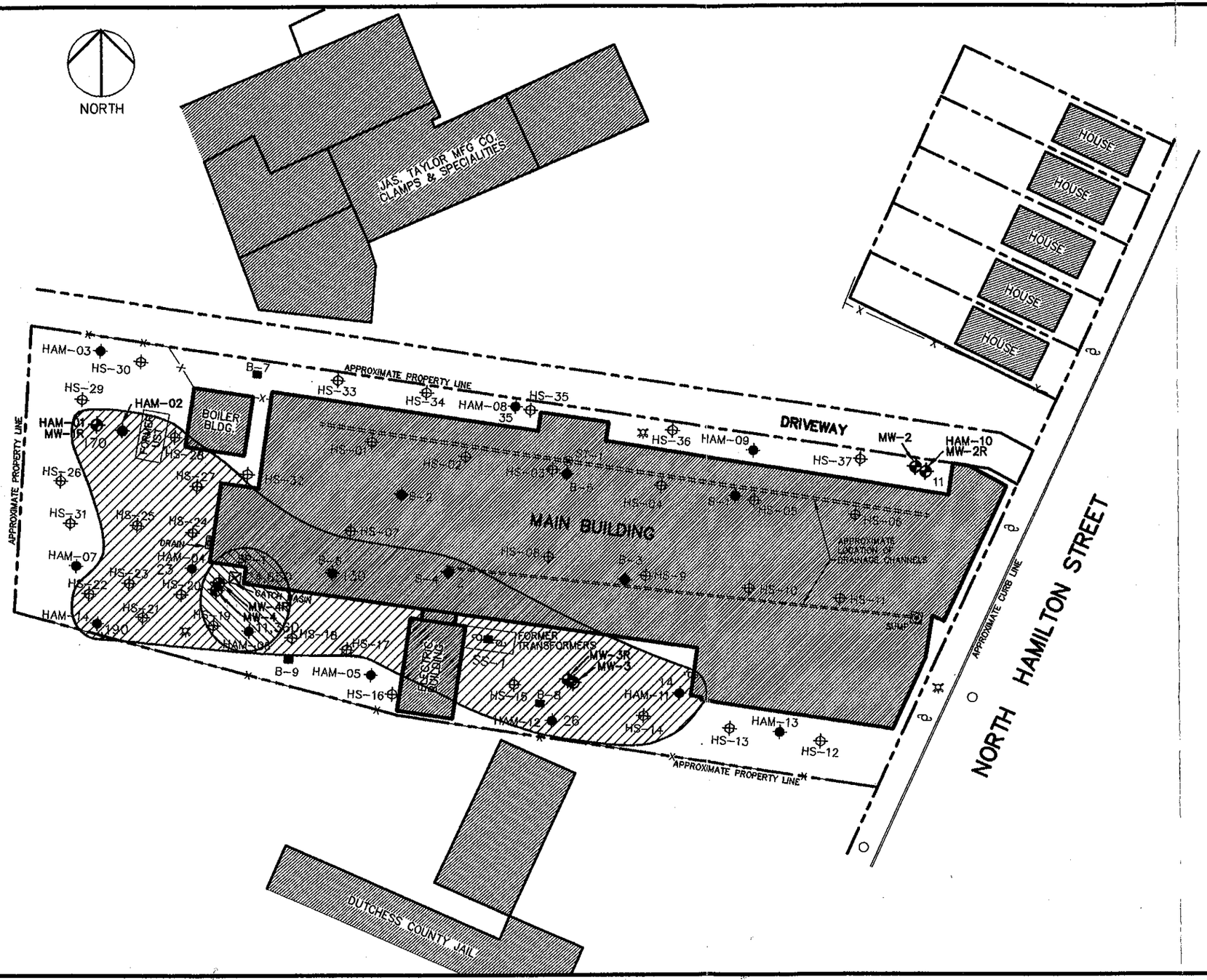

LEGEND

HAM–01 ◆	SOIL BORING
HS–01 ⊕	SOIL GAS LOCATION
MW–02 ◆	MONITORING WELL
B–7 ■	SHALLOW SOIL SAMPLE
11,360	CONCENTRATION (ppb) OF CHLORINATED VOLATILE ORGANIC COMPOUNDS (CVOC) DETECTED IN SOIL SAMPLES

APPROXIMATE EXTENT & INTENSITY OF CVOC'S DETECTED IN SOIL SAMPLES

APPROXIMATE EXTENT & INTENSITY OF CVOC'S DETECTED IN SOIL SAMPLES AT LEVELS ABOVE TAGM#4046

PLOT SCALE: 1=1 - SAVED UCS: PLOT

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FORMER HAMILTON REPRODUCTION SITE
SI/RA REPORT

CVOC IN SOIL SAMPLES

POUGHKEEPSIE, DUTCHESS COUNTY, NEW YORK

sheet no.
FIGURE 4

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drawn	JAS	11/9/98

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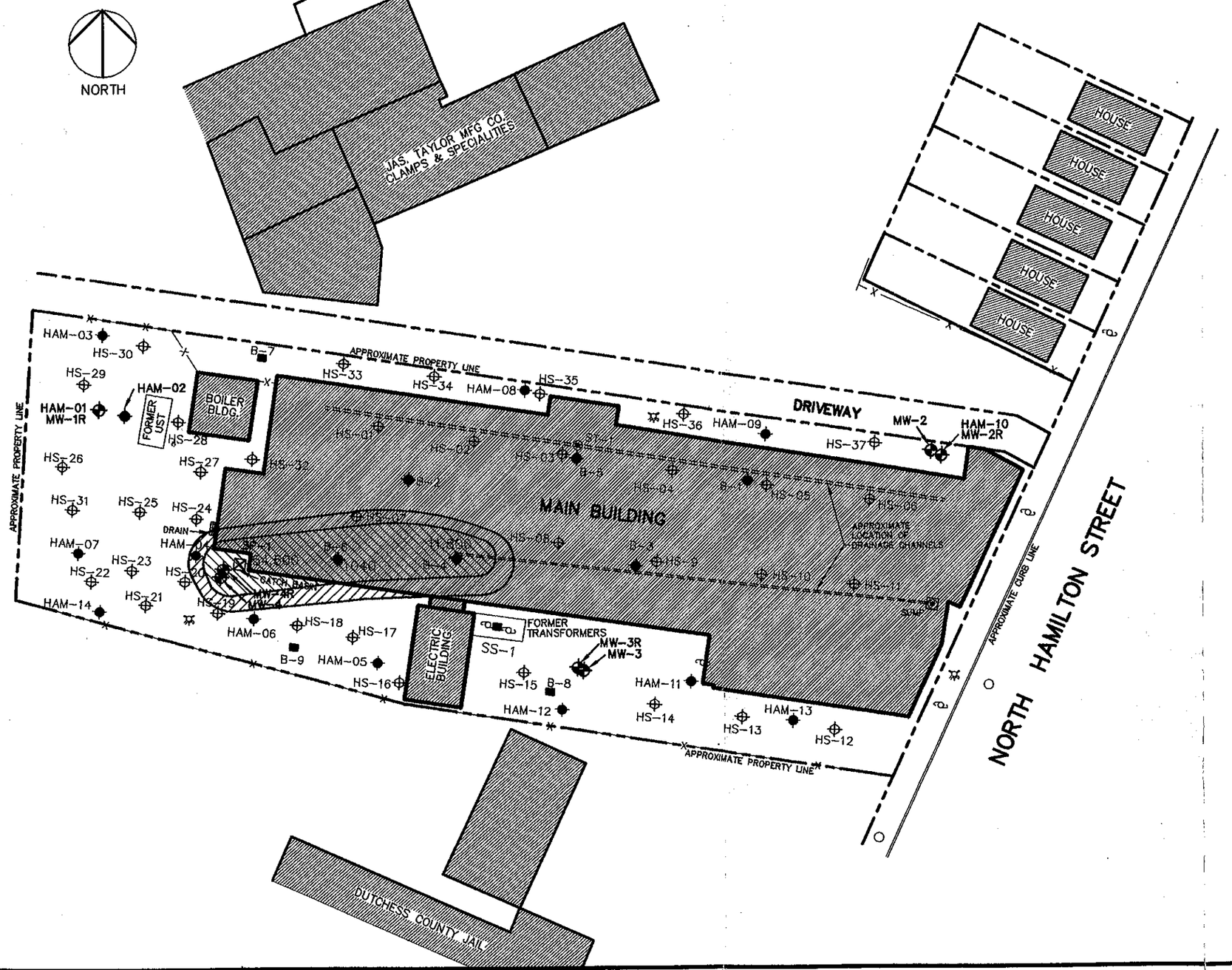

LEGEND

HAM-01	SOIL BORING
HS-01	SOIL GAS LOCATION
MW-02	MONITORING WELL
B-7	SHALLOW SOIL SAMPLE
11,800	CONCENTRATION (ppb) OF SEMI-VOLATILE ORGANIC COMPOUNDS (SVOC) DETECTED IN SOIL SAMPLES

APPROXIMATE EXTENT & INTENSITY OF SVOC'S DETECTED IN SOIL SAMPLES

APPROXIMATE EXTENT & INTENSITY OF SVOC'S DETECTED IN SOIL SAMPLES AT LEVELS ABOVE TAGM#4046

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FORMER HAMILTON REPRODUCTION SITE
SI/RA REPORT

SVOC IN SOIL SAMPLES

POUGHKEEPSIE, DUTCHESS COUNTY, NEW YORK

sheet no. **FIGURE 5**

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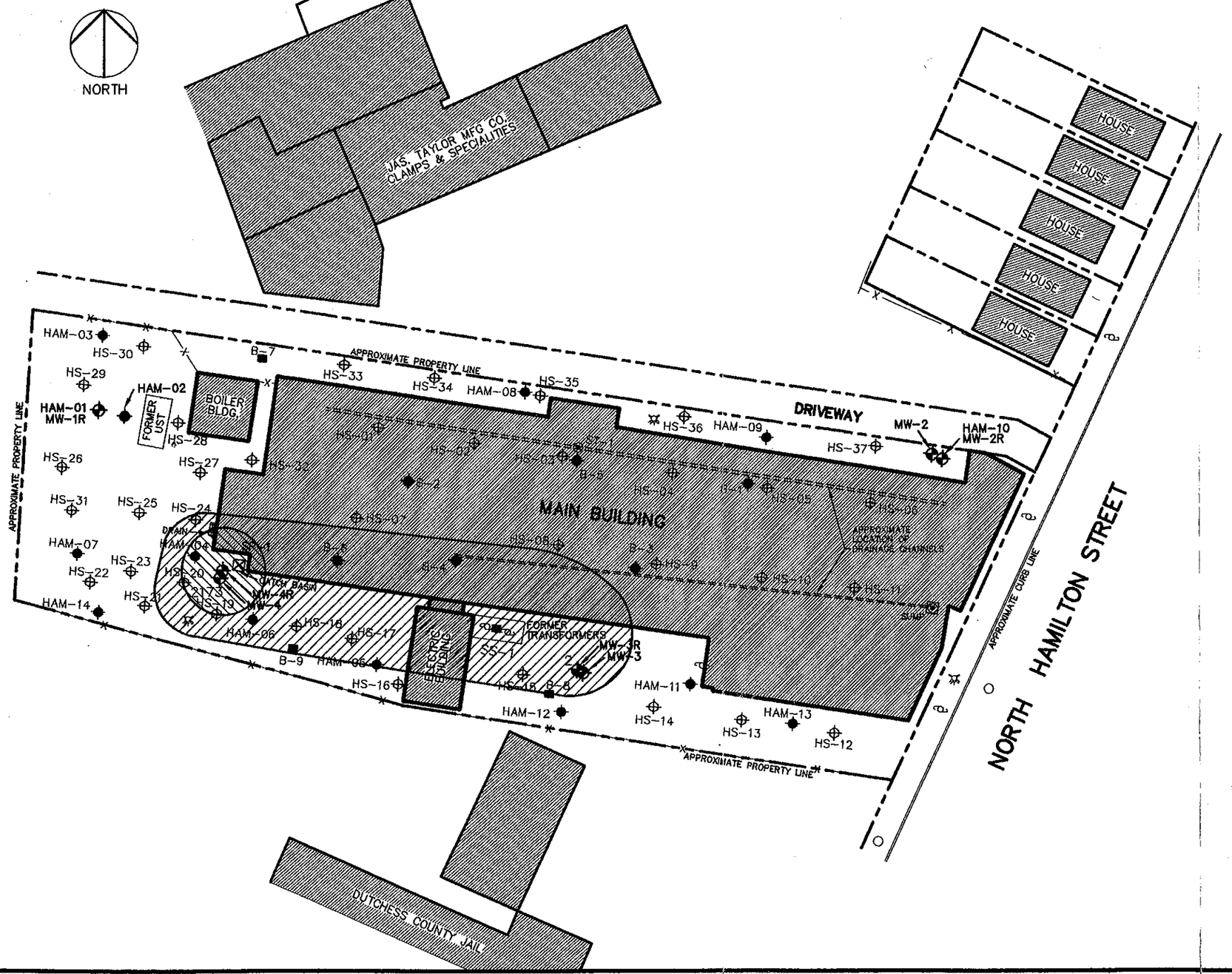

LEGEND

HAM–01	SOIL BORING
HS–01	SOIL GAS LOCATION
MW–02	MONITORING WELL
B–7	SHALLOW SOIL SAMPLE
	DRAINAGE SAMPLES
2173	CONCENTRATION (ppb) OF CHLORINATED VOLATILE ORGANIC COMPOUNDS (CVOC) DETECTED IN OVERBURDEN GROUNDWATER

APPROXIMATE EXTENT & INTENSITY OF CVOC'S DETECTED IN GROUND WATER

APPROXIMATE EXTENT & INTENSITY OF CVOC'S DETECTED IN GROUND WATER AT LEVELS ABOVE WATER QUALITY STANDARDS

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FORMER HAMILTON REPRODUCTION SITE
SI/RA REPORT

CVOC IN OVERBURDEN GROUNDWATER

POUGHKEEPSIE, DUTCHESS COUNTY, NEW YORK

sheet no. **FIGURE 6**

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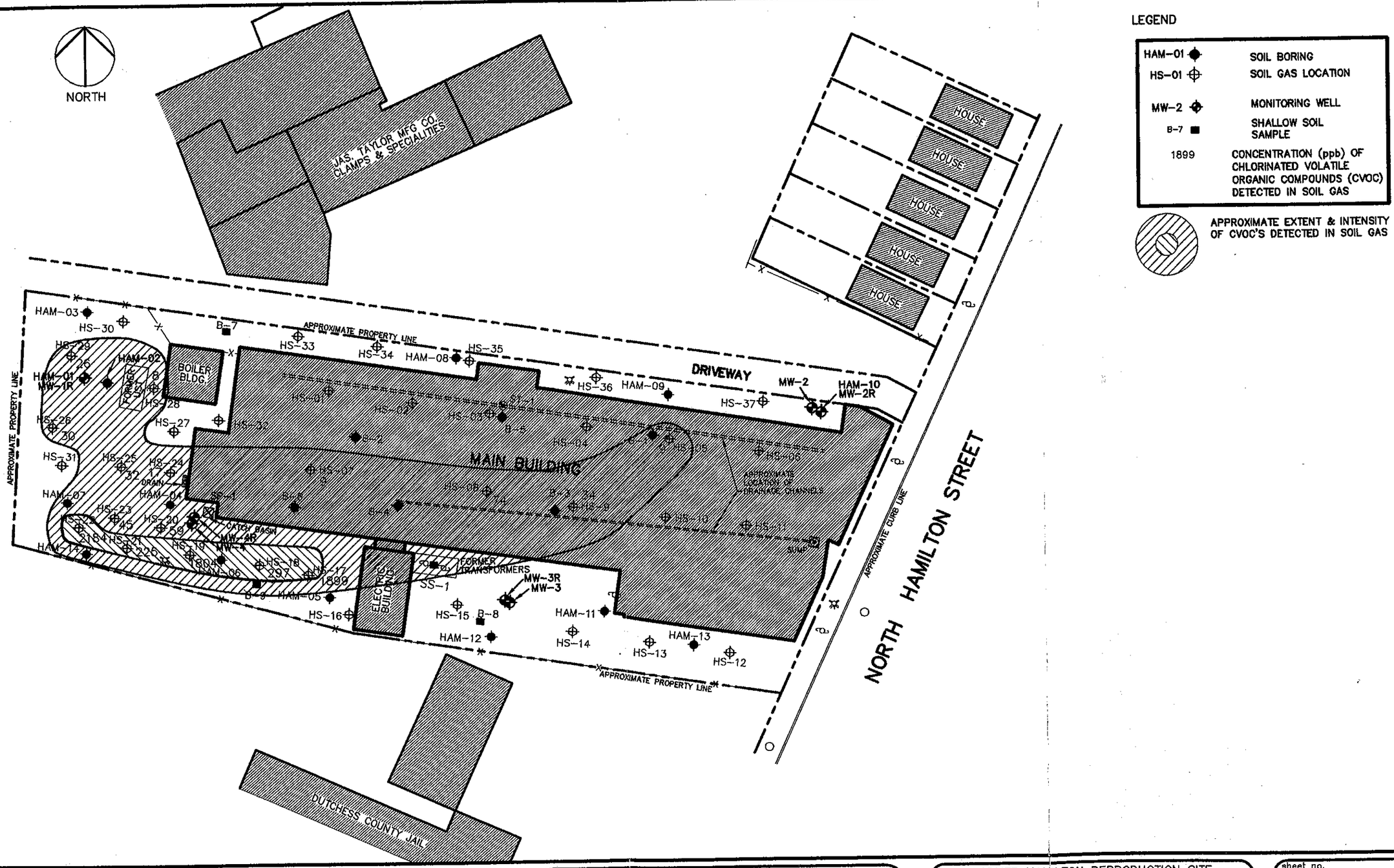

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FORMER HAMILTON REPRODUCTION SITE
SI/RA REPORT

CVOC IN SOIL GAS

POUGHKEEPSIE, DUTCHESS COUNTY, NEW YORK

sheet no.
FIGURE 7

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drawn	JAS	11/9/98

scale 1"=60'

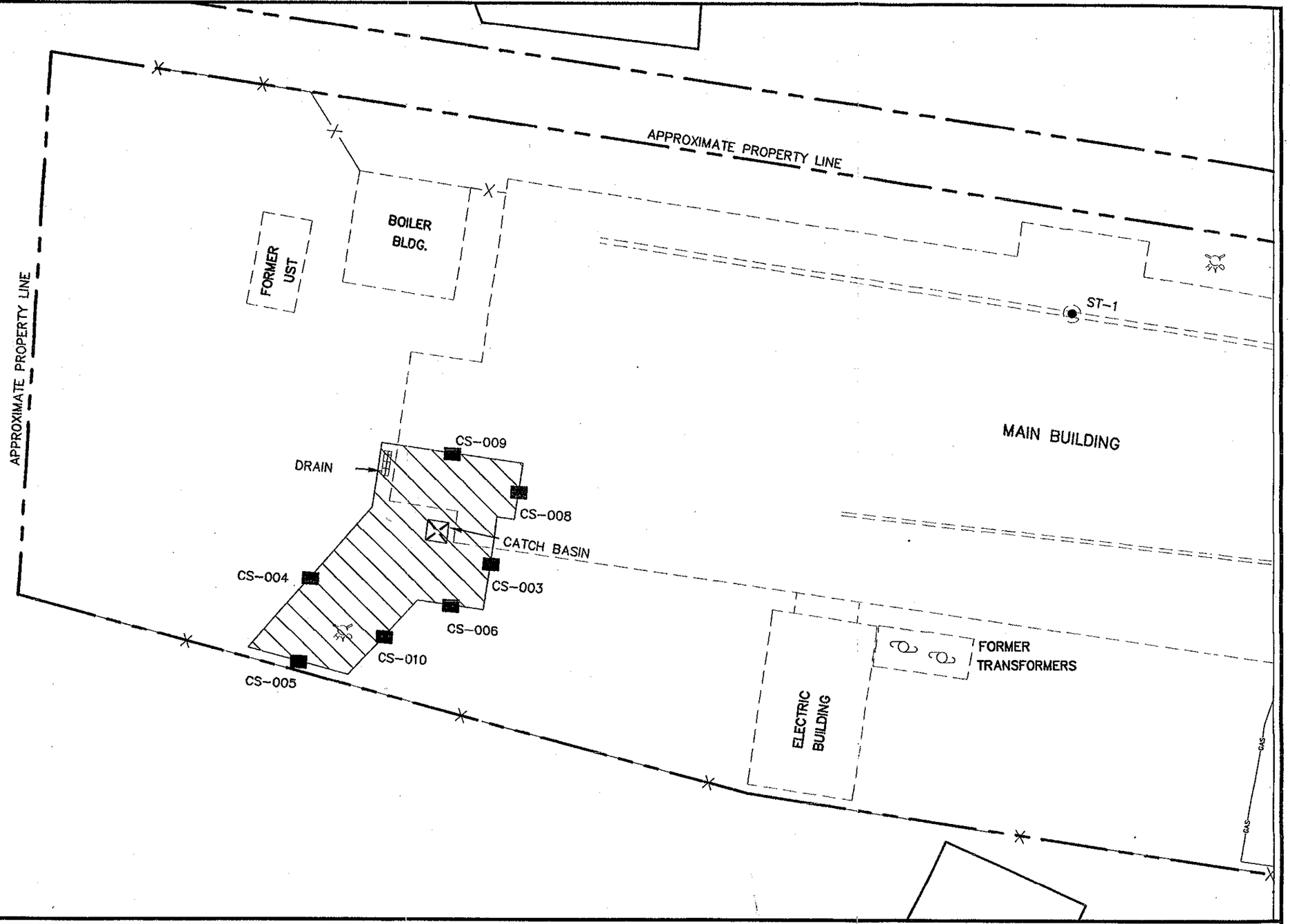
project no. 49723

NONE

REMOVED STRUCTURES

CS-009 ■ SOIL SAMPLE

SOIL EXCAVATION



X:\4/49723.01/SURVEY\RA.DWG\FIGURE8.DWG
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FORMER HAMILTON REPRODUCTION SITE
SI/RA REPORT

Extent of Remedial Excavation Performed and Confirmatory

SOIL SAMPLE LOCATIONS

POUGHKEEPSIE, DUTCHESS COUNTY, NEW YORK

sheet no.
FIGURE 8

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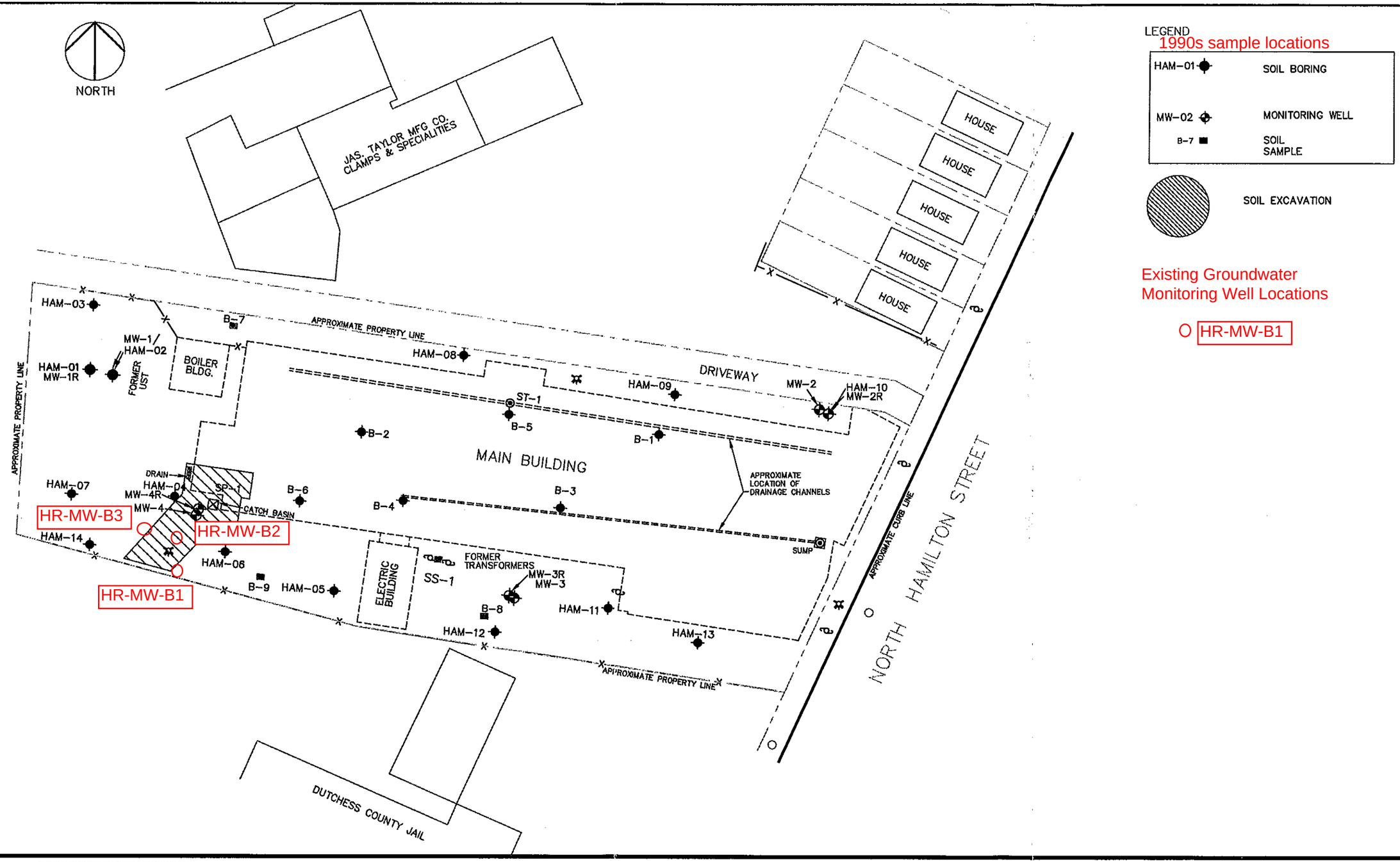

LEGEND

1990s sample locations

HAM-01	SOIL BORING
MW-02	MONITORING WELL
B-7	SOIL SAMPLE
	SOIL EXCAVATION

Existing Groundwater Monitoring Well Locations

○ HR-MW-B1

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FORMER HAMILTON REPRODUCTION SITE
SI/RA REPORT

Groundwater Monitoring Well Network

POUGHKEEPSIE, DUTCHESS COUNTY, NEW YORK

sheet no.
FIGURE 9

	name:	date:
design	GB	11/9/98
check	GB	11/9/98
drawn	JAS	11/9/98

scale
1"=60'

project no.
49723.01

Tables

Table 1
Former Hamilton Reproduction Site
Historic (1998) Soil Sample Volatile Organic Compound Results

Analyte	NYSDEC TAGM #4046 Recommended Soil Cleanup Objectives	6 NYCRR Part 375 Soil Cleanup Objectives		B-1	B-2	B-3	B-4	B-5	B-6	MW-1R	MW-2R	MW-3R	MW-4R
		Commercial	Industrial	0'-4'	0'-10	0'-8'	0'-4	0'-4	0'-4'	0'-4'	0'-10'	0'-4'	0'-4'
				1998 sampling									
	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1,1,1-Trichloroethane	800	500,000	1,000,000	1.4 U	1.3 U	1.2 U	1.2 U	1.2 U	9.9	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	600	NS	NS	2.9 U	2.5 U	2.4 U	2.4 U	2.3 U	2.5 U	ND	ND	ND	ND
1,1,2-Trichloroethane	**	NS	NS	2.9 U	2.5 U	2.4 U	2.4 U	2.3 U	2.5 U	ND	ND	ND	ND
1,1-Dichloroethane	200	240,000	480,000	1.4 U	1.3 U	1.2 U	1.2 U	1.2 U	1.4	ND	ND	ND	ND
1,1-Dichloroethene	**	500,000	1,000,000	1.4 U	1.3 U	1.2 U	1.2 U	1.2 U	1.2 U	ND	ND	ND	ND
1,2-Dichlorobenzene	7,900	500,000	1,000,000	2.9 U	2.5 U	2.4 U	2.4 U	2.3 U	2.5 U	ND	ND	ND	ND
1,2-Dichloroethane	100	30,000	60,000	1.4 U	1.3 U	1.2 U	1.2 U	1.2 U	1.2 U	ND	ND	ND	ND
1,2-Dichloropropane	**	NS	NS	1.4 U	1.3 U	1.2 U	1.2 U	1.2 U	1.2 U	ND	30.0	ND	ND
1,3-Dichlorobenzene	1,600	280,000	560,000	2.9 U	2.5 U	2.4 U	2.4 U	2.3 U	2.5 U	ND	ND	ND	ND
1,4-Dichlorobenzene	8,500	130,000	250,000	2.9 U	2.5 U	2.4 U	2.4 U	2.3 U	2.5 U	ND	ND	ND	ND
2-Chloroethylvinyl Ether	NS	NS	NS	2.9 U	2.5 U	2.4 U	2.4 U	2.3 U	2.5 U	ND	ND	ND	ND
Benzene	60	44,000	89,000	2.9 U	2.5 U	2.4 U	2.4 U	2.3 U	5.3	ND	ND	ND	ND
Bromodichloromethane	**	NS	NS	1.4 U	1.3 U	1.2 U	1.2 U	1.2 U	1.2 U	ND	ND	ND	ND
Bromoform	**	NS	NS	2.9 U	2.5 U	2.4 U	2.4 U	2.3 U	2.5 U	21.3	20.8	25.2	24.5
Bromomethane	**	NS	NS	7.2 U	6.3 U	5.9 U	6.1 U	5.8 U	6.2 U	ND	ND	ND	ND
Carbon Tetrachloride	600	22,000	44,000	1.4 U	1.3 U	1.2 U	1.2 U	1.2 U	1.2 U	ND	ND	ND	ND
Chlorobenzene	1,700	500,000	1,000,000	2.9 U	2.5 U	2.4 U	2.4 U	2.3 U	2.5 U	ND	ND	ND	ND
Chloroethane	1,900	NS	NS	2.9 U	2.5 U	2.4 U	2.4 U	2.3 U	2.5 U	ND	ND	ND	ND
Chloroform	300	350,000	700,000	1.4 U	1.3 U	1.2 U	1.2 U	1.2 U	1.2	ND	ND	ND	ND
Chloromethane	**	NS	NS	7.2 U	6.3 U	5.9 U	6.1 U	5.8 U	6.2 U	ND	ND	ND	ND
cis-1,2-Dichloroethene	NS	500,000	1,000,000	1.4 U	1.3 U	1.2 U	1.2 U	1.2 U	26	ND	ND	ND	ND
cis-1,3-Dichloropropene	**	NS	NS	1.4 U	1.3 U	1.2 U	1.2 U	1.2 U	1.2 U	ND	ND	ND	ND
Dibromochloromethane	**	NS	NS	2.9 U	2.5 U	2.4 U	2.4 U	2.3 U	2.5 U	--	--	--	--
Ethylbenzene	5,500	390,000	780,000	2.9 U	2.5 U	2.4 U	2.4 U	2.3 U	2.5 U	ND	ND	ND	ND
m/p-Xylenes	1,200+	100,000+	1,000,000+	1.4 U	1.3 U	1.2 U	1.6	1.2 U	1.2 U	35	10.4	17.2	48.2
Methylene Chloride	100	500,000	1,000,000	1.4 U	1.3 U	1.2 U	1.2 U	1.2 U	1.2 U	**482**	**343**	**296**	**586**
o-Xylenes	1,200+	100,000+	1,000,000+	1.4 U	1.3 U	1.2 U	1.2 U	1.2 U	1.2 U	ND	ND	ND	ND
Tetrachloroethene	1,400	150,000	300,000	1.4 U	1.3 U	1.2 U	1.8	1.2 U	58	ND	ND	ND	ND
Toluene	1,500	500,000	1,000,000	2.9 U	2.5 U	2.4 U	2.4 U	2.3 U	2.5 U	10.0	ND	ND	ND
trans-1,2-Dichloroethene	300	500,000	1,000,000	1.4 U	1.3 U	1.2 U	1.2 U	1.2 U	1.2 U	ND	ND	ND	ND
trans-1,3-Dichloropropene	**	NS	NS	2.9 U	2.5 U	2.4 U	2.4 U	2.3 U	2.5 U	ND	ND	ND	ND
Trichloroethene	700	200,000	400,000	1.4 U	1.3 U	1.2 U	1.2 U	1.2 U	35	ND	51.8	ND	ND
Trichlorofluoromethane	**	NS	NS	1.4 U	1.3 U	1.2 U	1.2 U	1.2 U	1.2 U	97.5	97.5	97.5	ND
Vinyl Chloride	200	13,000	27,000	2.9 U	2.5 U	2.4 U	2.4 U	2.3 U	2.5 U	ND	ND	ND	ND
TOTAL VOC concentration	10,000			0	0	0	2.4	0	80.2	645.8	553.5	435.9	658.7

NOTES:
All data are reported in micrograms per kilogram (ug/kg) = parts per billion (ppb)
NS indicates that there is no listed standard for the analyte
+ Data for m/p-Xylenes and o-Xylenes summed and compared to listed standard for total xylenes
Bold cells indicate values that are greater than the TAGM 4046
U = compound not detected above laboratory method reporting limit
ND = not detected
** Per TAGM #4046, individual and sum of VOCs < 10,000ppb.

Table 2
Former Hamilton Reproduction Site
Historic 1998 Soil Sample Semi-Volatile Organic Compound Results

Analyte	NYSDEC TAGM #4046 Recommended Soil Cleanup Objectives	6 NYCRR Part 375 Soil Cleanup Objectives		B-1	B-2	B-3	B-4	B-5	B-6	MW-1R	MW-2R	MW-3R	MW-4R
		Commercial	Industrial	0'-4'	0'-10'	0'-8'	0'-4'	0'-4'	0'-4'	0'-4'	0'-10'	0'-4'	0'-4'
				1998 sampling									
	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1,2 Dichlorobenzene	**	500,000	1,000,000	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
1,2,4 Trichlorobenzene	**	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
1,3 Dichlorobenzene	**	280,000	560,000	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
1,4 Dichlorobenzene	**	130,000	250,000	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
2,2-oxybis(1-Chloropropane)	**	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	--	--	--	--
2,4,5-Trichlorophenol	100	NS	NS	970 U	850 U	790 U	820 U	780 U	830 U	ND	ND	ND	ND
2,4,6-Trichlorophenol	* *	NS	NS	970 U	850 U	790 U	820 U	780 U	830 U	ND	ND	ND	ND
2,4-Dichlorophenol	400	NS	NS	970 U	850 U	790 U	820 U	780 U	830 U	ND	ND	ND	ND
2,4-Dimethylphenol	* *	NS	NS	970 U	850 U	790 U	820 U	780 U	830 U	ND	ND	ND	ND
2,4-Dinitrophenol	200 or MDL	NS	NS	1,900 U	1,600 U	1,500 U	1,600 U	1,500 U	1,600 U	ND	ND	ND	ND
2,4-Dinitrotoluene	* *	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
2,6-Dinitrotoluene	1000	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
2-Chloronaphthalene	* *	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	--	--	--	--
2-Chlorophenol	800	NS	NS	970 U	850 U	790 U	820 U	780 U	830 U	--	--	--	--
2-Methylnaphthalene	36,400	NS	NS	970 U	850 U	790 U	820 U	780 U	830 U	--	--	--	--
2-Methylphenol	100 or MDL	NS	NS	970 U	850 U	790 U	820 U	780 U	830 U	--	--	--	--
2-Nitroaniline	430 or MDL	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	--	--	--	--
2-Nitrophenol	330 or MDL	NS	NS	970 U	850 U	790 U	820 U	780 U	830 U	ND	ND	ND	ND
3,3'-Dichlorobenzidine	* *	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
3-Nitroaniline	500 or MDL	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	--	--	--	--
4,6-Dinitro-2-methylphenol	* *	NS	NS	1,900 U	1,600 U	1,500 U	1,600 U	1,500 U	1,600 U	--	--	--	--
4-Bromophenyl-phenylether	* *	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
4-Chloro-3-methylphenol	240 or MDL	NS	NS	970 U	850 U	790 U	820 U	780 U	830 U	ND	ND	ND	ND
4-Chloroaniline	220 or MDL	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	--	--	--	--
4-Chlorophenyl-phenylether	* *	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
4-Methylphenol	900	NS	NS	970 UJ	850 UJ	790 UJ	820 UJ	780 UJ	830 UJ	--	--	--	--
4-Nitroaniline	**	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	--	--	--	--
4-Nitrophenol	100 or MDL	NS	NS	1,900 U	1,600 U	1,500 U	1,600 U	1,500 U	1,600 U	ND	ND	ND	ND
Acenaphthene	50,000	500,000	1,000,000	480 U	420 U	390 U	340 J	380 U	120 J	ND	ND	ND	ND
Acenaphthylene	41,000	500,000	1,000,000	480 UJ	420 UJ	390 UJ	400 UJ	380 UJ	410 UJ	ND	ND	ND	ND
Anthracene	50,000	500,000	1,000,000	480 U	420 U	390 U	1,600	380 U	390 J	ND	ND	ND	ND
Benzo(a)anthracene	224 or MDL	5,600	11,000	480 U	420 U	390 U	**2,800**	380 U	*470*	ND	ND	ND	ND
Benzo(a)pyrene	61 or MDL	1,000	1,100	480 U	420 U	390 U	**2,700**	380 U	*410* J	ND	ND	ND	ND
Benzo(b)fluoranthene	1,100	5,600	11,000	480 U	420 U	390 U	**3,000**	380 U	*350* J	ND	ND	ND	ND
Benzo(g,h,i)perylene	50,000	500,000	1,000,000	480 U	420 U	390 U	850	380 U	200 J	ND	ND	ND	ND
Benzo(k)fluoranthene	1,100	56,000	110,000	480 U	420 U	390 U	**2,200**	380 U	*410* J	ND	ND	ND	ND
Benzyl Alcohol	**	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	--	--	--	--
bis(2-Chloroethoxy)methane	**	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
bis(2-Chloroethyl)ether	**	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
bis(2-Ethylhexyl)phthalate	50,000	NS	NS	4,600 J	3,800 J	180 J	4,100 J	2,100 J	1,100 J	ND	ND	ND	ND
Butylbenzylphthalate	50,000	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
Carbazole	**	NS	NS	480 U	420 U	390 U	190 J	380 U	110 J	--	--	--	--
Chrysene	400	56,000	110,000	480 U	420 U	390 U	**2,800**	380 U	*540*	ND	ND	ND	ND
Dibenz(a,h)anthracene	14 or MDL	560	1,100	480 U	420 U	390 U	**460**	380 U	410 U	ND	ND	ND	ND
Dibenzofuran	6,200	350,000	1,000,000	480 U	420 U	390 U	240 J	380 U	100 J	--	--	--	--
Diethylphthalate	7,100	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
Dimethylphthalate	2,000	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
Di-n-butylphthalate	8,100	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
Di-n-octyl phthalate	50,000	NS	NS	480 U	420 U	390 U	1,600 U	1,500 U	410 U	ND	ND	ND	ND
Fluoranthene	50,000	500,000	1,000,000	170 J	420 U	130 J	5400	380 U	1,200	ND	ND	ND	ND
Fluorene	50,000	500,000	1,000,000	480 U	420 U	390 U	690	380 U	220 J	ND	ND	ND	ND
Hexachlorobenzene	410	6,000	12,000	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
Hexachlorobutadiene	**	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	37.1	11.7
Hexachlorocyclopentadiene	**	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
Hexachloroethane	**	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	3,200	5,600	11,000	480 U	420 U	390 U	400 U	380 U	220 J	ND	ND	ND	ND
Isophorone	4,400	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
Naphthalene	13,000	500,000	1,000,000	480 U	420 U	390 U	400 U	380 U	140 J	13.6	16.0	11.8	12.0
Nitrobenzene	200 or MDL	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
N-Nitrosodimethylamine	**	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
N-Nitroso-di-n-propylamine	**	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
N-Nitrosodiphenylamine	**	NS	NS	480 U	420 U	390 U	400 U	380 U	410 U	ND	ND	ND	ND
Pentachlorophenol	1,000 or MDL	6,700	55,000	1,900 U	1,600 U	1,500 U	**4,900**	380 U	**1,600**	ND	ND	ND	ND
Phenanthrene	50,000	500,000	1,000,000	480 U	420 U	100 J	820 U	780 U	1600 U	ND	ND	ND	ND
Phenol	30 or MDL	500,000	1,000,000	970 U	850 U	790 U	400 U	380 U	830 U	ND	ND	ND	ND
Pyrene	50,000	500,000	1,000,000	110 J	420 U	82 J	4,400	380 U	940	ND	ND	ND	ND
TOTAL SVOC concentration	500,000			2,860	420	2,670	18,210	380	9,150	13.6	16	48.9	23.7

NOTES:
All data are reported in micrograms per kilogram (ug/kg) = parts per billion (ppb)
NS indicates that there is no listed standard for the analyte
U = compound not detected above laboratory method reporting limit

J indicates an estimated value when either 1) estimating a concentration for a tentatively identified compound or 2) the mass spectral data indicated the identification, however, the result was less than the specified detection limit greater than zero.
TIC = tentatively identified compounds
Bold cells indicate values that are greater than the TAGM 4046
Shaded cells indicate values that are greater than the Part 375 Commerical Use
** Per TAGM #4046, individual SVOCs <50,000 ppb, total SVOCS <500,000 ppb.

Table 3
Former Hamilton Reproduction Site
Historic 1998 Soil Sample TAL Metals Results

Analyte	NYSDEC TAGM #4046 Recommended Soil Cleanup Objectives	6 NYCRR Part 375 Soil Cleanup Objectives		B-7 (background)		B-8		B-9		SS-1
		Commercial	Industrial	0.5 feet	2.5 feet	0.5 feet	2.5 feet	0.5 feet	2.5 feet	0.5 - 1.0 feet
				1998 Sampling						
	ppm	ppm	ppm	ppm		ppm		ppm		ppm
Antimony	SB	NS	NS	ND	ND	4.67	ND	ND	ND	ND
Arsenic	7.5 or SB	16	16	11.40	47.80	36.00	8.33	10.10	26.00	5.96
Barium	300 or SB	400	10,000	40.90	127.00	ND	45.00	94.40	259.00	37.10
Beryllium	SB	590	2,700	ND	1.28	1.00	0.06	0.74	3.45	0.53
Cadmium	1 or SB	9.3	60	1.18	2.05	11.60	1.41	0.95	2.79	1.69
Chromium	10 or SB	400	800	13.90	40.20	28.70	15.40	27.20	159.00	11.90
Copper	25 or SB	270	10,000	32.80	79.40	19.40	135.00	56.70	117.00	43.20
Lead	SB*	1,000	3,900	44.80	65.10	ND	37.50	82.80	101.00	21.30
Mercury	0.1	2.8	6	ND	ND	20.50	ND	ND	ND	ND
Nickel	13 or SB	310	10,000	20.90	20.80	20.50	21.10	23.00	26.60	21.50
Selenium	2 or SB	1,500	6,800	0.57	3.16	ND	0.67	0.68	1.08	ND
Silver	SB	1,500	6,800	ND	ND	ND	ND	ND	ND	ND
Thallium	NS	NS	NS	ND	1.57	ND	ND	1.44	1.74	ND
Zinc	20 or SB	10,000	10,000	67.20	55.80	63.40	105.00	78.80	743.00	222.00

NOTES:
All data are reported in milligrams per kilogram (mg/kg) = parts per million (ppm)
NS indicates that there is no listed standard for the analyte
SB = site background
*Background levels for lead vary widely. Average background levels for metropolitan or suburban areas or near highways typically range from 200-500ppm
"nd <" indicates that the compound was not detected at or above the laboratory method reporting limit
Metals concentrations consisted typical of background concentrations.

Table 4
Former Hamilton Reproduction Site
Historic 1998 Groundwater Sample Volatile Organic Compound Results

Analyte	6 NYCRR Part 703.5	MW-1R	MW-2	MW-2R	MW-3	MW-3R	MW-4	MW-4R
		1998 sampling						
	ppb	ppb	ppb	pbb	pbb	pbb	pbb	pbb
1,1 Dichloroethane	5*	1.0 U	1.0 U	93	1.0 U	1.0 U	13	20
1,1 Dichloroethene	5*	1.0 U	1.0 U	1.9	1.0 U	1.0 U	10 U	1.1
1,1,1-Trichloroethane	5*	1.0 U	1.0 U	15	2.1	1.0 U	110	36
1,1,2,2-Tetrachloroethane	5*	1.0 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	2.0 U
1,1,2-Trichloroethane	1	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	2.0 U
1,2 Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	1.0 U
1,2-Dichlorobenzene	3	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	2.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	1.0 U
1,3-Dichlorobenzene	3	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	2.0 U
1,4-Dichlorobenzene	3	2.4 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	2.1 U
2-Chloroethylvinyl Ether	NS	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	2.0 U
Benzene	1	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	120
Bromodichloromethane	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	1.0 U
Bromoform	NS	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	2.0 U
Bromomethane	5*	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	50 U	5.0 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	1.0 U
Chlorobenzene	5*	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	2.0 U
Chloroethane	5*	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	2.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	1.0 U
Chloromethane	NS	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	50 U	5.0 U
cis-1,2-Dichloroethene	5*	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	440	7.3
cis-1,3-Dichloropropene	0.4+	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	1.0 U
Dibromochloromethane	5*	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	2.0 U
Ethylbenzene	5*	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	78
M + P Xylene	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	64
Methylene Chloride	5*	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	1.0 U
o-Xylene	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	4.4
Tetrachloroethene	5*	1.0 U	1.0 U	1.0 U	1.0 U	1.4	1,100	3.2
Toluene	5*	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	27
trans-1,2-Dichloroethene	5*	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	1.0 U
trans-1,3-Dichloropropene	0.4+	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	2.0 U
Trichloroethene	5*	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	510	11
Trichlorofluoromethane	5*	1.0 U	1.0 U	8.3	1.0 U	1.0 U	10 U	1.0 U
Vinyl Chloride	2	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	11
TOTAL VOC concentration				118.2	2.1	1.4	2173	383

NOTES:

All data are reported in micrograms per liter (ug/L) = parts per billion (ppb)
NS indicates that there is no listed standard for that analyte
nd < = Compound was not detected at or above laboratory method reporting limit
U = compound not detected above laboratory method reporting limit
Shaded cells indicate values that are greater than the standard.

Table 5
Former Hamilton Reproduction Site
Historic 1998 Groundwater Sample Semi-Volatile Organic Compound Results

Analyte	6 NYCRR Part 703.5	MW-1R	MW-2	MW-2R	MW-3	MW-3R	MW-4	MW-4R
		1998 sampling						
	ppb	ppb	ppb	pbb	pbb	pbb	pbb	pbb
1,2 Dichlorobenzene	3	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
1,2,4 Trichlorobenzene	5*	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
1,3 Dichlorobenzene	3	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
1,4 Dichlorobenzene	3	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
2,2'-oxybis (1-Chloropropane)	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
2,4,5, Trichlorophenol	NS	12 U	10 U	10 U	10 U	11 U	10 U	11 U
2,4,6, Trichlorophenol	NS	12 U	10 U	10 U	10 U	11 U	10 U	11 U
2,4-Dichlorophenol	1+	12 U	10 U	10 U	10 U	11 U	10 U	11 U
2,4-Dimethylphenol	1+	12 U	10 U	10 U	10 U	11 U	10 U	11 U
2,4-Dinitrophenol	1+	24 U	20 U	20 U	20 U	21 U	20 U	21 U
2,4-Dinitrotoluene	5*	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
2,6-Dinitrotoluene	5*	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
2-Chloronaphthalene	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
2-Chlorophenol	NS	12 U	10 U	10 U	10 U	11 U	10 U	11 U
2-Methylnapthalene	NS	12 U	10 U	10 U	10 U	11 U	10 U	3.5 J
2-Methylphenol	NS	12 U	10 UJ	10 U	10 U	11 U	10 UJ	11 U
2-Nitroaniline	5*	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
2-Nitrophenol	NS	12 U	10 U	10 U	10 U	11 U	10 U	11 U
3,3'-Dichlorobenzidine	5*	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
3-Nitroaniline	5*	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
4-Methylphenol	NS	12 UJ	10 UJ	10 UJ	10 UJ	11 UJ	10 J	11 UJ
4,6-Dinitro-2methylphenol	NS	24 U	20 U	20 U	20 U	21 U	20 U	21 U
4-Bromophenyl-phenylether	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
4-Chloro-3-Methylphenol	NS	12 U	10 U	10 U	10 U	11 U	10 U	11 U
4-Chloroaniline	5*	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
4-Chlorophenyl-phenylether	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
4-Nitroaniline	5*	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
4-Nitrophenol	NS	24 U	20 U	20 U	20 U	21 U	20 U	21 U
Acenaphthylene	NS	5.9 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.3 UJ	5.0 UJ	5.3 UJ
Acenapthene	NS	5.9 U	5.0 U	5.0 U	5.3 U	5.3 U	5.0 U	5.3 U
Anthracene	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Benzo (a) anthracene	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Benzo (a) pyrene	ND	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Benzo (b) fluoranthene	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Benzo (g,h,i) perylene	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Benzo (k) fluoranthene	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Benzyl Alcohol	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
bis (2-Chloroethoxy) methane	5*	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
bis (2-Chloroethyl) Ether	1.0	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
bis (2-Ethylhexyl) phthalate	5	8.8 J	3.3 J	4.3 J	5.0 U	5.4 J	3.0 J	1.8 J
Butylbenzylphthalate	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Carbazole	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Chrysene	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Dibenzo (a,h) anthracene	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Dibenzofuran	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Diethylphthalate	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Dimethylphthalate	NS	5.9 U	5.0 U	5.0 U	5.0 U	2.1 J	5.0 U	5.3 U
Di-n-butylphthalate	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Di-n-octylphthalate	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Fluoranthene	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Fluorene	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Hexachlorobenzene	0.04	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Hexachlorobutadiene	0.5	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Hexachlorocyclopentadiene	5*	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Hexachloroethane	5*	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Indeno (1,2,3-cd) pyrene	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Isophorone	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Naphthalene	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	2.4 J	14
Nitrobenzene	0.4	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
N-Nitrosodimethylamine	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
N-Nitroso-di-n-propylamine	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
N-Nitrosodiphenylamine	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Pentachlorophenol	1+	24 U	20 U	20 U	20 U	21 U	20 U	21 U
Phenanthrene	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
Phenol	1+	12 U	10 U	10 U	10 U	11 U	10 U	11 U
Pyrene	NS	5.9 U	5.0 U	5.0 U	5.0 U	5.3 U	5.0 U	5.3 U
TOTAL SVOC concentration	NS	8.8	3.3	4.3		7.5	15.4	19.3

NOTES:
All data are reported in micrograms per liter (ug/L) = parts per billion (ppb)
NS indicates that there is no listed standard for that analyte
U = compound not detected above laboratory method reporting limit
J = estimated value, compound detected below laboratory method reporting limit
Shaded cells indicate values that are greater than the standard.
* Listed groundwater standard is for the sum of these compounds
ND = a non-detectable concentration

Table 6
Former Hamilton Reproduction Site
Historic 1998 Groundwater Sample Pesticide Results

Analyte	6 NYCRR Part 703.5	MW-1R	MW-2	MW-2R	MW-3	MW-3R	MW-4	MW-4R
		1998 sampling						
	ppb	ppb	ppb	pbb	pbb	pbb	pbb	pbb
4,4' - DDD	0.3	0.050 U	0.050 U	0.050 U	0.050 U	0.058 U	0.050 U	0.050 U
4,4' - DDT	0.2	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U
4,4'-DDE	0.2	0.050 U	0.050 U	0.050 U	0.050 U	0.058 U	0.050 U	0.050 U
Aldrin	ND	0.050 U	0.050 U	0.050 U	0.050 U	0.058 U	0.050 U	0.050 U
Alpha Endosulfan	NS	0.050 U	0.050 U	0.050 U	0.050 U	0.058 U	0.050 U	0.050 U
alpha-BHC	NS	0.050 U	0.050 U	0.050 U	0.050 U	0.058 U	0.050 U	0.050 U
alpha-Chlordane	NS	0.050 U	0.050 U	0.050 U	0.050 U	0.058 U	0.050 U	0.050 U
Beta Endosulfan	NS	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U
beta-BHC	NS	0.050 U	0.050 U	0.050 U	0.050 U	0.058 U	0.050 U	0.050 U
delta-BHC	NS	0.050 U	0.050 U	0.050 U	0.050 U	0.058 U	0.050 U	0.050 U
Dieldrin	0.004	0.050 U	0.050 U	0.050 U	0.050 U	0.058 U	0.050 U	0.050 U
Endosulfan sulfate	NS	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U
Endrin	ND	0.050 U	0.050 U	0.050 U	0.050 U	0.058 U	0.050 U	0.050 U
Endrin aldehyde	5*	0.10 U	0.10 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U
Endrin ketone	5*	0.10 U	0.050 U	0.10 U	0.10 U	0.12 U	0.10 U	0.10 U
gamma- Chlordane	NS	0.050 U	0.050 U	0.050 U	0.050 U	0.058 U	0.050 U	0.050 U
gamma-BHC (Lindane)	NS	0.050 U	0.050 U	0.050 U	0.050 U	0.058 U	0.050 U	0.050 U
Heptachlor	0.04	0.050 U	0.050 U	0.050 U	0.050 U	0.058 U	0.050 U	0.050 U
Heptachlor epoxide	0.03	0.050 U	0.050 U	0.050 U	0.050 U	0.058 U	0.050 U	0.050 U
Methoxychlor	35	0.20 U	0.20 U	0.20 U	0.20 U	0.23 U	0.20 U	0.20 U

NOTES:
All data are reported in micrograms per liter (ug/L) = parts per billion (ppb)
NS indicates that there is no listed standard for that analyte
U = compound not detected above laboratory method reporting limit
ND = a non-detectable concentration
Shaded cells indicate values that are greater than the standard.

Table 7
Former Hamilton Reproduction Site
Historic 1998 Groundwater Sample PCB Results

Analyte	6 NYCRR Part 703.5	MW-1R	MW-2	MW-2R	MW-3	MW-3R	MW-4	MW-4R
		1998 sampling						
	ppb	ppb	ppb	pbb	pbb	pbb	pbb	pbb
Aroclor - 1016	0.09	0.5 U	0.5 U	0.05 U	0.5 U	0.58 U	0.5 U	0.5 U
Aroclor - 1221	0.09	0.5 U	0.5 U	0.5 U	0.5 U	0.58 U	0.5 U	0.5 U
Aroclor - 1232	0.09	0.5 U	0.5 U	0.5 U	0.5 U	0.58 U	0.5 U	0.5 U
Aroclor - 1242	0.09	0.5 U	0.5 U	0.5 U	0.5 U	0.58 U	0.5 U	0.5 U
Aroclor - 1248	0.09	0.5 U	0.5 U	0.5 U	0.5 U	0.58 U	0.5 U	0.5 U
Aroclor - 1254	0.09	0.5 U	0.5 U	0.5 U	0.5 U	0.58 U	0.5 U	0.5 U
Aroclor - 1260	0.09	0.5 U	0.5 U	0.5 U	0.5 U	0.58 U	0.5 U	0.5 U

NOTES:
All data are reported in micrograms per liter (ug/L) = parts per billion (ppb)
NS indicates that there is no listed standard for that analyte
U = compound not detected above laboratory method reporting limit
Shaded cells indicate values that are greater than the standard.

Table 8
Former Hamilton Reproduction Site
Historic 1998 Groundwater Sample Metals Results

Analyte	6 NYCRR Part 703.5	MW-1R	MW-2	MW-2R	MW-3	MW-3R	MW-4	MW-4R
		1998 sampling						
	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Aluminum	NS	8,340	2,090	152	245,000	129	112,000	226
Antimony	3	60 U	60 U	60 U	60 U	60 U	60 U	60 U
Arsenic	25	21.4 J	11.6 J	10.0 UJ	171 J	10.0 UJ	48.1 J	10.0 UJ
Barium	1,000	86.4	54.1	37.6	1,150	135	473	176
Beryllium	NS	5 U	5 U	5 U	16.8	5 U	6.49	5 U
Cadmium	5	5 U	5 U	5 U	5 U	5 U	5.99	5 U
Calcium	NS	143,000	170,000	103,000	617,000	114,000	128,000	221,000
Chromium	50	13.0	10 U	10 U	325	10 U	119	10 U
Cobalt	NS	50 U	50 U	50 U	502	50 U	173	50 U
Copper	200	20 U	20 U	20 U	1,130	20 U	544	20 U
Iron	300*	36,000	3,570	22,100	779,000	242	290,000	1,370
Lead	25	14.2	5 U	5 U	478	5 U	188	5 U
Magnesium	NS	47,700	32,500	13,600	127,000	21,600	50,400	22,800
Manganese	300*	560	727	872	25,600	118	9,960	4,000
Mercury	0.7	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U
Nickel	100	40 U	48.1	40 U	688	40.0 U	284	40.0 U
Potassium	NS	4,090	3,220	4,340	17,700	11,000	16,700	7,920
Selenium	10	5 U	5 U	5 U	348	5 U	27.4	5 U
Silver	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	20,000	25,200	93,700	17,600 U	35,900	35,300	20,100	916,000
Thallium	NS	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vanadium	NS	50 U	50 U	50 U	169	50 U	90.9	50 U
Zinc	NS	83.0	17.6	21.2	2,090	14.0	1,520	10.0 U

NOTES:
All data are reported in micrograms per liter (ug/L) = parts per billion (ppb)
NS indicates that there is no listed standard for that analyte
U = compound not detected above laboratory method reporting limit
Shaded cells indicate values that are greater than the standard.
* 500 ppb = criteria for sum of lead and manganese

Historic 1998 **Gas Chromatography Headspace Analysis Of Soil Boring Samples**

Chazen Job No. 49723.00 Task 004

Chlorinated Volatile Compounds

Sample ID	Date Collected	Date Analyzed	Freon 113 ppb	1,1-DCA ppb	cis 1,2-DCE ppb	1,1,1-TCA ppb	TCE ppb	PCE ppb
HAM-B1 0-2'	7/15/98	7/17/98	44.02	--	--	3.09	8.99	11.33
HAM-B1-002-XL	7/15/98	7/17/98	5.29	15.18	--	--	9.19	6.63
B-1 Composite	7/15/98	7/17/98	90.73	--	--	69.70	240.75	293.65
HAM-B1-Composite-XL	7/13/98	7/20/98	9.18	--	--	--	229.55	109.06
HAM-SD1-Composite-XL	7/16/98	7/21/98	127.94	379.44	25779.51	3281.75	18875.24	26980.58
HAM-B2-002-XL	7/14/98	7/20/98	6.06	--	20.67	--	--	9.71
HAM-B2-004-XL	7/15/98	7/20/98	--	--	--	110.22	--	83.56
HAM-B2-006-XL	7/15/98	7/21/98	--	5.48	--	53.27	--	24.96
HAM-B2-008-XL	7/15/98	7/21/98	4.64	--	--	3.29	--	3.47
HAM-B2-009-XL	7/15/98	7/20/98	25.69	--	--	--	12.71	47.66
HAM-B3-000-XL	7/14/98	7/21/98	--	--	--	3.02	2.71	16.27
HAM-B3-002-XL	7/13/98	7/17/98	6.98	3.72	--	5.86	4.90	20.93
HAM-ST2-002-XL	7/14/98	7/20/98	19.09	103.69	23.03	--	99.99	418.01
HAM-B3-Composite-XL	7/13/98	7/17/98	17.80	53.30	--	--	2.71	5.95
HAM-B4-000-XL	7/14/98	7/20/98	27.24	26.23	--	315.16	363.21	612.54
HAM-B4-Composite	7/14/98	7/21/98	9.85	--	13.33	35.84	195.59	1411.82
HAM-B5-Composite-XL	7/15/98	7/17/98	3.71	8.94	16.86	8.24	16.35	88.92
HAM-B5-000-XL	7/15/98	7/17/98	66.18	--	--	21.66	21.98	123.13
HAM-B6-000-XL	7/13/98	7/20/98	--	12.28	1069.18	69.04	2137.54	1948.87
HAM-B6-002-XL	7/14/98	7/20/98	3349.71	505.23	9124.43	7343.41	15226.17	19044.79
HAM-B6-Composite-XL	7/16/98	7/20/98	1336.61	197.81	4029.07	2564.69	8524.19	14035.28

Note that "--" indicates that the chemical component was not detected in the sample at a concentration above the method detection limit.

Hamilton Reproduction Site - Table 10

Historic 1998 Gas Chromatography Headspace Analysis Of Monitoring Well Soil Samples

Chazen Job No. 49723.00 Task 004

Gasoline Range Compounds

Sample ID	Collection Date	Analysis Date	MTBE ppb	Benzene ppb	Toluene ppb	E-Benzene ppb	m+p Xylene ppb	O-Xylene ppb	135-TMB ppb	124-TMB ppb	Napthalene ppb
B-1 0-2'	7/15/98	7/17/98	--	--	--	--	--	--	--	--	--
HAM-B1-002-XL	7/15/98	7/17/98	--	--	--	--	65.12	--	41.62	33.79	364.66
B-1 Composite	7/15/98	7/17/98	--	185.51	--	--	--	--	--	39.95	902.34
HAM-B1-Composite-XL	7/13/98	7/20/98	--	89.77	38.61	--	271.84	130.36	259.16	251.39	548.51
HAM-SD1-Composite-XL	7/16/98	7/21/98	--	487.36	236.36	--	39.97	45.30	24.45	68.17	395.64
HAM-B2-002-XL	7/14/98	7/20/98	--	--	--	--	--	97.03	56.08	--	2484.35
HAM-B2-004-XL	7/15/98	7/20/98	--	--	--	--	--	--	--	--	--
HAM-B2-006-XL	7/15/98	7/21/98	--	--	--	--	--	--	--	--	--
HAM-B2-008-XL	7/15/98	7/21/98	--	--	--	--	32.42	--	--	53.75	349.94
HAM-B2-009-XL	7/15/98	7/20/98	--	--	--	--	64.52	32.63	74.15	54.54	428.01
HAM-B3-000-XL	7/14/98	7/21/98	--	--	--	--	56.75	42.43	99.40	145.69	465.53
HAM-B3-002-XL	7/13/98	7/17/98	--	--	171.20	0.06	1278.91	581.24	451.97	935.14	35.15
HAM-ST2-002-XL	7/14/98	7/20/98	--	--	--	--	49.11	34.12	57.82	48.76	97.74
HAM-B3-Composite-XL	7/13/98	7/17/98	--	--	100.06	--	563.12	231.34	155.09	266.49	403.60
HAM-B4-000-XL	7/14/98	7/20/98	--	66.86	104.72	--	580.74	296.05	179.44	420.06	851.99
HAM-B4-Composite-XL	7/14/98	7/21/98	--	--	--	--	175.38	93.47	30.63	238.12	433.55
HAM-B5-Composite-XL	7/15/98	7/17/98	--	--	--	--	--	--	--	--	--
HAM-B5-000-XL	7/15/98	7/17/98	--	--	133.92	--	--	--	--	--	--
HAM-B6-002-XL	7/13/98	7/20/98	--	--	--	--	66.97	41.93	45.73	48.77	797.61
HAM-B6-002-XL	7/14/98	7/20/98	198.42	670.02	--	--	--	40.08	--	43.96	76.72
HAM-B6-Composite-XL	7/16/98	7/20/98	--	260.92	--	--	48.05	56.49	78.41	81.31	1316.12

Note that "--" indicates that the chemical component was not detected in the sample at a concentration above the method detection limit.

Historic 1998

Hamilton Reproduction Site - Table 11

Gas Chromatography Headspace Analysis Of Monitoring Well Soil Samples

Chazen Job No. 49723.00 Task 004

Chlorinated Volatile Compounds

Sample ID	Date Collected	Date Analyzed	Freon 113 ppb	1,1-DCA ppb	cis 1,2-DCE ppb	1,1,1-TCA ppb	TCE ppb	PCE ppb
HAM-MW-02R-000-XX	7/6/98	7/9/98	54.43	46.30	--	35.54	2.03	6.09
HAM-MW-02R-002-XX	7/6/98	7/8/98	4.31	--	99.53	93.84	2173.95	10.42
HAM-MW-02R-004-XX	7/6/98	7/9/98	16.60	--	--	4.19	35.48	6.55
HAM-MW-02R-006-XX	7/6/98	7/9/98	--	15.18	17.13	19.40	63.88	2.49
HAM-MW-02R-008-XX	7/6/98	7/9/98	--	--	3.81	--	18.28	--
HAM-MW-02R-010-XX	7/6/98	7/9/98	9.59	--	--	24.05	3.88	5.70
HAM-MW-02R-012-XX	7/6/98	7/8/98	9.93	--	5.06	4.90	32.32	3.33
HAM-MW-03R-XXX-XX composite	7/2/98	7/9/98	11.76	--	--	9.04	--	6.61
HAM-MW-03R-000-XX	7/2/98	7/9/98	95.96	--	--	3.14	4.45	15.33
HAM-MW-03R-002-XX	7/2/98	7/8/98	23.68	--	--	--	2.23	91.81
HAM-MW-03R-006-XX	7/2/98	7/8/98	4.23	--	8.59	--	--	40.01
HAM-MW-03R-008-XX	7/2/98	7/8/98	25.48	--	--	--	--	8.03
HAM-MW-03R-010-XX	7/2/98	7/8/98	43.56	--	4.39	--	--	26.29
HAM-MW-04R-002-XX	7/1/98	7/8/98	7.78	3.23	13194.75	1748.55	4625.50	44084.11
HAM-MW-04R-006-XX	7/1/98	7/8/98	20.74	23.08	14332.97	3440.95	11158.49	35243.44

Note that "--" indicates that the chemical component was not detected in the sample at a concentration above the method detection limit.

Hamilton Reproduction Site - Table 12

Historic 1998 **Gas Chromatography Headspace Analysis Of Monitoring Well Soil Samples**

Chazen Job No. 49723.00 Task 004

Gasoline Range Compounds

Sample ID	Collection Date	Analysis Date	MTBE ppb	Benzene ppb	Toluene ppb	E-Benzene ppb	m+p Xylene ppb	O-Xylene ppb	135-TMB ppb	124-TMB ppb	Napthalene ppb
HAM-MW-02R-000-XX	7/6/98	7/9/98	–	55.37	138.64	–	162.15	83.09	68.37	30.53	–
HAM-MW-02R-002-XX	7/6/98	7/8/98	–	–	–	–	–	–	26.72	29.26	–
HAM-MW-02R-004-XX	7/6/98	7/9/98	–	–	–	–	–	–	–	–	–
HAM-MW-02R-006-XX	7/6/98	7/9/98	–	–	–	–	–	–	–	–	–
HAM-MW-02R-008-XX	7/6/98	7/9/98	–	–	–	–	–	–	–	–	–
HAM-MW-02R-010-XX	7/6/98	7/9/98	–	–	–	–	–	–	–	–	–
HAM-MW-02R-012-XX	7/6/98	7/8/98	–	–	–	–	–	–	–	–	–
HAM-MW-03R-XXX-XX composite	7/2/98	7/9/98	–	–	–	–	50.44	37.90	–	–	–
HAM-MW-03R-000-XX	7/2/98	7/9/98	–	–	–	–	–	–	–	–	–
HAM-MW-03R-002-XX	7/2/98	7/8/98	–	–	–	–	–	–	–	–	–
HAM-MW-03R-006-XX	7/2/98	7/8/98	–	–	–	–	–	–	–	–	–
HAM-MW-03R-008-XX	7/2/98	7/8/98	–	–	–	–	–	–	–	–	–
HAM-MW-03R-010-XX	7/2/98	7/8/98	–	–	–	–	–	–	–	–	–
HAM-MW-04R-002-XX	7/1/98	7/8/98	–	–	–	–	–	–	–	–	–
HAM-MW-04R-006-XX	7/1/98	7/8/98	–	–	–	–	–	–	–	–	–

Note that "–" indicates that the chemical component was not detected in the sample at a concentration above the method detection limit.

Table 13
Former Hamilton Reproduction Site
Summary of Remaining Soil Contamination
Remedial Action Confirmatory Soil Sample Volatile Organic Compound Lab Results

Boring	NYSDEC TAGM #4046 Recommended Soil Cleanup Objectives	6 NYCRR Part 375 Soil Cleanup Objectives	6 NYCRR Part 375 Soil Cleanup Objectives							
Sample ID:				HAMCS003	HAMCS004	HAMCS005	HAMCS006	HAMCS008	HAMCS009	HAMCS010
Location:				E Sidewall	W Sidewall	SW Sidewall	S Sidewall	NE Sidewall	N Sidewall	SE Sidewall
Sample Date:		Unrestricted Use	Commercial	1/19/2000	1/19/2000	1/19/2000	1/19/2000	1/27/2000	1/27/2000	1/27/2000
Analysis Method:				8260	8260	8260	8260	8260	8260	8260
Units:	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1,1,1-TRICHLOROETHANE	800	680	500000	U	U	U	U	U	U	U
1,1,2,2-TETRACHLOROETHANE	600	NS	NS	U	U	U	U	U	U	U
1,1,2-TRICHLOROETHANE	NS	NS	NS	U	U	U	U	U	U	U
1,1-DICHLOROETHANE	200	270	240000	U	U	U	U	U	U	U
1,1-DICHLOROETHENE	400	330	500,000	U	U	U	U	U	U	U
1,2,4-TRIMETHYLBENZENE	NS	3,600	190,000	U	4	4400 E	59	U	U	U
1,2-DICHLOROBENZENE	7,900	1,100	500,000	U	U	U	U	U	U	U
1,2-DICHLOROETHANE	100	20	30,000	U	U	U	U	U	U	U
1,2-DICHLOROPROPANE	NS	NS	NS	U	U	U	U	U	U	U
1,3,5-TRIMETHYLBENZENE	NS	3,600	190,000	U	U	1500 E	22	U	U	U
1,3-DICHLOROBENZENE	1,600	2,400	280,000	U	U	U	U	U	U	U
1,4-DICHLOROBENZENE	8,500	1,800	130,000	U	U	U	U	U	U	U
2-CHLOROETHYLVINYL ETHER	NS	NS	NS	U	U	U	U	U	U	U
2-HEXANONE	NS	NS	NS	U	U	U	U	U	U	U
4-ISOPROPYLTOLUENE	NS	NS	NS	U	U	200	U	U	U	U
4-METHYL-2-PENTANONE	NS	NS	NS	U	U	55	U	U	U	U
ACETONE	110	50	50	U	U	U	15	U	U	U
BENZENE	60	60	44,000.00	U	U	U	U	U	U	U
BROMODICHLOROMETHANE	NS	NS	NS	U	U	U	U	U	U	U
BROMOFORM	NS	NS	NS	U	U	U	U	U	U	U
BROMOMETHANE	NS	NS	NS	U	U	U	U	U	U	U
CARBON TETRACHLORIDE	600	760	22,000	U	U	U	U	U	U	U
CHLOROBENZENE	1,700	1,100	500000	U	U	U	U	U	U	U
CHLOROETHANE	1,900	NS	NS	U	U	U	U	U	U	U
CHLOROFORM	300	370	350,000	5 B	6 B	22 B	6 B	JB	13 B	10 B
CHLOROMETHANE	NS	NS	NS	U	U	U	U	U	U	U
CIS-1,2-DICHLOROETHENE	NS	250	500,000	U	U	U	U	U	10	U
CIS-1,3-DICHLOROPROPENE	NS	NS	NS	U	U	U	U	U	U	U
DIBROMOCHLOROMETHANE	NS	NS	NS	U	U	U	U	U	U	U
ETHYLBENZENE	5,500	1,000	390,000	U	U	430	8	U	U	U
ISOPROPYLBENZENE	NS	NS	NS	U	U	210	4	U	U	U
METHLY ETHYL KETONE	300	120	500,000	U	U	U	U	U	U	U
METHYLENE CHLORIDE	100	120	500,000	17 B	12 B	28 B	12 B	28 U	U	U
NAPHTHALENE	13,000	12,000	500,000	U	U	860	8	U	U	U
n-PROPYLBENZENE	NS	NS	NS	U	U	810	15	U	U	U
sec-BUTYLBENZENE	NS	11,000	500,000	U	U	110	U	U	U	U
TETRACHLOROETHENE	1,400	1,300	150,000	4 J	6	320	180	U	35 B	13 B
TOLUENE	1,500	700	500,000	U	8	64	6	U	U	U
TRANS-1,2-DICHLOROETHENE	300	190	500,000	2	U	U	U	U	U	U
TRANS-1,3-DICHLOROPROPENE	NS	NS	NS	U	U	U	U	U	U	U
TRICHLOROETHENE	700	470	200,000	U	U	U	49	U	20	7
TRICHLOROFLUOROMETHANE	NS	NS	NS	U	U	U	U	U	U	U
VINYL CHLORIDE	200	20	13,000	U	U	U	U	U	U	U
XYLENE	1,200 (total)	260	100,000 (total)	U	6	**2170**	48	U	U	U

Table 14
Former Hamilton Reproduction Site
November 2009 Groundwater Sample Volatile Organic Compound Results

Sample ID		MW-4	HR-MW-B1	HR-MW-B2	HR-MW-B3
Sample Date		1998	11/3/2009		
Depth to Groundwater from Top of PVC (2009 elevations not surveyed)		between 6.71' and 8.13' (three readings collected)	4.6'	5.6'	4.55'
Constituent	Groundwater Standard				
1,1,1-Trichloroethane	5	**110**	**6**	5 U	5 U
1,1,1,2-Tetrachloroethane	5	NA	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5	20 U	5 U	5 U	5 U
1,1,2-Trichloroethane	1	20 U	5 U	5 U	5 U
1,1-Dichloroethane	5	**13**	5 U	**11**	**12**
1,1-Dichloroethene	5	10 U	5 U	5 U	5 U
1,1-Dichloropropene	5	NA	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	0.04	NA	5 U	5 U	5 U
1,2-Dibromoethane	NS	NA	5 U	5 U	5 U
1,2-Dichlorobenzene	3	20 U	5 U	5 U	5 U
1,2-Dichloroethane	0.6	10 U	5 U	5 U	5 U
1,2-Dichloropropane	1	10 U	5 U	5 U	5 U
1,3- Dichlorobenzene	3	20 U	5 U	5 U	5 U
1,3-Dichloropropane	5	NA	5 U	5 U	5 U
1,4-Dichlorobenzene	3	20 U	5 U	5 U	5 U
1,2,3-Trichlorobenzene	5	NA	5 U	5 U	5 U
1,2,3-Trichloropropane	0.04	NA	5 U	5 U	5 U
1,2,4-Trichlorobenzene	5	NA	5 U	5 U	5 U
1,2,4-Trimethylbenzene	5	NA	5 U	5 U	5 U
1,3,5-Trimethylbenzene	5	NA	5 U	5 U	5 U
1,3-Dichloropropane	5	NA	5 U	5 U	5 U
1,4-Dichlorobenzene	3	NA	5 U	5 U	5 U
2-Chloroethylvinyl Ether	NS	20 U	NA	NA	NA
2-Hexanone	50	NA	NA	NA	NA
2,2-Dichloropropane	5	NA	5 U	5 U	5 U
2-Chlorotoluene	5	NA	5 U	5 U	5 U
4-Chlorotoluene	5	NA	5 U	5 U	5 U
Benzene	1	20 U	5 U	**24**	5 U
Bromobenzene	5	NA	5 U	5 U	5 U
Bromochloromethane	5	NA	5 U	5 U	5 U
Bromodichloromethane	50	10 U	5 U	5 U	5 U
Bromoform	50	20 U	5 U	5 U	5 U
Bromomethane	5	50 U	5 U	5 U	5 U
Carbon Tetrachloride	5	10 U	5 U	5 U	5 U
Chlorobenzene	5	20 U	5 U	5 U	5 U
Chloroethane	5	20 U	5 U	5 U	5 U
Chloroform	7	10 U	5 U	5 U	5 U
Chloromethane	NS	50 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	5	**440**	5 U	**6**	**13**
trans-1,2-Dichloroethene	5	10 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	0.4 sum with trans-	10 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	0.4 sum with cis-	20 U	5 U	5 U	5 U
Dibromochloromethane	50	20 U	5 U	5 U	5 U
Dibromomethane	5	NA	5 U	5 U	5 U
Dichlorodifluoromethane	5	NA	5 U	5 U	5 U
Ethylbenzene	5	20 U	5 U	5 U	5 U
Hexachlorobutadiene	0.5	NA	5 U	5 U	5 U
Isopropylbenzene	5	NA	5 U	5 U	5 U
M+P-Xylene	5	10 U	5 U	5 U	5 U
Methylene Chloride	5	10 U	5 U	5 U	5 U
MTBE	NS	NA	5 U	5 U	5 U
Naphthalene	10	NA	5 U	5 U	5 U
n-Butylbenzene	5	NA	5 U	5 U	5 U
n-Propylbenzene	5	NA	5 U	5 U	5 U
O-Xylene	5	10 U	5 U	5 U	5 U
p-Isopropyltoluene	5	NA	5 U	5 U	5 U
sec-Butylbenzene	5	NA	5 U	5 U	5 U
Styrene	5	NA	5 U	5 U	5 U
tert-Butylbenzene	5	NA	5 U	5 U	5 U
Tetrachloroethene	5	**1100**	**9**	5 U	**7**
Toluene	5	20 U	5 U	5	5 U
Trichloroethene	5	**510**	**6**	**24**	**15**
Trichlorofluoromethane (Freon)	5	10 U	5 U	5 U	5 U
Vinyl Chloride	2	20 U	5 U	5 U	5 U

NOTES:
All data are reported in micrograms per liter (ug/L) = parts per billion (ppb)
Groundwater standards are from TOGS 1.1.1
Results which exceed ambient groundwater standards and guidance values are shown as **BOLD**
U = not detected above the listed method detection limit
NA = sample not analyzed for listed contituent
NS = No ambient groundwater standard for the listed constituent

APPENDIX A
Excavation Work Plan

APPENDIX A – EXCAVATION WORK PLAN

A-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination (i.e., saturated soil), the site owner or their representative will notify the Department. Currently, this notification will be made to:

Mr. Michael A. Mason, P.E.

Regional Hazardous Waste Remediation Engineer

625 Broadway, 12th Floor

Albany, NY 12233-7017

This notification will include:

- A detailed description of the work to be performed, including the location and aerial 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,

If planned excavation consists of a small volume of soil from above the water table that is reused on the site or directly loaded for off-site disposal, these activities would not require the stockpiling or fluids management provisions. Site soil may be regraded or excavated as part of construction activities but will, to the extent feasible, be reused on the site. Saturated soil in contact with contaminated groundwater will

not be relocated to the ground surface. If excavated, saturated soil will be reused at that excavation or disposed of off-site.

- 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 C 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 (i.e., PID) soil screening will be performed by a qualified environmental professional during all development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC. NYSDEC has determined that site soil meets commercial and industrial land uses; as such, site soil is planned for reuse on the site.

If there is evidence of previously unidentified contamination (i.e., based on historic analytical data, elevated field screening readings, and visual impacts), then impacted soil will be segregated, sampled and analyzed to determine disposal or reuse options. Saturated soil in contact with contaminated groundwater will not be relocated to the ground surface. If excavated, saturated soil will be reused at that excavation or disposed of off-site.

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 anticipates using excavated site soil as fill material on the property, with no load out necessary. This section includes load-out discussion, should there be excess soil on site.

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 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.

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 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 this site will not occur without formal NYSDEC approval.

If excavation activities identify soil that requires off-site disposal, disposal locations for excavated soils will be provided to NYSDEC. 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.

Excess non-hazardous historic fill and contaminated soils that are not reused on the site and are 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

The owner anticipates using all excavated site soil as fill material on the property, for the same excavation or excavations containing similar contaminants under the predetermined beneficial use determination (BUD) in 6 NYCRR 360.15(b)(8).

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 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 soil quality standards established in 6NYCRR 375-6.7(d). Based on the commercial/industrial land use, the resulting soil quality standards are listed in Tables 1 through 3. 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-10 STORMWATER POLLUTION PREVENTION

A Stormwater Pollution Prevention Plan (SWPPP) was not required at the time of remedial construction. As the site is 1.96-acres in size, future development activities will include considerations to develop and implement a site-specific SWPPP which will be discussed with the NYSDEC. The SWPPP will conform to the requirements of NYSDEC Division of Water guidelines and NYS regulations and will include the following provisions at a minimum: 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-11 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, surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for TCL volatiles and semi-volatiles based on site history and previous sampling results.

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-12 COMMUNITY AIR MONITORING PLAN

The New York State Department of Health's (NYSDOH) Generic CAMP guidance, Appendix 1A of DER-10, is attached to this document as Appendix C. As soil samples met 6 NYCRR Part 375 soil cleanup objectives, air monitoring is not expected to be needed. Should unknown or unexpected contaminated media be identified during invasive site work, CAMP monitoring may be implemented, if warranted. Air sampling stations will be established should air monitoring become necessary. Air sampling 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.

A-13 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used on a routine basis could include limiting exposed surface area, covering exposed soil, the application of odor control foam or other products applied directly to the exposed soil, or odor neutralizing devices. 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-14 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 though 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.

APPENDIX B
Environmental Easement
Metes and Bounds with survey map

KIM BAINES

The City of Poughkeepsie

New York

G. BRIAN MORGAN
Corporation Counsel

PAUL ACKERMANN
Assistant Corporation Counsel

62 Civic Center Plaza
P.O. Box 300
Poughkeepsie, New York 12602
Telephone: (845) 451-4065
Facsimile: (845) 451-4070

June 3, 2009

Yvonne M. Ward
Easement Attorney
New York State Department of
Environmental Conservation
Office of General Counsel, 14th Floor
625 Broadway
Albany, New York 12233-1500

RE: Hamilton Reproduction Restoration Site
Site No: B0020
166-186 Hamilton Street, Poughkeepsie

Dear Ms. Ward:

Enclosed please find a copy of the recorded Environmental Easement with regard to the above referenced property. The recording page attached notes that the easement was recorded on June 2, 2009 in the Dutchess County Clerk's office at Document number 02-2009-2716.

Very truly yours,

CITY OF POUGHKEEPSIE
G. Brian Morgan, Corporation Counsel

By: _____
Kristen Guthrie, Secretary to Corporation Counsel

O:\Kristen\Misc. Letters\Easement ltr 6 2 09.doc

JUN-02-2009 12:47 QUEEN CITY ABSTRACT 845 452 2747 P.02

Batch# 8112 User oth

Dutchess County Clerk

22 Market Street
Poughkeepsie, N.Y. 12601
(845) 486-2134

Receipt #	Date	Time
28970	06/02/2009	10:56:00 AM

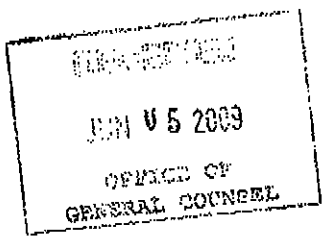
Received From: QUEEN CITY ABSTRACT
Fee Total: $80.00

Document	Account		Amount	Comment	Pages
02 Deed # 2716					
	010	Record Deeds	55.00	EASE	7
	030	Affidavit	5.00		1
	070	Records Mgmt - Local Fee	1.00		1
	504	Records Mgmt - State Fee	4.75		1
	511	Cultural Ed - State Fee	14.25		1
	030	Reference	0.00		1
11 TRANSFER TAX # 4803					
	290	Real Estate Transfer Tax	0.00		1
	250	Mortgage Tax County	0.00		

Tax District: 31 City of Poughkeepsie

Grantor POUGHKEEPSIE CITY
Grantee DEPT OF ENVIRONMENTAL CONSERVATION

Recorded under document # 02-2009-2716



County: Dutchess Site No: B00020

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

THIS INDENTURE made this 2 nd day of December, 2008, between Owner City of Poughkeepsie having an office at 62 Civic Center Plaza, Poughkeepsie, New York 12601 (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 of ensuring the potential restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and;

WHEREAS, Grantor, is the owner of real property located at the address of 166-186 North Hamilton Street, in the City of Poughkeepsie, Dutchess County, New York known and designated on the map of Dutchess County as section 6162, block 54, lot 240389, comprised of approximately 1.96 acres (the " Controlled Property"); and;

WHEREAS, the Commissioner does hereby acknowledge that the Department accepts this Environmental Easement in order to ensure the protection of human health and the environment and to achieve the requirements for remediation established at this 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 covenants and mutual promises contained herein and the terms and conditions of State Assistance Contract Number B00020, Grantor grants, conveys and releases to Grantee a permanent Environmental Easement pursuant to Article 71, Title 36 of the ECL in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement").

County: Dutchess Site No: B00020

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 potential restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The following controls 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. The Controlled Property may be used for restricted commercial/industrial use as long as the following long-term engineering controls are employed:

(i) the use of the groundwater underlying the Controlled Property for any purpose, including but not limited to, potable, process or irrigation water, is prohibited without the prior approval of the New York State Departments of Health and Environmental Conservation; and

(ii) soils on the Controlled Property must be managed, characterized, and properly disposed of in accordance with the NYSDEC laws and Regulations;

(iii) the potential for vapor intrusion into any buildings developed on the site must be evaluated, including provisions for mitigation of any impacts identified;

(iv) any subslab soil vapor mitigation system installed under any building structure must be inspected, certified, and maintained as required by the NYSDEC; and

(v) the owner must provide annual certification as required by NYSDEC that the institutional controls and engineering controls are unchanged.

B. The Controlled Property may not be used for a higher level of use such as unrestricted or restricted residential use and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of 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:

County: Dutchess Site No: B00020

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.

D. 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.

E. Grantor covenants and agrees that it shall annually, or such time as NYSDEC may allow, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury that the controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls employed at the Controlled Property were approved by the NYSDEC, and that nothing has occurred that would impair the ability of such control to protect the public health and environment or constitute a violation or failure to comply with any Site Management Plan for such controls and giving access to such Controlled Property to evaluate continued maintenance of such controls.

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 Controlled 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 the underlying fee interest to the Controlled Property by operation of law, by deed, or by indenture, 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.

County: Dutchess Site No: B00020

B. If any person intentionally violates this Environmental Easement, the Grantee may revoke the Certificate of Completion provided under ECL Article 27, Title 14, or Article 56, Title 5 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. Grantor shall then have a reasonable amount of time from receipt of such notice to cure. At the expiration of said second period, Grantee may commence any proceedings and take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement in accordance with applicable law to require compliance with the terms of this Environmental Easement.

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 its enforcement rights in the event of a subsequent breach of or noncompliance with any of the terms of this Environmental Easement.

6. Notice. Whenever notice to the State (other than the annual certification) or approval from the State 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 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: Environmental Easement Attorney
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-1500

Such correspondence shall be delivered by hand, or 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. This Environmental Easement may be amended only by an amendment executed by the Commissioner of the New York State Department of Environmental Conservation 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 and filed

County: Dutchess Site No: B00020

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.

Grantor's Name

By: _____
JOHN C. TKAZYIK
Title: MAYOR Date: 5/20/08

Grantor's Acknowledgment

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

On the 20th day of MAY, in the year 2008, before me, the undersigned, personally appeared JOHN C. TKAZYIK, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity as MAYOR, and that by his 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
KRISTEN GUTHRIE
Notary Public, State of New York
No. 01GU6040559
Qualified in Dutchess County
Comm. Expires April 24, 2010

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation

by: _____
Alexander B. Grannis, Commissioner

County: Dutchess Site No: B00020

Grantee's Acknowledgment

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

On the 22 day of Dec, in the year 2008, before me, the undersigned, personally appeared ALEXANDER B. GRANNIS, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity as Commissioner of the State of New York Department of Environmental Conservation, and that by his 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

CINDYLOU M. FRINKS-DIXON
Notary Public, State of New York
No. 4805685
Qualified in Albany County
Commission Expires August 24, 20 09

EDMS # 295772

TP-584.2 (10/96)

Recording Office Time Stamp

Real Estate Transfer Tax Return For Public Utility Companies' and Governmental Agencies' Easements and Licenses

This form may only be used by public utility companies regulated by the Public Service Commission and governmental agencies for the recording of easements and licenses where the consideration for the grant of such easement or license is $500.00 or less.

Name of grantee (public utility company or governmental agency)

The New York State Department of Environmental Conservation

Federal employer identification number

14-6013200

(if applicable to)

Name and telephone number of person to contact

Mary vanWergers (518) 402-9185

Address of grantee

625 Broadway, Albany, NY 12233-1500

Name(s) of Grantor Of Easement or License	Address of Property	Consideration Given For Easement or License
1. City of Poughkeepsie	166-186 North Hamilton Street	$0.00
2.	City of Poughkeepsie	
3.	Dutchess County, NY	
4.		
5. ENVIRONMENTAL EASEMENT HELD BY NYSDEC		
6. PURSUANT TO TITLE 36 OF ARTICLE 71		
7. OF THE NYS ENCIRONMENTAL CONSERVATION LAW		
8. SITE NO. B-00020		
9.		
10.		
11.		
13.		
14.		

15. If more than fifteen conveyances are to be recorded, attach a schedule of such other conveyances.

Signature of Grantee

I certify that the grantee is a public utility regulated by the Public Service Commission or is a governmental agency and the grantee of the easements and/or licenses above-listed; it is true to the best knowledge of the grantee that the granting of each such easement and/or license is exempt from Real Estate Transfer Tax imposition by Article 31 of the Tax Law by reason that each such conveyance is for a consideration of five hundred dollars or less and/or the conveyance is being made to a governmental agency.

THE PEOPLE OF THE STATE OF NY ACTING THROUGH THEIR COMMISSIONER OF THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Signature of partner, officer of corporation, governmental official, NYSDEC Office of General Counsel

Robert H. Wand NYSDEC - OGC

(518) 402-9217 SENIOR ATTORNEY

PAYMENT AGREEMENT

Montana Furniture Industries located at 96 North Star Lane, Bozeman, MT agrees to the following payment schedule to satisfy their past due account balance of $853.13.

$100.00 with signed payment agreement
$100.00 w/o June 15, 2009
$100.00 w/o June 22, 2009
$100.00 w/o June 29, 2009
$100.00 w/o July 6, 2009
$100.00 w/o July 13, 2009
$100.00 w/o July 20, 2009
$100.00 w/o July 27, 2009
$53.13 w/o August 3, 2009

All new orders received during this time will be shipped C.O.D. as long as payment schedule is kept.

Please sign below by employee with authority to sign such an agreement for above stated company.

_____ _____
Montana Furniture Industries Date

_____ _____
James L. Taylor Mfg. Co., Inc. Date

CHAZEN ENGINEERING & LAND SURVEYING CO., P.C.

Capital District Office
Phone: (518) 273-0055

21 Fox Street, Poughkeepsie, New York 12601
Phone: (845) 454-3980 Fax: (845) 454-4026
Web: www.chazencompanies.com

North Country Office
Phone: (518) 812-0513

Orange County Office
Phone: (845) 567-1133

SURVEY DESCRIPTION

ALL that certain plot, piece or parcel of land, situate in the City of Poughkeepsie, County of Dutchess and State of New York, bounded and described as follows:

BEGINNING at point marked by a railroad spike set on the westerly side of North Hamilton Street, said point being the northeasterly corner of the herein described parcel and a point on the southerly side of a 25 wide right of way, said point being located S09°23'15" W 55.00 from an iron pipe found at the southeasterly corner of the lands now or formerly Mokszyci as described in document #02-2002-11917, said point also being a distant 577.00 feet from the intersection of the westerly side of North Hamilton Street with the southerly side of North Street; thence along the westerly side of North Hamilton Street, S 09°23'15" W 179.57 feet to a capped iron rod set at the southeasterly corner of the herein described parcel and the northeasterly corner of the lands now or formerly the County of Dutchess as described in liber 1934 of deeds at page 494; thence along the division line between the herein described parcel and the lands now or formerly the County of Dutchess, S 83°45'22" W 257.80 feet to a capped iron rod set and S 89°54'40" W 209.01 feet to a mag nail set in a concrete base at the southwesterly corner of the herein described parcel and the southeasterly corner of the lands now or formerly James L. Taylor as described in Liber 1979 of deeds at page 666; thence along the division line between the herein described parcel and the lands now or formerly of James L. Taylor, N 08°52'20" W 155.00 feet to the northwesterly corner of the herein described parcel and the northeasterly corner of the lands now or formerly James L. Taylor, said point being located N 08°52'20" W 4.00 feet from a capped iron rod set, said point being on the southerly side of a 25 foot wide right of way; thence along the southerly side of said 25 foot right of way, N 82°59'40" E 482.79 feet to a railroad spike set and S 80°36'25" E 39.83 feet to the point or place of beginning.

CONTAINING 1.99 ACRES OF LAND MORE OR LESS.

TOGETHER with a perpetual right of way over a strip of land 20 feet in width extending from the rear of the premises above described along the easterly line of lands of C.W. Swift to North Street and together also with all the rights which said Seneca Button Company has acquired under a deed from Poughkeepsie Trust Company in and to a certain strip of land 25 feet in width extending along the northerly side of said premises above described from North Hamilton Street to the said lands of C.W. Swift

BEING and intended to be all that certain tract or parcel of land as described in a conveyance from 182 No. Hamilton St. Realty Corp to Tilsam Realty Corp recorded in Liber 1216 of deeds at page 775 dated January 16, 1967.

LEGEND:

NAD-1983

- NO PHYSICAL BOUNDS
- ADJACENT PROPERTY LINE
- 110 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 500.5 × EXISTING SPOT GRADE
- EXISTING FENCE
- OHW — EXISTING OVERHEAD WIRES
- EXISTING SIGN
- EXISTING CATCH BASIN
- EXISTING GUY WIRE
- EXISTING HYDRANT
- IPF ⊙ EXISTING IRON PIPE
- IRF ⊙ EXISTING IRON ROD
- EXISTING LIGHT POLE
- MB EXISTING MAILBOX
- EXISTING UTILITY POLE
- VM EXISTING MONITORING WELL
- EXISTING WATER VALVE
- T EXISTING TELEPHONE MANHOLE
- S EXISTING SANITARY MANHOLE

CERTIFICATIONS:

JAMES L. TAYLOR COMPANIES

MAP REFERENCE:

MAP ENTITLED "PLAN OF LAND BELONGING TO POUGHKEEPSIE CHAMBER OF COMMERCE INC." RECORDED IN THE DUTCHESS COUNTY CLERKS OFFICE ON JANUARY 9 1911 AS FILED MAP #723

MAP ENTITLED "MAP OF PROPERTY MARVIN O. DUTTON AND JAMES D. BURGESS" RECORDED IN THE DUTCHESS COUNTY CLERKS OFFICE ON JANUARY 1, 1925 AS FILED MAP #1193.

MAP ENTITLED "BOUNDARY AND TOPOGRAPHIC SURVEY FOR THE COUNTY OF DUTCHESS" PREPARED BY PAGGI AND MARTIN DATED NOVEMBER 1993.

RIGHT OF WAY NOTE:

PARCEL SHOWN HEREON HAS A PERPETUAL RIGHT OF WAY OVER THE 25 FOOT WIDE RIGHT OF WAY SHOWN HEREON AND THE 20 FOOT WIDE RIGHT OF WAY SHOWN HEREON.

DEED REFERENCE:

CITY OF POUGHKEEPSIE
LIBER 1958 PAGE 339

182 NO. HAMILTON ST. REALTY CORP
– TO –
TILSAM REALTY CORP
LIBER 1216 PAGE 775
RECORDED: JANUARY 16, 1967

TAX PARCEL NUMBER:

CITY OF POUGHKEEPSIE, DUTCHESS COUNTY, NEW YORK
131300-6162-54-240389

NOTES:

UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

ONLY COPIES FROM THE ORIGINAL OF THIS SURVEY MARKED WITH AN ORIGINAL OF THE LAND SURVEYOR'S INKED SEAL OR HIS EMBOSSED SEAL SHALL BE CONSIDERED TO BE VALID TRUE COPIES.

CERTIFICATIONS INDICATED HEREON SIGNIFY THAT THIS SURVEY WAS PREPARED IN ACCORDANCE WITH THE EXISTING CODE OF PRACTICE FOR PROFESSIONAL LAND SURVEYORS AS ADOPTED BY THE NEW YORK STATE ASSOCIATION OF PROFESSIONAL LAND SURVEYORS. SAID CERTIFICATIONS SHALL RUN ONLY TO THE PERSON SO NOTED. CERTIFICATIONS ARE NOT TRANSFERABLE TO ADDITIONAL INSTITUTIONS, THEIR SUCCESSORS AND/OR ASSIGNS, OR SUBSEQUENT OWNERS.

SURVEYED FROM RECORD DESCRIPTION AND AS IN POSSESSION.

TOPOGRAPHY SHOWN HEREON WAS COMPILED FROM A FIELD SURVEY COMPLETED JANUARY 23, 2010, BY CHAZEN ENGINEERING, LAND SURVEYING & LANDSCAPE ARCHITECTURE, P.C. DATUM NAVD-88, 1 FOOT CONTOUR INTERVAL

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH THE SURVEYOR DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

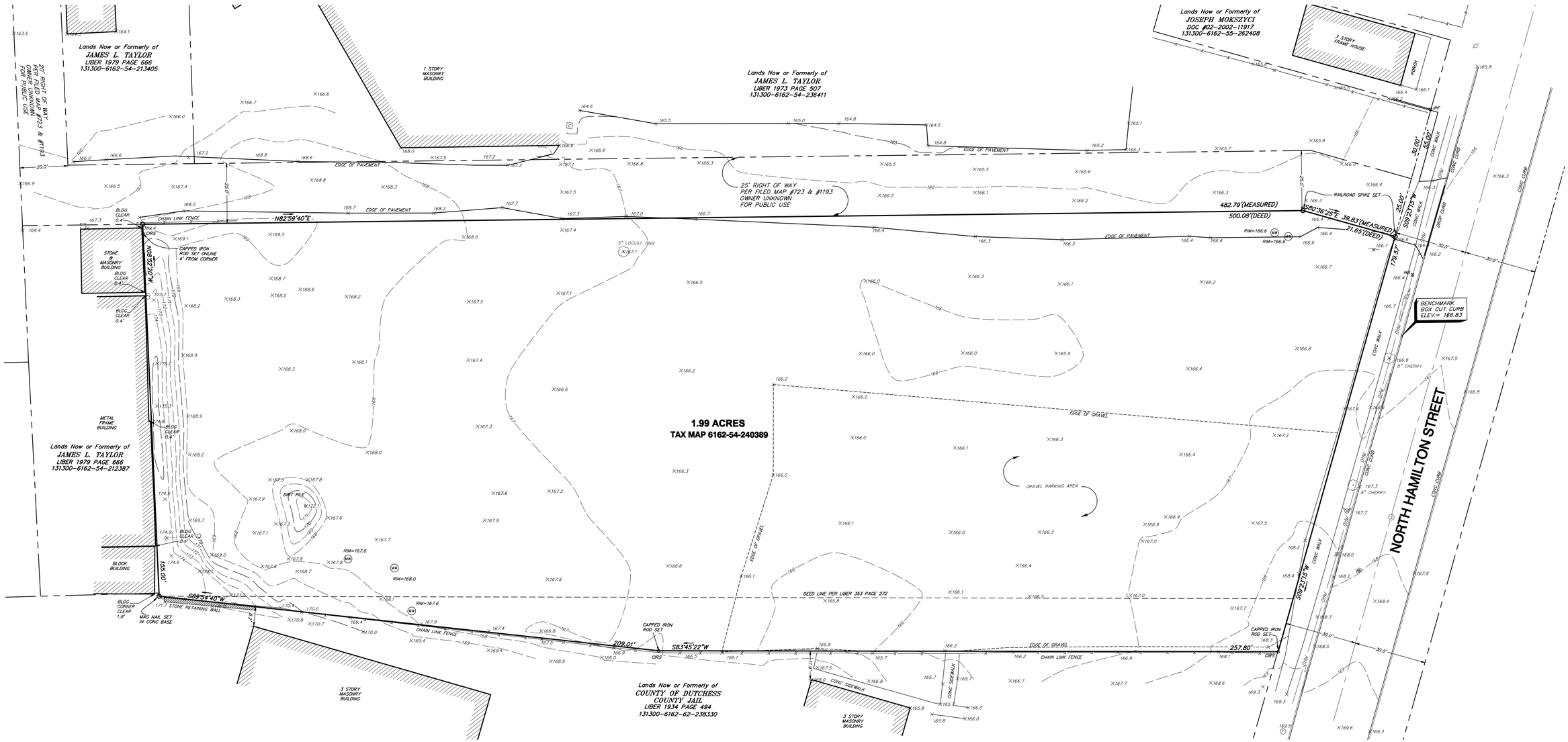
CONTROL:

HORIZONTAL: BASED UPON NEW YORK STATE PLANE COORDINATE SYSTEM NAD83 (CORS96) AS DETERMINED BY OPUS

GRID = GROUND AT BASELINE POINT #1: N1048961.6842, E649988.2118

BASELINE POINT #1 IS BASED UPON NEW YORK STATE PLANE COORDINATE SYSTEM NAD83 (CORS96) AS DETERMINED BY OPUS SOLUTION REPORT
DATED DECEMBER 23, 2009 USING BASE STATIONS:
DG7012 NYNP NEW PALTZ CORS ARP
DI0468 NYKT KINGSTON NY CORS ARP
DK7181 NYNB NEWBURGH CORS ARP

VERTICAL: BASED UPON NEW YORK STATE PLANE COORDINATE SYSTEM NAVD88 (CORS96) AS DETERMINED BY OPUS



I HEREBY CERTIFY THAT THIS SURVEY MAP IS BASED ON AN ACTUAL FIELD SURVEY COMPLETED JAN. 23, 2010 AND THAT THIS SURVEY MAP WAS MADE BY ME OR UNDER MY DIRECTION, AND CONFORMS WITH THE MINIMUM STANDARD OF PRACTICE ADOPTED BY THE NEW YORK STATE ASSOCIATION OF PROFESSIONAL LAND SURVEYORS.

STEVEN J ALEX, L.S. #50016

THE Chazen COMPANIES
Engineers/Surveyors
Planners
Environmental Scientists
Landscape Architects

CHAZEN ENGINEERING, LAND SURVEYING & LANDSCAPE ARCHITECTURE CO., P.C.

Office Locations:

Dutchess County Office:
21 Fox Street
Poughkeepsie, New York 12601
Phone: (845) 454-3980

Capital District Office:
547 River Street
Troy, New York 12180
Phone: (518) 273-0055

North Country Office:
100 Glen Street
Glens Falls, New York 12801
Phone: (518) 812-0513

Connecticut:
914 Hartford Turnpike
Waterford, CT. 06385
Phone:(860) 440-2690

rev.	date	description

THE JAMES L. TAYLOR COMPANIES

MAP OF SURVEY SHOWING LANDS OF #182 NORTH HAMILTON STREET

CITY OF POUGHKEEPSIE, DUTCHESS COUNTY, NEW YORK STATE

drawn	checked
TCR	SJA
date	scale
1/26/10	1"=20'
project no.	
50929.00	
sheet no.	
SV1	
1 OF 1	

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APPENDIX C
Health and Safety Plan
& Community Air Monitoring Plan

SHORT-FORM
SITE SPECIFIC HEALTH AND SAFETY PLAN

Plan Preparation Date: February 15, 2010

Project Name: Former Hamilton Reproduction

Project Number: 90928.00

Site Location: 166-186 North Hamilton Street, Poughkeepsie, NY

Description of Work to be Completed: Groundwater monitoring and screening site soil during site development/construction. A TCC field scientist will conduct groundwater sampling and provide oversight of construction activities conducted by others to note contaminated soil. The role of TCC is to identify screen soils for contamination by odor and/or PID readings, identify depth to groundwater, and collect samples of groundwater for submittal to a laboratory for analysis. Soil will be inspected visually and soils from the excavation screened with a photo-ionization detector (PID) for evidence of volatile organic compound (VOC) impacts.

On-site Contractors: To be determined by client.

Underground Utilities: Utility marking is needed. As per TCC policy, the contractor shall call in utility mark outs.

Primary Hazards: Symptoms associated with exposure to the VOC perchloroethylene include: depression of the central nervous system; damage to the liver and kidneys; impaired memory; confusion; dizziness; headache; drowsiness; and eye, nose, and throat irritation. Repeated dermal exposure may result in dermatitis. Adequate outdoor ventilation is expected to minimize respiratory exposure.

PPE Needed: Modified Level D to include street clothes and work shoes, hardhat, safety glasses, and ear plugs when working around heavy equipment, and nitrile gloves when collecting samples.

Health and Safety Precautions: Before leaving the office, personnel should sign out using PCA and record the number where they can be reached. TCC Employees should call their Supervisor: 1) at predetermined "check in" times; 2) immediately in the event of any accident or injury; 3) when the job is complete before leaving the site; and 4) when arriving back at the office or at home. Upon returning to office sign back in using PCA. TCC employees should carry a cell phone with them and assure the availability of cell phone service. If there is no service, arrangements should be made for another means of communication (e.g. calling from a pay phone) When in the field, personnel should keep a First Aid Kit, appropriate PPE and other essential supplies (e.g., drinking water) with them.

Digging should not commence until utilities have been clearly marked and utility locations have been conveyed to the project team. All personnel should remain at a safe distance from heavy equipment and should be clearly visible by the equipment operator at all times. Employees should maintain a safe distance from the edges of open excavations and should not enter any excavations.

Inhalation of VOCs can produce an intoxicating effect. Adequate outdoor ventilation is expected to minimize respiratory exposure. If solvent, petroleum or other unusual odor is noted, TCC personnel should stay upwind of excavation area in order to limit inhalation of vapors. All employees should wear disposable nitrile gloves when touching any site soil or water. The use of nitrile gloves will provide dermal protection to minimize contaminant exposure to any petroleum products.

Slip and trip hazards exist from uneven walking surfaces. TCC employees should walk on level and paved surfaces whenever possible. Appropriate preventive measures should be taken to minimize the possibility of heat/cold stress, sunburn, frost bite, insect bites, animal bites, and contact with poisonous plants.

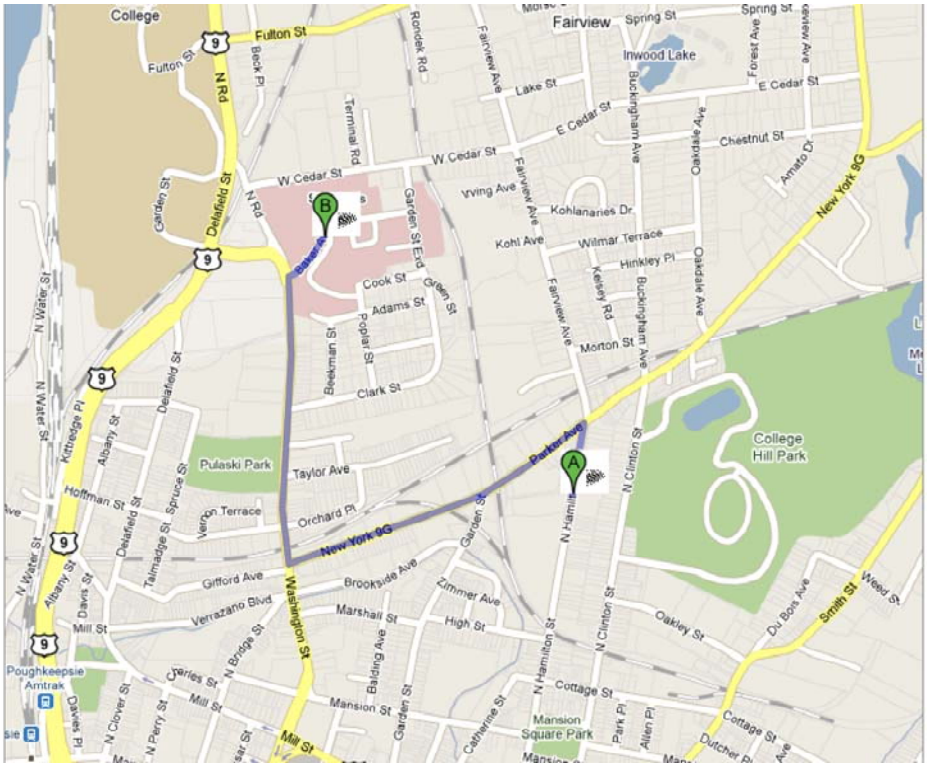
If a hazardous substance, other than petroleum based fluids or oil, is visually detected or any unusual odors are noted during site activities, the project will be temporarily halted until the substances/odors are identified and appropriate health and safety precautions are formulated and conveyed to the project team. An upgrade to Level C should be made if site circumstances warrant additional protection.

EMERGENCY SERVICES:

Hospital: **St. Francis Hospital** **Baker Ave** **Poughkeepsie, NY**	(845) 483-5000
Ambulance, Fire, Police:	911
Poison Control Center:	1-800-222-1222
National Response Center	1-800-424-8802
NYSDEC Oil & Chemical Spills *24-hour Hotline*	1-800-457-7362

Directions to St. Francis Hospital and route map are attached.

Map Showing Route from the site to the Hospital:



Site Location:186 North Hamilton Street, Poughkeepsie, NY 12601

Nearest Hospital Name: St. Francis Hospital

Hospital Location: Baker Ave, Poughkeepsie, NY

Hospital Telephone: (845) 483-5000

Directions to the Hospital:

1. Turn left to leave site and head north on North Hamilton Street
2. Turn left on New York 9G/Parker Ave
3. Turn right on Washington Ave
4. Turn right on Baker Ave and follow signs for Emergency Room

Total Distance: Approximately 1.5 miles

Total Estimated Time: 3 minutes

New York State Department of Health
Generic Community Air Monitoring Plan

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

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical-specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

Continuous monitoring will be required for all <u>ground intrusive</u> activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a **continuous** basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored **continuously** at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

June 20, 2000

P:\Bureau\Common\CommunityAirMonitoringPlan (CAMP)\GCAMPR1.DOC

APPENDIX D
Monitoring Well Boring and Construction Logs

TEST BORING AND WELL LOG

THE Chazen COMPANIES

21 Fox Street
Poughkeepsie, NY
12601

PROJECT: N. Hamilton Street
LOCATION: Poughkeepsie, NY
CLIENT: James L. Taylor Companies
PROJECT NO.: 90926

Test Boring No.: **B-1**
Total Depth: 8.2 ft.

Contractor: Todd Syska
Drill Rig: Geoprobe
Driller: Todd Syska
Inspector: Erroll O'Brien

Start Date: 10/21/2009
Finish Date: 10/21/2009
El. Datum:
G.S. Elevation:

Northing:
Easting:
Longitude:
Latitude:

Borehole Dia.: 1 in.
Depth to Water: - ft.
Depth to Rock: 8.2 ft.
Depth of Well: 8.2 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:
					26	0		3" Topsoil
1	-1					0		15" Light brown, Gravelly SAND, moist, NOSOC
						0		1" Light brown, Medium SAND, moist, NOSOC
2	-2					0		7" Light brown SILT, moist, NOSOC
3	-3							
4	-4							
					41	0		6" Rounded GRAVEL, moist, NOSOC
5	-5					0		3" Gravelly SAND, moist, NOSOC
						0		3" Light brown, SILT, moist, NOSOC
6	-6					0		4" Light Brown, Gravelly SAND, moist, NOSOC
						0		10" Light Brown SILT with some Sand, moist, NOSOC
7	-7					0		15" Mottled SILT, few pebbles, moist, NOSOC
8	-8							Refusal at 8.2 feet. Rock in drill tip.
9	-9							
10	-10							
11	-11							
12	-12							
13	-13							
14	-14							
15	-15							
16	-16							
17	-17							
18	-18							
19	-19							
20	-20							

Well Diagram

Field Notes, Well Notes, Comments:

4 inch bentonite seal approximately 1 ft below grade

Attempted to backfill with sand, but hole had collapsed around casing.

Screen from 3.2 ft. to 8.2 ft below grade.

Bottom of well at 8.2 ft.

STANDARD NOTES: 1. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.
2. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
3. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES

21 Fox Street
Poughkeepsie, NY
12601

PROJECT: N. Hamilton Street
LOCATION: Poughkeepsie, NY
CLIENT: James L. Taylor Companies
PROJECT NO.: 90926

Test Boring No.: **B-2**
Total Depth: 14.7 ft.

Contractor: Todd Syska
Drill Rig: Geoprobe
Driller: Todd Syska
Inspector: Erroll O'Brien

Start Date: 10/21/2009
Finish Date: 10/21/2009
El. Datum:
G.S. Elevation:

Northing:
Easting:
Longitude:
Latitude:

Borehole Dia.: 1 in.
Depth to Water: ~10 ft.
Depth to Rock: 14.7 ft.
Depth of Well: 14.7 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
					19		0	9" Light gray, Gravelly SAND, dry, NOSOC		
1	-1						0	10" Light brown Gravelly SAND, dry, NOSOC		
										Bentonite seal to 1 foot below grade.
2	-2									
3	-3									
										Sand Pack to 1 foot above screen.
4	-4									
					38		0	5" Light brown, SILT, damp, NOSOC		
5	-5						0	5" Dark gray, SAND, moist, NOSOC		
							0	8" Light brown, SILT, moist, NOSOC		
6	-6						0	20" Mottled, Clay SILT, moist, NOSOC		
7	-7									
8	-8									
					46		0	14" Dark gray, SAND with some Gravel, moist, NOSOC		
9	-9						0	6" Green, CLAY, wet, NOSOC		Screen from 4.7 ft to 14.7 ft below grade.
							0	14" Green-brown, CLAY, moist, NOSOC		
10	-10						0	13" Light Gray, CLAY with shale chips, NOSOC		
11	-11									
12	-12									
					46		0	6" Dark brown, Gravelly SAND, NOSOC		
13	-13						0	14" Green, CLAY, wet, NOSOC		
							0	26" Light gray, CLAY with some shale fragments, moist, NOSOC		
14	-14									
										Bottom of well at 14.7 ft.
15	-15							Refusal at 14.7 feet. Broken shale in drill tip.		
16	-16									
17	-17									
18	-18									
19	-19									
20	-20									

STANDARD NOTES: 1. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.
2. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
3. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:

DRILLING INFORMATION
Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES

21 Fox Street
Poughkeepsie, NY
12601

PROJECT: N. Hamilton Street
LOCATION: Poughkeepsie, NY
CLIENT: James L. Taylor Companies
PROJECT NO.: 90926

Test Boring No.: **B-3**
Total Depth: 10.5 ft.

Contractor: Todd Syska
Drill Rig: Geoprobe
Driller: Todd Syska
Inspector: Erroll O'Brien

Start Date: 10/21/2009
Finish Date: 10/21/2009
El. Datum:
G.S. Elevation:

Northing:
Easting:
Longitude:
Latitude:

Borehole Dia.: 1 in.
Depth to Water: ~6 ft.
Depth to Rock: 10.5 ft.
Depth of Well: 10.5 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
					27			11" Urban fill material with red brick and rock fragments, NOSOC		
1	-1							13" Sandy GRAVEL, angular, dry, NOSOC		
								3" Light brown, SILT, with few rock fragments, moist, NOSOC		
2	-2									
3	-3									
4	-4									6 inch bentonite seal.
					26			7" Sandy Gravel, moist, NOSOC		Sand pack to 1 foot
5	-5							4" Black, SAND, NOSOC		above screen.
								10" Green-brown Silty CLAY with some gravel, wet, NOSOC		
6	-6							5" Black SAND, NOSOC		
7	-7									Screen from 5.5 ft to
										10.5 ft below grade.
8	-8									
9	-9									
					26			3" Black SAND, NOSOC		
10	-10							10" Green-brown, SILT, with some Sand, saturated, NOSOC		
								13" Weathered Shale becoming competant in last 5 inches, NOSOC		Bottom of well at 10.5 ft
11	-11							Refusal at 10.5 ft		
12	-12									
13	-13									
14	-14									
15	-15									
16	-16									
17	-17									
18	-18									
19	-19									
20	-20									

STANDARD NOTES: 1. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.
2. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
3. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:

DRILLING INFORMATION
Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES

21 Fox Street
Poughkeepsie, NY
12601

PROJECT: N. Hamilton Street
LOCATION: Poughkeepsie, NY
CLIENT: James L. Taylor Companies
PROJECT NO.: 90926

Test Boring No.: **B-4**
Total Depth: 6 ft.

Contractor: Todd Syska
Drill Rig: Geoprobe
Driller: Todd Syska
Inspector: Erroll O'Brien

Start Date: 10/21/2009
Finish Date: 10/21/2009
El. Datum:
G.S. Elevation:

Northing:
Easting:
Longitude:
Latitude:

Borehole Dia.: 1 in.
Depth to Water: - ft.
Depth to Rock: 6 ft.
Depth of Well: - ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
					45			19" Black urban fill material, dry, NOSOC		
1	-1							12" Light brown-orange brown, SILT, moist, NOSOC		
								14" Weathered shale		
2	-2									
3	-3									
4	-4									
					36			36" Weathered shale		
5	-5									
6	-6									No well installed
7	-7							Refusal at 6 ft below grade.		
8	-8									
9	-9									
10	-10									
11	-11									
12	-12									
13	-13									
14	-14									
15	-15									
16	-16									
17	-17									
18	-18									
19	-19									
20	-20									

STANDARD NOTES: 1. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.
2. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
3. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:

DRILLING INFORMATION
Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

APPENDIX E
Groundwater Monitoring Well Sampling Log Form

The Chazen Companies

FIELD DATA SHEET - Groundwater Levels

SITE INFORMATION

Project Name: ____________________ Date: ____________________

Project Location: ____________________ Sample Tech(s): ____________________

Project Number: ____________________

Well ID	Measuring Point	Depth to Water

The Chazen Companies

FIELD DATA SHEET

SAMPLE INFORMATION:

Sample ID: _____ Sample Time: _____ Sample Matrix *(circle)*:

Well ID: _____ Sample Date: _____ ***Groundwater*** Soil

Project Name: _____ Sample Tech(s): _____ Surface Water Air

Sample Location: _____ Project and Task #: _____ Drinking Water Other:

Project Manager: _____

WELL INFORMATION:

Well Condition: _____

Lock Type: _____ Key #: _____

PURGE DATA:

Measuring Point: _____ ***(B)*** Purge Method: _____

Depth to Bottom: _____ Start Date: _____

Depth to Water: _____ Start Time: _____

Water Column Height: ***(A)*** _____ Stop Time: _____

(depth to bottom - depth to water) Purge Rate (gpm): _____

Elapsed Time (min): _____

# of Volumes to be Purged: ***(C)*** Well Vol. Purged (#): _____

Purge Vol. (gal): _____

Well went dry? No Yes

Gal. to be Purged: ***(AxBxC)*** Conditions: No Odor Odor

Clear Slightly-Turbid Turbid

Pipe Width	Gal/Foot
1.0"	0.037
1.5"	0.092
2.0"	0.163
2.5"	0.255
3.0"	0.367
4.0"	0.653
6.0"	1.469
8.0"	2.611

FIELD RESULTS:

Gal purged	Date & Time	Depth to Water	Temp	SpCond	Cond.	Resist	TDS	Sal	DO	pH	ORP	
gal		ft	deg C	mS/cm[c]	mS/cm	ohm*cm	g/L	mV	mg/L		mV	

SAMPLE INFORMATION:

Sample Method: _____ *(Peristaltic, Submersible, Dedicated or Disp. Bailer, Waterra, Dir. Instrument Reading, etc.)*

Sample Type: ***Grab*** Composite Sample Depth: _____

Weather: _____ Barometric Pres.: _____ Wind: _____

Air Temp.(^{o}F): _____

Notes: _____

LAB REQUESTS:

Laboratory Name: Analysis/Method: Turn Around Time:

QA/QC: Duplicate Equip. Blank Field Blank Trip Blank

APPENDIX F
Site-Wide Inspection Form

THE Chazen COMPANIES®

ANNUAL SITE INSPECTION FORM

Former Hamilton Reproduction Site B-00020-3
166-186 Hamilton Street, Poughkeepsie, NY

Performed by: _____ Date:_____Time:_____

Part 1 - Engineering Controls - Sub-Slab Depressurization System (SSDS) (circle noted condition)

1A - Describe SSDS function: explain if not normal:	normal	decreased function	non-functioning		
1B - Is there any damage or defect to the foundation that reduces or has the potential to reduce the effectiveness of the SSDS? (circle one)	No	Yes	If yes, describe needed repairs: If yes, owner to notify DEC within 48 hours. Attached documentation of notification.		
1C - Describe blower conditions:(circle one)	normal	decreased function	non-functioning		
Excess wear:	none	minimal (no change to system function)	non-functioning		
Visual damage:	none	minimal (no change to system function)	non-functioning		
Listen for smooth blower operation:	normal	inconsistent (describe)	non-functioning		
Measure vacuum pressure:	_____	is it within design parameters?	yes	no	
Measure air flow:	_____	is it within design parameters?	yes	no	
1D - Is system functioning as designed to continue to be protective of human health and the environment?	Yes	No	**If no**, describe needed modifications: **If no**, owner to notify DEC within 48 hours. Attach documentation of notification.		

Part 2 - Institutional Controls (circle one)

2A - Site usage:	Commercial	Industrial Other:_____ (inconsistent with Environmental Easement, must be reported to DEC)
2B - Is site water source from a municipal source? (circle one)	Yes	No, Explain inconsistecy with Environmental Easement
2C - Is site groundwater being used for any purpose? (circle one)	No	Yes, Explain inconsistecy with Environmental Easement

THE Chazen COMPANIES®

ANNUAL SITE INSPECTION FORM

Former Hamilton Reproduction Site B-00020-3
166-186 Hamilton Street, Poughkeepsie, NY

Part 3 - General Site Conditions

3A - Describe changes since last inspection

3B - Describe condition of monitoring wells and note changes or NYSDEC-approved closures since last inspection by entering data in table below:

Well ID (show on site map)	Intact	Damaged	Closed	Replaced	Explanation

Part 4 - Compliance with Excavation Work Plan and Operations & Maintenance Plan (to be expanded after SSDS is designed)

4A - Describe site construction activities that have been conducted since last inspection (see SMP for soil management criteria)

4B - Describe soil excavation and disposition (on site/off site). Map excavation areas and on site placement.

Part 5 - Monitored Natural Attenuation

5A - Groundwater sampling event due (circle one): 2010 is pending — was completed on (date): _____

2015 is pending — was completed on (date): _____

5B - Well(s) sampled for VOCs (list and show on map)

5C - If groundwater sampling was conducted during this calendar year, attach sampling report.

5C - DEC determination that monitoring can be terminated (circle one): not yet requested — requested (date)/pending _____ — granted (date): _____

Part 6 - Confirm that site records are up to date

No	Yes		6A - Are there any changes that need to be documented in site records (e.g., change of ownership, site usage)
No	Yes	NA	6B - Has DEC received 15-day advanced notice of any proposed ground intrusive activities?
No	Yes	NA	6C - Has DEC received notification within 48 hours of any damage or defect to the foundation that reduces or has the potential to reduce the effectiveness of the SSDS?

APPENDIX G
Quality Assurance Project Plan

Quality Assurance Program Plan
Former Hamilton Reproduction
NYSDEC Site No. B-00020-3

Dutchess County, New York

February 2010

Prepared for:

James L. Taylor Manufacturing
108 Parker Avenue
Poughkeepsie, New York

Prepared by:

Capital District Office:
The Chazen Companies
547 River Street
Troy, New York 12180

TABLE OF CONTENTS

1.0 PROGRAM DESCRIPTION

This Quality Assurance Program Plan (QAPP) describes protocols and procedures necessary to ensure that specific tasks and actions undertaken by The Chazen Companies (TCC) are planned and executed in a manner consistent with the Quality Assurance (QA) objectives. This QAPP also details responsibilities for compliance with these requirements.

The QAPP provides guidance and specifications for:

- Organizational structure within The Chazen Companies
- A method for determining Data Quality Objectives
- All routine calibration and sampling procedures conducted by The Chazen Companies
- Chain of Custody requirements and Analytical Procedures
- Data Reduction, Validation, and Reporting
- Internal Quality Control and Internal Auditing
- Specific Routines to Assess Data Quality
- Preventative Maintenance
- Performance Reporting

This document will support all work performed by TCC in the long-term environmental monitoring. While this QAPP is focused on groundwater monitoring existing wells for natural attenuation, relevant sections have been included for installation of additional groundwater wells, should wells need to be replaced or relocated as part of site construction activities.

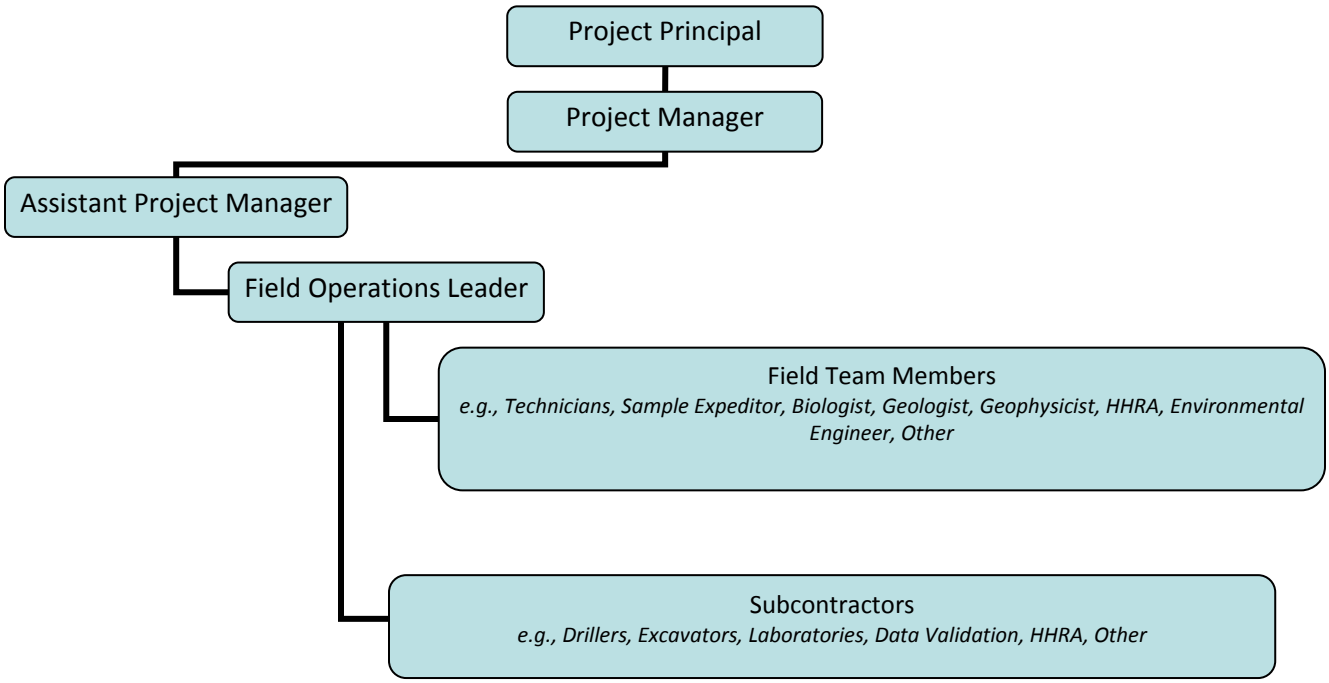
The format for this QAPP is based on New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation (November 2009) and "Data Quality Objectives for Remedial Response Activities (Development Process)", 1987 (EPA/540/G-87/003).

2.0 PROGRAM ORGANIZATION

2.1 Company Organization

The Chazen Companies assigns a specialized team of experts to each project. These individuals act together to meet the needs of the project. Each project is assigned a Project Principal and Project Manager who oversee the components of the project. A typical organization chart is shown below.

Organization Plan



2.2 Specific Responsibilities

Principals: Principals of The Chazen Companies are responsible for establishing a contract for the services to be performed, for committing the corporate resources necessary to conduct the program work activities, and for supplying corporate-level input for problem resolution.

Project Manager: The Project Manager will be responsible for establishing protocols to be used during the investigation and remedial activities, and establishing sampling methods. He will

provide oversight and technical guidance during field activities and report preparation, maintain quality and consistency, and monitor the overall work progression.

Project Manager: The Project Manager is responsible for the management and quality of the project. The Project Manger is named in the Site Investigation Work Plan and may be the Director of Environmental Services or his/her designee (e.g. Assistant Project Manager). The Project Manager is responsible for ensuring that all project objectives are met, including schedule and budget tracking, QA adherence, and ultimate product delivery. The duties and responsibilities of the Project Manager include:

- General supervision of project execution to ensure that the project objectives are met on schedule and on budget.
- Assisting in project activities.
- Financial management.
- Identifying project staff, equipment, and other resource requirements.
- Conducting project progress meetings with the client and the technical reviewers.
- Final review of project deliverables prior to issue.
- Implementation of subcontracting, as required.

Field Operations Leader: The Field Operations Leader named in the Work Plan is usually a member of the Senior Environmental staff at The Chazen Companies and is responsible for the coordination and execution of the field activities, data reduction, and interpretation. Assigned responsibilities include:

- Organization of personnel, equipment, and materials to meet the objectives of the field tasks.
- Direction of field activities in accordance with the Work Plan and project QAPP.
- Coordination of subcontractor activities including verification and adequacy of subcontractor QA/QC programs.
- Assisting in project activities.
- On-going Quality Control (QC) during performance of work.
- Field and laboratory data reduction and interpretation.
- Execution of corrective actions for identified QA/QC problems.
- Supervision of field team.
- Supervision of deliverable preparation.

Technical Reviewer/Quality Assurance Manager: The Technical Reviewer(s) named in the Work Plan is (are) generally peer reviewers, the Director of The Chazen Companies or the managing Principal. Technical reviewers review field data and methodology and act as Quality Assurance Managers. The Technical Reviewer(s) will be responsible for the overview of tasks and procedures, which affect the quality of work performed during the investigation. The Technical Reviewer/Quality Assurance Manager is responsible for:

- Verification of the Quality Assurance Program through evaluation and overview of program tasks.
- Identification of problems affecting quality and recommending corrective actions.

- Reporting to the Project Manager on the status and adequacy of the overall QA program.
- Consultation on data analysis and interpretation.
- Technical review of the project.

Field Team Member: Field Team Members involved in the field investigation, geophysical survey, location and elevation survey, or other field activities are responsible for the on-site execution of planned field activities. Field team members named in the Work Plan are assigned responsibilities which may include:

- Completion of all field activities in accordance with the Work Plan.
- Field supervision of subcontractor activities.
- Monitoring of, and adherence to, health and safety requirements in accordance with the HASP during field activities.

2.3 Personnel Qualifications and Training

The Project Manager and the Quality Assurance Manager review the assignment of technical staff and the project management plan with regard to the appropriate qualifications in the technical areas relevant to the Project and any associated QC techniques. Training, if required, is specified and implemented prior to project start-up.

Site-specific training is provided to all members of the field team and includes:

- General briefings covering the QA program and Project plans;
- Detailed briefings on specific methods required by the Work Plan and QAPP;
- Specific briefings on individual QA and QC procedures and activities.

All employees of TCC involved with hazardous waste investigations are required to attend an OSHA-approved 40-hour health and safety course prior to working on hazardous waste sites. In addition, these employees are required to annually attend an 8-hour refresher health and safety course and to participate in a medical surveillance program.

2.4 Analytical Laboratory and Other Support Services

The subcontractors for analytical services will be determined prior to the initiation of the field investigations. York Analytical Laboratories, Inc. has conducted groundwater analyses for the 2009 groundwater sampling and is anticipated to continue to be the analytical laboratory for this project..

The responsibility for implementing the laboratory QA Program resides with the laboratory subcontractor's Laboratory Analytical Task Manager. The Laboratory Analytical Task Manager is responsible for the following:

- Following the Project QC Plan.
- Supporting the TCC Project Manager and Quality Assurance Manager.

- Maintaining sufficient instruments, space resources, and personnel to perform the analyses as necessary.
- Handling/receiving samples in a manner consistent with New York State and Federal guidance as outlined in the Work Plan/QAPP.
- Implementing corrective action to account for analytical problems or QC deficiencies.
- Maintaining appropriate instrument controls/calibration.
- Reviewing all sampling and analyses, instrument blanks, sample blanks, and other QA/QC information to ensure that it meets the desired quality standards.
- Providing QA/QC checks at the proper frequency and maintaining an awareness of the laboratory condition to detect conditions which might jeopardize controls of the various analytical systems (e.g. improper calibration, improper sample storage conditions, and equipment maintenance intervals).
- Providing in-house QC audit documentation for sample storage, labeling, preservation, transportation, and disposal in accordance with Analytical Services Protocol (ASP).

3.0 QUALITY ASSURANCE OBJECTIVES

Quality Assurance (QA) is a management system that ensures that all information, data, and decisions generated during a site investigation is technically sound and properly documented. Quality Control (QC) is the functional mechanism through which the quality assurance objectives are achieved. The overall objective of the QA/QC program is to establish procedures such that data obtained from the field and laboratory analyses are of adequate quality to satisfy the project objectives.

3.1 Data Quality Objectives

The basis of data quality objectives (DQOs) is that the quality of data is dependent upon the intended use of the collected data. DQOs are established based upon site-specific conditions and project objectives and are applicable to all data collection activities.

3.2 Quality Assurance Reports

The Quality Assurance Manager will verify that the work being performed on the project adheres to all of the project plans, and that the collected data meet the goals for precision, accuracy, and completeness. The Chazen Quality Assurance Manager will verify that field data were collected using standard methods and that sample data sets are complete. The laboratory Quality Assurance Manager will verify that analyses were performed using standard methods and meet laboratory goals for precision, accuracy and completeness.

3.3 Problem Resolution

The successful execution of a field investigation requires that a system be in place for reporting and responding to unexpected events as well as correcting problems or mistakes when they occur. The system described below includes internal systems for decreasing the risk of such occurrences and the procedures for reporting such events.

Procedures designed to minimize the possibility of problems throughout this project include:

- The use of standard methods
- Development of written project plans
- Team member supervision and training
- Project meetings
- Clear definition of the project objectives and team member responsibilities

To ensure that the approach to data collection is applied in a uniform manner, all project team members will be trained in the methodologies and procedures detailed in all project documents including the Site Management Plan. Copies of the plan will be available to all team members for individual use and reference. In addition, the Project Manager and Field Operations Leader will review the plan with the project team prior to the start of field activities.

Training in the use of the procedures required in the plans will be provided to all designated team members as determined necessary by the Quality Assurance Manager. The Project Manager and/or Field Operations Leader will hold regular project meetings with team members to communicate changes in procedures or scope; to discuss and assign upcoming tasks; to address potential problem areas in tasks yet to be conducted; and to communicate ways that past problems encountered in the project were remedied. These meetings will be scheduled by the Project Manager or Quality Assurance Manager, as necessary, during this investigation.

Should an event occur that cannot be readily resolved or appears to have gone unnoticed, the Project Manager will be notified. The project Quality Assurance Manager and the site owner may also be notified. The notification will include a completed Problem Resolution Form (PRF) (shown below).

PROBLEM RESOLUTION FORM NO._____

Originator:_____ Date:_____

Contract/Task Involved:_____

Description of Event:_____

_____

Sequence of Response Actions (Date, Person, Action Taken):_____

_____

Description of Final Response:_____

_____

Final Response Approved By:_____

Project Manager:_____ Date:_____

The PRF will be available for use by all project team members. The user of the form will provide a mechanism for reporting and responding to specific events which require a more formal quality control review to ensure proper resolution of the problem.

The Project Manager and/or Quality Assurance Manager will be responsible for ensuring that each issue identified in a PRF is resolved. The Project Manager, after a review of the issue with the Field Operations Leader and Quality Assurance Manager, will work with the Field Operations Leader to assign responsibility for remedying the problem and for establishing procedures, if necessary, to ensure that the problem is not repeated. The steps of the problem resolution process are:

1. Identify and describe the event or problem
2. Investigate and determine the cause
3. Determine a response action to remedy the situation
4. Implement the response action

5. Monitor the effectiveness of the action to verify that the situation has been remedied

The PRF form is designed to document and track the resolution of the event from its initial reporting to the final solution. The form is completed by the person reporting the problem and includes a description of the event, possible cause(s), and recommended solution(s). The form will then be used to document the sequence of events resulting in an effective resolution. Final approval of the response action as described on the PRF will be documented by the signature of the Project Manager and Quality Assurance Manager.

Completed PRFs and copies will be maintained in TCC's project file for future reference. Copies of PRFs (if utilized) will also be forwarded to the client and to any affected regulatory agency, if warranted.

The analytical laboratory will also use a system for on-the-spot and formal problem resolution procedures. The specific laboratory procedures will be consistent with the requirements of USEPA-SW-846 and are defined in the laboratory's Quality Assurance Program Plan.

4.0 ENVIRONMENTAL SAMPLING / TESTING PROCEDURES

An essential aspect of any field investigation is assurance that sample collection is conducted in a manner that will provide high-quality, representative data. This section of the QAPP provides a description of sampling techniques, procedures, and equipment used during field sampling programs. These techniques and procedures conform to guidelines outlined in the EPA document "A Compendium of Superfund Field Operations Methods", and with NYSDEC Technical and Administrative Guidance Memorandum (TAGM) Nos. 4007, 4008, 4015, 4019, 4032, and 4051 (draft) and others, where applicable.

4.1 Site Specific Sampling and Testing Rationale

The Site Management Plan provides the sampling rationale for every investigation, including the rationale for the following tasks:

- sampling of environmental media,
- determination of constituents to be measured in each environmental media,
- sampling locations,
- sample depths and types,
- number and frequency of samples to be collected.

The specific details of a field investigation such as sampling locations, target depths, analytical methods, and a reference map are detailed in the Site Management Plan.

4.2 Documentation

As noted in the Site Management Plan (Section 3.3.1), groundwater monitoring activities will be recorded in a field log book and groundwater sampling log. Monitoring of site excavation activities will also be documented in a field log book. The field log book is a controlled document, which records all major on-site activities during the investigation. The log book is a bound notebook with pages that cannot be removed without cutting or tearing pages. Each page of the log book will be numbered consecutively and signed at the bottom of the page with the signature or initials of the person who completed the page. All entries will be made in ink and errors crossed-out with a single line and initialed and dated.

Field data for all tasks completed during this field program, as well as general observations, pertinent conversations, and unexpected occurrences will be documented in field log books. At a minimum, the following information will be recorded:

- Names of personnel on-site (including all subcontractors);
- Date and time of arrival and departure;
- Daily objectives;
- Site name, location, and project number;
- Field observations;
- Weather conditions;
- Site sketch with description of sampling points;

- Health and Safety monitoring data;
- Field calibration, decontamination procedures, and performance frequency;
- Well bailing or pumping procedure and equipment;
- Well specifics including static water level, depth, and volume of water removed;
- Type and quantity of monitoring well construction materials used;
- Surveying data;
- Sample identification numbers;
- Sample point names and descriptions;
- Sample collection procedures and equipment;
- Sample preservation used;
- References to maps or sketches of the sampling site;
- Results of any field measurements, such as pH, water temperature, specific conductivity, and field screening results;
- Notes on conversations with site personnel, observers, or subcontractors;
- Problems encountered and the manner of their resolution;
- General observations that may support the data; and
- Summary of daily activities completed.

4.3 Pre-Sample Planning

The quality of sample collection is maintained by specifying the technique used for both the medium/matrix to be sampled and the analytes of interest. For example, groundwater samples intended for SVOC analyses are collected in amber glass containers; groundwater samples for VOC analyses are collected in Teflon-capped glass vials with "zero" headspace to minimize diffusive and evaporative losses; and groundwater samples for inorganic analyses are collected in polyethylene bottles. Sample containers provided by the analytical subcontractor are prepared in a manner consistent with USEPA protocol.

Acquisition of environmental samples also requires specialized techniques to preserve sample integrity and to ensure that a representative portion of the source is collected. Media-specific sample collection techniques and sample preservation are specified in the following sections. Field programs are designed and implemented using the EPA's "Compendium of Superfund Methods", NYSDEC Sampling and Analysis Protocols, and NYSDEC TAGMs 4007, 4008, 4015, 4019, 4031, 4032, 4046, 4048, and 4051(draft) as primary references.

4.3.1 Sample Labels and Records

Sample labels will be prepared using a pre-determined labeling system. Each sample may require several containers depending on the intended analysis to be performed. At the time the sample is collected, a sample data record sheet and field logbook entries will be completed. The sample documentation may include:

- A plan of the site with the sample location and sample numbers indicated
- A description of the sample site

- Physical descriptors of the sample site, if appropriate (e.g., stream width, groundwater depth, etc.)
- Photographs of the sample site showing the sampling equipment and/or unusual conditions (orientation of photograph must be shown on sketch map, and photo number recorded in field notebook)
- Chain of Custody documentation (see Section 5)

Identification of samples collected during the field investigation will be accomplished using alphanumeric Sample Identification codes indicating sample type, sample identification, depth of sample (if applicable). An explanation of the Sample Identification codes system for soil, groundwater, and sediment samples is shown below:

Sample Identification Code System

Digits	*Identification*	*Description*	*Code/Example*	
1, 2	Site Code	Two letter code to identify the site	HR	Hamilton Reproduction
3, 4	Sample Type	Two letter code to identify sample media	SB	Test Boring Soil Sample
			SS	Surface Soil
			BW	Screened-auger Groundwater Sample
			MW	Monitoring Well Groundwater Sample
			SW	Surface Water
			SD	Sediment Sample
			TB	Trip Blank
			EB	Sampler Blank
			SV	Sub-Slab Vapor Sample
			TP	Test Pit Soil
			PW	Test Pit Water
			WT	Waste Sample
			DL	Drum Liquid
			DS	Drum Solids or Sludge
			IA	Indoor Air Sample
			OA	Outdoor Air Sample
			GP	Geoprobe® Soil Sample
			CD	Septic System/Sump Sludge Sample
			CL	Septic System/Sump Catch Basin Liquid Sample
			CB	Catch Basin/Storm Drain Sediment Sample
5, 6, 7	Sample Locator	Three numbers to identify sample site name or location	MW-B1	Monitoring Well Groundwater Sample from Well B-1
8, 9, 10	Depth of Sample Below Reference Surface		SB-XX0	SB samples collected from 0 to 2 feet below ground surface (bgs)
			SB-XX1	SB sample depth is assumed to be the top of a 2-foot, split-spoon sample
			X25	MW sample depth is assumed to be the bottom of the well screen measured in feet bgs

			128	All samples obtained from the ground surface or from drums or containers will be designated XXX
11, 12			XX	Duplicates will periodically be sent to the lab with the XX designation to preserve duplicate anonymity, according to Section 9.2.
			XF	Sample collected for field analysis or future reference
			XD	Duplicate sample
			MS	Matrix spike
			MD	Matrix spike duplicate
			XS	Laboratory split sample

4.3.2 Sample Container Requirements and Sample Preservation

Sample integrity will be maintained by using special containers and preservation methods keyed to both the medium/matrix to be sampled and the analytes. Sample containers and preservation methods specified in NYSDEC protocols are summarized in the table below. Any changes to these protocols required by a Specific project will be detailed in a site-specific Work Plan.

4.3.3 Preparation of Sample Containers

Sample containers will be provided by the laboratory and are prepared according to USEPA protocols. The bottles will be equivalent to I-Chem series 300. QC records for the bottles used will be maintained by the laboratory. The preparatory procedures used by the vendor providing the laboratory with sample containers are detailed below.

4.3.3.1 Volatile Organic Analyte (VOA) Containers

(40-mL glass vials and 2-oz or 4-oz glass jars)

1. Wash vials, septa, and closures in hot tap water with laboratory grade non-phosphate detergent.
2. Rinse three times with tap water.
3. Rinse three times with ASTM Type II water.
4. Oven dry vials, septa, and closures.
5. Remove vials, septa, and closures from oven.
6. Place septa in closures, Teflon side down, and place on vials. The attendant must wear gloves and the vials cannot be removed from the preparation room until sealed.

4.3.3.2 Semi-Volatile Organic Analyte (SVOA) Containers

While no SVOA sampling is planned at this time, this section is included should SVOA sampling be warranted at a later date.
(1-liter amber glass bottles and 4-ounce glass jars)

1. Wash containers, closures, and Teflon® liners in hot tap water with laboratory grade non-phosphate detergent.
2. Rinse three times with tap water.
3. Rinse with 1:1 nitric acid.

4. Rinse three times with American Society for Testing and Materials (ASTM) Type II water.
5. Rinse with pesticide-grade methylene chloride.
6. Oven dry.
7. Remove containers, closures, and Teflon® liners from oven.
8. Place Teflon liners in closures and place closures on containers. The attendant must wear gloves and the containers cannot be removed from the preparation room until sealed.

4.3.3.3 Metals Containers

While no metals sampling is planned at this time, this section is included should metals sampling be warranted at a later date.

(1-liter, 500, 250, 120 and 60-milliliter (mL) clear and 1-liter amber polyethylene bottles)

1. Wash bottles, closures, and Teflon® liners with hot tap water and laboratory grade non-phosphate detergent.
2. Rinse three times with tap water.
3. Rinse with 1:1 nitric acid.
4. Rinse three times with ASTM Type II water.
5. Air dry in contaminant-free environment.
6. Place liners in closures and place closures on bottles. The attendant must wear gloves and the bottles cannot be removed from the preparation room until sealed.

4.3.3.4 Sample Preservation

Samples are preserved according to the protocol established for the selected analytical method. Unless the proper sample container preparation and sample preservation measures are taken in the field, sample composition can be altered by contamination, degradation, biological transformation, chemical interactions, and other factors during the time between sample collection and analysis.

Steps to maintain the in-situ characteristics required for analysis may include storage of samples at 4°C, pH adjustment, and chemical fixation. Specific sample and container preservation requirements are detailed in Table 3 above. Where pH adjustment is performed, the pH will be checked in the field with pH paper to ensure the required pH level is achieved. If pre-preserved sample containers are provided by the laboratory, extra preservation material should be available in the field in case it is needed to achieve the target pH.

Table 3 - Summary of Required Containers, Preservation Requirements and Holding Times

Parameter	*Matrix*	*Required Container*	*Minimum Volume* *Required for Analysis*	*Preservation Technique*	*Holding Time (2)*
Volatile Organics (3)	Water	Glass vials with Teflon faced septa and screw cap. (Two 40 ml vials per sample)	50 ml	Cool (4°C) Preserved with acid (HCl to pH<2)	7 days
	Soil	2-2oz or 1-4oz wide-mouth glass jar with Teflon-lined cover.	10 grams	Cool (4°C)	7 days
Semi-Volatiles, Pesticides, PCBs (3), or Total Petroleum Hydrocarbons	Water	1-L Amber glass jar with Teflon lined screw cap.	1,000 ml (1 Liter)	Cool (4°C)	Extraction within 5 days of sampling. Analysis within 40 days of extraction
	Soil	8-oz wide mouth glass jar with Teflon-lined cover	50 grams	Cool (4°C)	Extraction within 5 days of sampling. Analysis within 40 days of extraction
Metals (Total and Dissolved) (1) (4)	Water	Polyethylene bottle (one 1 L bottle)	100 ml	(Dissolved metals only - field filtered using 0.45 micron filter) Cool (4°C) Preserved with acid (HNO_3 to pH<2)	180 days
	Soil	8-oz wide mouth glass jar with Teflon-lined cover	10 grams	Cool (4°C)	180 days
Total Petroleum Hydrocarbons Fingerprint Analysis	Water	Glass jar with Teflon lined screw cap (one 1 L bottle)	1,000 ml (1 Liter)	Cool (4°C)	28 days
	Soil	8-oz wide mouth glass jar with Teflon-lined cover	50 grams	Cool (4°C)	28 days
Total Cyanide	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C) Preserved with base (NaOH to pH>12)	180 days
	Soil	8-oz wide mouth glass jar with Teflon-lined cover	10 grams	Cool (4°C)	12 days
Mercury (Total and Dissolved)	Water	Polyethylene bottle (one 1 L bottle)	100 ml	(Dissolved metals only - field filtered using 0.45 micron filter) Cool (4°C) Preserved with acid (HNO_3 to pH<2)	26 days
	Soil	8-oz wide mouth glass jar with Teflon-lined cover	10 grams	Cool (4°C)	26 days
Biochemical Oxygen Demand	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C)	24 hours
Bicarbonate	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C)	14 days
Carbonate	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C)	14 days
Chemical Oxygen Demand	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C) Preserved with acid (H_2SO_4 to pH<2)	26 days
Chloride	Water	Polyethylene bottle (one 1 L bottle)	100 ml	None Required	26 days
Sulfate	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C)	28 days
Total Dissolved Solids (TDS)	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C)	7 days
Total Suspended Solids (TSS)	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C)	5 days

Reference: EPA Document No. 540 P-87 001, 1987, "A Compendium of Superfund Field Operations Methods"
NOTES: (1) Metals analysis will be conducted on unfiltered samples. If filtered samples are analyzed, unfiltered samples must also be collected and analyzed. If turbidity presents a problem, the samples will be handled according to NYSDEC "Guidelines for Handling Excessively Turbid Samples" following approval by the Division of Hazardous Waste Remediation (DHWR). (2) Holding times are calculated from VTSR (Verified Time at Sample Receipt). Samples must be received by the lab within 48 hours of collection. (3) TCL = Target Compound List. (4) TAL = Target Analyte List.

4.4 Decontamination Procedures

Standardized procedures for decontamination have been established to reduce the likelihood of cross-contamination between samples and sampling locations. Equipment to be decontaminated includes: backhoes, drilling equipment, and sampling equipment.

All decontamination procedures will comply with the personal protection requirements detailed in the site Health & Safety Plan (HASP). Personal protection levels will depend on the nature of the contamination and the specific decontamination method. Specific decontamination methods for exploratory and sampling equipment are described in the following sections.

4.4.1 Heavy Equipment

Heavy equipment such as drill rigs and backhoes may need to be steam cleaned with a portable high pressure steam cleaner upon arrival at the site and prior to demobilization. During the course of investigation activities, it is only necessary to decontaminate equipment that comes in contact with soils and/or groundwater (i.e., drill rods, bits, backhoe bucket, etc.).

Prior to initiation of drilling activities at the site, a temporary steam cleaning area will be established, if necessary, for the decontamination of the drill rig and associated tools and augers. When selecting the steam cleaning location, the following items will be considered:

- Free from traffic;
- Away from any proposed test boring or monitoring well locations;
- Readily accessible to the investigation area; and
- Free of known surficial contamination.

The decontamination area will consist of a controlled area or structure to contain all wash water and eliminate the possibility of drilling equipment coming in contact with the underlying surficial soils and/or pavement during steam cleaning. Site-specific decontamination area construction requirements may be detailed in the Work Plan.

All equipment will be placed on clean pallets or racks prior to and after steam cleaning. Potable water will be used for the steam cleaning activities. The equipment to be steam cleaned includes: drill rods, augers, bits, tools, and split-spoon samplers. Decontamination wastewater and soils will be initially drummed into 55 gallon steel containers or other appropriate holding vessels pending laboratory analyses.

4.4.2 Drilling Equipment

Drilling equipment that is exposed to soil and/or groundwater will be steam cleaned between sampling locations. The purpose of this decontamination is to ensure that potential contaminants are not transferred between sampling locations.

4.4.3 Sampling Equipment

Contaminated tools and sampling equipment will be placed in a plastic pail, tub, or other container with a Liquinox® (or equivalent) soap and water solution. The tools will be brushed off, rinsed, and transferred to a second soap and water solution bath. Tools will be rinsed with potable water and finally rinsed with de-ionized water. Tools such as wrenches, split-spoons, etc., may be decontaminated between exploration locations with a high-pressure steam cleaner instead of washing. Sampling equipment such as reusable bailers or submersible pumps will be wrapped in aluminum foil after cleaning to prevent contamination before their next use. Control and disposal of decontamination fluids are discussed in Section 4.4.4

4.4.4 Control and Disposal of Decontamination Materials

In general, The Chazen Companies is responsible for collecting, controlling, and staging hazardous material generated during field investigations. Disposal arrangements will be made for the client, if required, for particular work assignments.

Contaminated soil and water will be handled according to NYSDEC TAGM 4032 and TAGM 405 (draft) unless otherwise specified. These documents describe alternatives for disposal of these materials and requirements for handling.

4.4.4.1 Soil Disposal

Alternatives for on-site disposal of non-hazardous soils include:

- Backfill inside borehole;
- Collect and dispose on-site; or
- Temporarily store on-site prior to off-site disposal (pending laboratory analytical results).

Hazardous soils, if discovered, can be sent off site for disposal to a properly permitted treatment, storage, or disposal facility, and non-hazardous soils can be sent to a solid waste management facility. Representative samples of materials will be analyzed for proper classification, treatment, and disposal. Materials will be transported by a licensed hauler and accompanied by the proper manifests.

Disposal alternatives are subject to precautions listed in the TAGM 4032 including the general requirement that the soils "be handled and disposed of in a manner that does not pose a threat to health and the environment". Specific handling and disposal requirements for drill cuttings will be identified by the Field Operations Leader based on field screening and analytical results of drill cutting samples, if applicable.

4.4.4.2 Groundwater Disposal

The control of contaminated groundwater is important to prevent impacts to surficial soils. Five alternatives for the disposal of groundwater generated during sampling at hazardous or petroleum impacted sites are generally recognized and are provided below:

- Transportation off-site to an authorized disposal/treatment facility;
- Discharge to a sanitary sewer for treatment at a publicly-owned treatment works (POTW);or
- Transport by truck to a POTW;

In order to determine the proper disposal option for groundwater generated during monitoring well development and purging, the water will be containerized pending the receipt of laboratory analysis. Disposal of impacted or non-impacted water to a POTW or other disposal facility will require authorization from the receiving facility. Overall, handling and disposal of collected groundwater will be identified by the Field Operations Leader and approved by the DEC project manager based on field screening and analytical results of water samples.

4.4.5 Sample Handling/Shipping Areas

Sample containers will be wiped clean at the sample site, taken to the decontamination area to be further cleaned, as necessary, and transferred to a clean carrier. The sample identities will be checked off against the COC record. The samples will then be stored at approximately 4° C in a secure area prior to shipment.

Sample handling areas will be cleaned/wiped down daily. For final cleanup, all equipment will be disassembled and decontaminated. Equipment that cannot be satisfactorily decontaminated will be disposed of.

4.4.6 Monitoring Equipment

When monitoring equipment is used under conditions where contamination is possible, the equipment will be protected from contaminant sources by draping, masking, or otherwise covering as much of the instrument as possible with plastic without hindering the operation of the unit.

Any contaminated equipment will be taken from the source area and the protective coverings removed and disposed of in appropriate containers. Any direct or obvious contamination will be brushed or wiped with a disposable paper wipe. The units will then be dried, checked, and calibrated for subsequent operations.

4.5 Air Monitoring

The air monitoring program is designed to provide the necessary information to ensure the safety of on-site personnel and to evaluate potential increases to air contaminant levels and dispersion patterns during site activities. Air monitoring will be conducted during field activities as detailed in the Site Management Plan.

4.5.1 Site Safety Air Monitoring

The required level of personal protection equipment specified in the site-specific HASP will be verified by the results of air quality screening performed on-site during field activities. The screening will be performed using a photoionization detector (PID), which detects and measures concentration levels of total VOCs relative to a reference standard on a real-time basis. The PID

lamp sensitivity will be specified in the site-specific HASP based on any information regarding identification of potential contaminants. Most sites will require a PID with a lamp of 10.2 or 11.7 electron volts (eV).

The HASP outlines the air monitoring procedures to be followed during the field investigation. Air monitoring equipment used on site may include a PID, chemical indicator tubes (e.g., Draeger® tubes), percent oxygen/lower explosive limit meter, respirable dust monitor, or a radiation detector.

4.6 Field Screening

Headspace vapor monitoring will be performed as a screening tool for determining the relative concentrations of VOCs in soil samples. A photoionization-detector (PID) will be used. The PID will be calibrated daily in accordance with manufacturer's specifications. Headspace readings will be collected using the static headspace analysis method detailed below:

- Approximately 2 oz. of soil will be collected from each open split-spoon and placed in a dedicated laboratory-cleaned glass jar. Alternatively, soil may be placed in a resealable plastic bag which will be immediately sealed. The mouth of the jar will then be immediately covered with aluminum foil prior to sealing the jar lid to minimize the loss of VOCs. Headspace samples will be collected for each split spoon sample.
- The jar will be shaken to break up the compacted soil or material, and will be placed in a specified location (e.g., field vehicle), out of direct sunlight, for a period of no less than 15 minutes to equilibrate prior to field monitoring.
- Where ambient temperatures are below $0^{o}C$, headspace development should be within a heated vehicle or building. Ambient temperature during headspace analysis will be recorded and reported.
- The jar lid will be removed from the jar. Headspace will be monitored within the jar by piercing the aluminum foil with the PID probe. Care will be taken to prevent unnecessary mixing of jar headspace and outside air. Monitoring with the PID will continue for at least 1 minute or until a stable reading is shown. The highest PID concentration observed will be recorded along with the sample interval in the field notebook, and on the Soil Boring Log.

4.8 Borings and Environmental Wells

Should existing groundwater monitoring wells need to be relocated or replaced due to site development activities, replacement wells will be installed following the methods described in this section.

4.8.1 Drilling Methods

Drill rigs are utilized to advance the borings to facilitate the installation of monitoring wells. The rigs are typically mounted on trucks, all-terrain vehicles, or skids. There are a variety of drilling

methods that may be utilized including hollow-stem auger (HSA), drive and wash, and mud rotary. Each of these methods enables the collection of soil or groundwater samples.

A geologist will observe drilling operations summarizing boring information in a field notebook, taking photographs when appropriate. A boring log will be prepared that includes: characterization of subsurface materials and geologic conditions, air monitoring readings, field screening readings, pertinent drilling information, and relevant observations (i.e., staining, odor, sheen, etc.). An example of a typical boring and monitor well log is presented below.

Typical Boring Log

THE Chazen COMPANIES

PROJECT:		**Test Boring No.:**	**MW-6**
LOCATION:			
CLIENT:		**Total Depth:**	ft.
PROJECT NO.:			
Contractor:	**Start Date:** / **Northing:**	**Borehole Dia.:**	in.
Drill Rig:	**Finish Date:** / **Easting:**	**Depth to Water:**	ft.
Driller:	**El. Datum:** / **Longitude:**	**Depth to Rock:**	ft.
Inspector:	**G.S. Elevation:** / **Latitude:**	**Depth of Well:**	ft.

Depth *(Feet)*	Elevation *(Feet)*	Casing Data	Sample No.	Sample Data	Recovery *(Inches)*	PID *(ppm)*	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
			S1	9	5	0		0-3" Asphalt		
1	-1			8				3-6" Gravel road base		
				5				6"-11" Fill - Black, ash, wood, dry, no odor		
2	-2			5						
			S2	8	5	0		2'-2'5" Fill - Black ash, wood, gravel, tip of spoon wet, no odor		
3	-3			2 4						
				8						
4	-4			7						
			S3	6	3	0		4'-4'3" Black, silty CLAY, saturated, no odor		
5	-5			3						
				1						
6	-6			1						Bentonite:
			S4	3	12	0		6'-6'3" Same as above		Sand:
7	-7			8				6'3"-7' Reddish brown, silty CLAY, gravel, saturated, no odor		
				4						
8	-8			3						
			S5	4	12	0		8'-9' Dark brown and reddish brown, plastic CLAY, saturated,		
9	-9			1				no odor		
				1						
10	-10			2						
			S6	2	12	0		10'-11' Dark brown, silty CLAY, moist to wet, no odor		
11	-11			3						
				2						
12	-12			4						
								Boring terminated at 12 feet below ground surface		
14	-14									

ADDITIONAL NOTES:

Drilling methods used during an investigation will be determined in advance with the provision that the drilling procedure may be modified in response to conditions encountered during drilling. A more detailed discussion of the various drilling methods, sampling procedures, and well installation procedures is provided below.

4.8.1.1 Hollow-Stem Augers

The Hollow Stem Auger (HSA) method utilizes coupled lengths of continuous-flight, hollow steel augers to advance through overburden materials. With this method, drill cuttings rise upward on the flights as the string of augers is rotated.

Typically, $4^1/_4$-inch or $6^1/_4$-inch inner diameter (ID) augers are used for hazardous waste investigations. These produce nominal 8-inch and 10-inch boreholes, respectively.

A center plug equipped with cutting teeth is attached to drilling rods and placed inside the augers to facilitate cutting and to prevent subsurface materials from entering the augers.

When the augers are advanced to the appropriate depth, the center plug is removed to allow for the collection of soil or in situ samples.

The advantage of the HSA method is that limited fluid use is required. In addition, 2-inch ID monitoring wells can be easily installed inside the augers. The limitations of HSA drilling include the inability to advance through very dense materials like rock, cobbles, rubble, etc., or drilling through loose saturated sands and silts which tend to flow around the plug and seize the tooling. Drilling depths are usually limited to the first dense rock layer encountered or by the torque of the machine.

4.8.1.2 Direct Push

Soil probing or "direct push" machines such as the Geoprobe® push tools and sensors into the ground without the use of rotation to remove soil and to make a path for the tool. A Geoprobe® relies on a relatively small amount of static (vehicle) weight combined with a hydraulic hammer as the energy for advancement of a tool string. Probing tools do not remove cuttings from the probe hole but depend on compression of soil or rearrangement of soil particles to permit advancement of the tool string.

Probing tools are advanced as far as possible using only the static weight of the carrier vehicle. Greater depth is achieved using the combined effect of the vehicle weight and hydraulic hammer. Hammering is often required when probing near the ground surface to penetrate hard-packed surface soil and other hard surfaces. The probe is then allowed to penetrate using only static force until refusal is again encountered, at which time the hammer is reapplied. The hammer is applied as required when probing through sands, gravels, high friction clays, tills, fill materials, and surface frost.

A Geoprobe® can be used to drive tools to obtain continuous soil cores or discrete soil samples; obtain groundwater samples or soil gas samples; install permanent sampling implants and air sparging points; set small diameter permanent monitoring wells; or drive a conductivity sensor probe to map subsurface lithology. Soil probing equipment is typically used for site investigations to depths of 30 to 60 feet.

The advantage of using a Geoprobe® versus conventional drilling techniques, are:

- Minimal cuttings are generated. This reduces handling, containing, storing, sampling, analyzing, and disposing of potentially hazardous and contaminated cuttings. This also reduces disposal costs and potential exposure of site workers, facility employees, residents, and surroundings to hazardous contaminants.

- Only a small diameter hole is created. Grouting is less expensive because a small volume of grouting material is required.

- Less obtrusive equipment required. Small, light, probing equipment is used for sample collection which allows the operator to reach many locations not accessible to larger and heavier conventional drilling equipment.

- Minimal physical and chemical disturbance of the sample materials occurs.

- Typical penetration rates are from 5 to 25 feet per minute, although probing time is highly dependent upon soil conditions.

- Sampling time is shorter; therefore, more sample locations can be sampled per day, depending upon soil conditions.

- The unit can sample all subsurface media including soil, groundwater, and soil gas; log soil conductivity and contaminants; grout probe holes; and inject remediation materials.

4.8.2 Monitoring Well Installation

This section outlines the general procedures for monitoring well installation and typical materials utilized, should replacement wells be needed. If replacement wells are required for continued groundwater monitoring, the construction would be similar to the existing wells and the locations would be submitted to NYSDEC for approval.

4.8.2.1 Well Construction Materials

Well construction materials consist of well screen, riser pipe, sand pack, bentonite seal, cement grout, and protective casing. Specific monitoring well details may be outlined in the Work Plan. Typical well construction specifications are described below.

Well Screen and Riser Pipe

The most common materials used in the construction of monitoring wells are polyvinyl chloride (PVC) and stainless steel. Generally, PVC is used because it is less expensive and non-corrosive. However, PVC may deteriorate as a result of certain compounds. In such cases, stainless steel may be preferred. Riser pipe and well screen is typically 2-inch or 4-inch ID and has flush joint threads.

When PVC is used, wells constructed in unconsolidated materials less than 100 feet deep are constructed with Schedule 40 PVC.

Well screens are used in the construction of monitoring wells to limit sediment from entering the well. Generally, screens are machine slotted at slot sizes of 0.01 inches (10-slot) for fine materials or 0.02 inches (20-slot) for coarse materials such as coarse sand and gravel. The screen slot size should be selected to retain 90 percent of the filter pack material or native aquifer material.

Sand Pack

The sand pack consists of uniformly graded sand. A grade of sand is selected such that it will not to pass the well screen slot size and will exclude the fines from the formation. At least a 2-inch layer of sand will be placed at the bottom of the hole prior to the well installation. Sand will be placed around the well screen to a level of 2 feet above the top of the screen, site conditions permitting. In situations that require a well to straddle a shallow water table, it may be necessary to place less sand above the top of the screen to allow enough space for an adequate bentonite seal.

Bentonite Seal

The bentonite seal may consist of pure Wyoming sodium bentonite chips, pellets, or slurry. A bentonite seal expands by absorbing water, and due to its low permeability, serves to isolate the screened interval from the rest of the borehole. The bentonite seal should be at least 2 feet thick and be placed directly above the sand pack. It may be necessary to install less bentonite for shallow water table wells. Bentonite seals that are placed above the water table should be hydrated with potable water. NYSDEC guidelines (TAGM 4008) specify that bentonite seals must be placed via tremie method. For deeper installations it is often more practical to tremie a bentonite slurry. In such cases, the bentonite slurry may be placed up to the ground surface in place of cement or cement-bentonite grout.

Cement-Bentonite Grout

Grout will be placed from the top of the bentonite seal to the ground surface via the tremie method. Generally, the grout consists of a cement-bentonite mixture. Cement is Portland Type 1, in conformance to ASTM specifications C150. The bentonite is powdered Wyoming sodium bentonite. Cement-bentonite grout typically consists of 94 pounds of cement mixed with 3 to 5 pounds of powdered bentonite and 7 gallons of water or a media approximating this mixture. The purpose of the grout seal is to replace material removed from the borehole during drilling and prevent collapse and subsidence around the well. Pure bentonite slurry may also be used in place of the cement-bentonite grout.

Protective Casings

Protective casings are placed around wells to prevent damage, provide security, and to provide a seal to prevent surface runoff from entering the well. They usually consist of a 4- or 6-inch diameter steel casing with a 2-3 foot stick up above the ground or a manhole road box installed flush to the ground surface (flush-mounted casing). The casings should be watertight and equipped with a locking cover. All protective casings should be labeled with the well identification. A concrete surface seal should be constructed around the protective casing at the ground surface to provide a seal and to divert surface runoff away from the well. All details of well installation will be recorded by the geologist.

4.8.3 Well Development

Monitoring wells will be developed in order to restore the natural permeability of the formation adjacent to the borehole; to permit water to flow through the screen easily. Well development removes fine sediment from the formation so, during sampling, water will not be turbid or contain suspended materials that can interfere with chemical analysis.

Shallow wells are generally developed with a bailer, a foot-valve pump, or a submersible pump. Pumping is usually a more efficient method for deeper wells. The selection of the well development methods and equipment will be determined on site by the field personnel based on drilling, well construction, and site-specific geologic information.

Well development will occur after a minimum of 24 hours following construction or after recovery is complete, whichever is later (NYSDEC TAGM 4007). All equipment that is introduced into the well will be decontaminated according to the procedures discussed in Section 4.4. The general procedures for well development are summarized below:

1. Measure the water level in the well with a water level indicator. The depth to the bottom of the well is measured with a weighted measuring tape.
2. A bailer or other pumping device is lowered to the bottom of the well. The well is surged by the bailer or the pump to agitate and loosen fines in the well screen and sand pack.
3. Groundwater is bailed or pumped from the well. If a pump is used, the pump intake will be periodically placed at different depths throughout the well and within the screen interval during development.
4. Readings of pH, temperature, specific conductance, and turbidity will be collected after each well volume removed or at other intervals depending upon well output and other factors pertinent to sampling.
5. Well development will continue until the field measurements stabilize. Ideally, the well should be developed to 50 Nephelometric Turbidity Units (NTU), if possible, according to NYSDEC TAGM 4007. The goal of 50 NTUs may not be practical in formations which contain a lot of silt and clay in which case the well will be developed until the turbidity readings appear to have stabilized.
6. The development tools will be removed from the well and the water level and well bottom will be measured following development.
7. The well will be covered and locked.
8. Purged water will be containerized pending subsequent sampling and handled according to the procedures outlined in Section 4.4.4.
9. All pertinent field data will be recorded on a Field Data Sheet (see Section 4.10).

4.9 Groundwater Sampling

Groundwater samples are collected from monitoring wells for laboratory analysis. The specific number and location of samples, rationale, and parameters to be tested are discussed in the Site Management Plan. The equipment and general procedures normally utilized for groundwater sampling are presented below.

4.9.1 Groundwater Sampling Equipment

Monitoring wells will be purged using one of the following pieces of equipment:

- Lubricant-free stainless steel submersible pump with polyethylene or Teflon discharge tubing.
- Peristaltic pump equipped with dedicated polyethylene tubing with or without a foot valve.
- Dedicated Teflon bailer connected to new solid-braid nylon rope.
- Inertial lift pump with dedicated polyethylene valve and tubing.

The selection of a purging method is determined based on the following information:

1) Well depth
2) Static water level
3) Hydraulic conductivity
4) Well diameter
5) Well location

4.9.2 Procedures for Collecting Groundwater Samples

4.9.2.1 Pre-Sampling Activities

Before sampling, the following pre-sampling activities will occur:

- The well will be inspected for integrity and proper identification.
- A sheet of polyethylene will be laid out for placement of monitoring and sampling equipment.
- If site conditions are unknown, conditions warrant, or project requirements call for VOC monitoring, VOCs will be measured at the rim of the opened well with a PID and recorded in the field logbook.
- After removing the well cap, the water level will be allowed to equilibrate for a minimum of 5 minutes. The static water level in the well will be measured with a water level indicator to the nearest 0.01 feet referenced to a permanent mark on the PVC riser. The probe of the meter will be decontaminated according to the procedures detailed in Section 4.4.
- The volume of water in the well will calculated by the following equation:

$$V = (\pi) r^2 l (7.48)$$

where,
V = volume, in gallons
π = 3.14
r = inside radius of well, in feet
l = height of water in well, in feet
7.48 = conversion factor for cubic feet to gallons

- If desired, the depth of any non-aqueous phase liquids (NAPLs) will be measured using an interface probe and recorded. If LNAPLs or DNAPLs are detected, the well will not be sampled. A sample of the LNAPLs or DNAPLs present may be obtained using a bailer, if appropriate.

4.9.2.2 Sampling Procedures

Low Flow Sampling:

- Install Pump: Slowly lower the pump, safety cable and tubing into the well to the depth specified for that well. The pump intake should be in the middle or slightly above the middle of the screened interval. Too close to the bottom increases the possibility that solids that have collected in the well over time will be collected in the sample. Too close to the top increases the possibility that water stored in the casing will be included in the sample. Record the depth to which the pump is lowered.

- Measure Water Level: Before starting the pump, measure the water level again with the pump in the well. Leave the water level measuring device in the well.

- Purge Well: Start pumping the well at 100 to 500 milliliters per minute (ml/min). The water level should be monitored approximately every 5 minutes. Ideally, a steady flow rate should be maintained that results in a stabilized water level (drawdown of 0.3 ft or less). Pumping rates should be reduced, if needed, to the minimum capabilities of the pump to ensure stabilization of the water level. Care should be taken to maintain pump suction and to avoid entrainment of air in the tubing. Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment.

- Monitor Indicator Parameters: During purging of the well, monitor and record the field indicator parameters (temperature, specific conductance, and pH) approximately every 5 minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows:

  $\pm$0.1 for pH

  $\pm$3% for temperature

  $\pm$3% for specific conductance (conductivity)

  The pump must not be removed from the well between purging and sampling.

- Sample collection should be directly from the dedicated or disposable tubing, not from the flow-through cell discharge hose.

- Remove pump and tubing: After collecting the samples, the tubing must be properly discarded or dedicated to the well for resampling by hanging the tubing inside the well.

- Close and lock the well.

Sample Collection
All laboratory samples will be placed in containers according to the procedures outlined in Section 4.3.3 of this document. Drums containing purge water will be handled in accordance with Section 4.4.4.

4.10 Water Level Measurements

Groundwater level measurements are taken to calculate groundwater elevations so that groundwater contour maps can be constructed. Groundwater contour maps are used to assess flow directions and hydraulic gradients.

Water levels are measured with a water level indicator to the nearest hundredth (0.01) foot. Measurements collected from monitoring wells are taken from the top of well casing. The measurement point is notched or marked indelibly on the casing.

Water levels are measured according to the following procedures:

- Check the well for proper identification.
- Inspect the integrity of the protective casing and surface seal.
- If previous data warrant, or unknown conditions exist, then monitor the ambient air in the breathing zone and at the well head while unlocking and removing the well cover.
- Using a pre-cleaned water level indicator, measure the water level to the nearest hundredth (0.01) foot from the reference mark at the top of the well riser pipe.
- Record the water level measurements in a field notebook and/or on a field data sheet along with the date and time of measurement.
- Decontaminate the water level probe between locations by rinsing it with methanol and deionized water.
- Replace the well cover and lock.

5.0 DOCUMENTATION / CHAIN OF CUSTODY PROCEDURES

5.1 Chain of Custody

Chain-of-Custody (COC) procedures are followed to insure that sample integrity is maintained throughout the sampling and analysis process and that all samples collected are accounted for at all times. The COC process begins when the sample is collected and carries on throughout the analytical laboratory operations. The field team member responsible for the collection of the samples acts as the initial sample custodian.

A sample is considered "in custody" of an individual if it is either in direct view of, or directly controlled by, that individual. Chain-of-Custody transfer is accomplished when the samples or sealed sample containers are directly transferred from one individual to the next. At the time of transfer, the first individual witnesses the signature of the receiver on the COC record. The objective of the COC program is to ensure that:

- Samples are protected from loss or damage.
- The correct samples are analyzed.
- All samples are uniquely identified.
- Samples are traceable to their records.
- Documentation of sample handling procedures including: sample location, sample number, number of sample containers, and the COC process.
- A signed COC record is included for each sample shipment, documenting contents of the shipment. The COC record indicates the following information:
  - Site name
  - Sample Identification Numbers
  - Date and time of collection
  - Sample type (e.g., groundwater, soil, etc.)
  - Number and type of containers per sampling location
  - Parameters requested for analysis for each container
  - Signature of person(s) involved in the chain-of-possession
  - Description of sample bottles and their condition
  - Problems associated with sample collection (i.e., breakage, no preservatives), if any.

The COC records are printed on triplicate forms. One copy is retained by The Chazen Companies when the samples are taken into custody by either a shipping agency or the lab. A second copy is kept by the analytical lab. The third copy is returned to Chazen with completed lab results.

5.1.1 Sample Tracking

In order to track the samples sent to the laboratory, a permanent log of each shipment is maintained in a log book. A copy of all COC records is also maintained in a project file. All pertinent COC information is recorded in the log book, as well as follow-up correspondence with the laboratory, via telephone or mail, indicating receipt of the samples, breakage, turnaround

time, or any problems with the shipment. As analytical data are received, the database is updated to reflect the new information. Turnaround times are compared to protocols to ensure quality control. Missing data or invalid samples are addressed by the Field Operations Leader or the Project Manager.

5.1.2 Laboratory Operations

Specific laboratory Standard Operating Procedures used during the investigation are provided by the selected analytical laboratory. These procedures include sample tracking, methods for collection and handling of laboratory blanks, laboratory duplicates, matrix spikes, laboratory control samples, and surrogates. Maximum/minimum holding times and data reporting procedures are also defined by the laboratory.

5.2 Analytical Sample Shipping

Sample containers are packed in coolers. Bottles are packed tightly in materials such as Styrofoam, vermiculite, and/or "bubble pack" to minimize motion. Ice placed in zip-lock bags and can be added to the cooler to cool the samples to around 4° C. All paperwork is sealed in a separate zip-lock bag and placed in the cooler which is then taped shut. The samples are shipped to the laboratory together with the COC documents.

The standard procedure followed for shipping environmental samples to the analytical laboratory is:

1) Samples are shipped by courier or equivalent overnight delivery service.
2) Samples are shipped to the laboratory within 24 to 48 hours of acquisition.
3) Prior to leaving for the field, the Analytical Lab is notified of the number, type, collection date, and shipment dates for samples. If the number, type, or date of shipment changes due to site constraints or program changes, the Lab is informed of the change. Notification to the Lab also occurs when sample shipments will arrive on Saturdays. This communication is critical to allow the laboratory enough time to prepare for the samples' arrival.
4) If prompt shipping and laboratory receipt of the samples is not possible, (i.e., Sunday arrival), members of the Field Team are responsible for proper storage of the samples until adequate transportation arrangements can be made.
5) Field Operations Leader or his/her designee ensures that samples collected by the client are entered into the project sample log.

6.0 CALIBRATION PROCEDURES

This section details the calibration and operating procedures for the field and laboratory analytical instruments that will be used during this investigation.

6.1 Field Instruments

Field instrumentation is calibrated according to the manufacturer's instructions to ensure that accurate field data are collected. Each piece of equipment is calibrated daily prior to use or as specified by the manufacturer. More frequent calibration may be performed when accuracy of the equipment becomes suspect or under extreme field conditions. Calibration information is recorded in the same field notebook in which the field instrument readings will be recorded. The recorded calibration includes:

- Name of instrument
- Instrument serial number
- Date of calibration
- Observations and results of calibration
- Calibration gas used, if applicable
- Buffer solutions used, if applicable
- Specific calibration procedures and operating instructions are detailed below.

6.1.1 pH Meters

pH is the measure of the acidity or alkalinity of a solution. It is defined as the negative logarithm of the hydrogen ion activity. Hydrogen ion activity is related to the hydrogen ion concentrations, which in relatively weak solutions are nearly equal. For practical purposes, pH is the measure of the hydrogen ion concentration.

The operation of a pH meter relies on the same principal as many other ion-specific electrodes. Measurement relies on establishment of a potential difference in the response to hydrogen ion concentration across a membrane in the electrode. The membrane is conductive to ionic concentrations, which in combination with a reference electrode (which can be combined into a single "combination" electrode), can generate a potential difference proportional to the hydrogen ion concentration.

Variation in temperature will effect the association of hydrogen and hydroxide ions, which without proper compensation will affect the pH. pH meters have several controls to compensate for the variations between electrodes and the different responses to changes in temperature.

It is very important to obtain a pH measurement as soon as possible after sample collection, since temperature changes, precipitation/dissolution reactions, and sorption of carbon dioxide from the air all affect the pH of a solution.

Because of the great variety of pH meters available, operators should refer to the manufacturer's instruction manual for specific calibration, operation, and troubleshooting procedures for their instrument. The following general procedure is used for measuring pH in the field with a pH meter:

- The pH meter is calibrated at each sample site.
- The instrument and batteries are checked prior to the initiation of the field effort. pH electrodes are kept moist at all times.
- Buffer solutions used for calibration are checked since buffer solutions will degrade upon exposure to the atmosphere.
- Generally, 4.00 and 7.00 pH buffers are selected for calibration.
- All electrolyte solutions within the electrode(s) are filled to their proper levels and no air bubbles are present within the electrode(s).
- The electrodes are immersed in a pH-7 buffer solution.
- The temperature compensator is adjusted to the proper temperature (on models with automatic temperature adjustments, immerse the temperature probe into the buffer solution). Alternatively, the buffer solution may be immersed in the sample and allowed to reach temperature equilibrium before equipment calibration. It is best to maintain buffer solution at or near expected sample temperature before calibration.
- The pH meter is adjusted to read 7.0.
- The electrodes are removed from the buffer and rinsed well with deionized water. The electrodes are immersed in pH-4 (or pH-10 buffer solution) and the slope control is adjusted to read the appropriate pH. To check the calibration, three successive readings are taken, one minute apart, to see that readings are within ±0.1 pH unit.
- The electrodes are immersed in the unknown sample, slowly stirring the probe until the pH stabilizes. Stabilization may take several seconds to minutes. If the pH continues to drift, the sample temperature may not be stable, a chemical reaction (e.g., degassing) may be taking place in the sample, or the meter or electrode may be malfunctioning. This must be clearly noted in the logbook.
- The pH and temperature of the sample are read and recorded. pH is recorded to the nearest 0.1 pH unit.
- The electrodes are rinsed with deionized water.

6.1.2 Specific Conductance Meters

Conductivity is a numerical expression of the ability of a water sample to carry an electric current. This value depends on the total concentration of ionized substances dissolved in the water and the temperature at which the measurement is made. It is important to obtain a specific conductance measurement soon after sample collection since temperature changes, precipitation reactions, and sorption of carbon dioxide from the air affect the specific conductance.

Specific conductance can be used to identify the direction and extent of the migration of contaminants in groundwater and surface water. It can also be used as a measure of subsurface biodegradation or to indicate alternate sources of groundwater contamination.

A conductance cell and a Wheatstone Bridge (for the measurement of potential difference) may be used for measurement of electrical resistance. The ratio of current applied to voltage across the cell may also be used as a measure of conductance. Depending on ionic strength of the aqueous solution to be tested, a potential difference is developed across the cell which can be converted directly or indirectly (depending on instrument type) to a measurement of specific conductance.

Because many conductivity meters are available, operators should refer to the manufacturer's instruction manual for specific calibration, operation, and troubleshooting procedures. The following general procedure is used for obtaining specific conductance measurements:

- The conductivity meter is calibrated at the start of each sampling day or more frequently if deemed necessary.
- Batteries are checked before going into the field.
- The instrument is calibrated using a potassium chloride standard solution by completely immersing the electrode into the solution. The temperature of the calibration solution is checked and the temperature dial is adjusted on the meter (if not self-compensating). Calibration measurements and time are recorded in the field logbook.
- The umho value of the solution is checked in terms of the temperature. The Cell Constants dial is adjusted until the display reads the appropriate value.
- The electrode is rinsed with one or more portions of the sample to be tested.
- The electrode is immersed in the sample and the temperature and the conductivity are measured.
- The results are noted in the field logbook.
- If the specific conductance measurements become erratic, or inspection shows that any platinum black has flaked off the electrode, replatinization of the electrode is necessary. See the manufacturer's instructions for details.

6.1.3 Photoionization Detector

For monitoring total ambient air quality during field activities and for conducting static headspace testing, TCC uses a MiniRae PID. This instrument measures total VOC concentrations. The operating and calibrating procedures for this instrument follow.

A MiniRAE 2000 PID can be used to detect a variety of trace gases, particularly VOCs. The MiniRAE 2000 uses the principle of photoionization to detect and measure the VOC concentrations in the atmosphere or from a sample.

The MiniRAE 2000 operates using an electrodeless discharge ultraviolet (UV) lamp as the high-energy photon source. As organic vapors pass by the lamp, they are photo-ionized and the ejected electrons are detected as a current. The PID sensor with a standard 10.6 eV lamp detects a broad range of organic vapors. In principle, any compound with ionization energy lower than that of the lamp photons can be measured.

The following procedure is used for operating and calibrating the MiniRAE 2000:

- Press and hold the MODE key for one second and release to turn on the MiniRAE 2000. The audio buzzer will beep once and the air pump will turn on. The display will show "ON"
- To turn off the MiniRAE 2000, press and hold the MODE key for 5 seconds. The monitor will beep once per second during the power-down and the message "OFF" will flash and the screen will go blank.
- After the monitor is turned on, it runs through the start up menu and then a "READY…" message is displayed. At this point the user can either 1) step through the operation menu or 2) take a measurement.
- In the first menu of the programming mode, the user can calibrate the MiniRAE 2000. The calibration is a two-point process using "fresh air" and the calibration gas (Isobutylene)
- Calibration Process
  - Press and hold down both the [N/-] and MODE keys for three seconds to enter the programming mode; the first menu item is "Calibrate/select Gas"
  - The Fresh Air calibration determines the zero point of the sensor calibration curve. If a fresh air source from a cylinder or tedlar bag is not available, any clean ambient air without detectable contaminant or a charcoal filter can be used.
  - The first menu shows "Fresh Air Cal?"; make sure the instrument is connected to the fresh air source; press the [Y/+] key, the display will show "zero in progress", flowed by "wait.." and a countdown timer; after a pause, the display will show the message "zeroed…reading= x.x. ppm…"; press any key or wait about 20 seconds, the monitor will return back to the submenu.
  - For the second point of the sensor calibration, a cylinder of span gas (Isobutylene) fitted with a 500 cc/min. flow limiting regulator is attached to the instrument.
  - Press the [Y/+] key at the "Span Cal?" to stat the calibration. The display shows the gas name and the span value of the corresponding gas; the display will show "Apply gas now" at which point the valve will be turned to open the gas supply.
  - The display with ask you to wait 30 seconds. When the count down timer reaches 0, the display will show the calibrated value. Turn off the flow to gas and disconnect the span gas. Press any key
- To record measurements
  - Press the [Y/+] key to start a measurement in survey mode
  - Instantaneous readings in ppm are updated every second
  - To stop measurements press the MODE key and the display shows STOP. Press [N/-] to continue measurement

The meter is calibrated once per day or more frequently, if necessary. The MiniRAE 2000 is used to monitor the breathing zone for health and safety precautions or to screen samples by placing the probe near suspected sources of contaminants.

6.1.4 Airborne Particulate Matter Meters

For monitoring airborne particulate matter (i.e., dust) during field activities, TCC uses a MIE, Inc. Personal Data-logging Real-time Aerosol Monitor (*personal*DataRAM). This instrument provides direct and continuous data measurements and is a high sensitivity nephelometric monitor optimized for the measurement of the respirable fraction of airborne dust emitted from

ground intrusive work or work that has the potential to produce dust. The following procedures are used for calibrating and operating the *personal*DataRAM:

- Calibration/Zeroing Process
  - Conduct zeroing in a particle-free environment such as a *personal*DataRAM Z-Pouch, a clean room, a duct or area directly downstream of a HEPA filter, or the MINIRAM Z-Bag. The following instructions are for the Z-Pouch.
  - Wipe the outside surfaces of the instrument to remove as much dust as possible, then in a reasonably clean area, open the zipper of the Z-Pouch and place the unit inside.
  - Open the small nipple of the Z-Pouch and insert the fitting of the hand-pump/in-line filter unit into the nipple. Start pumping the hand-pump until the Z-Pouch begins to bulge slightly.
  - While continuing to pump, press ENTER and keep pumping slowly while ZEROING is displayed for 1.1 minutes followed by CALIBRATION: OK. If screen shows BACKGROUND HIGH or MALFUNCTION, consult instruction manual.
  - To set up a run and scroll logging/operating parameters, press NEXT when screen shows READY: NEXT.
  - After completing zeroing process, remove the *personal*DataRAM from the Z-Pouch, close the zipper and flatten the Z-Pouch while plugging its nipple to prevent dust contamination in the Z-Pouch.

- Operating Process
  - To enable the logging function, press ENTER when screen shows LOGGING DISABLED.
  - LOG INTRVL 600s indicates that logging is enabled (in this example for 10-minute log period). Press ENTER.
  - At ALARM: OFF press ENTER to toggle through alarm modes.
  - Press NEXT to move through the calibration factor screen and battery charge screen.
  - Press NEXT at CONNECT TO PC, then again to return to ready mode (this will enable data to be downloaded).
  - Press ENTER at LOG INTRVL with TAG # displayed. Concentration screen will be displayed after three seconds. Pressing NEXT will successively scroll to show various run values.
  - Press EXIT to terminate the current run, then ENTER to return to Ready mode.

6.2 Laboratory Equipment Calibration

The Laboratory's Project Manager will be responsible for the operation and calibration of laboratory analytical instruments in accordance with the schedules and procedures specified by the NYSDEC ASP (Analytical Services Protocol, Revised September 1993).

The laboratory calibration procedures are addressed in the QA documents for the laboratory subcontractor.

7.0 ANALYTICAL PROCEDURES

Laboratory analyses will be scheduled once every five years (e.g., 2014, 2019) for groundwater sample analysis of volatile organic compounds (VOCs) via EPA Method 8260.

7.1 Analytical Laboratory

All sample analyses will be performed by a laboratory certified by the New York State Department of Health (NYSDOH). In order to provide legally defensible data, selected analytical procedures to be used will be in accordance with the most recent NYSDEC ASP. Laboratory analytical parameters will be based on previous site information, as well as data quality objectives and applicable NYSDEC criteria. Samples will be received by the laboratory within 48 hours of collection.

8.0 DATA REDUCTION, VALIDATION, AND REPORTING

8.1 Data Reduction

Data reduction is the conversion of raw data into a useful form from which conclusions can be made and presented. Raw data may consist of field data, which are real-time measurements, and technical data, which includes field and laboratory analytical data. Raw field data (e.g. PID readings) will be compared to laboratory analytical results which will be compared to site-specific criteria.

8.2 Data Validation

Data validation is the process of reviewing data and accepting it or rejecting it on the basis of sound criteria.

Records of all data will be maintained, even those judged to be "outlying" or spurious values.

8.2.1 Field Data Validation

Field data will be validated at the time of collection by following standard procedures and QC checks and after the data is reduced to review data sets for anomalous values. The objectives of field data validation are as follows:

- Adherence to approved site-specific plans.
- Standard operating procedures are followed.
- Sufficient sample volume is obtained, sample integrity is maintained, all required analyses are conducted, and all applicable field QC samples are provided with each sample set.
- Complete chain-of-custody documentation is maintained throughout the duration of the field effort.
- Maximize data consistency between field personnel by random checks of sampling and field conditions by supervisory personnel.

8.2.2 Laboratory Data Validation

Laboratory data verification will be performed by qualified individuals appointed by the analytical laboratory. Data verification will involve routine audits of the data collection and flow procedures and monitoring GC sample results. Results from the analysis of project and blind audit QC samples will be calculated and evaluated as reported. Immediate corrective action will be taken if these results indicate data quality problems.

8.3 Reporting

Validated laboratory data will be presented in a final report in the form of tables and/or figures. Figures may include planimetric maps, cross sections, and contour maps. All supporting data,

such as laboratory analytical reports, will be presented as an appendix to the final report. Electronic files may be provided in lieu of hard copies.

9.0 INTERNAL QUALITY CONTROL PROCEDURES

Quality control (QC) checks will be performed to ensure the collection of representative and valid data. QC checks provide the mechanisms by which the quality assurance objectives are monitored.

9.1 Field Quality Control

Field quality control measures will be conducted in accordance with the NYSDEC RCRA Quality Assurance Project Plan Guidance dated March 29, 1991. The field QC checks that will be used are listed and described as follows.

9.1.1 Documentation

All activities must be properly documented including: sampling procedures, decontamination activities, chain-of-custody procedures, equipment calibration, and justification for all actions taken contrary to the approved QAPP and Site Management Plan.

9.1.2 Blank and Duplicate Samples

Three types of blanks can used during sampling: trip blanks, field blanks and equipment blanks. These are discussed below. Planned groundwater monitoring for natural attenuation will include the analysis of trip blanks. Field duplicates, equipment blanks, and MS/MSD samples will not be collected or analyzed as part of the groundwater monitoring events.

Trip Blanks: Trip blanks are for assessing the potential for contaminating aqueous samples with VOCs during sample shipment. The trip blank consists of a VOC sample container shipped to the site with the other VOC sample containers either filled with reagent water at the lab or filled on-site with reagent water. Trip blanks will be used so as to maintain a 1:20 ratio of blanks to samples or with each shipment, whichever is greater. Non-aqueous samples do not require trip blanks. One trip blank will be analyzed for each sampling event.

Field Duplicates (Replicates): When required, field duplicates of soil, sediment, and groundwater samples will be submitted for analysis of all site-specific parameters at a rate one every 20 samples collected for analyses. These duplicates are intended to assess the homogeneity of the sampled media and the precision of the sampling protocol. True duplicates of soil, sediment, and solid waste samples; however, are not possible because chemicals are typically not uniformly distributed. No field duplicates will be collected as part of the groundwater monitoring events.

Equipment Blanks: Equipment blanks for the bailer, sampling pump, and/or tubing assembly are collected during monitoring well sampling at a rate of one per day on one piece of equipment per equipment type. VOCs, SVOCs, or inorganics present within the bailer, pump apparatus, or discharge tubing are assessed by collecting a sample of reagent water passed through the

sampling apparatus after washing with the decontamination solution followed by at least one rinse with reagent water.

Equipment blanks, sometimes called rinsate blanks, are collected during each field event at a rate of one per day on one piece of equipment per equipment type. VOC, SVOC, or inorganics present within or on the sampling apparatus where intimate contact with the sample occurs (i.e., split-spoon, trowel) are assessed by rinsing the sampling apparatus with ASTM Type II water following decontamination. Rinsate blanks are collected directly into the appropriate water container. No equipment blanks will be collected as part of the groundwater monitoring events, as disposable field sampling equipment will be used.

Matrix Spike/Matrix Spike Duplicates (MS/MSD): For some projects, the NYSDEC ASP requires the laboratory to analyze MS/MSDs for organic analyses at a frequency of five percent. To meet this requirement, the Field Operations Leader will select samples for MS/MSD analyses and will provide additional sample volume to the laboratory. No MS/MSD samples will be collected as part of the groundwater monitoring events.

9.1.3 Completeness

Completeness of scheduled sample collection is controlled in the field by comparing a pre-sampling inventory with samples actually collected each day. Daily checking of field data sheets and comparison of transport and COC logs provides further control of documentation and completeness.

9.1.4 Field Analytical Quality Control

QC checks are performed on field measurement systems that emulate laboratory measurement systems (e.g., portable field GC).

9.2 Laboratory Analytical Quality Control

Data from QC samples (e.g., blanks, spiked samples) will be used as a measure of performance and as an indicator of potential sources of cross-contamination. Laboratory analytical quality control will be in accordance with the requirements outlined in the NYSDEC RCRA Quality Assurance Project Plan.

10.0 PERFORMANCE AND SYSTEM AUDITS

10.1 Systems Audit

System audits are performed to ensure that the QA/QC procedures are being followed. These audits include a careful evaluation of both field and laboratory control procedures.

Organization and Personnel: The project organization is reviewed for compliance with the proposed organization and for clarity of assigned responsibility. Personnel assigned to the project will be placed so that responsibility, skill, and training of the personnel are properly matched.

Facilities and Equipment: The audit will address whether field equipment and analytical instruments are meeting requirements specified by the project objectives stated in the Work Plan. Equipment and facilities provided for personnel health and safety may also be evaluated. Calibration and documentation procedures for instruments will also be verified.

Analytical Methodology: A review of analytical methodology with regard to the data requirements for the project will be performed. An on-site observation of analyst technique, data reduction, and record keeping may be performed if determined necessary. Periodic review of precision and accuracy of data will be performed.

Sampling and Sample Handling Procedure: An audit of scheduled samples versus samples collected versus samples received for analysis may be performed. Field documentation may be reviewed. If deemed necessary, a site visit will be made to document that designated control procedures are practiced during sampling activities.

Data Handling: During a system audit, the QAM will review data handling procedures with the TLs. Accuracy, consistency, documentation, and appropriate selection of methodologies will be discussed:

10.1.1 Field Systems Audit

Field systems audits are performed by QA personnel to compare field practices with standard procedures. These audits focus on such things as:

- Compliance with Work Plan
- Proper working order of field equipment
- Documentation procedures
- Field team efficiency
- Level of QA conducted by field members
- Proper sample packaging and shipping

10.1.2 Laboratory Systems Audit

Laboratory systems audit are conducted to ensure that measurement systems are properly maintained and used. Laboratory records and procedures may be reviewed for completeness, accuracy, precision, and adherence to prescribed methods.

10.1.3 Field Performance Audits

Field performance audits are conducted by QA personnel on an ongoing basis during a project as field data are generated, reduced, and analyzed. Field performance audits include review of numerical manipulations and review of blank and replicate samples.

10.1.4 Laboratory Performance Audits

Laboratory performance audits may be conducted and may include:

- Verification of written procedures, and analyst's understanding
- Verification and documentation of procedures and documents
- Periodic unannounced inspections, if warranted
- Review of a portion of all analytical data and calculations

11.0 PREVENTATIVE MAINTENANCE

11.1 Analytical Instrumentation

Preventative maintenance of analytical instrumentation is outlined in the QA documents of the subcontract analytical laboratory.

11.2 Field Instrumentation and Equipment

Preventative maintenance of field instrumentation and equipment includes the following measures:

- The field operations leader shall ensure that all scheduled maintenance occurs as obligated.
- Critical spare parts will be kept in stock.
- Equipment will be cleaned on a daily basis after use.
- Field crews will report on the condition and performance of the equipment after each sampling event.

12.0 CORRECTIVE ACTIONS

Corrective actions are QA/QC problem-solving measures taken to rectify a laboratory or field measurement system that is out of control. Corrective action is required when potential or existing conditions are identified which may adversely affect the data quality. The need for corrective action may be identified by system or performance audits or by standard QC procedures. The corrective action system will include the following procedures:

The Project Manager is immediately notified of any potential problem with the data quality, and will then evaluate the need for changes in affected procedures and conduct appropriate corrective actions. Potential data quality problems may include:

- Loss of a sample or damaged sample containers.
- Analytical results that are substantially different from those expected.
- Laboratory QC samples that do not attain target performance objectives.
- Events that may require changes in specifications and sampling procedures.

Corrective action related to questionable analytical results or damaged sample containers may include re-sampling and re-analysis, if appropriate. Modification of procedures may be necessary to remedy problems related to unexpected conditions encountered in the field.

13.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT

The Project Manager submits periodic QA reports for appraisal by management, appropriate to their level of responsibility. Reports to management include:

- Periodic assessment of measurement data accuracy, precision, and completeness.
- Results of performance and system audits.
- Significant QA/QC problems and recommended solutions.
- Resolutions of previously stated problems.

13.1 Field Quality Assurance Reports

Periodic status reports describing the progress of the project are submitted periodically to management. These reports include: copies of field notes or daily field progress reports, compiled field data sets, and corrective action documentation. The Project Manager is notified immediately of situations requiring corrective action measures.

14.2 Laboratory Quality Assurance Reports

A project QA report that summarizes QA activities and QC data is issued to the QA Manager and Project Manager. Any laboratory QA situations requiring immediate corrective action is reported to the Project Manager.

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