SITE INVESTIGATION WORK PLAN

Former Scolite Site
2 Madison Street
Troy, New York

NYSDEC Site Code #E442037

HRP #TRO2004.P2

PREPARED BY:

HRP ASSOCIATES, INC.
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Submitted: March 26, 2009

HRP Associates, Inc.

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1.0 Introduction

HRP Associates, Inc. (HRP) has developed this Site Investigation (SI) Work Plan (Work Plan) for the City of Troy (the City) to complete an investigation at the Former Scolite Site in Troy, Rensselaer County, New York, (referred to herein as the site). The 5.7 acre site was developed prior to 1869 as a foundry by the Rensselaer Iron Works. A previous site investigation determined that the site's soils and groundwater have been impacted by historical use and onsite operations. The City of Troy has entered into an Environmental Restoration Program State Assistance Contract with the NYSDEC in September 2007 for this site.

1.1 Purpose

The purpose of the site investigation is to determine the nature and extent of contamination on-site for all media of concern. HRP understands that the City wishes to obtain a "Release of Liability" from NYSDEC due to the presumed potential for on-site contamination. The "Release of Liability" will allow the City to assure any potential that the NYSDEC has reviewed the site and will not require any further actions with regards to the site.

1.2 Components

This work plan has six basic components: 1) General Scope of Work Tasks/Objectives; 2) Field Sampling Plan (FSP); 3) Quality Assurance Project Plan (QAPP); 4) Health and Safety Plan (HASP); 5) Community Air Monitoring Program (CAMP); and 6) Citizen's Participation Plan (CPP).

In particular, each component addresses the following:

- the Scope of Work addresses the tasks and objectives of the site investigation, and the logistics and resources required to achieve those tasks and objectives;
- The FSP discusses the procedures of how the data acquired during the project will be properly obtained (see Section 5);
- The QAPP will discuss quality assurance/quality control (QA/QC) methods during the investigation and will determined the usability of the data (see Section 6);

- The HASP and CAMP (See Appendix B) address the health and safety of both individuals involved with the project and the public; and,
- The CPP (See Appendix C) addresses community involvement aspects of the work outlined herein and an anticipated project schedule.

1.3 Goal

The goal of developing and implementing this work plan is to supplement the previously collected environmental data, as well as, define the nature and extent of on-site soil and groundwater contamination. To accomplish this goal a SI will be implemented in the vicinity of the site's historical areas of concern including, but not limited to:

- The location of the former iron foundry building;
- The former furnace areas;
- The former yard where drums, abandoned tankers and other debris was stored; and
- Other areas identified with potential soil and/or groundwater contamination.

During our January and February 2008 meetings between the City, HRP, and NYSDEC, the preliminary scope of work was discussed and incorporated into this work plan. Based on these meetings, the following tasks will be completed under the SI work plan:

- Completion of a comprehensive site inspection of the former Scolite property to identify areas of concern;
- Completion of a Ground Penetrating Radar Survey in areas of historical boilers, former USTs, and around the forming building perimeter;
- The collection and analysis of fifteen (15) surface soil samples from the site plus three (3) surface soil samples from offsite locations to provide background conditions. All fifteen (15) of the onsite surface samples and all three (3) of the background samples will be analyzed for TAL metals, TCL VOCs, TCL SVOCs, pesticides, PCBs, and total organic carbon to evaluate surficial soil conditions;
- The installation of fifteen (15) soil borings using a direct push rig. Continuous sampling will be conducted from each boring and at least one sample from each borehole will be will be analyzed for TAL metals, TCL VOCs, TCL SVOCs, pesticides, PCBs, and total organic carbon to evaluate subsurface soil conditions;
- The installation of an additional eight borings that will be converted into overburden monitoring wells. Groundwater from each of the on-site wells will be sampled for TAL metals (total and dissolved), TCL VOCs, TCL SVOCs, pesticides, and PCBs;

- Completion of a soil vapor evaluation that will include the collection of at least five (5) sub-slab vapor samples will be collected onsite in the former buildings slab foundations, the existing building sub slab, and the four (4) others will be collected in the yard including areas near the eastern and southern site boundaries to evaluate potential off site contamination migration. Each of the collected samples will be submitted to state certified laboratory for analysis of VOCs via Method T015;
- Completion of an ALTA survey of pertinent site features and sampling points to ensure that this data is reproducible in the future;
- Implement Interim Remedial Measures (IRMs) if necessary and under the approval of NYSDEC, including but not limited to:
    - Removal of abandoned drums and containers;
    - Removal of ASTs or USTs;
    - Removal or relocation of debris or abandoned equipment;
    - Demolition of building structures that may impede our ability to detect or define contamination areas;
    - Sampling and/or abatement of asbestos containment materials that may impede our ability to detect or define contamination areas;
    - The excavation and offsite disposal of grossly contaminated soils indicative of source areas;
    - The backfilling of excavation areas with clean material;
    - The removal and treatment/disposal of severely impacted groundwater infiltrating into the excavation;
    - The collection and analysis of confirmatory soil and/or groundwater samples for TCL VOCs and Semi-VOCs, as well as TAL metals and pesticides and PCBs in areas where IRMs have been completed; and
    - Additional site investigation to further delineate the degree and extent of contamination.

- A Site Investigation Report/Remedial Alternatives Report (SI/RAR) will be prepared and submitted to the NYSDEC for review;
- Administrative tasks including those associated with the preparation of the CPP, cost reimbursable worksheets, and the periodic reporting requirements under the Environmental Restoration Program (ERP); and
- Complete/assist the City with technical committee meetings and website material development.

1.4 General Information

Site Name:	Former Scolite Site
Site Address:	2 Madison Street Troy, New York
Site Owner:	City of Troy
Site Contact:	Mr. Bill Roehr Deputy Planning Commissioner, City of Troy
Contact Address:	City of Troy One Monument Square Troy, NY 12180
Phone Number:	(518) 378-8439
Work Dates:	Spring 2009
NYSDEC Site #:	E442037

2.0 Site Setting

The following section discusses the site's description, the surrounding areas, the environmental history, and the geologic/hydrogeologic setting.

2.1 Site Description and Current Use

The 5.7-acre, rectangular shaped site, consists one (1) tax parcel, which is owned by the City of Troy:

Tax ID Number	Size	Location
111.28-4-1	5.7 acres	2 Madison St. Troy, NY

The Former Scolite Site is located along the east shore of the Hudson River and the south shore of the Poestenkill Creek. The site is bounded on the south by Madison Street and on the east by railroad tracks. Prior to a fire that occurred in May 2008, the site contained nine buildings in various stages of disrepair including the iron foundry. Currently, the site contains one building, slab foundations from the former buildings, a large yard area, and a bulkhead for docking along the Hudson River. The site also has an accumulation of materials and mechanical devices (fly wheel) from the previous historical operations, as well as, brick and asbestos mixed rubble (former buildings) as a result of a fire that occurred in May 2008. A portion of the site is proposed as the location for the Upper Hudson River & Estuaries Satellite Center. The center will support scientific and engineering infrastructure for monitoring and experimentation on the river and in its local ecosystem.

2.1.1 Topography

The site is situated on a relatively flat parcel of land. However, the majority of the site apparently consists of fill materials, presumably from grading activities during the installation of the bulkhead, therefore, the original site topography cannot be determined. The yard has a wall made of large concrete blocks that runs parallel to the Hudson River, which allows the grade to transfer down from the height of the former buildings foundations and upper yard area, to an area at the level of the top of the bulkhead. According to the United States Department of the Interior Geologic Survey 7.5 minute Series Topographic Map, South Troy Quadrangle, the site elevation varies from 20 to 30 feet above mean sea level (MSL).

2.1.2 Surface Water Bodies

Surface waters were observed at the subject site's boundaries. The subject site is bound to the west by the Hudson River and to the north by the Poestenkill Creek.

2.2 Surrounding Land Uses

The site and surrounding area are located in a mixed industrial/commercial area of Troy, New York. At present, the areas surrounding the property include:

North:	Poestenkill Creek, then Troy Slag North (Salt Pile)
South:	Bruno Commercial Building
East:	New York Central Railroad
West:	Hudson River, then Highway 787.

2.3 Environmental History

2.3.1 Background

Reportedly, the iron foundry onsite opened in 1846. In 1869, the property was occupied by the Rensselaer Iron Works and allegedly assisted in building the first ironclad warship. By 1888, the property was occupied by the Albany Rensselaer Iron Works. According to Sanborn maps of the area, a new steel foundry was under construction onsite in 1904. By 1904 and through 1930, the property was occupied by the Ludlow Valve Manufacturing Co. By 1955 and through 1961 the property was occupied by the Ludlow Rensselaer Valve Foundry. Reportedly, these two companies manufactured valves and fire hydrants While used as a steel foundry, the site was broken out to processing areas, an engine room, a scratch room, a tumbling room, a furnace room and several storage areas.

The property was utilized as a roofing company warehouse in the 1990s, which stored drums containing asphalt and tanker truckers containing asphalt. The property was also occupied by Scolite, which manufactured and stored bags of Perlite. Mixing machinery and conveyers were used by Scolite onsite at that time. From 1999 to 2003, the area near the bulkhead along the Hudson River was used to manage scrap metal prior to loading on barges for shipment. The only remaining building currently onsite was used for office space and for minor equipment storage. The foundry building was housing a log sawmill and splitting operation.

In May 2008, a fire consumed the majority of the buildings onsite. During the demolition of the building remnants, friable asbestos from the transite roofing was mixed in with the brick rubble. The brick and debris mixed with asbestos, was stockpiled on the northern end of the site. Drums containing petroleum based oils located near the stockpile leaked and soaked a portion of the brick debris pile. The drums and petroleum impacted bricks were removed as part of an Interim Remedial Measure (IRM) in October and November of 2008. The remaining brick is scheduled for removal in the 1st quarter of 2009. This plan assumed that the bricks at the northern end of the site will be removed prior to HRP's mobilization to complete remedial investigation activities.

2.3.2 Previous Investigations and NYSDEC Correspondence

The following provides a summary of previous environmental investigations and correspondence with the NYSDEC regarding the site.

Sterling Environmental Engineering, P.C. in conjunction with Chazen Co./Engineers & Environmental Professionals, River Street Planning and Development, and Gary Bowitch, Esq., were hired by the City of Troy to implement the South Troy Brownfields Assessment Demonstration Pilot Project.

The Project was organized into the following tasks:

Task 0: Interagency Coordination and Project Management
Task 1: Community Involvement/Brownfields Task Force/Communication
Task 2: Site Inventory/Identification and Ranking, Site Assessments and Remediation Plans, including a Phase II Site Assessments and Remedial Designs
Task 3: Legal Issues and Redevelopment Planning.
Task 4: Planning and Marketing Tools and Public Notification.

To initiate Task 2, STERLING conducted a Historical Data Review and prepared the Site Reconnaissance Reports. These reports are expansions of the Phase I Brownfields Site Assessment Report entitled the "Environmental Planning and Research Report" dated July 26, 2000, supplemented with information obtained in subsequent site visits by STERLING.

The Phase I Brownfields Site Assessment was completed for approximately 54 parcels in an area from Congress Street at the north to the Troy City Line at the south and from the Hudson River on the west to approximately 1st Street on the east.

After public input, recommendations from a special task force formed as part of the Project, and careful ranking for a range of criteria by the Project Team and the City, The Former Rensselaer Iron Works was selected for Phase II investigations.

The Rensselaer County Industrial Development Authority obtained Environmental Restoration Funding from the New York State Department of Environmental Conservation (NYSDEC) to conduct its own investigation of all its lands in the South Troy Waterfront area, including the 5.7 acre parcel that the City of Troy selected for investigation.

The Phase I Environmental Site Assessments for the Rensselaer Iron Works AOC identified the potential presence of residual metals and hydrocarbon compounds. Additional site investigations were deemed necessary to determine the nature and extent of residual source areas and to evaluate if exposure to those impacts results in significant risk to human health or the environment, and what, if any, remedial action is needed. Thus, the Phase II Site Investigation Process goals were to obtain data to define site physical characteristics, contaminated source areas, and the extent of migration through potential pathways.

Report of the DRAFT Site-Specific Brownfields Site Investigation Report, Brownfields Assessment Demonstration Pilot Project, South Troy Brownfields, Troy, New York Prepared for: City of Troy, Prepared by: Sterling Environmental Engineering, P.C., Dated May 16, 2006.

According to the report, specific objectives of the Phase II Site Investigation included:

- Locating and identifying potential sources of hazardous waste or petroleum contamination (sampling data are used when formulating remediation strategies, and estimating remediation costs).
- Delineating horizontal and vertical contaminant concentrations, identifying clean areas, and estimating volume of contaminated soil (within budgetary constraints).
- Determining if there is an impact threat to public health or the environment from hazardous waste or petroleum releases.
- Provide data to assist in determining treatment and disposal options and characterizing soil for on-site or off-site treatment.
- Identify appropriate remediation goals.

Reportedly, at the Rensselaer Iron Works, seventy-six (76) soil samples, three (3) sediment samples and three (3) groundwater samples were analyzed for the CLP Target Compound List/Target Analyte List (TCL/TAL) SVOCs, PCBs and 13 Priority Pollutant Metals by Sterling. Also, sixteen (16) soil samples were analyzed for the CLP TCL/TAL SVOCs and 13 Priority Pollutant Metals.

Individual SVOCs exceeded the recommended soil cleanup objectives in the surface of the rail siding area, throughout the foundry building surface, and throughout the top two feet of the yard area. As depth increases in the yard area, Sterling reported that fewer individual SVOCs exceed the recommended soil cleanup objectives.

Total PCBs did not exceed the recommended soil cleanup objective of 1.0 ppm in the surface of the rail siding area. Total PCBs did exceed the recommended soil cleanup objective of 1 ppm in the yard area.

Individual metals exceeded the recommended cleanup objectives in the surface of the rail siding area, at seven of eight locations in the foundry building surface, and throughout the top two feet of the yard area. As depth increases in the yard area, fewer individual metals exceeded the recommended soil cleanup objectives. Lead concentrations generally decrease with depth and do not exceed the recommended cleanup objectives below six (6) feet.

According to Sterling, five (5) SVOCs compounds exceeded the detection limits of the relevant water quality standards.

Ten Metals, Antimony, Arsenic, Beryllium; Cadmium; Chromium, Copper, Lead, Nickel, Thallium, and Mercury, appear to exceed the water quality standards in 6 NYCRR Part 703 at least one of the three groundwater wells within the yard area though the analyses were performed on unfiltered samples. Five of the metals in groundwater from the well S-W-3, which is presumed to be the upgradient well at the AOC, exceeded the water quality standards, whereas, nine of the metals in the groundwater from the well S-W-1 and ten of the metals in the groundwater from the well S-W-2, exceed the 6 NYCRR Part 703.

All three sediment locations had individual SVOCs exceeding the recommended soil cleanup objective. All three locations have the same four SVOCs that exceeded their recommended soil cleanup objectives.

Perlite was found in a trench north of the foundry building and on the maintenance building floor. The Perlite is a fine dust and can be an irritant if inhaled. The Perlite should be cleaned up from its locations in a manner that does not expose the workers to the Perlite inhalation.

The risks at the Rensselaer Iron Works are posed by the contaminated soil, the contaminated groundwater, and the Perlite. The contaminated soil poses a risk from direct contact, ingestion of soil, and inhalation of fugitive emissions. The contaminated groundwater poses a risk to anyone ingesting groundwater and to the Hudson River.

It should be noted that site operations were carried on by Hudson Deepwater after Sterling's Remedial Investigation and thus some sample data is limited in reliability, specifically surface soil sample results.

Report of the DRAFT Site-Specific Brownfields Remedial Alternatives Report, Brownfields Assessment Demonstration Pilot Project, South Troy Brownfields, Troy, NY, Prepared for: City of Troy, Prepared by: Sterling Environmental Engineering, P.C. Dated May 16, 2006.

According to the report, the SVOC and metals concentrations, particularly the lead concentrations in the Foundry Building, represent a potential risk of human health exposure via direct ingestion and dust inhalation (see Table 1). The City is planning to raise the floor of this building during the redevelopment of this site. Careful placement of fill while protecting the workers and capping with a poured concrete slab would create a cover that will seal these contaminants below the cap, thereby preventing human exposure.

The SVOC, PCB and metal concentrations in the yard area represent a potential risk of human exposure via direct ingestion, dust inhalation and dermal contact. The City is planning to raise the ground elevation during the redevelopment of this site. Careful placement of fill while protecting the workers and capping with vegetated areas, asphalt parking areas and roadways, and poured concrete sidewalks and an amphitheater would create a cover that will seal these contaminants below the cap, thereby preventing human exposure.

It was suggested by Sterling that the Perlite should be vacuumed from the locations where it is found using High Efficiency Particulate Atmosphere (HEPA) vacuums and appropriate bathers to prevent inhalation of the dust by workers or visitors.

Based on these recommendations and the status of the site as an area the City has an interest in redeveloping for the recreational value and the proposed Hudson Rivers and Estuaries Center, the Rensselaer Iron Works AOC was selected for analysis and development of this Remedial Alternatives Report (RAR), which is structured similar to a Feasibility Study in the inactive hazardous waste program.

Four alternatives were found potentially suitable for the site characteristics, contaminated media, range of contaminants, and contaminant concentrations. The four alternatives subjected to detailed consideration are:

1. No Further Action
2. Consolidation, Capping and Institutional Controls
3. Soil Excavation and Off-Site Disposal
4. In-Situ Soil Treatment

After detailed screening and comparison, Alternative 2 was found to be protective of human health and the environment, fulfills the remedial goals, and permanently eliminates potential exposure to contaminants in groundwater and soil on-site. Therefore, consolidation, capping and institutional controls was recommended by Sterling as the remedial alternative for the Rensselaer Iron Works site in South Troy, New York.

2.3.3 Remedial Actions to Date

Several remedial actions have occurred onsite to date:

- The removal of abandoned drums and containers associated with Hudson Deepwater (former tenant) operations. The abandoned chemicals included petroleum waste, cans of paints/tars, aerosol cans and oil cans. The removal and cleanup activities were completed in July 2008 by Precision Industrial Maintenance and were overseen by HRP;
- The removal of abandoned drums associated with onsite historical operations. The abandoned drums contained petroleum wastes, oil and wastes mixed with water. The removal and cleanup activities were completed in October 2008 by Precision Industrial Maintenance and were overseen by HRP;
- The removal of oil soaked brick with friable asbestos debris clean up. Some of the abandoned drums onsite began to leak after being puncture during the fire clean up. The product which leaked from the drums then mixed with a portion of the brick rubble and debris. The removal and clean up activities were completed in November 2008 by Precision Industrial Maintenance and were overseen by HRP; and
- The removal of the brick and asbestos mixed rubble associated with the fire is in process.

The removal of the drums and containers associated with historical operations, as well as, the oil soaked brick with friable asbestos debris was performed as an IRM to facilitate the SI.

2.4 Geologic Setting

2.4.1 Surficial Geology

Based on Sterling Phase I ESA, site soils are characterized as granular fills overlying glaciolacustrine silts and clays and bedrock. Alluvial strata composed of firm to compact sand and gravel were encountered beneath surficial fills in some areas.

The Former Scolite Site is located in a region described as a small delta outwash deposit in the Hudson Champlain Lowland (D. Fisher, "Geologic Map of New York, Hudson Mohawk Street", 1970). These deltaic deposits consist primarily of sand and gravel. The deltaic deposits overlie lacustrine silt and clay deposited in proglacial lakes.

2.4.2 Bedrock Geology

The underlying bedrock is thinly bedded, weathered, black shale of Upper Ordovician age (D. Fisher, "Geologic Map of New York, Hudson Mohawk Street", 1970). Regional geology suggests that this inclined, faulted and folded shale is of either the Normanskill or Snake Hill formations.

2.4.3 Hydrogeology

The groundwater flow direction in the overburden aquifer is expected to be primarily to the west, toward the Hudson River, and locally toward the Poesten Kill channel at the Former Scolite Site.

Overburden groundwater elevations at the Rensselaer Iron Works AOC are expected to fluctuate with the Hudson River tides, which vary from 4 to 6 feet in magnitude.

According to the Site Specific Brownfield's Site Investigation Report prepared by Sterling Environmental Engineering, P.C, the groundwater was encountered at approximately 11 to 22 feet below ground surface.

3.0 Project Organization

3.1 Site Manager

Ms. Cailyn Dinan will serve as the Site Manager. As Site Manager, Ms. Dinan is responsible for the proper implementation of this Work Plan, the management of staff involved with the project, and for the project's overall technical content. Ms. Dinan resume is included in Appendix D.

3.2 Health & Safety Officer/General Supervisor

Mr. Ed Bell will serve as the Health & Safety Officer for the project. In addition, Mr. Bell will act as general supervisor and direct all site operations during the implementation of this Work Plan. As Health & Safety Officer, Mr. Bell will have the responsibility and authority to implement the site Health & Safety Plan and verify compliance. Mr. Bell will report any non-compliance issues to the Project Manager. The Health & Safety Officer will also have stop-work authorization. The Health & Safety Officer or an alternate will be on-site at all times when work is progressing. All on-site personnel involved with this project will be the responsibility of the Health & Safety Officer. Mr. Bell's resume is included in Appendix D.

3.3 Quality Assurance Officer

Ms. Zoe Belcher, Senior Project Geologist, will serve as the Quality Assurance Officer. The Quality Assurance Officer will have the responsibility of assuring that quality measures are implemented throughout the project, such as equipment calibrations, collecting proper field duplicates and equipment blanks. Ms. Belcher's resume is included in Appendix D.

3.4 Contract Laboratory

Chemtech of Mountainside, New Jersey will be the contract laboratory for this project. Chemtech is a laboratory certified by the New York State Department of Health's Contract Laboratory protocols (CLP) and Environmental Laboratory Approval Program (ELAP), as required by NYSDEC protocols. In addition, Chemtech is a New York State certified Minority Business Enterprise (MBE).

3.5 Data Validation

Chemtech will also provide Category B deliverable packages for the analyses, which will be used by Alpha Geoscience, Inc., an independent data validator for completion of a Data Usability Summary Report (DUSR). The DUSR will be prepared to verify that the laboratory data is usable. The resume of the individual responsible for preparing the DUSR, Mr. Donald Anne of Alpha Geoscience, Inc. is included in Appendix D.

3.6 Subcontractors

HRP will retain Sub-Surface Informational Surveys, Inc (SSI) to complete the GRP survey of the subject property.

HRP will retain Zebra to install the soil borings and soil vapr points using a direct push drill rig.

HRP will retain Aztech Drilling (Aztech) to install monitoring wells using a hollow stem auger drill rig. Aztech is a New York State certified Woman Business Enterprise (WBE).

HRP will retain CENTEK Labs to provide soil vapor sampling equipment and complete lab analysis of soil vapor samples.

HRP will retain David Flanders Surveying to complete an ALTA Survey of the subject site.

3.7 Field Team Members

HRP will utilize several experienced and qualified individual to perform the field work/tasks outlined in this work plan. These field team members include, but are not limited to: Ms. Cailyn Dinan, Senior Project Geologist (HRP-NY); Mr. Edward Bell, Project Geologist (HRP-NY), Lyman Tinc, Project Engineer (HRP-NY), and Matt Finkenbinder, Project Geologist (HRP-NY). The resumes of these individuals are included in Appendix D.

4.0 General Scope of Work and Objectives

4.1 Proposed Work Plan Tasks

HRP proposes to complete the following Twelve (12) Tasks during the implementation of this Work Plan:

Task One	Comprehensive Site Walkthrough
Task Two	Ground Penetrating Radar Survey
Task Three	Collection of Surficial and Background Soil Samples
Task Four	Installation of Soil Borings
Task Five	Collection and Analysis of Soil Samples
Task Six	Installation and Development of Monitoring Wells & Well Survey
Task Seven	Conduct Groundwater Sampling
Task Eight	Soil Vapor Evaluation
Task Nine	Site Survey
Task Ten	Preparation of Site Investigation/Remedial Alternatives Report
Task Eleven	Administrative Tasks
Task Twelve	Interim Remedial Measures

The investigation tasks described in this work plan will utilize the NYSDEC's *Draft DER-10 (DER-10), Technical Guidance for Site Investigation and Remediation, dated December 25, 2002* for guidance. Each of the tasks will be conducted by HRP or under the direction of HRP, and are detailed below.

4.2 Task Objectives and Methods

4.2.1 Task One: Site Walkthrough

HRP will conduct a comprehensive site inspection of the former Scolite property. The goal of the walkthrough will be to:

- Identify areas of concern (e.g., sumps, staining, releases, areas of USTs, ASTs, floor drains, chemical storage areas, transformer locations, etc.)
- Confirm all brick asbestos mixed debris from the former buildings has been removed from site;
- Identify any other debris or other abandoned materials that needs removal; and
- Mark out sample locations for future tasks.

The collected information will be used for executing the remaining SI and/or IRM tasks.

4.2.2 Task Two: Ground Penetrating Radar Survey

In order to evaluate the potential existence of USTs on-site associated with historical operations, as well as documenting existing UST locations, HRP will complete a ground penetrating radar (GPR) survey at the site. GPR is a non-destructive and non-intrusive geophysical exploration technique that uses radar waves to detect subsurface metallic objects. HRP's GSSI Subsurface Interface Radar System 3, coupled with a 500 MHz antenna will be used to provide an instant graphic printout during the survey. Survey lines will be established in the field and measured from fixed points so that reconstruction of the survey grid can be done at a later date, if necessary. In some cases, GPR technology has also been known to detect tank graves in areas of removed storage tanks. The entire site will be surveyed including areas near historical boilers and around the former foundry perimeter.

Review of the GPR survey data will provide preliminary information with regard to the status and location of potential underground tanks or other underground structures. Any identified anomalies will be marked using stakes and the approximate location will be identified with paint or flagging. The anomaly's centerline axis endpoints and depth will also be documented and the anomaly's location will be entered into a portable GPS unit.

The collected information will be used for executing the remaining SI and/or IRM tasks.

4.2.3 Task Three: Surface Soil and Background Sampling

Under this task HRP will establish a grid across the site to provide adequate coverage of the site. One surface soil sample will be collected from the center or nearest point center of each grid sector to total fifteen (15) surface samples (see Figure 3). Only locations where pavement and asphalt coverage does not exist will be considered for surface soil sampling. In accordance with DER-10, at least 3 background surface soil samples will be collected at a location unaffected by current and historic site operations and from locations that are topographically up-gradient and upwind of contaminant sources. In addition, the background samples will not be located near railroad tracks, parking lots, recreation areas, schoolyards or other areas containing potentially elevated contaminant concentrations

Surface soil samples will be collected from a depth of 0-2-inches excluding vegetative cover.

Each surface soil sample will be submitted to a New York State Certified Laboratory. All Fifteen (15) of the surface samples and all three (3) of the background samples will be analyzed for TAL metals, TCL VOCs, TCL SVOCs, pesticides, PCBs, and total organic carbon to evaluate surficial soil conditions.

4.2.4 Task Four: Installation of Soil Borings

To supplement existing data from previous on-site investigations, as well as to meet the goals of the ERP, HRP will coordinate with NYSDEC to select locations to advance soil borings. Fifteen (15) soil borings will be advanced using direct push drilling methods by Zebra under the supervision of a qualified HRP geologist. Soil boring and sampling locations will be biased toward locations of highest suspected contamination and based on known area history, discolored soil, stressed vegetation, drainage patterns or other filed observations.

Soil Borings/Field Screening

During the soil boring installations using direct push methods, continuous soil sample will be obtained in new, acetate liners in a four foot, 1.75" outer diameter (O.D.) macro core sampler at each soil boring to a total depth of 30 feet below ground surface, or approximately five feet into the observed groundwater or refusal. The soil samples collected from each macro core will be divided into two (2) two-foot intervals.

During the eight monitoring well installations, using hollow stem auger techniques, soil samples will be obtained by advancing a 4.25-inch inner diameter hollow stem auger in five-foot intervals to 10 or 15 feet based on soil conditions and collecting a two-foot split spoon sample at each interval.

Each split spoon will be examined in the field for physical evidence of contamination (i.e., odor, staining). HRP personnel will maintain a detailed log of each soil boring, and record all pertinent field information on the logs, including boring designation, date, location, sample interval, recovery, and geologic descriptions utilizing the New York State Department of Transportation soil description procedure (NYSDOT Soil Mechanics Bureau STP-2 dated May 1, 1975, as amended).

A portion of each soil segment will be placed into a sealable (i.e., Ziploc®) bag, labeled, and subjected to a headspace analysis for gross volatile organics via a photoionization detector (PID) equipped with a 10.2 eV bulb. Decontamination procedures (i.e., wash with alconox and water, rinse deionized water) will be performed between sampling intervals to prevent cross-contamination.

Following the collection of soil samples, each soil boring will be backfilled to grade using bentonite chips. All soil cuttings, used liners, personal protective equipment and other Investigation Derived Waste (IDW) will be stored in DOT approved 55-gallon drums. Drums will be properly labeled with the following information: contact information of owner/contractor, contents, start date, and end date, and staged at an appropriate on-site location. The IDW will be evaluated and disposed off-site at an approved facility.

4.2.5 Task Five: Collection and Analysis of Soil Samples

HRP will select soil samples from the soil borings for laboratory analysis based on the results of the field screening and observations. HRP will select soil samples for laboratory analysis from the two-foot interval exhibiting the highest PID reading. If no elevated PID readings are observed, then the soil sample that corresponds with the water table interface will be selected. If a distinct change in soils is observed additional soil samples will be collected from each distinct soil type. Fifteen (15) soil samples from the installed borings will be analyzed for TAL metals, TCL VOCs, TCL Semi-VOCs, pesticides, PCBs, and total organic carbon to evaluate subsurface soil conditions.

4.2.6 Task Six: Installation and Development of Monitoring Wells and Well Survey

In order to evaluate the site's potential impact to underlying groundwater, and to supplement existing data from previous on-site investigations, eight (8) additional borings will be completed and converted into permanent two-inch diameter polyvinyl chloride (PVC) monitoring wells, installed using 4.25-inch inside diameter hollow stem augers. Locations for monitoring wells will be made in the field with NYSDEC concurrence. The locations of the proposed monitoring wells are presented on Figure 3.

Each monitoring well will be developed in order to establish a connection between the well screen and the surrounding aquifer and to ensure a representative groundwater sample. Monitoring wells will be developed using dedicated tubing and a peristaltic pump. During development, the wells will be pumped until the discharge water is relatively free of sediment and a minimum of six well volumes of water have been removed.

Refer to the Field Sampling Plan (FSP) presented in Section 5 for details of the monitoring well installation and development program.

In addition, the location and elevation of each monitoring well will be surveyed. HRP will utilize an auto level mounted to a tripod, to conduct a relative groundwater elevation survey across the site. The elevation of an on-site benchmark (stationary flat surface) will be arbitrarily established as 100 ft in elevation. Each monitoring well's measuring point (black mark on casing) will then be surveyed relative to the benchmark to establish the measuring point elevation. The acquired groundwater levels, which are measured from the measuring point, will be subtracted from each measuring point elevation to obtain the groundwater elevation at the monitoring well. The groundwater elevations will be used to construct a groundwater contour map. The contour map will be used to determine the groundwater flow direction and hydraulic gradient at the site. HRP proposes collecting at least two rounds of water levels during the project to verify groundwater contours and flow direction.

4.2.7 Task Seven: Groundwater Sampling

To evaluate the groundwater quality beneath the site, groundwater samples will be collected from each newly installed monitoring wells at the site. Groundwater samples will be collected from each monitoring well in accordance with USEPA Low Flow purge and sample guidelines, outlined in the FSP (Section 5). Groundwater samples will be collected into laboratory-provided containers, labeled, and placed in an iced cooler for shipment to the laboratory.

Groundwater samples will be submitted to a New York State certified laboratory for analysis for TAL metals (total and dissolved), TCL VOCs, TCL SVOCs, pesticides, and PCBs. All wells will be sealed from infiltration and developed before sampling. In addition, a monitoring well survey will be completed to determine groundwater flow direction.

4.2.8 Task Eight: Soil Vapor Evaluation

In order to evaluate the shallow soil vapor conditions at the site, HRP will coordinate with NYSDEC and NYSDOH and select locations to collect nine (9) soil vapor samples. At least five (5) sub-slab vapor samples will be collected onsite within the former buildings sub-slabs and the existing buildings sub slab and the four (4) others will be collect in the yard, including points along the eastern and southern boundaries to evaluate potential offsite contaminant migration. Each of the collected samples will be submitted to state certified laboratory for analysis of VOCs via Method T015. Soil vapor sampling locations and depths will be based on the results of HRPs soil and groundwater sampling at the site. It should be noted that based on the results of soil, groundwater, and initial vapor samples, additional soil vapor sampling points may be necessary.

Soil vapor sampling points will be installed in accordance with New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October, 2006. Refer to the FSP presented in Section 5.0 for details of the soil vapor implant installation and sampling program.

4.2.9 Task Nine: Site Survey

HRP will initially conduct an survey of pertinent site features and sampling points to ensure that this data is reproducible in the future. As one the final tasks an ALTA survey map will be created of the site which will meet the City's specified requirements. The survey will include:

- Monuments placed at all major corners of site boundaries;
- Vicinity map;
- Flood Zone designation;
- Land area of site;
- Contours and datum elevations;
- Setback, height, and floor space restrictions of record or disclosed by applicable zoning/building codes, if any;
- Exterior dimensions of all buildings at ground level;
- Square footage of exterior footprint of all building at ground level;
- Substantial visible improvements such as signs, parking areas, swimming pools;
- Parking areas and number of parking spaces;
- Public access locations;
- Utility locations;
- Governmental agency survey related requirements;
- Adjoining property owner names;
- Observed evidence of earth moving work, building construction or building additions within recent months;
- Any changes in street right of ways lines or observable evidence of recent street or sidewalk construction or repairs; and
- Observable evidence of site use as a solid waste dump, sump or sanitary landfill.

4.2.10 Task Ten: Preparation of Site Investigation and Remedial Alternatives Analysis Report

Once field activities have been completed and analytical results reviewed, HRP will complete a Site Investigation Report (SIR) and a Remedial Alternatives Analysis Report (RAAR) for the subject site. The main sections of the SIR will include a site description and history, summary of the investigation components, results of the investigation, description of the nature and extent of contamination fate and transport, exposure assessment and conclusions. Results will be compared to

applicable standards, criteria and guidance. For this site, it is anticipated that the future use will fall into the commercial use scenario, Therefore, the appropriate soil clean up objectives (SCOs) contained in Part 375 include both unrestricted SCOs and Commercial SCOs. The RAAR will include an in depth analysis of the potential remedies to address site contamination. The alternatives will be evaluated based on the criteria contained in DER-10.

4.2.11 Task Eleven: Administration Tasks

HRP will completed administrative tasks associated with the project including, but not limited to, the following:

- Copying/reproduction;
- Mailing/package deliveries;
- Invoice creation and processing; and
- Monthly WBE/MBE reporting.

4.2.12 Task Twelve: Interim Remedial Measure (if necessary)

If, during any of the above tasks, underground storage tank(s), grossly contaminated soil and/or groundwater, or non-aqueous phase liquids (NAPLs) are encountered, an Interim Remedial Measure (IRM) will be implemented. IRMs may include but are not limited to the following activities:

- **Underground Storage Tank Removal**

  If underground storage tanks are encountered during the investigation, HRP will first register the tank with the DEC Petroleum Bulk Storage Program and then will remove the tank(s) in accordance with NYSDEC DER-10 requirements subsequent to authorization from the NYSDEC. First, the soil from the top of the tank will be removed and then an access manway will cut in the top of the tank. Any remaining product/water will be removed from the tank.

  Next, the tank(s) and associated piping will be removed and then cleaned to standards suitable for recycling. Any sludge in the tank(s) will be removed and drummed for disposal. The removed tanks will be photographed and reviewed for evidence of corrosion or holes. Assuming the tank(s) are steel, the cleaned tank and piping will be transported to a scrap metal yard for recycling.

Following the UST removal, the tank and piping graves will be reviewed for physical evidence of contamination (odor or staining) and selected soil samples will be subjected to headspace screening via a photoionization detector (PID) to evaluate the presence of volatile hydrocarbons. If no physical evidence of contamination (i.e., holes in the tanks, odor or discoloration of soil, or elevated PID readings) is noted, then soil samples will be collected from the tank and piping graves for confirmatory analytical analysis. As per DER-10 guidance, one soil sample will be collected from every 30 linear feet of sidewall or a minimum of one per sidewall and one bottom sample per five feet. If groundwater is encountered, then the bottom sample will be replaced by a groundwater sample.

The soil samples will be submitted to for analysis of STARS volatile and semi-volatile organic via EPA method 8021B and 8270C, respectively. In addition 10% of all soil and groundwater samples submitted for analysis will be analyzed for Complete VOCs, SVOCs, PCBs, Pesticides, and TOC.

Subsequently, the tank and piping graves will be backfilled with both previously stockpiled, uncontaminated soil and clean fill from an off-site source. The excavation will be backfilled and compacted with the bucket of the excavator.

- **Contaminated Soil Excavation**;

  If during the course of the investigation or other IRM tasks, grossly contaminated soil is encountered then HRP will excavate the grossly contaminated soil. Under this scenario, if physical evidence of contamination is noted (PID readings above 15 ppm via headspace), then the excavation area will be extended to the limits of observed contamination. Any contaminated soil encountered will be stockpiled on a remote 6 mil polyethylene (poly) lined staging area and covered with poly for future characterization.

- **Excavation Dewatering**

  Excavation dewatering may be warranted if the water table is encountered prior to completion of an excavation (tank removal or contaminated soil removal. Excavation dewatering would include pumping of water from an excavation into a portable water-staging tank (frac-tank), or portable treatment system. If a portable treatment system were used, then appropriate permits and authorization would be required and obtained.

- **Removal of Structures**

  If it is determined during the investigation or IRM that contaminated soil or groundwater; or UST(s) are present beneath structures on-site (e.g. concrete slabs associated former buildings, etc.) and these structures present physical barriers to the delineation and/or remediation of the contamination then it may be warranted to remove these structures. If necessary, HRP will remove the former building concrete slab using an excavator equipped with a jack hammer or other appropriate equipment if necessary subsequent to authorization from the NYSDEC. All waste generated from structure removal will be segregated and recycled or disposed in accordance with federal and state regulations.

- **Disposal/Treatment of Contaminated Soil or Groundwater**

  Contaminated soil or groundwater may be generated during the investigation or IRMs. As previously noted; any contaminated soil will be placed on poly and covered with poly pending treatment or disposal. Based on the volume of contaminated soil or groundwater generated HRP will coordinate with NYSDEC for the most appropriate disposal options (treatment onsite or off-site disposal).

- **Placement of Clean Fill**

  If contaminated soil is removed from test pits, excavations, etc, it will be necessary to backfill the pits/excavation with clean soil from an offsite source. HRP and will coordinate with the subcontractors to provide clean fill to bring any excavations to original grade level.

Should the need for an IRM be identified, the City and HRP will notify NYSDEC. Any IRM tasks will be completed in accordance with this work plan, DER-10 and subsequent to authorization from the NYSDEC.

5.0 Field Sampling Plan

The following Field Sampling Plan (FSP) will be utilized during the proposed RI. The specific sampling methods, organized by task, are discussed in detail below. Table 1 presents the sample container, preservation, and holding time requirements. Example field sheets (boring logs, well purge logs, chain-of-custody record) are provided in Appendix E.

5.1 Task One: Ground Penetrating Radar Survey

Ground penetrating radar will be used to determine the presence of underground storage tanks (USTs), underground piping, buried drums or areas of other geophysical anomalies at the site. Prior to GPR survey, the subject site will be cleared of any brush or debris to allow for a thorough investigation.

HRP will subcontract the GRP survey to Sub-Surface Informational Surveys, Inc. (SIS) of East Longmeadow, Massachusetts. SIS will survey the specific areas of the property using a SIR-system-3000 with model #3102 (500MHz) or equivalent antenna along with a model #38 video display microprocessor controlled module. This module converts the SIR data to a color video which is displayed on a self-contained monitor. The field engineer will operate this equipment with all necessary supplies. Profile records interpreted in the field will be delivered to HRP.

The GRP survey will be used to provide an instant graphic printout during the survey. Survey lines will be established every five feet in the field and measured from fixed points so that reconstruction of the survey grid can be done at a later date, if necessary. In some cases, GPR technology has also been known to detect tank graves in areas of removed storage tanks.

Review of the GPR survey data will provide preliminary information with regard to the status and location of potential underground tanks or other underground structures.

Review of the GPR survey data will provide preliminary information with regard to the status and location of potential underground tanks or other underground structures. Any identified anomalies will be marked using stakes and the approximate location will be identified with paint or flagging. The anomaly's centerline axis endpoints and depth will also be documented and the anomaly's location will be entered into a portable GPS unit for ease of location reproduction.

5.2 Task Two: Collection of Surface and Background Soil Samples

Surface soil samples will be collected at the site and from at least three locations in the surrounding area for background purposes. All sampling will be conducted away from potentially interfering situations such as close to internal combustion engines or other non-site related sources. The proposed locations of the background samples include along the east bank of Hudson River on the adjacent

property to the south, as well as, a parcel of land located four blocks to the east and one block south of the site. The proposed parcel of land if owned by the City of Troy and therefore property access should not be an issue. The following outlines the surface soil sampling procedures that will be employed.

- Using a pre-cleaned stainless steel scoop or trowel, remove the grass layer over the soil.
- Advance the stainless steel hand auger into the soil approximately two-inches below the vegetative cover and remove the soil in one piece.
- Place the soil into a stainless steel mixing bowl.
- Collect the sample for VOC analysis, then composite the remaining contents of the mixing bowl and place an adequate volume into the appropriate containers.
- Secure a Teflon-lined cap onto each of sample jar and appropriately label the jars.
- Place the sample on ice in a cooler.
- Record observations in field book.
- Decontaminate equipment after each use and between sample locations.
- Repair sampling location with native soil.

5.3 Task Three: Soil Borings and Collection of Soil Samples

All drilling and well installations will be conducted by a New York State Licensed driller. Prior to commencing drilling activities, the drill rig and tooling will be decontaminated. Prior to drilling, the on-site geologist will ensure that the drill rig is not leaking any fluids that may enter the borehole or contaminate equipment that may enter the borehole. The use of rags or absorbent materials to absorb leaking fluids is unacceptable.

A direct push or hollow-stem auger drill rig will be used to obtain soil samples. During direct-push drilling activities a nominal 2-inch diameter by 4-foot long macrocore sampler with an acetate liner will be driven into the ground to the desired depth using the drill rig. Prior to each soil boring, the macrocore sampler will be decontaminated with an alconox wash and clean water rinse.

During hollow stem augur drilling activities, soil samples will be obtained by advancing a 4.25-inch inner diameter hollow stem auger in five-foot intervals until termination of the boring based on soil conditions and collecting a two-foot split spoon sample at each interval. Prior to each soil boring, the split spoon sampler will be decontaminated with an alconox wash and clean water rinse.

During soil boring installation activities, a representative soil sample will be collected at each two-foot interval (i.e., eight samples per boring if boring continues to 16 feet total depth). The samples will be collected by the attending HRP geologist wearing disposable, nitrile gloves. The soil samples will be placed in laboratory-provided, 4-ounce (oz.) clear glass jars (for VOCs), and 6-ounce clear glass jars (for remaining analyses) labeled, and preserved on ice in a cooler.

Each sample will be reviewed for physical evidence of contamination (i.e. odor, staining). In addition, a small portion (1-2 oz.) will be placed in a polyethylene bag, allowed to attain ambient temperature, and then subjected to a headspace analysis via a photoionization detector (PID).

HRP will also select at least one soil sample from each soil boring for laboratory analysis based on the results of the field screening and observations. If a distinct change in soils is observed, additional soil samples will be collected from each distinct soil type. HRP will select soil samples for laboratory analysis from the two-foot interval exhibiting the highest PID reading. If no elevated PID readings are observed, then the soil sample that corresponds with the water table interface will be selected.

The lithology of soils in each boring will be logged. The soil boring log form is provided in Appendix E. Information on the boring log sheet will include:

- Borehole location
- Drilling information
- Sample intervals
- Percent recovery
- Sample description information

Soil samples will be described during boring advancement according to the New York State Department of Transportation soil description procedure (NYSDOT Soil Mechanics Bureau STP-2 dated May 1, 1975, as amended).

All non-disposable soil sampling equipment will be decontaminated between samples using an alcinox wash followed by a clean water rinse.

All drill cuttings, and other investigation derived waste (IDW) will be stored in DOT approved 55 gallon drums for proper disposal.

Boreholes that are not completed as monitoring wells will be abandoned (backfilled) using bentonite chips. All abandoned borings will be checked 24-48 hours after abandonment to determine if curing is occurring properly.

5.4 Task Four: Monitoring Well Installation and Development

Installation

Monitoring wells will be installed at the site within unconsolidated material in order to enable the monitoring of groundwater elevation and acquisition of groundwater samples for laboratory testing. At least eight of the proposed soil borings will be completed as two-inch inside diameter PVC monitoring wells, installed in the shallow saturated zone beneath the site. The monitoring wells will be installed using the procedures described below.

- Advance the soil boring to the desired depth using 4.25-inch inside diameter hallow stem augers.

- Insert the 2-inch diameter Schedule 40 PVC well screen (0.010-inch slot) and riser pipe to the bottom of the borehole. Cap the riser to prevent well construction materials from entering the well.
- Add washed #0 sand to the annular space between the well material and the borehole sidewall. The sand pack should extend at least two feet above the top of the screen section. Measure with a weighted tape and slowly remove the augers allowing for sand to settle.
- Slowly add bentonite pellets to the borehole. The bentonite seal should extend at least two feet above the top of the sand pack section.
- If the bentonite seal is above the groundwater level within the borehole, add clean water to the borehole to hydrate the pellets. Allow the pellets to hydrate for at least 30 minutes.
- Cut the well riser to about 2-inches below grade.
- Insert a lockable gripper plug onto the top of the well casing. Add a lock. All wells should be keyed alike.
- Install a 4-inch diameter flushmount road box around the well head and concrete in place.

Development

Following completion of drilling and monitoring well installation, each monitoring well will be developed by pumping until the discharged water is relatively sediment free and a minimum of six well volumes have been removed. Developing the well not only removes any sediment but also may improve the hydraulic properties of the sand pack. The effectiveness of the development measures will be closely monitored in order to keep the volume of discharged water to a minimum necessary to obtain sediment free groundwater samples.

Procedure:

- An appropriate well development method should be selected, depending on water depth, well productivity, and sediment content of the water. Well development options include: (a) manual pumping and surging; and (b) powered suction-lift or hydrolift pumping.
- Equipment should be assembled, decontaminated (if non-disposable), and installed into the well. Care should be taken not to introduce contaminants to the equipment during installation.
- All development waters will be discharged directly to the ground at a rate that will allow infiltration to occur. The volume of water, depth to bottom of the well, and other visual observations will be recorded in a field notebook.
- Well development will be discontinued when the discharge water is relatively clear, or a minimum of six well volumes have been removed.

5.5 Task Five: Groundwater Sampling

To evaluate the groundwater quality beneath the site, groundwater samples will be collected from each newly installed monitoring well. To collect representative groundwater samples, monitoring wells must be adequately purged prior to

sampling. A minimum of 48 hours following development will elapse prior to commencing groundwater sampling. Low flow sampling equipment and procedures will be used to purge and sample the monitoring wells. Purging will require removing water from the well at a rate of at least 250 milliliters per minute, but not to exceed 1 liter per minute for a sufficient length of time for water quality parameters to stabilize and at least 30 minutes. Drawdown must not exceed ten percent of the standing water column. Sampling should commence immediately after purging, without adjusting the flow rate or water intake depth.

The following are well purging and sampling procedures:

- Calibrate all field instruments at the beginning of each work day.
- Unlock and carefully remove the monitoring well cover to avoid having any foreign material enter the well.
- Screen the interior of the riser pipe for organic vapors with a photoionization detector (PID).
- Measure the water level below the top of casing using an electronic water level indicator. Knowing the total depth of the well, it will be possible to calculate the volume of water in the well. Clean the tape and probe of the water level indicator with an alcinox and water soaked paper towel while reeling in.
- Slowly install new polyethylene tubing into the well and set the end of the tubing to about the midpoint of the well screen.
- Attach the polyethylene tubing to a section of new silicone tubing fitted into the drive head of a peristaltic pump. Attach another section of polyethylene tubing to the effluent side of the pump drive head.
- Attach the tubing to a flow through cell water quality monitor (YSI 6820 or equivalent).
- Turn the pump on and set to a relatively low discharge rate (less than 1 lpm) and monitor the drawdown rate using a water level indicator.
- Purge the well while collecting water quality measurements (pH, Specific Conductivity, Temperature, Dissolved Oxygen, Oxidation/Reduction Potential, and Turbidity) and water level measurements every 3 to 5 minutes for at least 30 minutes. Target criteria for well stabilization will be:
    1. PH within +/- 0.1 Standard Units
    2. Specific electrical conductance within +/- 3%
    3. Oxygen-reduction potential within +/- 10 millivolts (mV)
    4. Turbidity values of groundwater within +/- 10% (when turbidity is greater than 10 NTUs)
    5. Dissolved oxygen within +/- 0.3 milligrams per liter
- After well purging is complete, a groundwater sample will be collected into the appropriate containers.
- The TCL VOC sample containers should be filled first. Direct the discharge tubing toward the inside wall of the sample container to minimize volatilization. Fill VOC sample containers so that no headspace (air bubbles) are present and cap the bottle.
- Each sample bottle will be labeled in the field using a waterproof permanent

parker.

- Following sample collection, place the sample bottles in a cooler with ice.
- Decontaminate all non-disposable equipment with alconox and water prior to and after each use. Rinse with deionized water after washing.
- Record monitoring well sampling data in a groundwater sampling data sheet (provided in Appendix E).

5.6 Task Six: Soil Vapor Evaluation

Soil vapor samples will be collected from temporary soil vapor probe installations. A direct push drill rig will be used to facilitate the collection of the soil vapor samples by boring a hole into the ground a depth of at least 5 feet or greater below grade or if shallow groundwater is encountered one foot above the groundwater table. The depth to water will be determined by measuring the water level at each of the monitoring well on-site. The following procedures will be followed during soil vapor sampling.

- Soil vapor sampled will be collected using on inch diameter by six-inch long stainless steel screen fitted with polyethylene tubing.
- Porous backfill material (e.g., glass beads or coarse sand) will be used to create a sampling zone 1 to 2 feet in length.
- Soil vapor probes will be sealed above the sampling zone with a bentonite slurry for a minimum distance of three feet to prevent outdoor air infiltration. The soil vapor probe bentonite seal will be given sufficient time to provide for hydration of the bentonite seal prior to sampling. The remainder of the borehole will be backfilled with sand.
- Soil vapor samples will be collected into 6 liter Summa canisters provided by the analytical laboratory.
- A tracer gas (e.g. helium, butane, or sulfur hexafluoride) will be used during soil vapor sample collection to verify that adequate sampling techniques are being implemented. Further discussion about tracer gas is provided below.

Tracer Gas

When collecting soil vapor samples, a tracer gas served as a quality assurance/quality control device to verify the integrity of the soil vapor probe seal. Without the use of a tracer gas, there is no was to verify that a soil vapor sample has not been diluted by surface air.

HRP anticipates using either helium or sulfur hexafluoride as a tracer gas for this SI. After the soil vapor probe is set and the surface seal is in place a plastic pail or garbage bag will be placed over the implant tubing, while allowing the tubing to protrude from the enclosure. The enclosure will be sealed to the ground surface and the effluent tubing using a bentonite slurry, hydraulic cement or equivalent. Next the tracer gas will be introduced into the enclosure and the implant will be monitored with an appropriate meter. If high concentrations of the tracer gas (>20%) exist, the seal of the probe should be re-evaluated. If high concentrations

of tracer gas do not exist within the implant, then purging and sampling can commence.

After it is determined that an adequate seal has been established, purging and sampling will commence. The volume of the sample train (implant, and tubing) will be calculated and slowly purged using a Gil-Air pump equipped with a low flow module at a rate not to exceed 0.2 liters per minute. After the purge is complete, a 6-liter summa canister equipped will be directly attached to the tubing. The summa canister valve will then be opened and allowed to fill at a rate that does not exceed 0.2 liters per minute. When the pressure gauge on the summa canister is reaching ambient level, the valve will be closed.

All sampling equipment will be removed from the borehole. The summa canister will be appropriately labeled and stored in a shipping container.

Soil vapor boreholes will be abandoned (backfilled) using bentonite chips. All abandoned borings will be checked 24-48 hours after abandonment to determine if curing is occurring properly.

5.7 Task Seven: Sampling Equipment Cleaning Procedures

To assure that no outside contamination will be introduced into the samples/data, thereby invalidating the samples/data, the following cleaning protocols will apply for all equipment used to collect the samples during the SI:

- The equipment will be washed in laboratory detergent solution (Alconox) and water;
- The equipment will then be washed with a solution of Citronox to remove trace organics;
- The equipment will then be washed with a solution of nitric acid to remove trace inorganics;
- The equipment will undergo a rinse of tap water;
- The equipment will undergo a final rinse using deionized water; and,
- The equipment will be wiped dry with a paper towel.
- If equipment will not be used immediately, wrap in oil-free aluminum foil.

5.8 Task Eight: Sample Labeling

In order to prevent misidentification and to aid in the handling of environmental samples collected during the SI, sample-labeling procedures listed below will be followed:

Procedure: Affix a label to each sample container. The following information will be written on each label with permanent ink prior to wrapping label in cellophane tape:

- Site Name
- Sample Identification
- Date
- Time
- Sampler Initials
- Sample Preservative
- Analysis Required

Each sample of each matrix will be assigned a unique alpha-numeric identification code.

5.9 Task Nine: Sample Shipping

Proper documentation of sample collection and the methods used to control these documents are referred to and chain-of-custody procedures. Chain-of-custody procedures are essential for presentation of sample analytical chemistry results as evidence in litigation or at administrative hearings held be regulatory agencies. Chain-of-custody procedures also serve to minimize loss or misidentification of sampled and to ensure that unauthorized persons do not tamper with the samples.

The procedures used in this investigation follow the chain-of custody guidelines outlined in the NEIC Policies and Procedures, prepared by the National Enforcement Investigations Center (NEIC) of the U.S. Environmental Protection Agency Office of Enforcement.

Procedure:

- The chain-of custody (COC) record (Appendix E) should be completely filled out, with all relevant information.
- The original COC stays with the samples. It should be placed in a sealable polyethylene baggie and taped inside the sample cooler. The sampler should retain a copy of the COC.
- Place 2-inches of inert cushioning material such as vermiculite or bubble wrap in bottom of cooler.
- Place bottles in cooler in such a way that they do not touch each other (use cardboard dividers or bubble wrap).
- Wrap VOA vial securely in tape and place them in the center of the cooler.
- Pack cooler with ice in doubled zip lock plastic bags.
- Pack cooler with cushioning material
- Tape cooler drain shut
- Wrap cooler with strapping tape at two locations securing the lid. Do not cover any shipping labels.
- Place the laboratory address on top of cooler.
- Ship samples via overnight carrier the same day they are collected whenever possible.

6.0 Quality Assurance Project Plan (QAPP)

Section 6.0 is the Quality Assurance Project Plan (QAPP), which is a discussion of the quality Assurance/Quality Control (QA/QC) procedures to be followed during this investigation. It is the policy of HRP that methods utilized to collect, analyze and evaluate field and laboratory data are consistent with the highest appropriate level of (QA/QC) procedures. The QA/QC program provisions ensure:

- Generation of high quality data;
- Use of sound QA/QC management practices;
- Documented field data collection methodologies which meet QA/QC standards;
- Field interpretations and analytical results which are valid;
- Sample identification and integrity are controlled by adherence to strict chain of custody protocols;
- Laboratory accuracy and precision of analyses are maintained by the specific laboratory identified; and,
- Calculations and evaluations are accurate and well documented.

Table 1 presents the proposed sampling analytical chart, including the number of samples for each matrix (arranged by task and location), while Table 2 is a summary of the sample analysis, including the total number of samples per matrix, the number of QA/QC samples, container requirements, preservatives, and holding times for the RI.

6.1 Laboratory Quality Assurance

As indicated in Section 3.4, Chemtech of Mountainside, New Jersey will be the contract laboratory for this project. Chemtech is a laboratory certified by the New York State Department of Health's Contract Laboratory protocols (CLP) and Environmental Laboratory Approval Program (ELAP), as required by NYSDEC protocols. Chemtech will provide all the laboratory analysis for the project, including Analytical Services Protocol (ASP), Category B deliverables packages, sample containers, coolers, chemical fixatives, and chain of custody documents.

Quantitative limits that the laboratory that the laboratory will need to achieve for each analytical parameter is included as Appendix F

6.2 Quality Control

Quality control measures will be in place during the entire project. This will include, but not be limited to, strict adherence to the following: sample handling, chain-of-custody procedures, equipment calibrations, maintenance, the collection of equipment blanks, field blanks, trip blanks, and decontamination.

6.2.1 Sample Handling

All samples collected as part of this project will be handled in strict accordance with Section 6.2.2 of this Work Plan. Any deviations will require an addendum, as authorized by the project manager.

Samples collected during field investigations will be transported by HRP field personnel in laboratory-provided coolers directly to the laboratory. Those samples that require a lower temperature for preservation will be placed inside an insulated cooler of wet ice. Prior to transport, the ice chest/cooler will be sealed with custody tape to ensure that the seal has not been inappropriately broken prior to receipt by the laboratory.

6.2.2 Chain of Custody Procedures

Chain of custody of procedures begin when clean sample bottles are picked up from the laboratory. Each sample container is identified by a unique number located on the sample label. Properly labeled samples remain in the custody of the HRP field-sampling technician until they are relinquished for transport to the laboratory. A copy of the chain of custody will remain on file under each project number in the custody of the project manager.

The primary objective of sample chain of custody is to create an accurate written verified record, which can be used to trace the possession and handling of the sample containers from the moment of receipt until returned by the laboratory. Sample custody will be archived by approved field and laboratory documentation. A sample for this project is defined to be in someone's custody if:

1. It is in one's actual physical possession;
2. It is in one's view, after being in one's physical possession;
3. It is in one's physical possession and then locked or otherwise sealed so that tampering will be evident; or
4. It is kept in a secure area, restricted to authorized personnel only.

Field procedures will be designed to minimize sample handling and transfers. During sampling, the field crews will record the following information in field notebooks using ink:

1. The unique sample number as obtained from the sample label and parameters to be analyzed;
2. Source of sample (including designation, name, location, and matrix type);
3. Description of sampling points (i.e., monitor well, number, boring, key landmarks, etc.);
4. Date and time of sample collection;

5. Order of sample collection;
6. Preservatives used;
7. Name(s) of collector(s);
8. Field data (weather and other site conditions);
9. Sampling equipment (i.e., purge method, bailer type, etc.); and
10. Types of quality assurance samples collected (i.e., field blanks, equipment blanks, split, etc.).

HRP field personnel are responsible for uniquely identifying and labeling each sampling point. This identification should be logged onto all field forms, chain of custody, and into field logbooks. It will not be permissible to change the sampling point identification once it has been established. All sample collection activities will be traceable by field records, sample collector, chain of custody documents, and a database if available. Errors made in original field documentation must be shown with a single line drawn though and initialed by the author of the documentation.

6.2.3 Equipment Calibrations

During the implementation of the field sampling plan, several pieces of field equipment, which require calibration, will be utilized at the site. The proposed equipment to be used at the site will include, but not be limited to, the following:

- Photoionization Detector (PID);
- Water Quality Analyzer;
- Particulate Meter

All field equipment will be calibrated immediately prior to use in the field. The calibration procedures will follow standard manufacturer's instructions or routine HRP procedures to assure that the equipment is functioning within tolerances established by the manufacturer and required by the project. Field personnel will document all instrument calibration in bound field notebooks and on calibration forms found at the end of the site specific Health and Safety Plan (HASP). All records generated will be maintained by field personnel and are subject to audit by the QA Manager.

The detailed calibration, operation, and maintenance procedures for field instrumentation routinely used by HRP personnel are specific to manufacturer's instructions.

All calibrations will be recorded in a field notebook and on calibration forms found in the HASP. These calibration records become part of the individual project files as documentation of QA objectives.

6.2.4 Maintenance

HRP personnel routinely maintain field equipment for optimal results. All maintenance procedures are documented in control logbooks designated for each piece of equipment. The individual performing the adjustment of the equipment will record any field activities involving routine maintenance in field logbooks. Maintenance performed at an authorized repair service will be documented in the maintenance log, including service location, specific repair, and method of transport. Methods of routine maintenance depend on the instrument and manufacturer. Refer to the manufacturer's operations manual for these procedures.

In the event that the primary field equipment is inoperable as determined by calibration difficulties, back-up field instruments will be obtained from other sources. These instruments will be calibrated prior to recording data. In no event shall instruments be used to record data unless the performance of the equipment has been documented.

6.2.5 Blanks

To ensure the validity of the field sampling plan, equipment blanks will be collected at the site. In addition, trip blanks will be prepared at the laboratory and accompany the sample containers during the entire sampling event (i.e., from the laboratory, to the field, to the sample locations, and back to the laboratory). Trip blanks will be analyzed for VOCs via EPA Method 8260, while equipment blanks will be analyzed for VOCs via EPA Method 8260, semi-volatiles (SVOCS) via EPA Method 8270, Polychlorinated Biphenyls (PCBs) via EPA Method 8082, Pesticides via EPA Method 8081, and TAL Metals.

Equipment, and trip blanks are slightly different from one another. For preparation of an equipment blank, an appropriate blank material (water) will be brought in contact with the sampling tools used for "real" samples. Equipment blanks will be collected by pouring laboratory grade deionized water over decontaminated equipment (stainless steel scoop, split spoon, etc.) and collecting the water in laboratory-supplied containers. Equipment blanks demonstrate whether the sampling equipment has been properly decontaminated.

Trip blanks are prepared at the laboratory and transported to the site in sealed containers. They evaluate whether airborne contamination is present at any point during the trip, and whether or not the gas chromatograph columns have been thoroughly purged between samples.

HRP proposed to collect one equipment blank sample for each soil and groundwater matrices. In addition, and one trip blank will be collected during the soil, groundwater and soil vapor sampling.

6.2.6 Duplicates

As per ASP protocols, HRP proposes to collect one duplicate sample per matrix or one duplicate sample for every 20 analytical samples, at a minimum. The duplicate for soil and groundwater samples will be analyzed for VOCs via USEPA Method 8260, SVOCs via USEPA Method 8270, PCBs via USEPA Method 8082, Pesticides via USEPA Method 8081, TOC via Lloyd Kahn, and TAL Metals. The duplicate sample for soil vapor will be analyzed for VOCs via USEPA Method TO-15.

6.2.7 Spikes

As per ASP protocols, HRP proposes to collect one matrix spike/matrix spike duplicate (MS/MSD) sample per matrix or one MS/MSD for every 20 analytical samples, at a minimum. The MS/MSD samples for soil and groundwater samples will be analyzed for VOCs via USEPA Method 8260, SVOCs via USEPA Method 8270, PCBs via USEPA Method 8082, Pesticides via USEPA Method 8081, and TAL Metals.

6.2.8 Decontamination Procedures

All non-disposable field equipment which comes into direct contact with sampling media will undergo decontamination procedures. This includes: Geoprobing equipment, stainless steel scoops, and any other necessary hand tools. Prior to the commencement of fieldwork, a decontamination area will be constructed on site, and will be designated for decontamination only.

Macro core samplers, SP-15 groundwater sampler, stainless steel scoops and other hand tools will be decontaminated after each sample is collected in the following manner:

- The equipment will be washed in laboratory detergent solution (Alconox) and water;
- The equipment will then be washed with a solution of Citronox to remove trace organics;
- The equipment will then be washed with a solution of nitric acid to remove trace inorganics;
- The equipment will undergo a rinse of tap water;
- The equipment will undergo a final rinse using deionized water; and,
- The equipment will be wiped dry with a paper towel.

6.3 Data Usability Summary Report (DUSR)

Chemtech will provide Category B deliverable packages for the analyses, which will be forwarded to Alpha Geoscience, an independent data validator for completion of a Data Usability Summary Report (DUSR). The DUSR will be prepared to verify that the laboratory data is usable. The DUSR will examine the laboratory data provided in the deliverables packages and answer the following questions:

- Is the data package complete, as defined under the requirements of NYSDEC ASP Category B deliverables?
- Have all the holding times been met?
- Do all the QC data (i.e., blanks, instrument tunings, calibration standards, verifications, surrogate recoveries, spike recoveries, replicate analyses (duplicates), laboratory controls, and sample data) fall within the protocol required limits and specifications?
- Have all the data been generated using established and agreed upon analytical protocols?
- Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?
- Have all the correct data qualifiers been used?

TABLE 1-SUMMARY OF SAMPLE ANALYSES

Task	Matrix	No. of Sample Locations	No. of Samples Collected	Analyses
Three	Soil (Surface Samples)	15 onsite 3 offsite	18	TCL VOCs by EPA 8260 TCL SVOCS by EPA 8270 PCBs by EPA 8082 Pesticides by EPA 8081 TAL Metals by EPA 6010 TOC by Lloyd Kahn
Four	Soil (Borings)	15 borings 8 monitoring well installations	At least 15 (more than one sample from each boring may be required dependent on field observations)	TCL VOCs by EPA 8260 TCL SVOCS by EPA 8270 PCBs by EPA 8082 TAL Metals by EPA 6010 Pesticides by EPA 8081 TOC by Lloyd Kahn
Seven	Groundwater	8	8	TCL VOCs by EPA 8260 TCL SVOCS by EPA 8270 PCBs by EPA 8082 Pesticides by EPA 8081 TAL Metals (Total and Dissolved) by EPA 6010
Eight	Soil Vapor	5 Sub-slab 4 Soil vapor	9	VOCs by TO-15
Blanks (Trips, Equipment)	Groundwater (DI water for trips)	1 Trip Per Day, 2 Equipment Blanks	5 Trip Blanks 2 Equipment Blanks	TCL VOCs by EPA 8260 (Trip only) TCL VOCs by EPA 8260 TCL SVOCS by EPA 8270 PCBs by EPA 8082 Pesticides by EPA 8081 TAL Metals by EPA 6010
Duplicates	Groundwater, Soil	2 surface soils 1 soil boring/MW 1 groundwater	4	TCL VOCs by EPA 8260 TCL SVOCS by EPA 8270 PCBs by EPA 8082 Pesticides by EPA 8081 TAL Metals by EPA 6010 TOC by Lloyd Kahn (soil only)
	Soil Vapor	1	1	VOCs by TO-15
Spikes (MS/MSD)	Groundwater, Soil	2 surface soils 2 soil boring/MW 1 groundwater	5	TCL VOCs by EPA 8260 TCL SVOCS by EPA 8270 PCBs by EPA 8082 Pesticides by EPA 8081 TAL Metals by EPA 6010

TABLE 2-ANALYTICAL SAMPLE SUMMARY

Sample Matrix	Analytical Methods	Number of Samples	Quality Control Samples	Sample Container Requirements	Sample Preservative	Sample Holding Times
Groundwater	TCL VOCs by EPA 8260 TCL SVOCS by EPA 8270 PCBs by EPA 8082 Pesticides by EPA 8081 TAL Metals (total and dissolved) by EPA 6010	8	*1 Duplicate *1 MS/MSD *1 Trip Blank per day *2 Equip. Blanks	(3) 40 ml. clear glass VOA (VOCs) (1) 1 liter clear glass (SVOCs) (1) 1 liter amber glass (PCBs) (1) 1 liter amber glass (Pesticides) (1) 1 liter amber glass (TOC) (1) 16 oz plastic (metals)	Cool to 4℃ 1:1 HCl to pH <2 (VOCs) Cool to 4℃ Cool to 4℃ Cool to 4℃ H_2SO_4 HNO_3 to pH<2 (metals),	14 days (VOCs) 7 days (SVOCs, PCBs, Pesticides) 28 Days TOC 180 days (metals except Hg) 26 days (Hg)
Soil	TCL VOCs by EPA 8260 TCL SVOCS by EPA 8270 PCBs by EPA 8082 TAL Metals by EPA 6010 Pesticides by EPA 8081 TOC by Lloyd Kahn	33	*3 Duplicate *2 MS/MSD	(1) 4 oz. Clear glass (VOCs) (1) 6 oz. Clear glass (SVOCs, PCBs, Pesticide, TOC, and metals)	Cool to 4℃	14 days (VOCs, SVOCs, PCBs, Pesticides) 28 Days TOC 180 days (metals except Hg) 26 days (Hg)
Soil Vapor	VOCs by TO-15	9	9	6 Liter Summa Canister		

*-Minimum number of samples

TABLE 3

PERSONNEL ASSIGNMENTS

Project Manager	Health & Safety Officer (HSO)	Security Officer (SO) Record keeper	Quality Assurance Officer	Field Team Members	Public Information Officer
Cailyn Dinan	Ed Bell	Ed Bell or designated alternate	Zoe Belcher	HRP: Ed Bell, Cailyn Dinan, Lyman Tinc, Matt Finkenbinder, Nancy Garry Drilling (Aztech), GPR operator (SSI), and other IRM subcontractors and field members	Mr. Bill Roehr or Ms. Andrea Briggs
PERSONNEL RESPONSIBILITIES					
• Site Project Manager	• Implementation of HASP/CWP and CAMP • General Site Supervisor • Stop work if poor work practices or conditions endanger worker health & safety • Act as Emergency Coordinator if necessary • Provide pre-entry briefing	• Maintain site records • Enforce site control program	• Assure that quality measures are implemented throughout the project.	• Perform site work tasks	• Provide public information as necessary

TABLE 4

PROJECT SCHEDULE

TASK		COMPLETION
Implement Workplan		
Task One	Comprehensive Site Walkthrough	Within three weeks of workplan approval
Task Two	Ground Penetrating Radar Survey	Within four weeks of workplan approval
Task Three	Collection of Surficial and Background Soil Samples	Within seven weeks of workplan approval
Task Four	Installation of Soil Borings	Within eight weeks of workplan approval
Task Five	Collection and Analysis of Soil Samples	Within eight weeks of workplan approval
Task Six	Installation and Development of Monitoring Wells	Within ten weeks of workplan approval
Task Seven	Conduct Groundwater Sampling	Within ten weeks of workplan approval
Task Eight	Soil Vapor Evaluation	Within eleven weeks of workplan approval
Task Nine	Site Survey	Within twelve weeks of workplan approval
Complete RI/IRMs on-site work		By September 30, 2009
Submit RI Report to City of Troy, NYSDEC, and NYSDOH		By November 30, 2009

TABLE 5

PROJECT BUDGET

Task	Title	Cost
1	Project Scoping	$2,400
2	Comprehensive Site Walk though	$2,660
3	Citizen Participation Planning:	
	Prepare CPP	$1,786
	Public Meetings	$3,067
	Additional activities	$607
4	SI Work Plan Development	$5,100
5	GPR Survey	$7,887
6	Surficial and Background Soil Sampling	$12,090
7	Soil Borings Installation and Sampling	$21,656
8	Groundwater Monitoring Wells Installations and Sampling	$28,629
9	Soil Vapor Evaluation	$9,413
10	Site Survey	$11,400
11	SI/RAAR Preparation	$8,890
12	Other Tasks	$4,960
	Subtotal	$120,545
13	IRM's*	$104,456
	Total	$225,000

* HRP has completed tar and drum removal as part of IRM activities. The cost for the removal was $46,122.63.

USGS **Troy, New York, United States** 01 Jul 1995

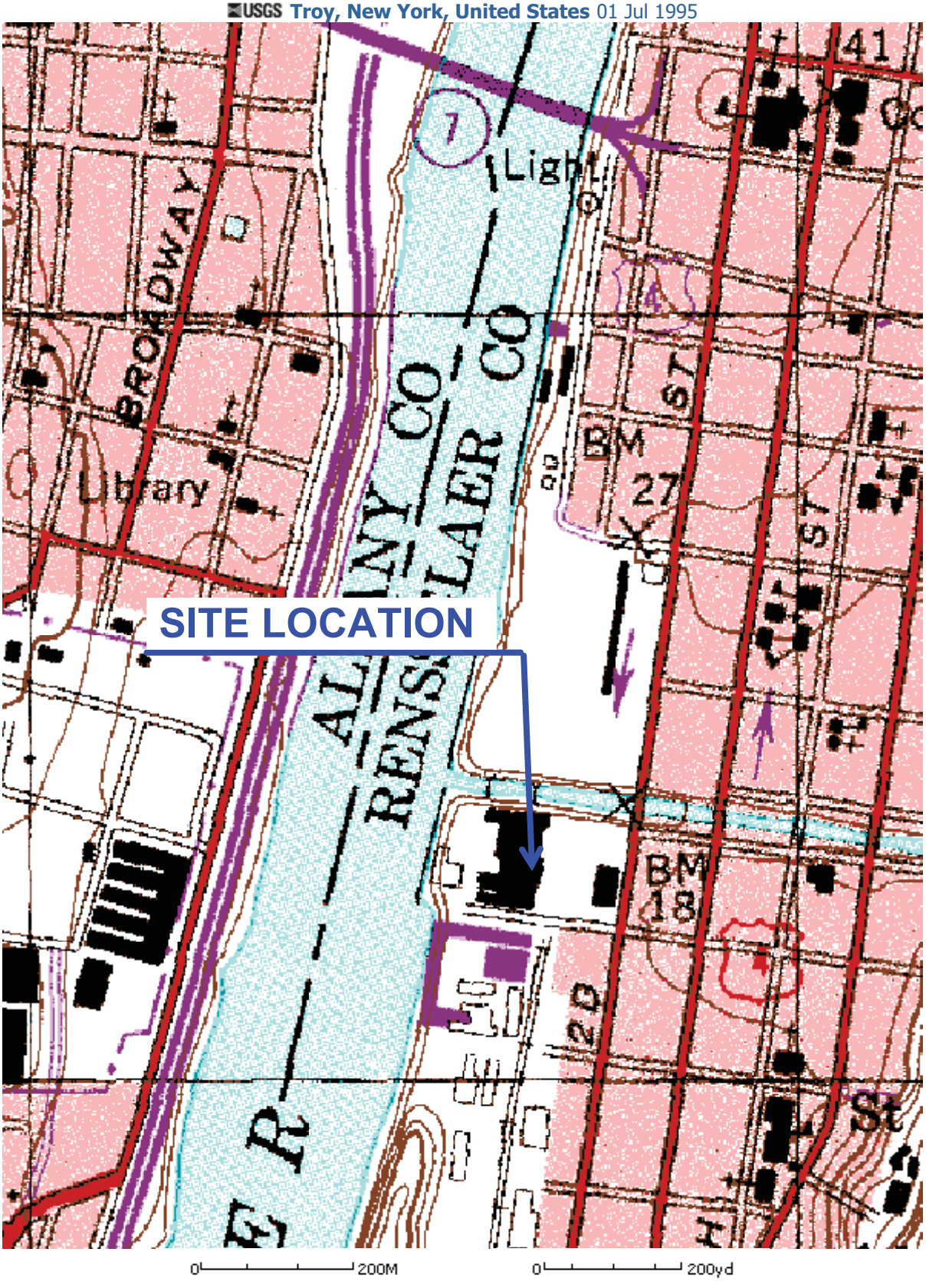

FIGURE 1

SITE LOCATION

FORMER SCOLITE SITE

2 MADISON STREET

TROY, NY

HRP# TRO2004.P2

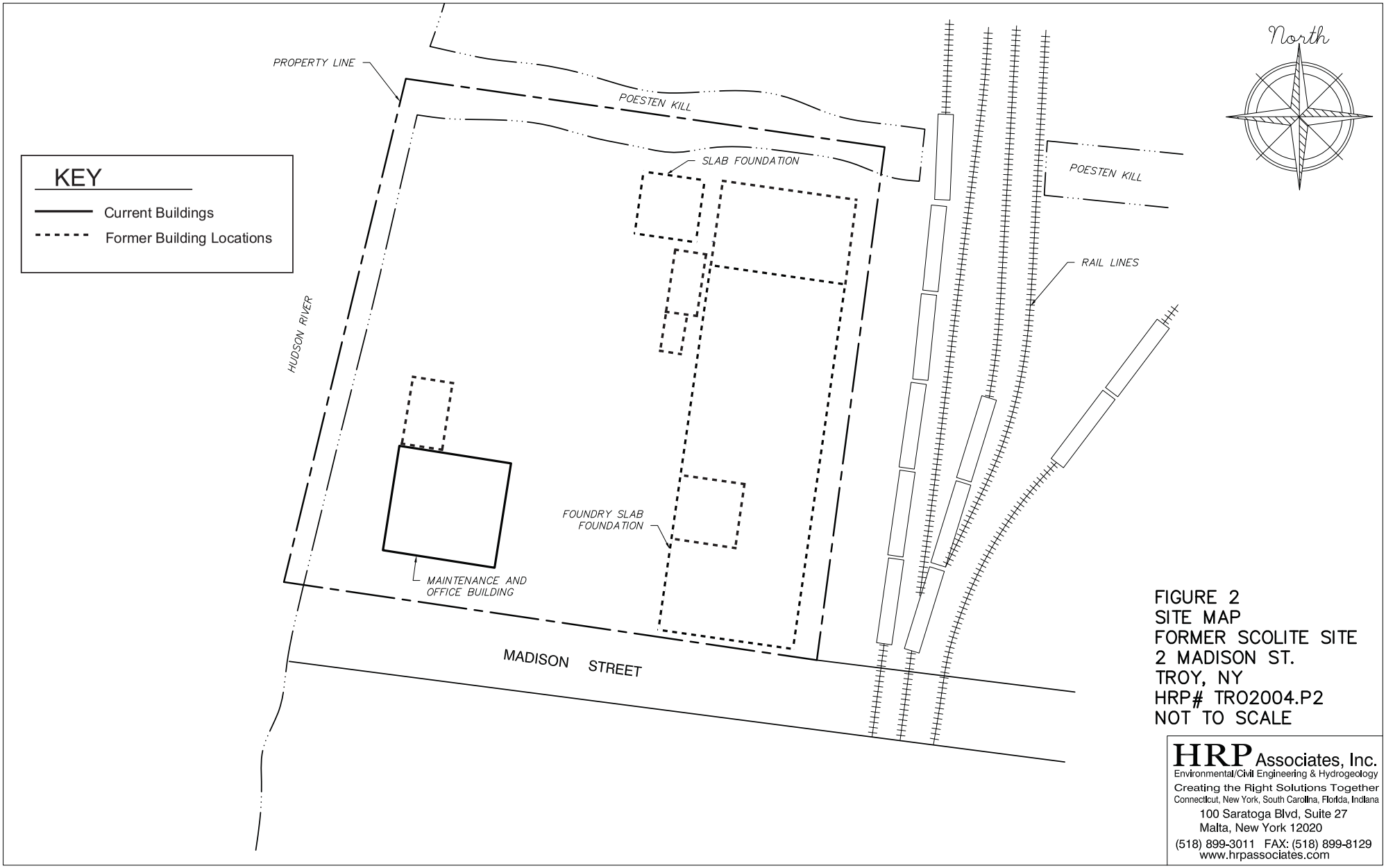

FIGURE 2
SITE MAP
FORMER SCOLITE SITE
2 MADISON ST.
TROY, NY
HRP# TRO2004.P2
NOT TO SCALE

HRP Associates, Inc.
Environmental/Civil Engineering & Hydrogeology
Creating the Right Solutions Together
Connecticut, New York, South Carolina, Florida, Indiana
100 Saratoga Blvd, Suite 27
Malta, New York 12020
(518) 899-3011 FAX: (518) 899-8129
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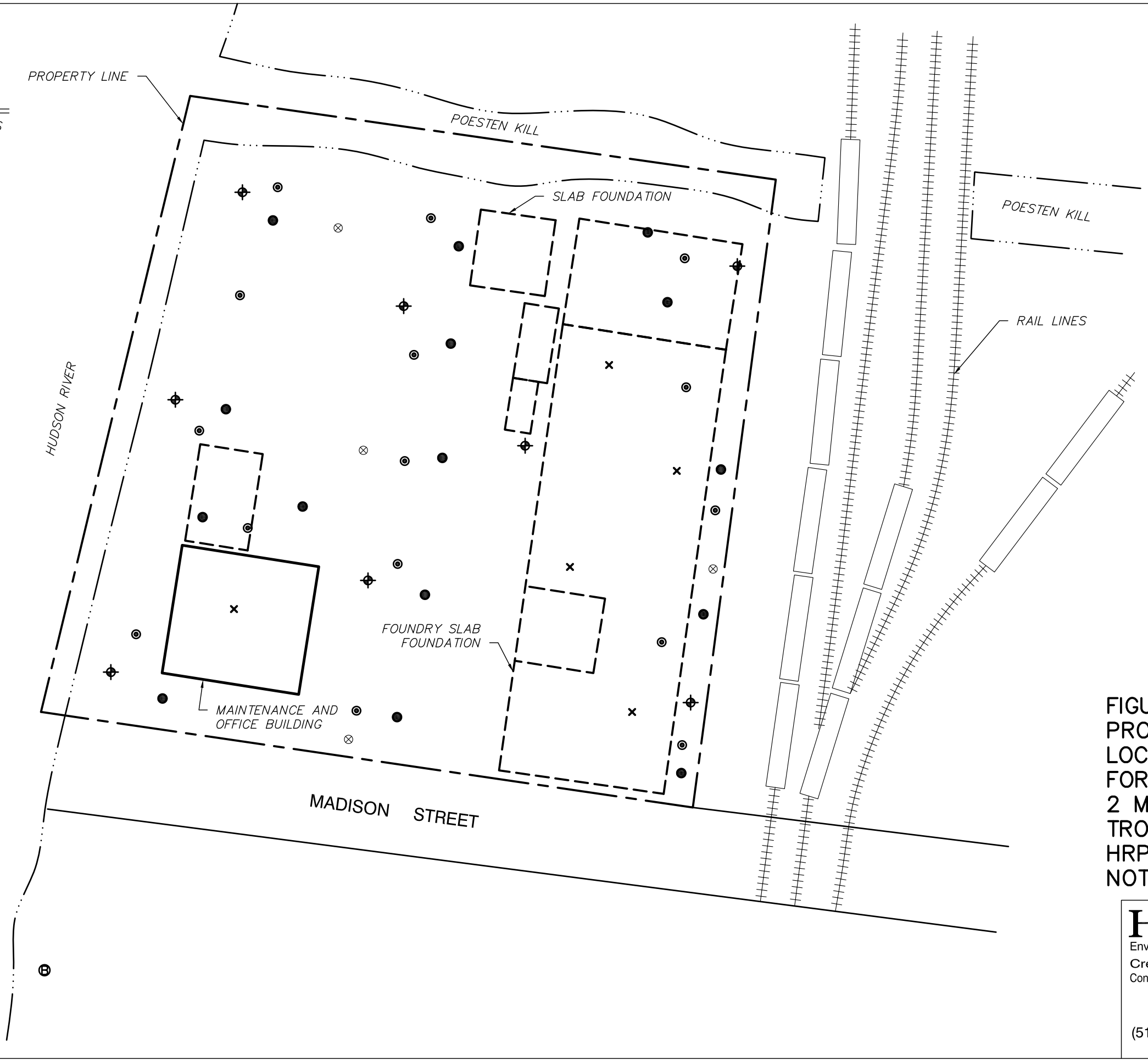
SAMPLE LOCATION KEY

- (B) – BACKGROUND SURFACE SAMPLES
- × – SUB–SLAB SOIL VAPOR
- ⊗ – SOIL VAPOR
- ⌖ – GW WELLS
- ● – SURFACE SOIL SAMPLES
- ◎ – SOIL BORINGS
- ▭ – CURRENT BUILDINGS
- ▭ – FORMER BUILDINGS



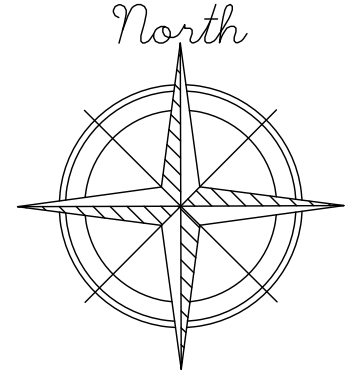


FIGURE 3
PROPOSED SAMPLING LOCATIONS
FORMER SCOLITE SITE
2 MADISON ST.
TROY, NY
HRP# TRO2004.P2
NOT TO SCALE

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S:\Data\T\TROYC - CITY OF TROY\SCOLITE SITE\TRO2004P2\CAD\PROPOSED SAMPLING LOCATIONS.dwg, Layout1, 3/24/2009 2:19:39 PM

Map of Off-Site Sampling Locations
Former Scolite Property, Troy, New York
DEC Site No. E4-42-037

Photography Source:
New York State High Resolution Statewide Digital Orthoimagery, 2007.

0 250 500
feet

North

HRP Associates, Inc.
1 Fairchild Square, Suite 110
Clifton Park, NY 12065

APPENDIX B

HEALTH AND SAFETY PLAN

SITE-SPECIFIC
HEALTH AND SAFETY PLAN

FOR

FORMER SCOLITE SITE
2 MADISON STREET
TROY, NY 12180

HRP # TRO2004.P2

DECEMBER 2008

Prepared by:

HRP *Associates, Inc.*

Engineering and Geology
Malta Business Commons
100 Saratoga Village Blvd., Suite 27
Malta, New York 12020

Disclaimer

HRP ASSOCIATES DOES NOT GUARANTEE THE HEALTH OR SAFETY OF ANY PERSON ENTERING THIS SITE. DUE TO THE POTENTIAL HAZARDS OF THIS SITE AND THE ACTIVITY OCCURRING THEREON, IT IS NOT POSSIBLE TO DISCOVER, EVALUATE, AND PROVIDE PROTECTION FOR ALL POSSIBLE HAZARDS WHICH MAY BE ENCOUNTERED. STRICT ADHERENCE TO THE HEALTH AND SAFETY GUIDELINES SET FORTH HEREIN WILL REDUCE, BUT NOT ELIMINATE, THE POTENTIAL FOR INJURY AT THIS SITE. THE HEALTH AND SAFETY GUIDELINES IN THIS PLAN WERE PREPARED SPECIFICALLY FOR THIS SITE FOR USE UNDER DIRECT HRP SUPERVISION AND SHOULD NOT BE USED ON ANY OTHER SITE.

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1.0 EMERGENCY PHONE NUMBERS

Site Name: Former Scolite Scolite Site

Address: 2 Madison Street

City, State: Troy, NY 12180

Site Contact: Bill Roehr, Deputy Planning Commissioner, City of Troy, NY
Troy City Hall, One Monument Square, Troy NY 12180
(518) 378-8439

See Figure 2 at the end of this plan for a site location map and site plan. In case of emergency, the following phone numbers should be used. Site personnel should familiarize themselves with the location of the nearest telephones. The Emergency Action Plan is contained in Section 8.0.

NOTE: **When contacting the local authorities be sure to give: your name, facility name, full address, telephone number, and the nature of the emergency.**

Troy Fire Department, Ambulance, Police Department:		911
Troy Police Station (361 3rd Street – 0.3 mile away)	911	(518-270-5157)
Upstate NY Poison Control Center:		(800) 222-1222
NYSDEC Spill Hotline:		(800) 457-7362
National Response Center:		(800) 424-8802
U.S. EPA (Region 2)		(212) 637-3000
NY State Police Barracks Troop G:		(518) 279-4426

Local Hospital: Samaritan Hospital

Address: 2215 Burdett Avenue, Troy NY 12180

Hospital Telephone: (518) 271-3300

Travel Distance (approx.): 2.3 miles Travel Time (approx.): 8 minutes

Directions (Map attached, as Figure 3):

1. Head **east** on **Madison St** toward **Harrison St**	0.2 mi
2. Turn **left** at **4th St/US-4 N** Continue to follow US-4	1.1 mi
3. Turn **right** at **Federal St**	0.2 mi
4. Turn Slight **left** at **Peoples Ave**	0.7 mi
5. Turn **left** at **Burdett Ave** Destination will be on the left	394 ft

2.0 INTRODUCTION

2.1 Purpose and Scope

This Site Specific Health and Safety Plan (HASP) addresses the health and safety practices that will be employed by all HRP Associates, Inc. (HRP). The scope of the project will include:

- Site walkthrough
- Ground penetrating radar (GPR) survey
- Surficial and background soil sampling
- Soil boring and groundwater well installation
- Soil and groundwater sampling
- Soil vapor evaluation
- Interim remedial actions

Based on our review of historical operations potential contaminants principally include, VOCs, SVOCs, PAHs, metals, solvents, and asbestos. See Table 1 at the end of this plan for a list of known or suspected chemical hazards onsite.

This HASP has been developed in accordance with HRP's Corporate Safety and Health Program as required under OSHA's Hazardous Waste Operations standard (29 CFR 1910.120). As previously mentioned, this Plan has been developed to establish minimum standards for project oversight and environment sampling activities to protect the health and safety of HRP personnel and HRP's subcontractors. All HRP site personnel have received the required level of training and field experience as required under subpart (e) of the standard, and have received medical examinations in accordance with HRP's medical surveillance program as required under subpart (f) of the standard. Non-HRP personnel will not be permitted in the Exclusion Zones unless they have received training and medical surveillance under the standard.

This Plan is to be used only for project oversight conducted by HRP at the Former Scolite Site located at 2 Madison Street, Troy, NY. All HRP personnel shall be familiar with this HASP prior to conducting proposed site work. This plan must be present on-site and be available for reference/inspection when the subject site work is being conducted.

2.2 General Information

Site Name: SCOLITE

Site Address: 2 MADISON STREET, TROY, NY 12180

Site Contact: Bill Roehr, Deputy Planning Commissioner, City of Troy
Troy City Hall, One Monument Square

Phone Number: (518) 378-8439

2.3 Site Description

The site comprises 5.7 acres at the corner of First and Madison Streets in the City of Troy, Rensselaer County. The site is located in an urban and industrial area and is bordered by the Hudson River to the west, the Poestenkill Canal to the north, and the CSX railroad tracks to the east. A portion of the site is proposed as the location for the Upper Hudson Rivers and Estuaries Satellite Center (UHRESC). See figure 1 and 2 at the end of this plan for site location map and site plan.

In May 2008, a fire consumed the majority of the buildings onsite. During the demolition of the building remnants, friable asbestos from the transite roofing was mixed in with the brick rubble. The brick and debris mixed with asbestos, was stockpiled on the northern end of the site. Drums containing petroleum based oils located near the stockpile leaked and soaked a portion of the brick debris pile. The drums and petroleum impacted bricks were removed as part of an Interim Remedial measure (IRM) in October and November of 2008. The remaining brick is scheduled for removal in the 1st quarter of 2009. This plan assumed that the bricks at the northern end of the site will be removed prior to HRP's mobilization to complete remedial activities.

2.4 Personnel Designations

The following HRP personnel are designated to perform the stated project activities and to assure that the requirements of the HASP are met. Table 2 provided an outline of the designated personnel and their responsibilities.

Site Personnel:

Site Manager: Cailyn Dinan, HRP

Health and Safety Manager (HSM): Jeffrey R. Sotek, PE, CSP, CIH, HRP

Health and Safety Officers (HSO):	Ed Bell, HRP or Lyman Tync, HRP, Alternate
Security Officer/Recordkeeper:	Cailyn Dinan, HRP or Matt Finkenbinder, HRP
Field Team members/Company:	Ed Bell, HRP Cailyn Dinan, HRP Lyman Tync, HRP Matt Finkenbinder, HRP
Public Information Officer:	Bill Roehr, Deputy Planning Comm., City of Troy

3.0 AREAS OF ENVIRONMENTAL CONCERN

3.1 Scope of Work

Based on HRP's proposal and discussions with the City of Troy representatives, the Scope of Work consists of the following:

Site Walkthrough

HRP will conduct a comprehensive site inspection of the Former Scolite Site. The goal of the walkthrough will be to:

- Identify areas of concern (e.g., sumps, USTs, ASTs, floor drains, chemical storage areas, transformer locations, etc.)
- Inventory abandoned drums and other containers.
- Estimate debris and inventory other abandoned materials (e.g., tankers, cars, tires, old equipment) and
- Determine accessibility for investigatoy equipment in future tasks.

Ground Penetrating Radar (GPR) Survey

To determine if underground storage tanks or tank graves are located on-site, a ground penetrating radar (GPR) survey will be conducted in onsite areas which historically could have reasonable potential to have utilized an underground Storage Tank (UST). The areas to be surveyed are proposed include near historical boilers and around the building perimeter. Any anomalies identified by the GPR survey will field marked and GPS marked for future identification.

Surficial and Background Soil Sampling

HRP will mobilize to the site to collect fifteen (15) surficial and three (3) background soil sample at locations approved by the NYSDEC and NYSDOH and submit them to a state certified laboratory. Five (5) of the surface samples and all three (3) of the background samples will be analyzed for TAL metals, TCL VOCs, TCL Semi-VOCs, pesticides, PCBs, and total organic carbon to evaluate surficial soil conditions. The remaining surface samples will be analyzed for STARS VOCs and SVOCs, RCRA metals and PCBs.

Soil Borings Installations and Soil Sampling

To supplement existing data from previous on-site investigations, as well as to meet the goals of the ERP, HRP is proposing to install fifteen (15) soil borings will be installed in areas of concern. Fifteen (15) soil samples from the installed borings will be analyzed for TAL metals, TCL VOCs, TCL Semi-VOCs, pesticides, PCBs, and total organic carbon to evaluate subsurface soil conditions.

Groundwater Monitoring Wells Sampling and Testing

HRP will install an additional eight borings that will be converted into overburden monitoring wells. Each of the on-site wells will be sampled for TAL metals (total and dissolved), TCL VOCs, TCL Semi-VOCs, pesticides, and PCBs. All wells will be sealed from infiltration and developed before sampling. In addition, a monitoring well survey will be completed to determine groundwater flow direction.

Soil Vapor Evaluation

To determine if soil gas contamination exists on-site, HRP will conduct a soil vapor evaluation. In particular, based on the draft NYSDOH vapor intrusion guidance, HRP proposes to collect 9 soil vapor samples. At least five (5) sub-slab vapor samples will be collected onsite within the existing buildings, the others will be collect in the yard. Each of the collected samples will be submitted to state certified laboratory for analysis of VOCs via Method T015.

Interim Remedial Actions

If needed, HRP will complete Interim Remedial Actions (IRMs). Prior to the engagement of any IRM, HRP will receive approval from the City and NYSDEC. Scenarios that may be require the implementation of an IRM include but are not limited to:

- Removal of abandoned drums and containers;
- Removal of ASTs or USTs;
- Removal or relocation of debris or abandoned equipment;
- Demolition of building structures that may impede our ability to detect or define contamination areas;
- Sampling and/or abatement of asbestos containment materials that may impede our ability to detect or define contamination areas;
- The excavation and transported off-site for appropriate disposal of grossly contaminated soil in “hot spot” areas;
- The backfilling of excavation areas with clean material;

- The removal and treatment/disposal of severely impacted groundwater infiltrating into the excavation;
- The collection and analysis of confirmatory soil and/or groundwater samples for TAL VOCs and Semi-VOCs, as well as TAL metals and pesticides and PCBs in areas where IRMs have been completed; and
- Additional site investigation to further delineate the degree and extent of contamination.

4.0 HAZARD ANALYSIS

The overall health & safety risk for HRP personnel from environmental investigation activities is considered low due to the minimal contact personnel will have with potentially contaminated soil or groundwater, or asbestos debris during the investigation activities. Hazards are most likely to be encountered by HRP personnel during drilling or subsequent sampling activities. Suspected hazards are summarized below.

4.1 Physical Hazards

A. Slip, trip, fall
B. Cold/Heat stress
C. Traffic
D. Heavy Machinery
E. Elevated Noise
F. Underground Utilities
G. Adverse Weather
H. Excavation Instability
I. Petroleum/Chemical Vapors
J. Dust
K. Vectors (e.g. vagrants, small wild animals)
L. Drowning
M. Illumination

4.2 Chemical Hazards

Presented in Table 1 is a list of chemical substances potentially present on site, along with odor threshold, permissible exposure limit (PEL), threshold limit value (TLV), OSHA ceiling, IDLH concentration, route of exposure and symptoms of acute exposure, if any. Additional substances can be referenced in the *Niosh Pocket Guide to Chemical Hazards*, which will be provided on-site by the Health and Safety Officer

4.3 Environmental Hazards

The environmental hazards that have been identified on-site are slip/trip/fall, cold/heat stress, traffic, heavy machinery, elevated noise, underground utilities, adverse weather, dust, and vectors.

4.4 Additional Hazards

Drowning is a potential physical hazard at the site. HRP personnel will remain at least ten (10) feet away from the Hudson River and Poestenkill Creek water line/bulkhead on-site. No other potential hazards have been identified.

4.5 Confined Space Entry

HRP personnel are not authorized or trained to enter confined spaces. Confined space work is not part of the scope of work for this project.

4.6 Hazard Analysis Summary/Minimization

See the Hazard Analysis Summary presented in Section 4.1 through 4.5 for a listing of the various physical, chemical, and environmental hazards presumed to exist on-site. The risk of these hazards will be minimized by:

- Engineering controls;
- The use of the buddy system;
- Postponement of work during poor weather conditions;
- Maintenance of a clean, organized work area;
- Avoid extended, direct exposure to contaminated soil, groundwater or soil gas;
- Air quality monitoring with PID and Dust Tracker;
- Utilizing experienced personnel trained in both their job functions and health and safety protocols;
- Use cold/heat stress reduction techniques, including drinking adequate fluids, work scheduling; and
- Utilization of personal protective equipment.

In addition to the hazard minimization techniques listed above, additional hazard minimization information can be found in the following sections of HRP's (Standard Operating Procedure) SOPs:

- SOP 6.2.2 Engineering Controls/Work Practices
- SOP 6.2.4 Illumination/Sanitation
- SOP 6.2.5 Site Communications
- SOP 6.2.6 Site Hazard Communication
- SOP 6.2.7 Personal Protective Equipment
- SOP 6.2.8 Community Relations
- SOP 6.3.2 Excavations

- SOP 6.3.5 Buddy System
- SOP 6.3.6 Donning/Doffing Equipment
- SOP 6.3.7 Noise
- SOP 6.3.8 Heat Stress Control
- SOP 6.3.9 Cold Stress Control
- SOP 6.3.10 Control/disposal of Contaminated/Waste materials
- SOP 6.3.11 Rain/Electrical Storms/Snow/Ice
- SOP 6.3.14 Utility Markouts

See Appendix A and HRP's Corporate Health and Safety Program for full text of SOPs.

4.7 Monitoring Procedures

The following environmental monitoring instruments/procedures shall be used on-site at the specified intervals.

Instrument/Procedure	Sampling Interval
Photoionization Detector (PID) in breathing zone.	Upwind location sampling at sixty second intervals.
Dust Tracker	Upwind and Downwind location sampling at sixty second intervals.

Background ambient air levels will be established outside the exclusion zone prior to commencement of site work. Ambient air sampling will occur in the breathing zone of site workers for comparison to the action levels (described below). Additionally, air sampling will be conducted in the vicinity of any intrusive exploration (i.e. near excavations, test borings, etc.) to determine if any contaminants are present.

The following Action Levels will be used:

Instrument	Action Level	Level of Protection or Action Required
PID	No reading above background	▪ No action required. ▪ Continue PID monitoring. ▪ Level D protection.
PID	Up to 5 ppm above background	▪ Evacuate exclusion zone. ▪ Recheck levels after 15 minutes.

Instrument	Action Level	Level of Protection or Action Required
		▪ If levels are sustained, contact Health and Safety Manager. ▪ Use engineering controls to lower breathing zone vapors. ▪ Level C protection (at the Health & Safety Manager's direction).
PID	>5 ppm above background	▪ Evacuate exclusion zone. ▪ Recheck levels after 15 minutes. ▪ Use engineering controls to lower breathing zone vapors. ▪ If levels are sustained, contact Health and Safety Manager, and re-evaluate HASP.

When an action level is equaled or exceeded, the work area should be evacuated and the area re-tested with the sampling device. If the appropriate action level continues to be exceeded, the HSO will have to assess the use of engineering controls to lower vapor levels or availability of required increased personal protection equipment before authorizing re-entry.

In addition to ensure the protection of receptors surrounding the site HRP has developed and will implement a Community Air Monitoring Program (CAMP), which requires real time monitoring of volatile organics and dust during the remedial investigation. The CAMP is included in Appendix B. Calibration of all instruments will occur at least once per day. A calibration log has been included in Appendix C.

5.0 ENGINEERING CONTROL MEASURES

5.1 Air Monitoring

In order to determine potential health hazards and to determine the level of personal protection needed during sampling activities within the areas of concern, a photo-ionization detector will be periodically operated to monitor air quality for the purpose of ensuring minimal exposure to volatile organic compounds. Please refer to Section 4.7 of this plan for specific air monitoring procedures/action levels.

5.2 Protective Zones

Protective zones will be established by the Health and Safety Officer and Martin Environmental Services, Inc. prior to the start of field work associated with those phases of the Plan. The purpose of the protective zones is to prevent potential cross-contamination of adjacent areas as well as to protect project personnel from exposure to contaminated areas.

Protective zones shall be delineated in the field prior to work as follows:

- *Exclusion Zone*: This is the contaminated area in which intrusive activities are performed. The exclusion zone is an area surrounding the excavator or drill rig and sampling activities. A single access point for entrance and exit should be established and maintained, if possible.

- *Support Zone*: This zone will be utilized by equipment and vehicle storage and will be kept free of contaminated material. The Site Safety Officer will determine the location of this zone.

- *Contaminant Reduction Zone*: This zone is a transition zone located between the Exclusion Zone and the Support Zone and is utilized to decontaminate personnel and equipment.

6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

6.1 Level of Protection

As previously discussed in Section 4.0, the overall health and safety risk associated with chemical hazards for HRP personnel are considered minimal/low. This is primarily due to the anticipated low concentrations of chemical contaminants expected based on results of previous sampling of the scrap metal soil as well as the expected minimal contact personnel will have with any potentially contaminated media. Therefore, the minimal level of protection for HRP during the conduct of all the environmental work performed at the site will be modified Level D (see table 3 for PPE select based on job task). Generally, the modified Level D PPE includes:

- Work gloves,
- Steel toe work boots,
- Hard hat,
- Safety vests
- Hearing protection
- Safety glasses
- Disposable outer boots or boot coverings
- Nitrite or latex gloves

If site conditions warrant, an upgrade to Level C (refer to Section 4.7 for the appropriate action levels). Level C includes:

- Half or Full face air purifying respirator
- Same as Level D, but also includes tyvek taped pant/boot and glove/shirt

If it is determined protection beyond Level C is required, HRP will re-evaluate the HASP, as well as, the site conditions and may revise the HASP as necessary.

7.0 DECONTAMINATION

7.1 Decontamination Procedures

All personnel and equipment leaving the exclusion zone must be properly cleaned and decontaminated. When there is evidence of chemical contamination during the site operations, all personnel will be decontaminated under the direction of the HSO. Cleanup and/or decontamination of personnel shall consist of washing off excessively soiled PPE with an Alconox detergent scrub and water. At the very least, all personnel should wash their hands and face before leaving the exclusion zone. After washing, all disposable clothing (tyvek, gloves, etc.) will be removed and placed in a double lined plastic bag. Waste paper towels will also be placed in the double lined plastic bag.

Heavy equipment, hand tools, and any other non-disposable items will be steam cleaned between sampling points, and at the direction of the HRP Geologist, to prevent cross contamination of work areas or environmental samples.

7.2 Emergency Decontamination

If immediate medical attention is required in an emergency, decontamination will be performed after the victim has been stabilized. If a worker has been exposed to an extremely toxic or corrosive material, then emergency decontamination will consist of flushing with copious amounts of water. If the victim can not be decontaminated because it will interfere with emergency medical aid being administered, then the victim should be wrapped with plastic or other available items (i.e. an uncontaminated coverall) to reduce potential contamination of other personnel or medical equipment.

If a site worker has been overcome by heat related illness, then any protective clothing should be removed immediately. In the case of non-medical emergency evacuation, decontamination should be performed as quickly as possible, unless instant evacuation is necessary to save life or prevent injury.

8.0 EMERGENCY ACTION PLAN

In the event of a worker injury, fire, explosion, spill, flood, or other emergency that threatens the safety and health of site workers, the following procedure will be followed.

1. If the emergency originates within the work area covered by this Plan, HRP's HSO shall act as the Emergency Coordinator. The emergency evacuation signal is an air horn or a loud yell. All emergency situations (including worker injuries, no matter how small) will be reported to the HSO, who will determine the appropriate emergency response, up to and including evacuation. Only the HSO may initiate evacuation of the work area. The HSO will be responsible for reporting any emergency situation to the appropriate authorities, using a telephone or other appropriate method.

2. In the case of an evacuation, site workers will exit the site along the safest route(s) and assemble with team members at the rally point (Figure 2). Those workers in the Exclusion Zone will follow the emergency decontamination procedures outlined in Section 7.2. Accounting of all site personnel will be conducted by the HSO using the personnel log at a location determined by the HSO.

3. HRP personnel are not permitted to participate in handling the emergency. Fire and medical emergencies will be handled by the local fire department and ambulance service. In the case of a spill of hazardous materials, one of the following commercial spill clean-up firms should be contacted:

    1. Op-tech Environmental
       Albany, NY (518) 452-9641

    2. Marcor Environmental
       Albany, NY (518) 456-5909

    3. Clean Harbors Environmental Services
       Glenmont, NY (518) 434-0149

In addition, the HSO/Project Manager must advise the site contact that the NYS Spill hotline should be contacted and, if the spill quantity is greater than the Reportable Quantity (RQ) under CERCLA and/or SARA, the National Response Center and Local Emergency Planning Committee should also be contacted.

If the spill begins to flow overland and threatens to contaminate a storm drain or surface water, HRP personnel may attempt to contain and isolate the spill using any available resources, but only if, in the judgement of the HSO, such action will not expose the workers to dangerous levels of hazardous substances and is necessary to preserve life or property.

4. Once initial emergency procedures to protect worker safety and health and control the emergency have been completed, the HSO will apprise the site contact and the HRP project manager of the nature of the emergency and the control actions taken. The HSO will also complete a Supervisor's Investigation Report form (a blank investigation report form is included as Appendix D) and submit this form to HRP's Project Manager and Health and Safety Manager within 24 hours.

5. All site workers will be familiarized with the above procedures during the pre-entry briefing to be conducted before site work begins.

9.0 TRAINING/MEDICAL SURVEILLANCE

9.1 Training Requirements

All HRP personnel who enter the work zone and/or Exclusion Zone must have successfully completed the 40 hour or 24 hour training requirement outlined in 29 CFR 1910(e). If the 40 hour or 24 hour training of any person occurred more than 12 months prior to commencement of work, then that person must have attended an 8 hour refresher course within the 12 months prior to commencement of work. If respirators are in use in the Exclusion Zone, then all personnel must have undergone respirator training and a fit test within the last 12 months. Training certificates and records for each HRP employee are on file at HRP.

9.2 Pre-Entry Briefing

Prior to commencement of work in area of suspected contamination, HRP's Health and Safety officer will conduct a pre-entry briefing with on-site HRP personnel:

- Name of the HSO and person responsible for the personnel log.
- Description of the parcel as well as location of emergency telephones and the location/boundaries of the Exclusion Zone, Contamination Reduction Zone, and Support Zone, if established.
- Review of hospital locations and directions.
- Review of tasks to be conducted within the parcel by the Contractor's personnel.
- Review of the Emergency Action Plan and rally point (Figure 2), including the nearest emergency communications and telephone numbers.
- The nature, level, and degree of anticipated hazards (physical, chemical, environmental, etc.) involved in the site work.
- Required personal protective equipment.
- Decontamination procedures.

The HSO should also, at this time, ensure that all on-site HRP personnel have read the HASP and signed the last page of the original (Section 11.0). If additional information on the site becomes available, the HSO will call additional briefings as necessary.

9.3 Medical Surveillance

All HRP personnel entering the Exclusion Zone must have had a physical within the 12 months prior to commencement of site work. A physician's written opinion regarding fitness for work for each HRP employee including work limitations, if any, is on file at HRP. Any work limitations for site personnel, or relevant medical information (i.e. allergic reactions to medication) should be listed below.

Limitations:

None known.

10.0 AUTHORIZATIONS

Personnel authorized to enter the Exclusion Zone include the personnel listed in Section 3.0. Persons not listed in Section 3.0 may enter the exclusion Zone only if the appropriate training and medical fitness certifications have been supplied to either the HRP Project Manager or the Health and Safety Manager and the HSO or his designee on-site has approved site entry. All personnel entering or leaving the Exclusion Zone must sign in and sign out with the record keeper. A personnel log is included in Appendix E.

11.0 FIELD TEAM REVIEW

All HRP personnel shall sign below after reading the HASP and before entering any exclusion zones as set forth by the contractor's site safety officer. Personnel shall agree with the following statement:

"I have read and understand this site specific Health and Safety Plan. I will comply with the provisions set forth therein."

Printed Name	Signature	Date

12.0 APPROVALS

By their signature, the undersigned certify that this HASP is approved and will be utilized during the observation of the removal of soil mixed with scrap metal debris from the site and the stockpiling of contaminated soil at the Scolite site located at 2 Madison Street in Troy.

_____ _____

Health and Safety Officer Date

_____ _____

Site Project Manager Date

_____ _____

Health and Safety Manager Date

ADDITIONAL APPROVALS (OR RE-APPROVALS)	
NAME	DATE

TABLE 1.0

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
1,1,1 Trichloroethane	44 ppm	350 ppm	350 ppm	---	700 ppm	Inh, Ing, Con	Head, Lass, CNS, Derm
1,1,2-Trichloroethane	---	10 ppm	10 ppm	----	[100 ppm]	Inh, Ing, Abs, Con	Eyes, Nose Irrit, Resp Irrit, CNS, Liver, Kidney Damage, Derm, [Carc]
1,2,4 Trimethylbenzene 1,3,5 Trimethylbenzene		25 mg/m^3	25 ppm	25 mg/m^3	ND	Inh, Ing, Con	Irrit Eyes, Skin, Nose, Throat, Resp Sys, Bron, Hyprochronic Anemia, Head, Drow, Ftg, Dizz, Nau, Inco, Vomit, Conf, Chemical Pneu (aspir lig)
1,1' Biphenyl	0.0062 mg/m^3	0.2 ppm	0.2 ppm	---	100 mg/m^3	Inh	
1,1-Dichloroethane	120 ppm	100 ppm	100 ppm	---	3,000 ppm	Inh, Ing, Con	CNS Depres, Skin Irrit, Liver, Lung and Kidney Damage
1,1-Dichloroethylene	500 ppm	---	5 ppm	---	---	Inh, Con	CNS depress, Resp, [Carc]
1,2-Dichlorobenzene	50 ppm	50 ppm	25 ppm		200 ppm	Inh, Ing, Abs, Con	Irrit, Resp
1,2-Dichloroethylene	26-87 ppm	200 ppm	200 ppm	---	1,000 ppm	Inh, Ing, Con	Vomit, Irrit Eyes, Resp Sys; CNS Depres
1,2-Dichloropropane	130-190 ppm	75 ppm	75 ppm	---	[400 ppm]	Inh, Con, Ing	Eye irritation, Drow, light-headedness; irritated skin, [Carc]
1,3-Dichlorobenzene	---	----	---	----	---	----	----
1,4-Dichlorobenzene	20 ppm	75 ppm	10 ppm	----	[150 ppm]	Inh, Ing	[Carc], Eye Irrit, swelling around eye, headache, nausea, vomiting
1-Methylnaphthalene	0.02 ppm	---	---	---	---	---	---
2,4-Dichlorophenol	1.4007 mg/m^3	---	---	---	---	---	---
2,4-Dimethylphenol	0.001 mg/m^3	---	---	---	---	---	---
2-Methylnaphthalene	0.01 ppm	---	---	---	---	---	---
2-Methylphenol (o-cresol) [skin]	1.4 mg/L	5 ppm	5 ppm	---	250 ppm	Inh, Abs, Ing, Con	Confusion, depression, Resp Fail; difficulty breathing, irregular rapid respiration, weak pulse; skin, eye burns; dermatitis
3, 3'-Dichlorobenzidine	---	None	**---**	---	---	Inh, Abs, Ing, Con	Sens, Derm, Head, Dizz, Burns, GI Upset, [Carc]
4-Isopropyltoluene	---	---	---	---	---	Con, Inh, Ing	Defat, Eryt
Acenephthene	0.5048 mg/m^3	---	---	---	---	---	---
Acenaphthylene	---	---	---	---	---	---	---

TABLE 1.0

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Acetone	47.5 mg/m^3	1,000 ppm	500 ppm		2,500 ppm	Ing, Inh, Con	Head, Dizz; Irrit Eyes, Nose, Throat; Derm, CNS, Depress, Derm
Acetonitrile	70 mg/m^3	40 ppm	20 ppm	---	500 ppm	Inh, Ing, Abs, Con	Asphy; Nau, Vomit; Chest Pain; Weak, Stupor, Convuls; Eye Irrit
Aldrin	---	0.25 mg/m^3	0.25 mg/m^3	---	25 mg/m^3	Inh, Abs, Ing, Con	Head, Dizz, Nau, Vomit, Mal, Myo, [Carc]
Anthracene (Coal Tar Pitch)	---	0.2 mg/m^3			[80 mg/m^3]	Inh, Con	Derm, bron, [carc]
Antifreeze		50 ppm	100 mg/m^3 (aerosol)	---	ND	Inh, Ing, Con	Irrit Eyes, Skin, Nose, Throat, Nau, Vomit, Abdom Pain, Lass, Dizz, Stup, Conv, CNS, Depres, Skin Sen
Arsenic	----	0.010 mg/m^3	0.01 mg/m^3	----	[5 mg/m^3]	Abs, Inh, Con, Ing	Derm; GI; Resp Irrit; ulceration of nasal septum; Resp, Irrit, Hyper Pig of Skin, [Carc]
Asbestos	----	0.1 f/cc	0.1 f/cc	----	----	Inh, Ing	Shortness of Breath, chest or abdominal pain, and irritation to the skin or eyes. [Carc]
Barium (elemental)	---	0.5 mg/m^3	0.5 mg/m^3		50 mg/m^3 (barium components)	Inh, Ing, Con	Resp. Irrit, GI, Muscle Spasm, Eye Irrit, Slow Pulse; skin burns
Benzene	4.7 ppm	1 ppm	0.5 ppm	5 ppm	[500 ppm]	Inh, Ing, Abs, Con	Irrit Eyes, Nose, Throat; Head, Nau, Derm, Ftg, Anor, Lass, [Carc]
Benzo(a)anthracene (coal tar pitch)	---	0.2 mg/m^3			[80 mg/m^3]	Inh, Con	[Carc], Derm, Bron
Benzo(a)pyrene (coal tar pitch)	---	0.2 mg/m^3	---		[80 mg/m^3]	Inh, Con	[Carc], Derm, Bron
Benzo(b)fluoranthene (coal tar pitch)	---	0.2 mg/m^3	---		[80 mg/m^3]	Inh, Con	[Carc], Derm, Bron
Benzo(g,h,i)perylene (coal tar pitch)	---	0.2 mg/m^3			[80 mg/m^3]	Inh, Con	[Carc], Derm, Bron
Benzo(k)fluoranthene (coal tar pitch)	---	0.2 mg/m^3			[80 mg/m^3]	Inh, Con	[Carc], Derm, Bron
Bis (2-ethylhexyl) Phthalate	N/A	5 mg/m^3	5 mg/m^3	10 mg/m^3	[5,000 mg/m^3]	Inh, Ing, Con	[Carc], Irrit Eyes

TABLE 1.0

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Cadmium (dust)	---	0.005 mg/m^3	Lowest concentration feasible 0.01 mg/m^3	---	[9 mg/m^3]	Inh, Ing	CNS, Resp, Irrit, Vomit, Cough, Head, Chills, Nau, Diarr, Pulm Edema, Dysp, Chest Tight, [Carc]
Carbazole	---	---	---	---	---	Inh	---
Carbon disulfide	0.1-0.2 ppm	20 ppm	1 ppm	30 ppm	500 ppm	Inh, Abs, Ing, Con	Diz, Head,Ftg, Ner, anorexia, trembling hands, loss of fine motor coord, gastritis, eye, skin burns, Derm
Carbon Tetrachloride	21.4 ppm	10 ppm	5 ppm	25 ppm	[200 ppm]	Inh, Abs, Con, Ing	CNS Depres, Nau, Vomit, Irrit, Irrit Eyes, Skin, Drow, Dizz, [Carc]
Chlorobenzene	0.98 mg/m^3	75 ppm	10 ppm	---	1,000 ppm	Inh, Ing, Con	Irrit, Drow, CNS, Depres, Eyes, Skin, Nose, Inco.
Chloroform	85 ppm	50 ppm	10 ppm	50 ppm	[500 ppm]	Inh, Ing. Con, Abs	Dizz, Dullness, Nau, Head, Ftg, Irrit Eyes, Skin, Conf, [Carc]
Chromium	---	1 mg/m^3	0.5 mg/m^3	---	250 mg/m^3	Inh, Ing, Con	Irrit Eyes, Sens Derm
Chrysene (coal tar pitch)		0.2 mg/m^3	---		[80 mg/m^3]	Inh, Con	Derm, Bron, [Carc]
Cis-1-2-Dichloroethylene	---	200 ppm	200 ppm	----	1000 ppm	Inh, Con, Ing	Irrit Eyes, Resp, CNS Depress
Copper (dusts and mists) (fumes)		1 mg/m^3 0.1 mg/m^3	1 mg/m^3 0.2 mg/m^3	----	100 mg/m^3	Inh, Ing, Con	Vomit, Derm, CNS, Irrit, Derm, Nau, Taste (metallic)
Cyanide	0.9 mg/m^3	5 mg/m^3	5 mg/m^3 (10 min)	5 mg/m^3	25 mg/m^3	Inh, Ing, Abs, Con	Weak, Head, Nau, Conf, Cyan
Dibenzo(a,h)anthracene						Inh, Ing	
Dichloromethane	540 mg/m^3	25 ppm	50 ppm	125 ppm	[2,300 ppm]	Inh, Abs, Ing, Con	Irrit Eyes, Skin, lass, drow, dizz, Numb, tingl, Nau, [Carc]
Diethylphthalate	---	None	5 mg/m^3	---	N.D.	Inh, Ing, Con	Irrit Eyes, Skin, Nose, Throat, Head, Dizz, Nau, Lac, Possible Polyneur, Vestibular Dysfunc, Pain, Numb, lass, Spasms in Arms and Legs
Di-n-octylphthalate	---	---	---	---	---	Inh, Ing, Con	---
Dimethylpthalate	---	5 mg/m^3	5 mg/m^3	---	2,000 mg/m^3	Inh, Ing, Con	Irrit, Resp, Abdom
Ethyl Benzene	8.7 mg/m^3	100 ppm	100 ppm	125 ppm	700 ppm	Inh, Abs, Con	Head. Irrit, Derm, Narc., Irrit Eyes, Skin; Coma

TABLE 1.0

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Fluoranthene		0.2 mg/m^3	0.2 mg/m^3			Ing, Inh	[Carc]
Fluorine	6 mg/m^3	0.1 ppm	1 ppm	2 ppm	25 ppm	Inh, Con	
Fuel Oil/#2	----	----	300 ppm	----		Inh, Abs, Ins, Con	Irrit Eyes, Skin, Derm, Head, Ftg, Blurred Vision, Dizz, Conf
Fuel Oi/Gasoline	----	----	300 ppm	----		Inh, Abs, Ins, Con	Irrit Eyes, Skin, Derm, Head, Ftg, Blurred Vision, Dizz, Conf
Ideno(1,2,3-cd)pyrene		0.2 mg/m^3				Ing, Inh	
Iron (as iron oxide)	---	10 mg/m^3		---	2,500 mg/m^3	Inh	Benign Pneumoconiosis
Lead	---	0.2 mg/m^3	0.05 mg/m^3	---	100mg/m^3	Ing, Inh, Con	Irr, Cns, Vomit, Narco, Weak, Pall, Insom, Lass, Abdom, Constip, Anor, Anemia
Lead (inorganic forms and dust as Pb)		0.05 mg/m^3	0.05 mg/m^3		100 mg/m^3	Inh, Ing, Con	Irrit, Cns, Vomit, Narco, Weak, Pall, Insom, Lass, Abdom, Constip
Mercury (organic alkyl compounds) [skin]		0.01 mg/m^3	0.01 mg/m^3	0.03 mg/m^3	2 mg/m^3	Inh, Abs, Ing, Con	Irrit Eyes, Skin; Cough & Chest Pain, Bron Pneatis, Tremor, Insom, Irrty, Indecision, Head, Ftg, Weak, Stomatitis, Salv, GI Dist, Anor, Low-wgt, Ataxia
Mercury (compounds)	----	0.1 mg/m^3	0.025 mg/m^3	0.1 mg/m^3	10 mg/m^3	Inh, Abs, Ing, Con	Irrit Eyes, Skin; Cough & Chest Pain, Bron Pneatis, Tremor, Insom, Irrty, Indecision, Head, Ftg, Weak, Stomatitis, Salv, GI Dist, Anor, Low-wgt, Ataxia
Mercury (vapor)	----	0.1 mg/m^3	0.025 mg/m^3	0.1 mg/m^3	28 mg/m^3	Inh, Abs, Ing, Con	Irr Eyes, Skin; Cough & Chest Pain, Bron Pneatis, Tremor, Insom, Irrty, Indecision, Head, Ftg, Weak, Stomatitis, Salv, GI Dist, Anor, Low-wgt, Ataxia
Methanol	13.1150 mg/m^3	200 ppm	200 ppm	---	6,000 ppm	Inh, Abs, Ing, Con	Irrit Eyes, Skin, Resp, Head, drow, dizz, Nau, Vomit, vis dist, Optic, derm
Methyl Ether	----	----	---	----	---	Inh	Poison
Methyl Ethyl Ketone (2-Butanone)	0.7375 mg/m^3	200 ppm	200 ppm	300 ppm	3,000 ppm	Inh, Con, Ing	Irrit Eyes, Skin, Nose, Throat, Head, Dizz, Vomit, Derm

TABLE 1.0

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Methylene Chloride	540 mg/m^3	25 ppm	50 ppm	125 ppm	[2,300 ppm]	Inh, Ing, Con, Abs	Ftg, Weak, dizz, drow, Numb, Tingle [carc], Irrit Eyes, Skin, Nau
Mineral Spirit	20 ppm	500 ppm	100 ppm	---	20,000 mg/m^3	Inh, Ing, Con	Irrit Eyes, Nose, Throat, Dizz, Derm, Chemical pneu
Methyl tert butyl ether (MTBE)	---	---	50 ppm	---		Inh, Abs	
Naphtha	0.86 ppm	100 ppm	400 ppm	---	1,000 ppm	Inh, Con, Ing	Light Head, Drow, Irrit, Derm, Irrit Eyes, Skin, Nose
Naphthalene	0.084 ppm	10 ppm	10 ppm	15 ppm	250 ppm	Inh, Abs, Ing, Con	Eye irritation; headache; confusion, excitement, malaise (vague feeling of ill-being); nausea, vomiting, abdominal pain; irritated bladder; profuse sweating; renal shutdown; dermatitis
Nickel (metal)	---	1 mg/m^3	1.5 mg/m^3	---	[10 mg/m^3]	Inh, Ing, Con	Head, Vert, Nau, Vomit, Pain, Cough, Weak, Convuls, Delirium, Pheuitis, Hyperpneo,[Carc]
Nitrobenzene	0.0235 mg/m^3	1 ppm	1 ppm	---	200 ppm	Inh, Abs, Ing, Con	Irrit Eyes, Skin, Anoxia, Derm, Anem, Methem
n-Butylbenzene	---	---	---	---	---	---	---
n-Propylbenzene	---	---	---	---	---	---	---
PCBs 42% chlorine (Aroclor 1242)	---	1 mg/m^3 (skin)	1 mg/m^3 (skin)	---	[5 mg/m^3]	Inh, Abs, Ing, Con	Irrit Eyes, Chloracne, Liver Damage [carc]
PCBs 54% chlorine (Aroclor 1254)	---	0.5 mg/m^3 (skin)	0.5 mg/m^3 (skin)	---	[5 mg/m^3]	Inh, Abs, Ing, Con	Irrit Eyes; Chloracne, Liver Damage [carc]
Petroleum Distillates	---	500 ppm	100 ppm		[1,100 ppm]	Inh, Ing, Con	Dizz, Drow, Head, Dry Skin, Nau, Irrit Eyes, Nose, Throat, [Carc]
Phenanthrene (Coal Tar Pitch)		0.2 mg/m^3	0.2 mg/m^3		[80 mg/m^3]	Inh, Con	Derm, bron, (carc)

TABLE 1.0

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Phenol	0.1786 mg/m^3	5 ppm	5 ppm	---	250 ppm	Inh, Abs, Ing, Con	Irrit Eyes, Nose, Throat, Anor, Low Wgt, Weak Musc Ache, Pain, Dark Urine, Cyan, Liver, Kidney Damage, Skin, Burns, Derm, Chronosis, Tremor, Convuls, Twitch
Pyrene		0.2 mg/m^3			[80 mg/m^3]	Inh, Con	[Carc]
Sec-Butylbenzene	---	---	---	---	---	---	---
Selenium	N/A	0.2 mg/m^3	0.2 mg/m^3	Unknown	1 mg/m^3	Inh, Ing, Con	Irrit, Head, Fever, Chills, Skin/Eye Burns, Metallic Taste, GI, Dysp, Bron
Silver (metal and soluble compounds as Ag)	----	0.01 mg/m^3	Metal = 0.1 mg/m^3 Soluble 0.01 mg/m^3		10 mg/m^3	Inh, Ing, Con	Blue-gray Eyes, Nasal Septum, Throat, Skin; Irrit, Ulcer, Skin, GI Dist
Tetrachloroethene		100 ppm		200 ppm		Con, Inh, Ing	Vom, CNS, Resp, Irr, Card Ar
Tetrachloroethylene (a.k.a. perchloroethylene)	4.68 ppm	100 ppm	25 ppm	200 ppm	[150 ppm]	Inh, Ing, Con, Abs	Irrit Eyes, Skin, Nose, throat, Resp. Nau, flush face, Neck, dizz, inco, head, drow, eryth, [Carc]
Toluene	2.14 ppm	200 ppm	50 ppm	300 ppm	500 ppm	Inh, Abs, Ins, Con	Resp, Irrit, Ftg, Conf, Dizz, Head, Derm, Euph, Head, Dilated Pupils, Lac, Ner, Musc FTs, Insom, Pares, Derm, lass
Petroleum Distillates (naphtha)	10 ppm	100 ppm	400 ppm	---	1,000 ppm	Con, Inh, Ing	---
Trans 1,2-Dichloroethylene	0.3357 mg/m^3	200 ppm	200 ppm	---	1,000 ppm	Inh, Con	Irrit, Resp, CNS depress
Trichloroethylene	21.4 ppm	100 ppm	50 ppm	200 ppm	[1,000 ppm]	Inh, Con, Abs, Ing	Head, Vert, Nau, Vomit, Derm, Vis Dist, Tremors, Som, Nau, Irrit Eyes, Skin, Card Acc., Ftg, [Carc]
Trichlorofluoromethane	28 mg/m^3	1,000 ppm	1,000 ppm		2,000 ppm	Inh, Con, Ing	Inco, trem, derm, card, asph, frost
Trichlorotrifluoroethane	45 ppm	1,000 ppm	1,000 ppm	1,250 ppm	2,000 ppm	Inh, Con, Ing	Irrit Skin, throat, Drow, Derm, CSN, Depress

TABLE 1.0

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Vinyl Chloride	10-20 ppm	1 ppm	1 ppm	5 ppm	ND	Inh, Con	Lass, Abdom, Gi Bleeding; Hepatomegaly; Pallor or Cyan of Extremities; Liq: Frostbite; [Carc]
VM&P Naphtha (petroleum naphtha)	---	---	300 ppm	---	ND	Con, Ing, Inh	Irrit Eyes, Nose, Throat, Dizz, drow, head, nau, dry skin, chem. Pneumonitis
Varnish/Xylene	----	100 ppm	100 ppm	150 ppm		Ing, Abs, Ing, Con	Irrit, Dizz, Cough, Vomit, Nau, DermZ
Vinyl Chloride	10-20 ppm	1 ppm	1 ppm	5 ppm		Inh, Con	Weak; Abdom Pain, Gi Bleeding; Hepatomegaly; Pallor or Cyan of Extremities; Liq: Frotbite;[carc]
Zinc (oxide)	---	5 mg/m^3	2 mg/m^3	---	500 mg/m^3	Inh	Dry Throat, Cough, Chills, Tight Chest, Blurred Vision
4,4' DDD	---	---	---	---	---	Ing, Inh, Con	---
4,4' DDE	---	---	---	---	---	Ing, Inh, Con	---
4,4' DDT	5.0725 mg/m^3	1 mg/m^3	1 mg/m^3	---	[500 mg/m^3]	Inh, Abs, Ing, Con	Irrit Eyes, Skin, Pares, Tongue, Lips, Face, Trem, Anxi, Dizz, Conf, Mal, Head, Lass, Conv, Paresi Hands, Vomit, [Carc]
Aldrin		0.25 mg/m^3	0.25 mg/m^3	---	[25 mg/m^3]	Inh, Abs, Ing, Con	Head, Dizz, Nau, Vomit, Mal, Myo [Carc]
Chlordane [skin]	0.0084 mg/m^3	0.5 mg/m^3	0.5 mg/m^3		[100 mg/m^3]	Inh, Abs, Ing, Con	Blurred vision, confusion, delirium, cough; abdominal pian, nausea, vomiting diarrhea; irritability, tremor, convulsions [Carc]
EDB	76.8 mg/m^3	20 ppm		30 ppm	[100 ppm]	Inh, Abs	Resp. Irr, Eye Irr. [Carc]
Endosulfan I Endosulfan II	---	0.1 mg/m^3	0.1 mg/m^3	---	N.D.	Inh, Abs, Ing, Con	Irrit, Skin, Nau, Conf, Agit, Flush, Dry, Trem, Conv, Head
Endosulfan Sulfate		---	0.1 mg/m^3	---	---	Ing, Con	---
Endrin	1.8 x 10^{-2} ppm	0.1 mg/m^3	0.1 mg/m^{-3}	---	2 mg/m^3	Inh, Abs, Ing, Con	Epil Conv, Stup, Head, Dizz, Abdom, Nau, Vomit, Insom, Agress, Conf, Drow, Lass, Anor
Endrin Aldehyde	1.8 x 10^{-2} ppm	---	---	---	---	Inh, Con	---
Endrin Ketone	---	---	---	---	---	---	---

TABLE 1.0

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Heptachlor	0.02 ppm	0.5 mg/m^3	0.05 mg/m^3	---	[35 mg/m^3]	Inh, Abs, Ing, Con	In animals, Trem, Conv, [Carc]
Heptachlor epoxide	0.02 ppm	---	0.05 mg/m^3	---	---	Ing, Inh	Trem, Conv, [Carc]
Hydrogen Cyanide(Hydrocyanic Acid)	0.9 mg/m^3	10 ppm (11 mg/m^3)	4.7 ppm	4.7 ppm	50 ppm	Con, Inh, Ing, Abs	Asphy & death at high levels; Weak, Head, Conf, Nau, Vomit, Incr. Rate and Depth of Respiration or Respiration Slow and Gasping

NOTES

[1]PEL = Permissible Exposure Limit. If no PEL is available, then the NIOSH Threshold Limit Value (TLV) should be used, if available.

[2]Ceiling limit or Short Term Exposure Limit (STEL), if available. Again, the NIOSH TLV may be used if no OSHA standard exists.

[3]Abbreviations are contained on the next page

[ ] = Potential Occupational Carcinogen

ND = Not Been Determined

ABBREVIATIONS

abdom = Abdominal
abs = Absorption
aggress = Agressiveness
agit = Agitation
anor = Anorexia
anos = Anosmia (loss of the sense of smell)
Anxi = anxiety
anem – Anemia
aspir = Aspiration
asph – asphyxia
bron = Bronchitis
[carc] = Potential occupational carcinogen
Card = Cardiac arrhythmias
CNS = Central nervous system
conf = Confusion
constip = Constipation
con = Skin and/or eye contact
conv = Convulsions
corn = Corneal
defat = Defatting
depres = Depressant/Depression
derm = Dermatitis
diarr = Diarrhea
dist = Disturbance
dizz = Dizziness
drow = Drowsiness
dry = Dry mouth
dysp = Dyspnea (breathing difficulty)
emphy = Emphysema
epil-conv = Epileptiform convulsions
eryth = Erythema
euph = Euphoria
fib = Fibrosis
frost = frostbite
ftg = Fatigue
flush = Flushing
GI = Gastrointestinal
head = Headache
hyperpig = Hyperpigmentation
inco = Incoordination
ing = Ingestion
inh = Inhalation
inj = Injury
insom = Insomnia
irrit = Irritation
lac = Lacrimination (discharge of tears)
lass = Lassitude (weakness, exhaustion)
li-head = Lightheadedness
liq = Liquid
low-wgt = Weight loss
mal = Malaise (vague feeling of discomfort)
malnut = Malnutrition
methem = Methemoglobinemia
myo = Myochonic (jerks of limbs)
mg/m = milligrams/cubic meter
muc memb = Mucous membrane
narco = Narcosis
nau = Nausea
ner = Nervousness
numb = Numbness
optic = Optic nerve damage (blindness)
parap = Paralysis
ppm = Parts per million
pares = Paresthesia
paresi = Paresis
peri neur = Peripheral neuropathy
pneu = Pneumonia
prot = Proteinuria
pulm = Pulmonary
peri neur = Peripheral neuropathy
pneu = Pneumonia
prot = Proteinuria
pulm = Pulmonary
repro = Reproductive
resp = Respiratory
skin sen = skin sensitization
som = Somnolence (sleepiness unnatural drowsiness)
subs = Substernal (occurring beneath the sternum)
stup = Stupor
sys = System
tingle = tingle limbs
trem - Tremors
vis dist = Visual disturbance
vomit = Vomiting
weak = Weakness

TABLE 2.0

PERSONNEL ASSIGNMENTS

Site Manager	Health & Safety Officer (HSO)	Security Officer (SO) Recordkeeper	HSO/SO Designated Alternate	Field Team Members / Company	Public Information Officer
Cailyn Dinan	Jeff Sotek or designated alternate	Cailyn Dinan or Matt Finkenbinder or designated alternate	Edward Bell or Lyman Tinc	Ed Bell, HRP, Cailyn Dinan HRP Lyman Tinc, HRP Matt Finkenbinder, HRP	Bill Roehr, Dept. Planning Commissioner, City of Troy
PERSONNEL RESPONSIBILITIES					
• General project supervisor and director of hazardous waste operations	• Implementation of HASP/CWP • Stop work if poor work practices or conditions endanger worker health & safety • Act as Emergency Coordinator if necessary • Provide pre-entry briefing	• Maintain site records • Enforce site control program	• Perform HSO/SO duties if so designated	• Perform site work tasks	• Provide public information as necessary

Modified level D personal protective equipment is suitable to protect against the anticipated hazards at this site. This equipment is listed below. ***Prior to entry and periodically throughout the duration of the project, the HSO must confirm that this level of protection is appropriate through air monitoring and evaluation of identified hazards.***

TABLE 3.0 – Personal Protective Equipment

WORK TASK	MINIMUM PROTECTIVE EQUIPMENT												
	Work Clothes	Steel Toe Shoes	Work Gloves	Chem. Resistant Gloves[1]	Saf ety Glasses	Hearing Protection	Tyvek	Apron	Hard Hat	Face Shield	Fall Protection[2]	Visibility Vest	Respirator
SAMPLING/ROUTINE TASKS													
Air Sampling	X	X		X									
Asbestos Remediation	X	X	X		X		X		X				X
Asbestos Sampling	X	X	X		X								X
Bridge Inspection/Const. Supervision	X	X				X			X				
Drilling	X	X		X	X	X			X				
Drum Sampling & Moving	X	X	X	X	X				X	X			
Ground Water Sampling (MW,RW)	X	X		X	X								
Hand Sampling (shovel, auger)	X	X	X	X									
Landfill Sampling (soil, sediment, gw, sw, leachate)	X	X		X	X		X						
Phase 1 Site Inspection	X	X											
Probing	X	X		X	X	X			X				
Product Sampling (RW)	X	X		X	X		X						
Remediation Monitoring (air systems)	X	X		X	X	X							
Remediation Monitoring (water systems)	X	X	X	X	X	X							
Soil Gas Sampling	X	X		X	X								
Stack Testing	X	X		X					X		X		
Stormwater Sampling	X	X		X									
Surface Water Sampling	X	X		X	X								
Surveying	X	X											
Wastewater Sampling	X	X		X	X								
Wastewater Benchmark Test	X	X		X	X			X		X			
CHEMICAL HANDLING													
Filling Decon Bottles	X	X			X			X					
Soil Sample Disposal	X	X		X	X								
POWER EQUIPMENT													
Circular Saw	X	X			X	X							
Concrete Core Machine	X	X	X		X	X							
Drill Press	X	X			X	X							
Generators	X	X	X		X	X							
Industrial Vacuum	X	X	X		X	X							
Pavement Saw	X	X	X		X	X							
Power Equipment (handrills, grinder, etc.)	X	X	X		X	X							
Power Washer	X	X		X	X	X							
Regenerative Blowers/Air Compressors	X	X	X		X	X							
Rotary Percussion Hammer	X	X	X		X	X							
Sawzall	X	X			X	X							

Notes: Minimum protective equipment means the minimally acceptable protective gear to be donned when performing or using the equipment listed above. Additional protective equipment (i.e. respirators) may be required as described in the site specific health and safety plan or based on the anticipated hazards associated with the project. Work clothes include long pants, short or long sleeve shirt and other winter clothing. If upgrade to level C respiratory protection is necessary the appropriate respirator cartridges will provide protection against hydrogen sulfide and volatile organics, but not oxygen deficient atmospheres due to methane gas displacement of ambient air.

[1]The type of chemical resistant glove (i.e. disposable rubber, nitrile, other) must be selected based on the anticipated chemical hazards.

[2]Must be reviewed on a case by case basis.

USGS **Troy, New York, United States** 01 Jul 1995

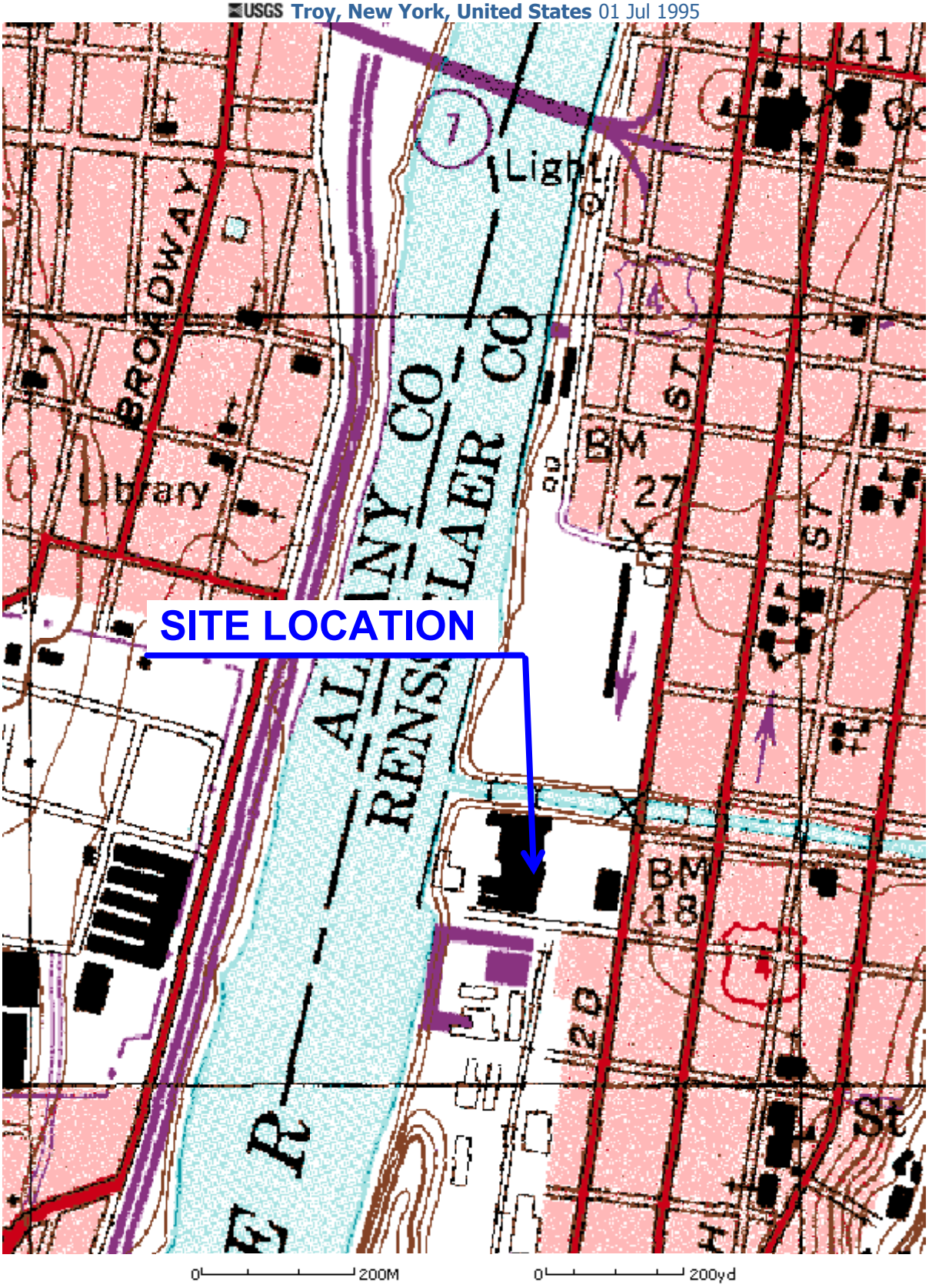


FIGURE 1

SITE LOCATION

FORMER SCOLITE SITE

2 MADISON STREET

TROY, NY

HRP# TRO2004.P2

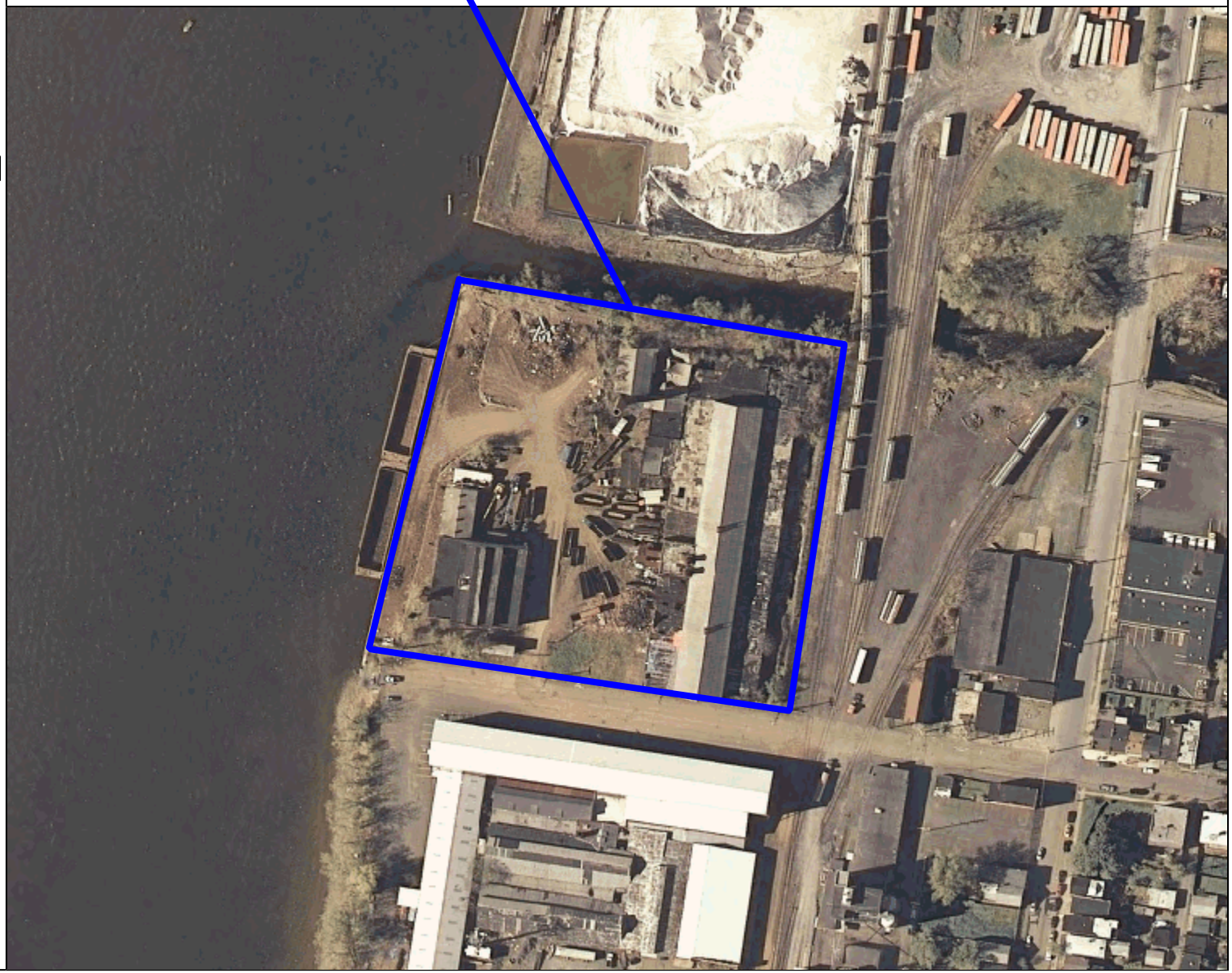
Overview

Map Layers

0 100 200

feet

SITE



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Google Maps

Directions to Samaritan Hospital
2215 Burdett Ave, Troy, NY 12180 - (518) 271-3300
2.3 mi – about **8 mins**

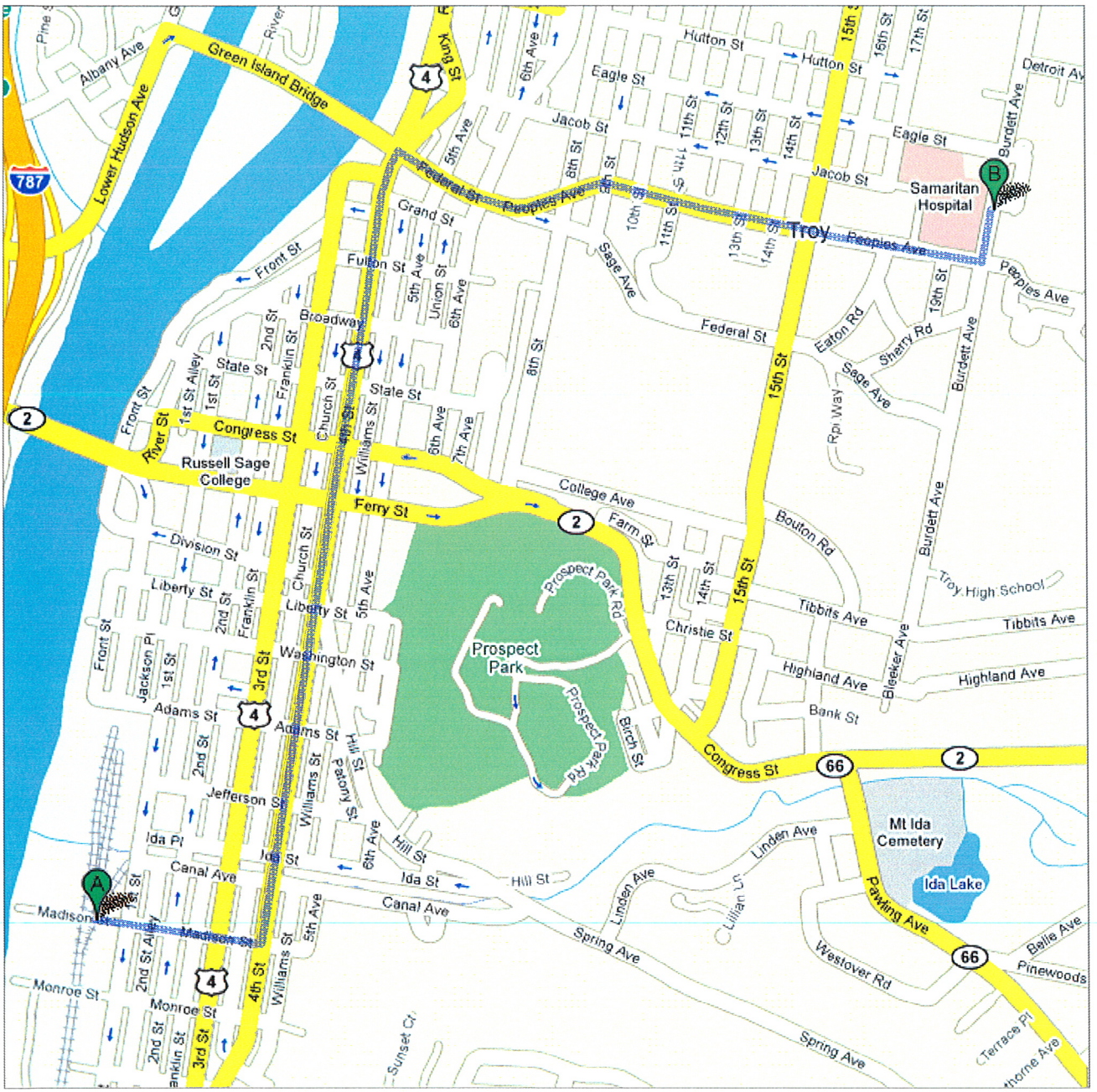

FIGURE 1
SITE LOCATION
FORMER SCOLITE SITE

SITE LOCATION

A 2 Madison St, Troy, NY 12180

1.	Head **east** on **Madison St** toward **1st St** About 2 mins	go 0.2 mi total 0.2 mi
2.	Turn **left** at **4th St/US-4** Continue to follow US-4 About 3 mins	go 1.1 mi total 1.4 mi
3.	Turn **right** at **Federal St**	go 0.2 mi total 1.5 mi
4.	Slight **left** at **Peoples Ave** About 2 mins	go 0.7 mi total 2.2 mi
5.	Turn **left** at **Burdett Ave** Destination will be on the left	go 394 ft total 2.3 mi

B Samaritan Hospital
2215 Burdett Ave, Troy, NY 12180 - (518) 271-3300

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

APPENDIX A

Health and Safety SOPs

6.0 STANDARD OPERATING PROCEDURES

6.1 Introduction/Scope

This section sets forth the Standard Operating Procedures (SOP's) that are to be used on all HRP sites when applicable (regardless of regulatory status), with the exception of SOP 7.2.4 Buddy System, which, because of personnel availability, scheduling and budget constraints, is only required on 1910.120 sites. These SOP's have been developed in order to minimize worker injuries and exposure to hazardous chemicals, and therefore are not to be modified in the field, except when authorized in writing by the Health and Safety Manager (HSM).

The SOP's which follow are broken into two groups: General SOP's and Site-Specific SOP's. General SOP's will always be applicable to every site. Site-specific SOP's will be applicable on various sites depending on the activities to be conducted.

6.2 General SOP's

6.2.1 Incident Investigation and Reporting

Although HRP strives to have an accident and incident free workplace, it is recognized that from time to time incidents which cause injury, lost work time, or equipment damage can occur. As part of the Program, investigations of all incidents will be conducted so that prevention measures can be taken to minimize or eliminate future occurrences.

All incidents, regardless of severity, must be reported to the respective Project Manager by the involved employee using HRP's Supervisor's Investigation Report Form (included as Appendix C). Incidents which do not cause injury or equipment damage, but could have, if circumstances had been slightly different (i.e. near misses) shall also be reported. Also, the Project Manager shall notify the Accounting Manager and OHSM of the incident. The Project Manager shall then complete the Supervisor's Investigation Report Form with the affected employee(s). Incident investigations will address the following items:

- Description of incident (near miss, equipment damage, personal injury);
- Timing;
- Interview of witnesses/injured;
- Nature of injury;
- Body part injured;
- Accident type;
- Hazardous condition;
- Equipment, etc. involved in accident;
- Unsafe act;
- Contributing factors;
- Identification of corrective measures; and
- Written report.

Table 6-1 is a list of descriptions of the terms listed above which should be used in completing the investigation.

Depending on the severity of the incident, further investigation may be conducted by the Principal or OHSM. All Supervisor's Investigation Report Forms will be maintained at each office and forwarded to the Accounting Manager. Supervisor's Investigation Report Forms will also be reviewed on a quarterly basis by HRP's Health and Safety Committee.

6.2.2 Engineering Controls/Work Practices

Engineering controls and work practices will be used as the preferred means to reduce and maintain employee exposure at or below the permissible exposure limits (PELs) to the maximum extent practical for substances listed in 29 CFR 1910 Subpart G and Z. This includes, but is not limited to:

- Using pressurized cabs or control booths on equipment;
- Using remotely operated material handling equipment;
- Removing all non-essential employees from potential exposure during the opening of drums; or
- Wetting down dusty operations;
- Using local exhaust systems to remove air contaminants; or
- Locating employees upwind of possible airborne hazards.

If engineering controls and work practices are not feasible, then any reasonable combination of engineering controls, work practices and personal protective equipment should be used to reduce and maintain employee exposure at or below the PELs for substances listed in 29 CFR 1910 subpart G and Z and/or ACGIH Threshold Limit Values.

TABLE 6-1

INCIDENT INVESTIGATION DESCRIPTIONS

HRP ASSOCIATES, INC.
FARMINGTON, CONNECTICUT

NATURE OF INJURY/DAMAGE			
Foreign body	Strain and sprain	Amputation	
Dermatitis	Cut	Fracture	
Puncture wound	Bruises, contusions	Burns	
Hernia	Abrasions	Equipment Damage	
PART OF BODY			
HEAD & NECK	UPPER EXTREMITIES	BODY	LOWER EXTREMITIES
Scalp	Shoulder	Back	Hips
Eyes	Upper Arm	Chest	Thighs
Ears	Elbow	Abdomen	Legs
Mouth, teeth	Forearm	Groin	Knee
Neck	Wrist	Other	Ankle
Face	Hand		Feet
Skull	Fingers		Toes
Other	Other		Other
ACCIDENT TYPE			
Struck Against	Struck By	Overexertion	
Caught In or On	Fall same level	Fall different level	
Slip, Trip	Inhalation	Absorption	
Ingestion	Contact with temp. extreme		
	Contact with electrical current		
HAZARDOUS CONDITION			
Inadequate guard	Defective Tool	Hazardous Arrangement	
No guard	Unsafe design	Illumination	
Ventilation	Dress	Housekeeping	
Congested area	Other		
EQUIPMENT			
Machine	Conveyor	Hoists, Cranes	Chemicals
Vehicles	Hand tools	Elevators	Building
Floor	Stairs	Ladders	Scaffolds
Electrical	Pressure		
UNSAFE ACT			
Unsafe Speed	No training	Safety devices made inoperative	
Unsafe lifting	Unsafe position	Use of defective equipment	
Housekeeping	Lockout/tagout	Failure to use equipment	
CONTRIBUTING FACTORS			
Disregard instructions		Bodily defects	
Lack knowledge/skill		Act of Other individual	
Failure to report to medical department		Other	

6.2.3 Personal Hygiene/Habits

Eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of material in any area designated as contaminated is strictly prohibited. The wearing of contact lenses in the exclusion zone or in conjunction with respiratory protection is also prohibited.

Contact with contaminated surfaces or with surfaces suspected of being contaminated shall be avoided. Whenever possible, site personnel should not walk through puddles, areas of vegetative stress, mud, or other discolored surfaces. They should not kneel on the ground or lean, sit or place equipment on drums, containers, vehicles, or the ground. All personnel must wash an affected area immediately after obvious contact with a hazardous substance and notify their Project Manager.

6.2.4 Illumination/Sanitation

Illumination of work areas is extremely important, as lack of adequate illumination can be the cause of accidents and mistakes. The minimum illumination intensities specified in 1910.120(m) will be followed on all sites.

If potable (drinking) water is not available on site, then potable water containers will be brought by HRP personnel. Potable water containers will be capable of being tightly closed and equipped with a tap, unless each employee is provided with his/her own container, in which case the container only need be capable of being tightly capped. Dipping of water from containers is prohibited. All containers used for potable water should be clearly marked as such and not used for any other purpose. Any non-potable water supplies on-site should also be clearly marked as non-potable.

If toilet facilities are not provided at a site, and site workers do not have transportation to a nearby toilet facility, then temporary toilets will be provided as outlined in 1910.120(n)(3). If wash facilities are not available at the site, then temporary wash facilities will be provided at the site as outlined in 1910.120(n)(6).

Food handling, temporary sleeping quarters and showers and change rooms, when provided or required to be provided, will conform to the requirements set forth in 1910.120(n), and any other applicable regulations, as referenced therein.

6.2.5 Site Communications

The establishment of an effective communication system for a project is an essential element for the safety of site personnel. The type of communication to be used between site workers and with off-site support and emergency personnel will be specified in the HASP. Methods of communication can include (but are not limited to) verbal, hand or other signals, via radio and/or via telephone. Where signals are used, including the emergency evacuation signal,

their meanings will be agreed upon and stated in the HASP prior to the commencement of site work. While the HSO will be responsible for communication with outside support and emergency personnel, all site personnel should know the location of the nearest telephone and how to obtain an outside line in order to summon assistance. It should be noted that a cellular telephone or other non-intrinsically safe communication devices shall not be used in the vicinity of operations where flammable atmosphere may be present.

6.2.6 Site Hazard Communication

OSHA hazard communication regulations require that all site personnel be educated and trained regarding the proper handling, labeling, use and dangers of hazardous substances (as defined by OSHA) encountered in the work place. All HRP employees have been trained in accordance with the standard, and it is expected that all subcontractor and client employees have also been properly trained in accordance with the standard. Transfer of hazard communication information to the client regarding any hazardous substances which HRP may bring on-site is included as Item 10 of HRP's standard "Terms and Conditions". It is the responsibility of the Project Manager of every job to ensure that the hazardous substances to which HRP employees may be exposed is provided by the client. In cases of work which is done without a signed Agreement (for whatever reason), then the Project Manager must ensure that the transfer of hazard communication information from HRP to the client and vice-versa prior to the commencement of site work occurs through the sending a copy of the form letter as shown in Appendix D to the client. In a similar manner, transfer of hazard communication information to any subcontractor present on site, whether or not hired by HRP, must also occur through the subcontractor form letter also included in Appendix D.

6.2.7 Personal Protective Equipment

Protective equipment, including personal protective equipment for eyes, face, hand and extremities, protective clothing and respiratory protection, will be required whenever conditions are encountered which are capable of causing injury or impairment in the function of any part of the body throughout absorption, inhalation or physical contact. This covers hazards of process or environment, including chemical, electrical, radiological or mechanical hazards. When protective equipment is required, it will be equipment which meets the applicable standards set forth in 29 CFR 1910 subpart I and used and maintained in a sanitary and reliable condition.

Specific programs for respiratory protection and protective clothing are provided in Sections 8.0 and 9.0 of this Program.

TABLE 6-2

EYE AND FACE PROTECTOR SELECTION GUIDE

HRP ASSOCIATES, INC

Operation	Hazard	Recommended Protectors
Acetylene—Burning, Acetylene--Cutting, Acetylene--Welding	Sparks, harmful rays, molten metal, flying particles	7, 8, 9
Chemical Handling	Splash, acid burns, fumes	2, 10 (for severe exposure add 10 over 2)
Chipping	Flying particles	1, 3, 4, 5, 6, 7A, 8A
Electric (arc) welding	Sparks, intense rays, molten metal	9, 11, (11 in combination with 4, 5, 6, in tinted lenses, advisable)
Furnace operations	Glare, heat, molten metal	7, 8, 9 (For severe exposure add 10)
Grinding—Light	Flying particles	1, 3, 4, 5, 6, 10
Grinding—Heavy	Flying particles	1, 3, 7A, 8A (for severe exposure add 10)
Laboratory	Chemical splash, glass breakage	2 (10 when in combination with 4, 5, 6)
Machining	flying particles	1, 3, 4, 5, 6, 10
Molten metals	Heat, glare, sparks, splash	7, 8 (10 in combination with 4, 5, 6, in tinted lenses)
Spot welding	Flying particles, sparks	1, 3, 4, 5, 6, 10

1. Goggles, Flexible Fitting, Regular Ventilation
2. Goggles, Flexible Fitting, Hooded Ventilation
3. Goggles, Cushioned Fitting, Rigid Body
*4. Spectacles, Metal Frame, with Sideshields
*5. Spectacles, Plastic Frame, with Sideshields
*6. Spectacles, Metal-Plastic Frame, with Sideshields
**7. Welding Goggles, Eyecup Type, Tinted Lenses
7A. Chipping Goggles, Eyecup Type, Clear Safety Lenses
**8. Welding Goggles, Coverspec Type Tinted Lenses
8A. Chipping Goggles, Coverspec Type, Clear Safety Lenses
**9. Welding Goggles, Coverspec Type, Tinted Plate Lens
10. Face Shield (Available with Plastic or Mesh Window)
**11. Welding Helmets

* Non-side shield spectacles are available for limited hazard use requiring only frontal protection.

** See Filter Lens Shade Numbers for Protection Against Radiant Energy below.

TABLE 6-2
(continued)
EYE AND FACE PROTECTOR SELECTION GUIDE

HRP ASSOCIATES, INC

Operation	Hazard	Recommended Protectors
FILTER LENS SHADE NUMBERS FOR PROTECTION AGAINST RADIANT ENERGY		
Welding Operation		**Shade Number**
Shielded metal-arc welding 1/16, 3/32, 1/8, 5/32 – inch diameter electrodes		10
Gas-shielded arc welding (nonferrous) 1/16, 3/32, 1/8, 5/32 inch diameter electrodes		11
Gas-shielded arc welding (ferrous) 1/16, 3/32, 1/8, 5/32 inch diameter electrodes		12
Shielded metal-arc welding 3/16, 7/32, 1/4 inch diameter electrodes		12
5/16, 3/8 inch diameter electrodes		14
Atomic hydrogen welding		10-14
Carbon-arc welding		14
Soldering		2
Torch brazing		3 or 4
Light cutting, up to 1 inch		3 or 4
Medium cutting, 1 inch to 6 inches		4 or 5
Heavy cutting, over 6 inches		5 or 6
Gas welding (light), up to 1/8 inch		4 or 5
Gas welding (medium), 1/8 inch to 1/2 inch		5 or 6
Gas welding (heavy), over 1/2 inch		6 or 8

Eye and Face Protection

Whenever there is a reasonable probability that flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or light radiation may be encountered that could cause injury to the eye or face, then eye protection or face shields should be worn. An example of this is when working with chemicals in the laboratory (see Table 6-2).

Foot Protection

Steel toe safety shoes/boots are required to be worn whenever the possibility of injury to the foot exists from falling/dropped or rolling objects. Examples of this include working around drill rigs, bailing monitoring wells with stainless steel bailers, or walking through facilities when powered industrial trucks are utilized.

Head Protection

Hard hats or helmets for protection of the head are required whenever the possibility of falling or swinging objects hitting the head exists. Examples of this include construction type jobs and drill rigs.

Hand Protection

Gloves must be worn whenever employee's hands are exposed to hazards such as those from skin adsorption of harmful substances, severe cuts or lacerations, severe abrasions, punctures, chemical burns, thermal burns, and harmful temperature extremes.

Electrical Protection

Special gloves, hard hats, mats, etc. may be necessary when employees could be potentially exposed to electrical hazards.

Company Specific PPE

It should be noted that HRP may be required to wear specific PPE (i.e., hart hats, safety glasses, etc.) when performing work at a facility. These PPE requirements may have been established by the Client. HRP employees, at a minimum, must adhere to facility PPE requirements, unless HRP determines an unsafe condition is created. In which case, HRP will coordinate alternative PPE with the client.

6.2.8 Community Relations

On most sites, community relations are not expected to be a consideration, as most work is conducted on private property with no community contact. Nonetheless, the manner in which inquiries from citizens (whether the client's employees or the general public) and the media regarding site operations are to

be handled should be decided prior to the commencement of site work. The project manager should establish with the client who will be the public relations officer, and have the responsibility of handling community relations. It is preferable for this person to be the site contact or other client representative, rather than HRP. All site workers should be instructed to direct any inquiries from the public or media to the public relations officer. In cases where the potential for contact with the community is high, such as operations conducted at or near a property boundary or on a public right-of-way, then a statement should be prepared for any inquiries, including probable questions.

6.2.9 Inspections

A number of pieces of equipment present and/or used at HRP must be periodically inspected, as required by OSHA regulations. In order to comply with these requirements, a monthly inspection form has been created which will be used to document that the appropriate inspections have been performed. A copy of the form is included on HRP's Intranet (*http://hrpweb/HINTS/healthsafety.htm)*. The following items are included on the inspection list:

- Extension cords
- GFCI circuit breakers
- Power hand tools
- Generators
- Ladders
- Respirators
- Labels in the Laboratory
- Compressed Gas Cylinders
- Eyewashes
- Fire Extinguishers

Inspections will be performed by the Field Services Manager, OHSM, or designee, depending on office location.

6.3 Site-Specific SOP's

6.3.1 Confined Space

Confined spaces are defined as an enclosed space meeting all of the following criteria:

1) It is large enough and so configured that a person can bodily enter;

2) It has limited or restricted means for entry or exit (some examples are tanks, vessels, silos, storage bins, hoppers, vaults, pits, diked areas and trenches);

3) It is not designated for continuous human occupancy; and

4) It has one or more of the following characteristics:

a) It contains or has a known potential to contain a hazardous atmosphere (including an oxygen deficiency);

b) It contains a material with the potential for engulfment of an entrant;

c) It has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or a floor which slopes downward and tapers to a smaller cross-section; or

d) It contains any other recognized serious safety or health hazard.

Due to the inherent dangers of entering confined spaces and the fact that HRP employees are not trained in confined space entry, HRP personnel are strictly prohibited from performing confined space entry. Confined space entry will only be performed by subcontractors who have the proper training and experience to conduct this type of task.

6.3.2 Excavations

Because excavations greater than 4 feet deep are required to be tested for hazardous atmosphere for constituents which may reasonably be deduced to be present (including oxygen deficiency) if a reasonable possibility for such and atmosphere exists, excavations over 4 feet deep are considered confined spaces, and SOP 7.3.1 applies.

If an excavation greater than 5 feet deep is to be entered, then the sloping, shoring or cave-in protection requirements of 29 CFR 1926 Subpart P (1926.650-1926.652) will be followed, in addition to the confined entry procedures of SOP 7.3.1.

6.3.3 Drum and Container Sampling/Handling

Whenever drums or containers of unknown contents are encountered, they will be handled or sampled in accordance with the following procedures.

General Procedures

- The minimum personal protective equipment for drum sampling will be tyvek, steel toe boots, impermeable gloves and face shield.
- Air sampling equipment will be used to test ambient air prior to sampling for constituents which may reasonably be deduced to be present a minimum of once every 10 minutes.

- At a minimum of once every ten minutes, the ambient air space near the open drum will be tested for constituents which may reasonably be deduced to be present.

- The buddy system shall be used at all times.

- Drums of unknown/unsampled contents should be numbered or otherwise labeled to eliminate confusion prior to the start of sampling.

Drum and Container Handling

- Unlabelled drums and containers will be assumed to contain hazardous substances and handled accordingly until the contents are positively identified and labeled.

- Drums and containers will not be moved until inspected for integrity, unless complete inspection is impossible because of stacking or other obscuring reason, in which case they will be moved as little as possible until an inspection can be completed.

- Drums and containers which cannot be moved without rupture, leakage or spillage will be emptied into a sound, suitable (compatible) container using an appropriate device.

- Site operations will be organized to minimize drum and container movement, and all potentially exposed site workers will be warned of hazards prior to drum or container movement.

- In situations where spills may occur, suitable DOT/OSHA/EPA approved salvage containers, extra drums, and absorbent material in case of spills or leaks will be available on-site. A spill containment program specifying procedures in case of spills or leaks will also be maintained on-site.

- If the potential for fires exist, then fire extinguishing equipment meeting the requirements of 1910 Subpart L will be on hand and ready to control incipient fires.

Drum and Container Opening

- Drums will be opened slowly to allow any excess pressure to be relieved slowly and safely. If a drum begins to hiss upon opening, then the worker should retreat to a safe distance until the pressure is relieved.

- Employees not actually involved in opening drums or containers should keep a safe distance.

- Employees must not stand upon or work from drums or containers.

- Drums should not be opened until ready to be sampled, and should be closed immediately after sampling.

- Additional drum opening procedures are listed in 1910.120(j)(2).

Drum and Container Sampling

- Drums of unknown/unsampled contents should be numbered or otherwise labeled to eliminate confusion prior to the start of sampling.

- Sampling of drums or containers of liquids should be done with a thief or other device which will collect liquid from all strata in the drum or container to obtain a representative sample.

- Any spilled liquid from the transfer of the sample from the drum or container to the sample jar will be wiped up immediately, both from the top of the drum or container and from the sample jar.

- If the sample jars are not labeled before sampling, they should be left on the top or next to the drum or container until labeled.

PPE Disposal

- Leave disposable sampling material and PPE in a sealed open-head drum which is labeled appropriately.

Procedures and requirements for material handling equipment, radioactive wastes, shock sensitive wastes, lab packs, shipping and transport, and tanks and vaults are specified in 1910.120(j). Additional drum handling procedures can be found in "Standard Operating Safety Guides" (see Section 1.4 References).

6.3.4 Subcontractors

Subcontractors will be informed of site hazards and site emergency procedures through the Hazard Communication SOP (7.2.6) and the pre-entry briefing of the HASP. Prior to the entry of any subcontractor onto a 1910.120 site, the HRP project manager will assure that documentation of 40-hour training/8-hour refresher training and medical clearance for all involved subcontractor employees is on file at HRP.

6.3.5 Buddy System

A minimum of two (2) employees, in constant communication (either visual or voice) with each other, are required to perform any work within the Exclusion Zone of a 1910.120 site or during drum sampling. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.

6.3.6 Donning/Doffing Equipment

Before donning any protective equipment, the equipment should be inspected for any deficiencies that will decrease its effectiveness. Clothing with holes, rips, broken closures, etc. or respirators with cracks, worn parts, etc. should not be used. Any deficient or malfunctioning equipment should be brought to the attention of the HSM or the field services manager and be repaired or replaced.

When doffing equipment during the day for breaks, lunch, etc., it should be stored in a clean, dry location away from potential contamination sources. At the end of the day, all disposable equipment will be placed in the appropriate receptacle in accordance with the contaminated/waste material SOP. Non-disposable equipment must be decontaminated prior to re-use. This should be done by the employee using the equipment. Field Services personnel will be responsible for ensuring that the equipment is properly decontaminated and stored for the next person's use.

6.3.7 Noise

Although HRP employees are not normally exposed to noise above the 8 hour Time Weighted Average (TWA) Action Level of 85 decibels (dB) during the course of employment at HRP, as documented by employee monitoring contained in HRP's Health and Safety Files, some job sites present an exposure level which could exceed the 85 dB action level. Therefore, HRP has initiated a Hearing Conservation Program in accordance with 29 CFR 1910.95, which is contained in Section 13.0.

Based on the employee monitoring conducted by HRP, the following sites and/or activities are likely to exceed the action level:

- Operating a drill rig within a building (>90 dB)
- Operating a drill rig and conducting split spoon sampling (>85 but <90 dB)
- Operating a direct push (i.e. Geoprobe®) rig (88dB)

When on a site which exceeds the OSHA's 8-hour TWA of 90 dB, hearing protection is required (ear plugs and/or ear muffs are provided free of charge at each office location). Because the employee monitoring conducted by HRP can not be completely representative of all sites encountered, and noise levels can vary widely depending on the type of work and distance to source, it will be standard operating procedure to use ear plugs on other types of sites not identified above if the employees expect excessive noise, based on their judgment. For more information regarding HRP's Hearing Conservation Program, see Section 13.0.

In addition, it should be noted manufacturing sites may have established their own hearing protection policies. In these situations, HRP will follow company hearing policies and wear plant provided hearing protection.

6.3.8 Heat Stress Control

Heat-induced occupational illnesses, injuries, and reduced productivity occur in situations in which the total heat load (environmental plus metabolic) exceeds the capacities of the body to maintain normal body functions without excessive strain. The reduction of adverse health effects can be accomplished by the proper application of engineering and work practice controls, worker training and acclimatization, measurements and assessment of heat stress, medical supervision, and proper use of heat protective clothing and equipment. In many cases heat illness can be avoided by common sense techniques such as frequent rest periods, replacement of lost body fluids, and avoidance of working in direct sun. If a lengthy period of work in hot environments is scheduled (i.e. more than three days) then specific heat stress control procedures should be developed.

Specific techniques for the prevention of heat disorders include the following:

- Have workers drink 16 ounces of water before beginning work, such as in the morning or after lunch. Provide disposable 4 ounce cups and water that is maintained at 50-60°F. Urge workers to drink 1-2 of these cups water every 20-minutes for a total of 1-2 gallons per day. Provide a cool, preferably air conditioned area for rest breaks. Discourage the use of alcohol in non-working hours and discourage the intake of coffee during working hours. Monitor for signs of heat stress.

- Acclimate workers to site work conditions by slowly increasing workloads. New employees and workers returning from an absence of 2 weeks or more should have a 5-day period of acclimatization. This period should begin with the worker doing 50 percent of the normal workload and experiencing only 50 percent of heat-exposure time the first day, and gradually building up to 100 percent on the fifth day.

- In hot weather, conduct field activities in the early morning or evening.

- Ensure that adequate shelter is available to protect personnel against heat which can decrease physical efficiency and increase the probability of heat stress. If possible, set up the command post in the shade.

- In hot weather, rotate shifts of workers wearing impervious clothing.

- Good hygienic standards must be maintained by frequent changes of clothing and showering. Clothing should be permitted to dry during rest periods. Persons who notice skin problems should immediately consult medical personnel.

- Educate employees to be aware of the signs and symptoms of heat disorders.

Monitoring of personnel wearing impervious clothing should commence when the ambient temperature is 70°F or above. Frequency of monitoring should increase as the ambient temperature increases or as slow recovery rates are indicated. When temperatures exceed 85°F, workers should be monitored for heat stress after every work period. The following procedures should be used:

1. Heart rate (HR) should be measured by the radial pulse for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats/min. If the HR is higher, the next work period would be shortened by 10 minutes (or 33 percent) while the length of the rest period stays the same. If the pulse rate is 100 beats/minute at the beginning of the next rest period, the following work cycle should be shortened by 33 percent.

2. Body temperature should be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature (OT) at the beginning of the rest period should not exceed 99°F. If it does, the next work period should be shortened by 10 minutes (or 33 percent) while the length of the rest period stays the same. However, if the OT exceeds 99.7°F at the beginning of the next period, the following work cycle should be further shortened by 33 percent. OT should be measured again at the end of the rest period to make sure that it has dropped below 99°F.

3. Manage work/rest schedule. The following work/rest schedule shall be used as a guideline:

Adjusted Temperature (°F)	Active Work Time (min/hr) Using Level B/C Protective Gear
75 or less	50
80	40
85	30
90	20
95	10
100	0

If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur ranging from mild (such as fatigue, irritability, anxiety, and decreased concentration, dexterity, or movement) to fatal. Standard reference books should be consulted for specific treatment.

Heat-related problems include:

1. Heat rash caused by continuous exposure to heat and humid air and aggravated by chafing clothes. Heat rash decreases the ability to tolerate heat as well as being a nuisance.

2. Heat cramps caused by profuse perspiration with inadequate fluid intake and chemical replacement (especially salts). Signs: muscle spasm and pain in the extremities and abdomen.

3. Heat exhaustion caused by increased stress on various organs to meet increased demand to cool the body. Signs: shallow breathing, pale, cool, moist skin, profuse sweating, dizziness, and lassitude.

4. Heat stroke, the most severe form of heat stress. Body must be cooled immediately to prevent severe injury and/or death. Signs and symptoms are: red, hot, dry skin, no perspiration, nausea, dizziness and confusion, strong, rapid pulse, coma.

6.3.9 Cold Stress Control

Persons working outdoors in temperatures at or below freezing may be adversely affected by cold. Extreme cold for a short time may cause severe injury to the surface of the body, frostbite, or result in profound generalized cooling, causing coma or death. Areas of the body that have a high surface area to volume ratio, such as fingers, toes or ears, are the most susceptible.

Two factors influence the development of a cold injury: ambient temperature and the velocity of the wind. Wind chill is used to describe the chilling effect of moving air in combination with low temperature. Even when ambient temperatures are as warm as 50°F, hypothermia can become a significant factor. As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph. Additionally, water conducts heat 240 times faster than air. Thus, the body cools suddenly when chemical protective equipment is removed if the clothing underneath is soaked with perspiration.

Employees should be cognizant of the following symptoms of incipient frostbite and systemic hypothermia.

Frostbite - This condition is characterized by white, waxy, firm or hard skin.

Systemic hypothermia - This condition is characterized by shivering, apathy, listlessness and sleeping (in the initial stages) and unconsciousness, glassy stare, slow pulse and slow respiratory rate (in the later stages).

Measures to protect oneself from cold injury which should be implemented whenever temperatures drop below 50°F include the use of gloves, hats, thermal underclothes, insulated footwear, and frequent breaks within a warm area. If any symptoms of frostbite or systemic hypothermia develop, then a longer break in a warm area should be taken until the body returns to normal. In severe cases, medical attention may be necessary. It should be noted that alcohol and caffeine are not recommended for persons with hypothermia.

6.3.10 Control/Disposal of Contaminated/Waste Materials

All waste generated at a site is the responsibility of and must be properly disposed of by the site owner/operator, although HRP may make arrangements for disposal of waste with a treatment/disposal facility on behalf of the client. In accordance with RCRA regulations, all industrial wastes generated must have a hazardous waste determination performed to classify the waste as hazardous or non-hazardous. This determination may be based on knowledge of the waste, or by analytical testing. Wastes determined to be hazardous must be stored and disposed of in compliance with all applicable RCRA and State regulations. Wastes determined to be non-hazardous must be disposed of in accordance with State and local regulations. HRP employees should remind the client/owner/operator of the applicable regulations with regard to wastes generated at a site. **Under no circumstances should HRP employees sign hazardous waste manifests or other official documents regarding waste management, unless specifically directed by HRP management.**

6.3.11 Rain/Electrical Storms/Snow/Ice

Because of the increased danger of slip, trip and fall and other dangers associated with loss of traction, outside operations will not be conducted in the rain, unless no increased danger of these types of occurrences exists. Because of the danger of electrical storms, no outside operations whatsoever will be conducted in electrical storms, regardless of site conditions.

6.3.12 Lockout/Tagout

Lockout/tagout procedures must be used whenever servicing or monitoring machines and equipment in which the unexpected energization of start up of the machines or equipment, or release of stored energy could cause injury to employees. In order to prevent injury, a lockout/tagout procedure must be followed to effectively eliminate the hazard. Because the types of machines and equipment which will be encountered and require lockout/tagout in HRP's field work is unknown, it is impossible to prepare the proper procedures. Therefore, whenever a lockout/tagout hazard is encountered, it is the responsibility of the HRP employee to alert an OHSM, who will help develop a procedure for the safe lockout of the hazards. Hazards to be alert for include electrical, mechanical, hydraulic, pneumatic, chemical, thermal or other energy. For more information regarding Lockout/ Tagout, see HRP's Lockout/Tagout Program in Section 14.0.

6.3.13 Electrical Safety

Because of the extreme dangers associated with electrical hazards, all personnel will follow standard electrical safety procedures including installation safety requirements and safety related work practices. These procedures are set forth in the electrical safety training manual provided on HRP's intranet (*http://hrpweb/HINTS/healthsafety.htm)*. It is HRP's policy to require GFCI circuit breakers during all field work. All extension cords used by HRP in field operations will have been provided with GFCI circuit breaker boxes. GFCI adap-

tors are available at each office location. GFCI's must always be utilized when using power equipment and/or extension cords in the field.

In addition, prior to engaging in a project (i.e., remedial system operation and maintenance) where the unexpected startup of machine/equipment is possible or electrical hazards exist, HRP will determine if plant specific lockout/tagout requirements exist and communicate lockout/tagout procedures to the company.

6.3.14 Utility Markouts

For all subsurface investigation work, HRP must utilize locale utility markout agencies (i.e. Call Before You Dig in many states). In addition, it may be appropriate for certain sites to utilize a private markout company. HRP has established guidelines (see HRP's intranet) for when private markouts are prudent including:

- Gasoline service stations,
- Marinas
- Sites with multiple buildings
- Interior subsurface work and
- Work in areas where street lights, parking lights, lighted signs, transformer or other features associated with a buried line are present.

6.3.15 Tools – Hand and Power

Requirements for hand and tower tools are provided by OSHA under 29 CFR 1910.242 and 29 CFR Subpart I. In general HRP is responsible for the safe condition of tools and equipment used by employees, including tools and equipment which may be furnished by employees. As such, HRP will ensure:

- Hand tools such as chisels and punches, which develop mushroomed heads during use are reconditioned or replaced as necessary
- Broken or fractured handles on hammers, axes and similar equipment are replaced promptly
- Worn or bent wrenches are replaced regularly
- Appropriate handles are used on files and similar tools
- Tool handles are wedged tightly in the head of all tools
- Tool cutting edges kept sharp so the tool will move smoothly without binding or skipping
- Tools stored in dry, secure location where they won't be tampered with

- Power tools are equipped and used with the correct shield, guard, or attachment, recommended by the manufacturer
- Portable circular saws are equipped with guards above and below the base shoe
- All hand-held powered circular saws having a blade diameter greater than 2 inches, electric, hydraulic or pneumatic chain saws, and percussion tools without positive accessory holding means shall be equipped with a constant pressure switch or control that will shut off the power when the pressure is released.
- All hand-held gasoline powered chain saws shall be equipped with a constant pressure throttle control that will shut off the power to the saw chain when the pressure is released.
- All hand-held powered drills, tappers, fastener drivers, horizontal, vertical, and angle grinders with wheels greater than 2 inches in diameter, disc sanders with discs greater than 2 inches in diameter, belt sanders, reciprocating saws, saber, scroll, and jig saws with blade shanks greater than a nominal ¼-inch, and other similarly operating powered tools are equipped with a constant pressure switch or control, and may have a lock-on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.
- All other hand-held powered tools, such as, but not limited to, platen sanders, grinders with wheels 2 inches in diameter or less, disc sanders with discs 2 inches in diameter or less, routers, planers, laminate trimmers, nibblers, shears, saber, scroll, and jig saws with blade shanks a nominal ¼-inch wide or less, are equipped with either a positive "on-off" control, or other controls, as appropriate by OSHA.
- All cord-connected, electrically operated tools and equipment are effectively grounded or of the approved double insulated type
- Effective guards are in place over belts, pulleys, chains, sprockets, on equipment such as concrete mixers, and air compressors
- Portable fans are provided with full guards or screens having openings ½ inch (1.2700 centimeters) or less

HRP employees will conduct a pre-use inspection of all hand and power tools for conditions. Also, employees using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases will be provided with the particular personal protective equipment necessary to protect them from the hazard. See Sections 6.0 and 9.0 for more specific information regarding HRP's PPE requirements.

6.3.16 Site Inspection & Safety Training/Education – Construction Sites

For all construction related projects, it is the responsibility of HRP to initiate and maintain effective health and safety programs. To comply with 29 CFR 1926.120, HRP will ensure frequent and regular inspections are completed by HRP employees of the job sites, materials, and equipment. These inspections will be made by competent persons designated by HRP.

The use of any machinery, tool, material, or equipment which is not in compliance with any applicable requirement promulgated by OSHA is prohibited. Such machine, tool, material, or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from its place of operation. HRP will permit only those employees qualified by training or experience to operate equipment and machinery.

HRP, through the various training sessions each employee is required to attend, will instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury. Employees required to handle or use poisons, caustics, and other harmful substances will be instructed regarding the safe handling and use, and be made aware of the potential hazards, personal hygiene, and personal protective measures required. In job site areas where harmful plants or animals are present, employees who may be exposed will be instructed regarding the potential hazards, and how to avoid injury, and the first aid procedures to be used in the event of injury. In addition, employees required to handle or use flammable liquids, gases, or toxic materials shall be instructed in the safe handling and use of these materials and made aware of the specific OSHA requirements.

6.3.17 Construction Safety – Excavation Inspections

OSHA requires daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

Furthermore, where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

It is HRP's policy to ensure that for construction projects the subcontracted environmental contractor will provide a competent person to perform daily

and as needed inspections of excavation sites. This policy will be conveyed through the subcontract agreement with the environmental contractor. HRP will provide our employees involved with construction projects with awareness level training regarding excavation hazards and notify the subcontracted firm if any obvious excavation safety hazard exists during the course of on-site activities.

6.3.18 Fall Protection

Although many tasks at HRP fall under the General Industry standards, there is no fall protection standard under the General industry requirements. However, OSHA regulates fall protection for the construction industry under 29 CFR 1926 Subpart M. In order to comply with OSHA and minimize fall hazards for HRP employees, it will be HRP's policy to either retain a contractor who is fall protection trained to complete the task or comply with 29 CFR 1926 Subpart M where a work assignment can result in an employee falling more than 6 feet. In this case, HRP will ensure:

- Any employee who might be exposed to fall hazards will be trained.
- Walking/working surfaces will be inspected before work begins.
- Employees will only work on surfaces strong enough to support them
- Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is 6' (1.8m) or more above a lower level shall be protected from falling by use of:
    - guardrail system
    - safety net systems or
    - personal fall arrest systems.
- Manufacturer's specifications for proper installation are met

If a personal fall arrest system is used for fall protection, it must do the following:

- Limit maximum arresting force on an employee to 1,800 pounds (8 kiloNewtons) when used with a body harness;
- Be rigged so that an employee can neither free fall more than 6 feet (1.8 meters) nor contact any lower level; Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet (1.07 meters); and
- Have sufficient strength to withstand twice the potential impact energy of an employee free-falling a distance of 6 feet (1.8 meters) or the free fall distance permitted by the system, whichever is less.

Personal fall arrest systems must be inspected prior to each use for wear damage, and other deterioration. Defective components must be removed from service. Dee-rings and snaphooks must have a minimum tensile strength of 5,000 pounds (22.2 kiloNewtons). Dee-rings and snaphooks shall be proof-tested to a minimum tensile load of 3,600 pounds (16 kiloNewtons) without cracking, breaking, or suffering permanent deformation. Snaphooks shall be sized to be compatible with the member to which they will be connected, or shall be of a locking configuration.

6.3.19 Stairways & Ladders

During the course of office and field activities, HRP employees may utilize stairways and ladders to ascend to work areas for work completion or where assessment is required. HRP periodically inspects off-site facilities to ensure compliance with OSHA regulations. During work assignment, HRP employees will not utilize stairways or ascend to elevated surfaces where load capacity has not been established or conditions may be considered unsafe.

Prior to portable ladder use (whether HRP or otherwise supplied), HRP will ensure that the ladder is:

- in good condition;
- joints between steps and side rails are tight;
- all hardware and fittings securely attached and moveable parts operating freely without binding or undue play;
- non-slip safety feet are provided;
- ladder rungs and steps are free of grease and oil;
- suitable for the work environment (e.g., non-conductive ladders where electrical hazards exist) and not damaged; and
- Is of appropriate class to complete the work proposed.

HRP maintains an inventory of company owned ladders at each office location and employees are instructed to conduct pre-use inspections to ensure each ladder proposed for use is acceptable. HRP provides self-supporting (foldout) and non-self-supporting (leaning) portable ladders that are load rated by ANSI. It should be noted that the loading rating includes the individual and the individual's equipment.

During the course of work, HRP employees will not:

- Place a ladder in front of doors opening toward the ladder except when the door is blocked open, locked or guarded;
- Place ladders on boxes, barrels, or other unstable bases to obtain additional height; or
- Use the top step of ordinary stepladders as a step.

In addition, when portable rung ladders are used to gain access to elevated platforms, roofs, etc., the ladder that extend at least 3 feet (0.9144 meters) above the elevated surface will be used. When portable rung or cleat type ladders are used, HRP employees will secure the base is so placed that slipping will not occur, or it is lashed or otherwise held in place. Non-self-supporting ladders, which must lean against a wall or other support, are to be positioned at such an angle that the horizontal distance from the top support to the foot of the ladder is about 1/4 the working length of the ladder.

APPENDIX B

Community Air Monitoring Program

Community Air Monitoring Plan
Former Scolite Site Troy, New York

This 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 during Remedial Investigation (RI) activities at the former Scolite Site, located on 2 Madison Street in the City of Troy, NY (the site). The CAMP is not intended for use in establishing action levels for workers 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.

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

Depending on the nature of known or potential contaminants at the site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary.

Continuous monitoring will be required for all ground intrusive activities. 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 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, continuing 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

VOCs will 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 will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using a photo ionization detector (PID) equipped with a 10.2 eV bulb. The PID will 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 will be halted, the source of the 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 will be shutdown.

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

Particulate Monitoring, Response Levels, and Actions

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

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than the background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work may continue with dust suppression techniques provided that 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 will 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 will be recorded and be available for State (DEC and DOH) personnel to review.

APPENDIX C

EQUIPMENT CALIBRATION LOG

EQUIPMENT CALIBRATION LOG		
Instrument	**Calibration Date**	**Calibrated By**

EQUIPMENT CALIBRATION LOG		
Instrument	**Calibration Date**	**Calibrated By**

APPENDIX D

Supervisor’s Investigation Report

HRP ASSOCIATES, INC.
SUPERVISOR'S INVESTIGATION REPORT

<table>
<tr><td>Name</td><td>Age</td><td>Time</td><td>Date</td></tr>
<tr><td>Department/Project Manager</td><td colspan="3">Site Name/Location</td></tr>
<tr><td colspan="2">WHAT HAPPENED?</td><td colspan="2">Describe what took place or what caused you to make this investigation.</td></tr>
<tr><td colspan="2">WHY DID IT HAPPEN?</td><td colspan="2">Get all the facts by studying the job and situation involved. Question by use of
WHY – WHAT – WHERE –
WHEN – WHO- HOW</td></tr>
<tr><td colspan="2" rowspan="2">WHAT SHOULD BE DONE?</td><td colspan="2">Determine which of the 12 items under EMP require additional attention.</td></tr>
<tr><td><u>Equipment</u>
Select
Arrange
Use
Maintain</td><td><u>Material</u>
Select
Place
Handle
Process</td><td><u>People</u>
Select
Place
Train
Lead</td></tr>
<tr><td colspan="2">WHAT HAVE YOU DONE THUS FAR?</td><td colspan="2">Take or recommend action, depending upon your authority. Follow up – was action effective?</td></tr>
<tr><td colspan="2">HOW WILL THIS IMPROVE OPERATIONS?</td><td colspan="2">OBJECTIVE
Eliminate job hindrances</td></tr>
<tr><td>Investigated by:</td><td>Date</td><td><u>Reviewed By</u></td><td>Date</td></tr>
</table>

APPENDIX E

Personnel Log

PERSONNEL LOG				
NAME	REPRESENTING	DATE	TIME IN	TIME OUT

PERSONNEL LOG

NAME	REPRESENTING	DATE	TIME IN	TIME OUT

APPENDIX F

Scope of Work

April 25, 2008

Ms. Andrea Poley
Assistant Planner, City of Troy
One Monument Square
Troy, NY 12180

RE: PRELIMINARY COST ESTIMATE PROPOSAL – ERP SITE INVESTIGATION AND REMEDIAL ALTERNATIVES, FORMER SCOLITE PROPERTY, CITY OF TROY, NEW YORK

Dear Ms. Poley:

Pursuant to your request, HRP is pleased to present this preliminary cost estimate and proposal to complete a Site Investigation and Remedial Alternatives Evaluation of the Former Scolite Property in Troy, New York. HRP understands the 5.7 acre site was developed prior to 1869 as a foundry by the Rensselaer Iron Works. A previous site investigation determined that the site's soils and groundwater have been impacted. The City of Troy has entered into an Environmental Restoration Program State Assistance Contract with the NYSDEC in September 2007 for this site.

Based on our discussions with the NYSDEC and NYSDOH, our understanding of the City of Troy's project goals, and our experience completing similar projects the following Scope of Services is offered.

SCOPE OF SERVICES

Task One – Project Scoping

HRP will conduct an initial meeting to review project requirements and site conditions, confirm work and time schedules and transfer information from the City to HRP. In addition, HRP will meet representatives from the City of Troy and the NYSDEC onsite for preliminary site inspection to discuss details regarding the proposed site investigation, establish overall site conditions, determine the existence of monitoring wells and areas of concern. This information will be utilized in the project scoping phase to determine the level of effort needed to conduct a comprehensive site walkthrough, as well as in future workplan development.

Task Two - Site Walkthrough

HRP will conduct a comprehensive site inspection of the former Scolite property. The goal of the walkthrough will be to:

- Identify areas of concern (e.g., sumps, staining, releases, USTs, ASTs, floor drains, chemical storage areas, transformer locations, etc.)
- Inventory abandoned drums and other containers
- Estimate debris and inventory other abandoned materals (ie., tankers, cars, tires, old equipment); and
- Determine accessibility for investigatory equipment in future tasks.

HRP assumes this task can be completed by a senior staff and a project staff on-site for one day.

Task Three – Citizen Participation Planning

Subsequent to the project scoping meeting and site walkthrough, HRP will prepare a Citizen Participation Plan (CPP) that is based on the guidelines provided by the NYSDEC. Upon review and approval from the City, HRP will submit a draft copy to the NYSDEC and NYSDOH for review. In the CPP, repositories will need to be established and future ERP documents will need to be sent to each repository.

Upon approval of the workplans (see Task Four) HRP will need to develop a Fact Sheet, which will need to be distributed to local property owners and interested parties. HRP will work with the City to obtain property contact information and develop a database for future mailings if necessary. HRP assumes one trip to the City to obtain this information will be necessary.

In addition, HRP will be responsible for attending and if needed, presenting at public meetings, as well as, developing meeting materials including PowerPoint presentations, posters, and related visuals as necessary. HRP will be prepared to discuss the technical aspects of the Site Investigation and Remedial Alternatives Report and provide a written summary of meeting including speakers and attendees. As necessary, HRP will draft press releases and letters pertaining to the meeting.

HRP assumes two public meetings will be required.

Task Four - Site Investigation (SI) Work Plan

Subsequent to the onsite meeting, HRP will complete a detailed Site Investigation Work Plan (Work Plan), which will be submitted to the NYSDEC for review prior to the commencement of on-site work. All work will be proposed in accordance with NYSDEC polices including DER-10. The Work Plan will include, at a minimum, the following elements:

- Scope of Work/Objectives;
- Project Organization;

- Field Sampling and QA/QC Plan;
- Health and Safety Plan; and
- Community Air Monitoring Plan.

Task Five - Ground Penetrating Radar Survey

To determine if underground storage tanks or tank graves are located on-site, a ground penetrating radar (GPR) survey will be conducted in onsite areas which historically could have reasonable potential to have utilized an underground Storage Tank (UST). The areas to be surveyed are proposed include near historical boilers and around the building perimeter. Any anomalies identified by the GPR survey will field marked and GPS marked for future identification.

HRP assumes the GPR survey can be completed in one day with one mobilization. It should be noted that this task does not include the removal or relocation of debris, if warranted.

Task Six - Surficial and Background Soil Sampling

HRP will mobilize to the site to collect fifteen (15) surficial and three (3) background soil sample at locations approved by the NYSDEC and NYSDOH and submit them to a state certified laboratory. Five (5) of the surface samples and all three (3) of the background samples will be analyzed for TAL metals, TCL VOCs, TCL Semi-VOCs, pesticides, PCBs, and total organic carbon to evaluate surficial soil conditions. The remaining surface samples will be analyzed for STARS VOCs and SVOCs, RCRA metals and PCBs.

HRP assumes that this task will be completed in conjunction with Tasks 7 and a separate mobilization will not be required.

Task Seven - Soil Borings Installations and Soil Sampling

To supplement existing data from previous on-site investigations, as well as to meet the goals of the ERP, HRP is proposing to install fifteen (15) soil borings will be installed in areas of concern. Fifteen (15) soil samples from the installed borings will be analyzed for TAL metals, TCL VOCs, TCL Semi-VOCs, pesticides, PCBs, and total organic carbon to evaluate subsurface soil conditions.

HRP assumes soil boring installation will be completed in three field days.

Task Eight - Groundwater Monitoring Wells Sampling and Testing

HRP will install an additional eight borings that will be converted into overburden monitoring wells. Each of the on-site wells will be sampled for TAL metals (total and dissolved), TCL

VOCs, TCL Semi-VOCs, pesticides, and PCBs. All wells will be sealed from infiltration and developed before sampling. In addition, a monitoring well survey will be completed to determine groundwater flow direction.

Task Nine - Soil Vapor Evaluation

To determine if soil gas contamination exists on-site, HRP will conduct a soil vapor evaluation. In particular, based on the draft NYSDOH vapor intrusion guidance, HRP proposes to collect 9 soil vapor samples. At least five (5) sub-slab vapor samples will be collected onsite within the existing buildings, the others will be collect in the yard. Each of the collected samples will be submitted to state certified laboratory for analysis of VOCs via Method T015.

Task Ten – Site Survey

HRP will initially conduct a survey of pertinent site features and sampling points to ensure that this data is reproducible in the future. As one the final tasks an Alta survey map will be created of the site which will meet the City's specified requirements. The survey will include:

- Vicinity map;
- Flood Zone designation;
- Contours and datum elevations;
- Exterior dimensions of all buildings at ground level;
- Square footage of exterior footprint of all building at ground level;
- Public access locations;
- Utility locations;
- Governmental agency survey related requirements; and
- Adjoining property owner names.

Task Eleven - Preparation of Site Investigation/Remedial Alternatives Report

A Site Investigation Report/Remedial Alternatives Report (SI/RAR) will be prepared and submitted to the NYSDEC for review.

Task Twelve – Other Tasks

Under this task, HRP will complete/assist the City with technical committee meeting and website material development.
Specifically, HRP understands that the technical committee will meet monthly and/or as needed, and will consist of the consultant, city staff, and DEC representatives. HRP will prepare for and attend all monthly update meetings for the duration of the project. Under this task, HRP will prepare a draft agenda approximately ten (10) days before the progress

meeting, revise the agenda as suggested and distribute at meeting. Update meetings may be held to:

- Present, discuss, and receive direction on the progress and scheduling of work in this agreement.
- Present, discuss, and receive direction on project specifics.
- Discuss and resolve comments resulting from review of project documents, advisory agency review, and coordination with other agencies.
- Preview visual aids for public meetings.
- Manage sub consultants and/or subcontractors.
- Evaluate the work completed to date

Lastly, HRP will develop a formatting protocol for project documentation that will ensure that all documents can be posted to the City's web site, troyny.gov. All press releases, public meeting announcements, and documents should be published in an Internet ready format that will be applicable to the website and available for public dissemination. HRP will supply content for the webpage consistent with the style of the existing project web pages.

Task Thirteen – Interim Remedial Actions
If needed, HRP will complete Interim Remedial Actions (IRMs). Prior to the engagement of any IRM, HRP will receive approval from the City and NYSDEC. Scenarios that may be require the implementation of an IRM include but are not limited to:

- Removal of abandoned drums and containers;
- Removal of ASTs or USTs;
- Removal or relocation of debris or abandoned equipment;
- Demolition of building structures that may impede our ability to detect or define contamination areas;
- Sampling and/or abatement of asbestos containment materials that may impede our ability to detect or define contamination areas;
- The excavation and transported off-site for appropriate disposal of grossly contaminated soil in “hot spot” areas;
- The backfilling of excavation areas with clean material;
- The removal and treatment/disposal of severely impacted groundwater infiltrating into the excavation;
- The collection and analysis of confirmatory soil and/or groundwater samples for TAL VOCs and Semi-VOCs, as well as TAL metals and pesticides and PCBs in areas where IRMs have been completed; and
- Additional site investigation to further delineate the degree and extent of contamination.

PROJECT COSTS

HRP will complete the Scope of Services on a time and materials not-to-exceed basis as follows:

TASK	TITLE	COST
1	Project Scoping	$2,400
2	Comprehensive Site Walkthrough	$2,660
3	Citizen Participation Planning	
	Prepare CPP	$1,786
	Public Meetings	$3,067
	Additional Activities	$607
4	SI Work Plan Development	$5,100
5	GPR Survey	$2,819
6	Surficial and Background Soil Sampling	$6,640
7	Soil Borings Installation and Sampling	$21,116
8	Groundwater Monitoring Wells Installation and Sampling	$27,824
9	Soil Vapor Evaluation	$8,362
10	Site Survey	$11,400
11	SI/RAR Preparation	$8,890
12	Other Tasks	$3,960
	Subtotal	$107,631[1]
13	IRMs[2]	$117,369
	TOTAL	$225,000

[1] Please note that these costs are preliminary based on the recent project scoping meeting, our preliminary site inspection and discussions with the NYSDEC. Projects generally vary slightly upon DEC/DOH work plan review and negotiation.

[2] HRP assumes that prior to engagement of any IRM approve will be required by the City and DEC. HRP assumes that any remaining monies available after the SI will be put towards IRMs.

AUTHORIZATION TO PROCEED

HRP will begin work on this project upon receipt of the attached Terms and Conditions. If you have any questions about this proposal, please do not hesitate to contact HRP Associates, Inc. at (518) 899-3011.

Sincerely yours,
HRP ASSOCIATES, INC.

Jeffrey Sotek, PE, CSP, CIH
Senior Project Manager

TERMS AND CONDITIONS

HRP Associates, Inc.

CLIENT: City of Troy *DOLLAR VALUE OF PROPOSAL: $225,000.00*

PROPOSAL DATE: December 18, 2008 **SITE LOCATION: Former Scolite Property, Troy, New York**

1. **AGREEMENT AND PARTIES:** HRP Associates, Inc. is referred to herein as HRP. The individual or group to which our Proposal is addressed is hereby referred to as the Client. The Agreement by and between HRP and the Client consists of the scope of services specifically defined in the attached Proposal, any documents that are attached to the Proposal and these Terms and Conditions.

2. **COMPENSATION:** The costs of basic services to be provided by HRP are specified in the Proposal. HRP will submit invoices to the Client on a monthly basis documenting costs incurred in the previous calendar month including labor charges, laboratory analysis charges, and expenses, as applicable, unless a different billing method is specified in the Proposal. Invoices are due and payable upon receipt by the Client. Invoices not paid within sixty (60) calendar days of the invoice date will result in cessation of work until such invoices rendered are paid in full. In the event payment in full is not received within ninety (90) calendar days of the invoice date, the account shall also be subject to collection by our attorney, and any and all reasonable costs of collection, including reasonable attorney's fees, shall be paid by the Client. Further, HRP reserves the right to sell the work product to any interested party in the event the Client is in default of its payment obligations for a period of greater than ninety (90) days. Payment can be made by check to: **HRP Associates, Inc., 197 Scott Swamp Road, Farmington, Connecticut 06032, Attention: Accounts Receivable**. To arrange payment by credit card (MasterCard or Visa), contact HRP's Accounts Receivable Department at **860-674-9570**. Reference to HRP's invoice number should be included with the payment.

3. **ADDITIONAL CHARGES:** Costs quoted include State or local taxes, which will be added to invoices where applicable. A twenty-five percent (25%) surcharge applies to labor in connection with expert testimony, and such labor will be billed in ½ day increments.

ADDITIONAL SERVICES: HRP will not exceed the cost for basic services outlined in the Proposal without the Client's written consent. If authorized by the Client, services provided beyond the basic Scope of Services will be billed on the following basis:

(a) **Direct Labor Costs** – A specified rate for each category of HRP's personnel, for the time that they actually spent working on the Client's project and for required travel (portal to portal), as documented and certified by HRP. HRP may revise rates from time to time to account for salary adjustments and increased costs.

(b) **Laboratory Analysis Charges** – A specified rate for each laboratory analysis parameter beyond those included in the Proposal (where applicable).

(c) **Expenses** – Where applicable, project-related expenses for travel, meals, overnight delivery, priority mail, outside reproduction, courier services, subcontracting (other than laboratory analysis), material and equipment purchases, and miscellaneous other direct charges are billed in accordance with the requirements set forth in the NYS DEC Municipal Handbook.

4. **HRP'S RESPONSIBILITIES:** HRP shall comply with all Federal, State and local laws, ordinances, rules and regulations, permits, licenses, and requirements applicable to HRP while performing the services described in this Agreement. HRP shall be an independent contractor with respect to the services rendered under this Agreement, and no other relationship shall exist or be deemed to exist between HRP and the Client. During the performance of services called for in this Agreement, HRP shall be responsible for exercising that degree of skill and care as is the generally accepted professional practice of other engineers undertaking similar services at the same time and in the same geographical area. HRP will make reasonable efforts to perform its investigations in a manner consistent with the requirements of that Environmental Restoration Program State Assistance Contract that the City entered into with NYS DEC in September 2007. HRP's work product is also subject to certain limitations which are described in HRP's report(s) provided in connection with the Proposal, and are incorporated herein by reference. Notwithstanding anything herein or elsewhere to the contrary, the total liability of HRP and its officers, directors, employees, and agents arising out of this Agreement is limited to $50,000 or the total compensation received by HRP under this Agreement, whichever is greater.

HRP's insurance policies do not cover HRP's defense against claims alleging damage caused by a release of pollutants as a result of HRP's work. Since HRP is normally engaged in efforts to stop/reduce the release of pollutants to the environment and is not the originator of any pollutants, it cannot and does not accept any responsibility for damages that may result from a release or migration of existing pollutants that may be associated with the work performed at or associated with the Client's work site or premises.

When work performed by HRP or HRP's subcontractors pursuant to the Proposal involves subsurface (subterranean) investigations, explorations, and/or excavations of any type (below ground surface, paved surfaces, graded surfaces or floors), HRP will contact the appropriate Call Before You Dig organization to obtain utility mark outs as are customarily provided through such services and review plans and information provided by the Client. If a private utility mark-out service is necessary to assure utility clearance, the Client agrees to pay for such service in addition to the cost of the Proposal. In any event, provided HRP is not grossly negligent, HRP will not be responsible for any losses, damages, injuries, or interference to or with any subsurface structure, utility, tank system or system component, pipe, cable, or any other improvements (collectively, "Subsurface Features") if they are not brought to HRP's attention before the commencement of work and/or which are not clearly and accurately physically located on the ground by the Client, such mark-out service or any other public or private utility, agency, company, or individual.

The Client recognizes that disturbances to vegetation, terrain, drainage, paved surfaces and other structures, improvements and equipment will result from the use of exploration or excavation equipment. HRP will use reasonable precautions to minimize such damage, but cost of restoration of such damage is not included in the Proposal and the Client will not hold HRP liable for such disturbances, effects or damages arising from such subsurface investigation, exploration or excavation work performed by HRP or HRP's subcontractors pursuant to this Agreement.

HRP shall maintain the following insurance in force at all times:

Worker's Compensation Insurance, including Employer's Liability, with a limit of at least $500,000.
Comprehensive Liability Insurance with limits of at least $1,000,000 per occurrence for bodily injury & property damage.
Automobile Liability Insurance with minimum limits of: Bodily Injury & Property Damage – Combined single limit $1,000,000.
Combined Contractor's Pollution and Professional Liability with $5,000,000 per occurrence and $5,000,000 aggregate, claims made basis.

5. **THE CLIENT'S RESPONSIBILITIES:** The Client is required to appoint an individual who shall be authorized to act on behalf of the Client, with whom HRP can confer, and whose instructions, decisions and consent will be binding on the Client. The Client will also obtain all required permits and approvals necessary for performance of the Proposal; provide HRP with access to all available information pertinent to the project including all maps, drawings and records; reveal to HRP all facts that may be relevant to or have a bearing on the work (and HRP shall be entitled to rely on same); assist HRP in obtaining access to all public and private lands and/or records that may be required to perform the work; and promptly notify HRP, at the earliest opportunity, when and if the Client determines portions of the work are not being performed with customary skill and care. The Client or another party designated by the Client shall be responsible for all waste generated by HRP's activities, including the responsibility to sign manifests, bills of lading, or other shipping documents.

6. DOCUMENTS: All reports, boring logs, field notes, laboratory data, calculations, research and other documents and information prepared by HRP or its subcontractors are instruments of service and shall remain the sole property of HRP. Such documents and information are delivered to the Client, are for the Client's use only, and are not to be relied upon by any other party, unless agreed to by HRP in writing.

7. **TERMINATION PROVISIONS:** Either party may terminate this Agreement upon thirty (30) days written notice, provided termination by the Client shall not be effective unless and until the Client has paid HRP for the work performed up to the point of termination.

8. **ARBITRATION:** Any controversy or claim relating to or arising out of this Agreement, or the breach thereof, shall be settled by Arbitration in the City of Hartford, Connecticut, in accordance with the then current rules of the American Arbitration Association, and judgment upon the award rendered by the arbitrator(s) may be entered in any court having jurisdiction thereof. Any claim brought by the Client against HRP shall be brought no later than one year after the date of substantial completion of HRP's services hereunder or the expiration of the applicable statute of limitations, whichever is earlier.

9. **HAZARD COMMUNICATION:** Part of the services to be provided by HRP may involve the use or storage of certain chemicals such as cleaning/decontamination fluids, sample preservatives, and/or gas chromatograph standards. It is expected that no special precautionary measures will need to be taken to protect the Client's employees from these chemicals during normal operating conditions or unforeseeable emergencies, as relatively small amounts of these chemicals will be present. Material Safety Data Sheets for such chemicals are available upon request.

10. **INDEMNIFICATION:** HRP does hereby agree to defend, indemnify and save the Client, its officials, directors, employees, agents, subcontractors and affiliates from and against all claims, suits, fines, penalties, and attorneys fees (all of the foregoing, collectively, "Claims") that arise out of or are related to HRP's negligent performance of services under this agreement , including, without limitation, Claims involving access to the site, Subsurface Features, generation of waste, hazardous materials brought on site, and pre-existing and/or migration of hazardous substances and materials, except to the extent caused by the City of Troy, it's officers, directors, employees, agents, or subcontractors and affiliates gross negligence.

11. **FORCE MAJEURE:** HRP shall be excused for the period of any delay in the performance of any obligations hereunder, when prevented by doing so by cause or causes beyond HRP's reasonable control, which shall include, without limitation, all labor disputes, civil commotion, war, warlike operation, invasion, rebellion, hostilities, military or usurped power, terrorism, government regulations or controls, inability to obtain any material or services or acceptable substitute therefore, or through acts of God.

12. **MISCELLANEOUS**: This Agreement contains the complete understanding between HRP and the Client with respect to the work to be performed. These Terms and Conditions shall govern over any inconsistent provisions in the Proposal, unless a particular term or condition is specifically revoked or amended in the Proposal. This Agreement may not be changed or modified except in writing, and when signed by both parties. This Agreement shall be executed in the State of Connecticut and shall be interpreted and enforced according to the laws of the State of Connecticut. This Agreement may not be assigned by either party without the other's consent. In the event of any litigation, the parties waive trial by jury. In the event any term or provision of this Agreement is deemed invalid, the remaining terms and provisions shall apply. The person signing this Agreement represents that the execution of this Agreement have been duly authorized by the Client and such person has the authority to sign. The headings of this Agreement are for convenience only and shall not limit or enlarge the meaning of the language of this Agreement. The failure by either party to enforce against the other any term or provision of this Agreement shall not be deemed to be a waiver of such party's right to enforce against the other party the same or any other such term or provision in the future. The Proposal is valid for a period of sixty (60) days. This Agreement shall not constitute an offer and shall only be binding on HRP when executed by HRP.

ACCEPTED FOR CLIENT:

Signature of Authorized Representative

Name: _____

Title: _____

Date: _____

ACCEPTED FOR HRP:

Signature of Authorized Representative

Name: _____

Title: _____

Date: _____

APPENDIX C

CITIZENS PARTICIPATION PLAN

REMEDIAL INVESTIGATION CITIZEN PARTICIPATION PLAN

Former Scolite Site
2 Madison Street
Troy, New York

NYSDEC Site Code # E442037

HRP #TRO2004.P2

PREPARED BY:

HRP ASSOCIATES, INC.
100 SARATOGA VILLAGE BOULEVARD, SUITE 27
MALTA, NEW YORK 12020

Cailyn Dinan
Senior Project Geologist

Jeffrey R. Sotek, PE, CSP, CIH
Senior Project Manager

Submitted: March 26, 2009

HRP
Associates, Inc.

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CITIZEN PARTICIPATION PLAN

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PREFACE

ENVIRONMENTAL RESTORATION PROJECT

This Citizen Participation Plan has been developed for the Former Scolite Site under New York State's Environmental Restoration Projects Program.

Brownfields are abandoned, idled, or under-used properties where expansion or redevelopment is complicated by real or perceived environmental contamination. They typically are former industrial or commercial properties where operations may have resulted in environmental contamination. They often pose not only environmental, but legal and financial burdens on communities. Left vacant, contaminated sites can diminish the property value of surrounding sites and potentially threaten the economic viability of adjoining properties.

RESOURCES AVAILABLE FOR COMMUNITY REDEVELOPMENT

In an effort to spur the cleanup and redevelopment of brownfields, Governor Pataki proposed, and New Yorkers approved, a $200 million Environmental Restoration Fund as part of the $1.75 billion Clean Water/Clean Air Bond Act of 1996 (1996 Bond Act). Under the Program, the State provides grants to municipalities to reimburse up to 90 percent of eligible costs for site investigation and remediation activities. Only New York State municipalities are eligible. The term "municipality" includes counties, cities, towns and villages as well as local public authorities, public benefit corporations, school and supervisory districts and improvement districts. The term also includes a municipality acting in partnership with a community based organization.

Once remediated, the property may then be reused for commercial, industrial, residential or public use. In addition, the municipality and all successors in title, lessees, and lenders are released from remedial liability for hazardous substances that were on the property prior to the grant. The State indemnifies these same persons in the amount of any settlements/judgments obtained regarding an action relating to hazardous substances that were on the property prior to the grant.

1.0 Introduction

The City of Troy and the New York State Department of Environmental Conservation (NYSDEC), in cooperation with the New York State Department of Health (NYSDOH), are committed to informing and involving the public during the process to develop the Site Investigation and Remedial Alternatives Report (SI/RAR) for the Former Scolite Site. The 5.7 acre site was developed prior to 1869 as a foundry by the Rensselaer Iron Works. A previous site investigation determined that the site's soils and groundwater have been impacted. The City of Troy has entered into an Environmental Restoration Program State Assistance Contract with the NYSDEC in September 2007 for this site.

This Citizen Participation Plan (CPP) has been prepared by HRP Associates, Inc., on behalf of the City of Troy, specifically for this site. Definitions of some common terms used in the SI/RAR process may be found in Appendix 1.

The SI is a detailed study to determine how much contamination there is, how far it extends, and potential threats to public health and the environment. Using information developed during the SI, the RAR evaluates possible ways to clean up the site. NYSDEC describes its preferred remedy in a Proposed Remedial Action Plan. After public comment, the selection of a remedy is finalized in a Record of Decision.

The CPP seeks to assure an open process for the interested and possibly affected public. This includes public officials at all levels, citizen interest groups, commercial interests, individuals in the area of the site, and the media. These parties can be a part of the decision-making process for this site, and need to be informed about on-site activities. It also identifies locations where these parties can obtain additional information about the remedial program for this site. Specific opportunities for public and community input into the decision-making process are indicated.

The CPP is a working document. It can be enhanced to accommodate major changes in either public attitude, or in the nature and scope of technical activities at the site. The activities listed below are not intended to be an all-inclusive list, but an outline of possible activities which may be conducted in coordination with the site investigation and remedial process.

This CPP includes the following information:

- A description of the site history, indicating possible types of contamination, any past studies, and any previous remedial measures that may have occurred at the site;

- A description of the proposed Site Investigation/Remedial Alternatives Report (SI/RAR) activities;

- Listing of contacts representing the affected and interested public agencies associated with this project;
- Identification of a local repository for information and reports generated during the course of completing the investigation activities; and
- Description of planned citizen participation activities.

2.0 Site Location

The Former Scolite Site is located along the east shore of the Hudson River and the south shore of the Poestenkill Creek. The site is bounded on the south by Madison Street and on the east by railroad tracks. Prior to a fire that occurred in May 2008, the site contained nine buildings in various stages of disrepair including the iron foundry. Currently, the site contains one building, slab foundations from the former buildings, a large yard area, and a bulkhead for docking along the Hudson River. The site also has an accumulation of materials and mechanical devices (fly wheel) from the previous historical operations, as well as, brick and asbestos mixed rubble (former buildings) as a result of a fire that occurred in May 2008. A portion of the site is proposed as the location for the Upper Hudson River & Estuaries Satellite Center. The center will support scientific and engineering infrastructure for monitoring and experimentation on the river and in its local ecosystem.

The site is situated on a relatively flat parcel of land. However, the majority of the site apparently consists of fill materials, presumably from grading activities during the installation of the bulkhead, therefore, the original site topography cannot be determined. The yard has a wall made of large concrete blocks that runs parallel to the Hudson River, which allows the grade to transfer down from the height of the former buildings foundations and upper yard area, to an area at the level of the top of the bulkhead. According to the United States Department of the Interior Geologic Survey 7.5 minute Series Topographic Map, South Troy Quadrangle, the site elevation varies from 20 to 30 feet above mean sea level (MSL).

3.0 Site History

Reportedly, the iron foundry onsite opened in 1846. In 1869, the property was occupied by the Rensselaer Iron Works and allegedly assisted in building the first ironclad warship. By 1888, the property was occupied by the Albany Rensselaer Iron Works. According to Sanborn maps of the area, a new steel foundry was under construction onsite in 1904. By 1904 and through 1930, the property was occupied by the Ludlow Valve Manufacturing Co. By 1955 and through 1961 the property was occupied by the Ludlow Rensselaer Valve Foundry. Reportedly, these two companies manufactured valves and fire hydrants While used as a steel foundry, the site was broken out to processing areas, an engine room, a scratch room, a

tumbling room, a furnace room and several storage areas.

The property was utilized as a roofing company warehouse in the 1990s, which stored drums containing asphalt and tanker truckers containing asphalt. The property was also occupied by Scolite, which manufactured and stored bags of Perlite. Mixing machinery and conveyers were used by Scolite onsite at that time. From 1999 to 2003, the area near the bulkhead along the Hudson River was used to manage scrap metal prior to loading on barges for shipment. The only remaining building currently onsite was used for office space and for minor equipment storage. The foundry building was housing a log sawmill and splitting operation.

In May 2008, a fire consumed the majority of the buildings onsite. During the demolition of the building remnants, friable asbestos from the transite roofing was mixed in with the brick rubble. The brick and debris mixed with asbestos, was stockpiled on the northern end of the site. Drums containing petroleum based oils located near the stockpile leaked and soaked a portion of the brick debris pile. The drums and petroleum impacted bricks were removed as part of an Interim Remedial Measure (IRM) in October and November of 2008. The remaining brick is scheduled for removal in the 1st quarter of 2009. This plan assumed that the bricks at the northern end of the site will be removed prior to HRP's mobilization to complete remedial investigation activities.

To date, several environmental investigations, including the installation of test pits and groundwater monitoring wells and analysis of representative soil and groundwater samples have been completed on-site. Site investigations have determined that VOCs, SVOCs, and PCBs are present in the site's soils and groundwater.

For a detailed analysis of the environmental history of this site, including prior investigations and remedial activities, see Section 2.3.2 of the RI Work Plan.

4.0 Planned Site Investigation

4.1 Scope of the investigation

An Investigation Work Plan has been prepared which includes the following major tasks:

- Completion of a comprehensive site inspection of the former Scolite property to identify areas of concern;
- Completion of a Ground Penetrating Radar Survey in areas of historical boilers, former USTs, and around the forming building perimeter;
- The collection and analysis of fifteen (15) surface soil samples from the site plus three (3) surface soil samples from offsite locations to provide background conditions. Five (5) of the onsite surface samples and all three (3) of the background samples will be analyzed for TAL metals, TCL VOCs, TCL SVOCs, pesticides, PCBs, and total organic carbon to

evaluate surficial soil conditions. The remaining surface samples will be analyzed for STARS VOCs and SVOCs, RCRA metals and PCBs;

- The installation of fifteen (15) soil borings using a direct push rig. Continuous sampling will be conducted from each boring and one sample from each borehole will be will be analyzed for TAL metals, TCL VOCs, TCL SVOCs, pesticides, PCBs, and total organic carbon to evaluate subsurface soil conditions;
- The installation of an additional eight borings that will be converted into overburden monitoring wells. Groundwater from each of the on-site wells will be sampled for TAL metals (total and dissolved), TCL VOCs, TCL SVOCs, pesticides, and PCBs;
- Completion of a soil vapor evaluation that will include the collection of at least five (5) sub-slab vapor samples will be collected onsite within the former buildings slab foundations, the four (4) others will be collect in the yard. Each of the collected samples will be submitted to state certified laboratory for analysis of VOCs via Method T015;
- Completion of an ALTA survey of pertinent site features and sampling points to ensure that this data is reproducible in the future;
- Implement Interim Remedial Actions (IRMs) if necessary and under the approval of NYSDEC, including but not limited to:
    - Removal of abandoned drums and containers;
    - Removal of ASTs or USTs;
    - Removal or relocation of debris or abandoned equipment;
    - Demolition of building structures that may impede our ability to detect or define contamination areas;
    - Sampling and/or abatement of asbestos containment materials that may impede our ability to detect or define contamination areas;
    - The excavation and transported off-site for appropriate disposal of grossly contaminated soil in "hot spot" areas;
    - The backfilling of excavation areas with clean material;
    - The removal and treatment/disposal of severely impacted groundwater infiltrating into the excavation;
    - The collection and analysis of confirmatory soil and/or groundwater samples for TAL VOCs and Semi-VOCs, as well as TAL metals and pesticides and PCBs in areas where IRMs have been completed; and
    - Additional site investigation to further delineate the degree and extent of contamination.

- A Site Investigation Report/Remedial Alternatives Report (SI/RAR) will be prepared and submitted to the NYSDEC for review;
- Administrative tasks including those associated with the preparation of the CPP, cost reimbursable worksheets, and the periodic reporting requirements under the Environmental Restoration Program (ERP); and
- Complete/assist the City with technical committee meetings and website

material development.

The SI workplan provides additional details about the investigation. Copies can be reviewed at the repositories listed in Section 5.2 of this Citizen Participation Plan.

4.2 Project Schedule

The above activities are expected to begin at the site by Spring 2009. The field activities will take approximately 12 weeks to complete. Laboratory results should be available about three weeks after sample collection. The interim remedial measures will take place based on the results of the initial data gathered. A draft SI report should be submitted to the City of Troy, the NYSDEC and the NYSDOH about two months following data submittal, which is anticipated to be late summer/fall 2009.

5.0 Citizen Participation Activities

It is the expressed intent of the City of Troy and the NYSDEC to provide information to the public in a timely, complete, and accurate manner. Towards this end, the City of Troy has compiled a list of individuals to whom the public can address specific requests for information. These contacts are both local and state public officials and are knowledgeable of the proposed investigative activities. This list of contacts is provided in Table 1, Section 5.1, below.

A local repository has been established at the City Hall and The Public Library, in addition to the ones established at the NYSDEC offices at the Region 4, Schenectady, New York office and Central Office, Albany, New York. Repositories of information are identified in Section 5.2 below. A copy of the documents relevant to the SI/RAR, including the SI/RAR Work Plan, will be placed in the repositories to allow interested citizens and groups to review these documents.

A Fact Sheet detailing the availability of the SI/RAR Work Plan will be sent out to the residents and other interested parties on the mailing list. This mailing will include information about the document repositories, the name and address of the Mayor, NYSDEC Citizen Participation Specialist, NYSDEC Project Manager and NYS Department of Health contact. Parties who express interest in being placed on or removed from the mailing list will be added or removed as requested

The Fact Sheet will also serve as an invitation for the public to provide input on the Work Plan via written or oral comments.

Additional activities, such as a public meeting and/or Fact Sheet after the site investigation is completed will be added as appropriate.

Once the SI/RA Report has been accepted, the NYSDEC will issue a Proposed Remedial Action Plan (PRAP) for the site. This plan will use the information contained in the SI/RAR and evaluate several alternatives to address the contamination at the site. This plan will then propose a course of remedial action for the site.
A public meeting will then be held to present the SI/RAR and the PRAP to the public. This presentation will be followed by a formal question and answer period. The PRAP will also have a 45-day comment period, during which written comments and questions can be submitted.

After the comment period, a Record of Decision (ROD) will be issued by the NYSDEC identifying the remedy selected for the site, and the basis for this selection. As part of the ROD, a responsiveness summary will be prepared. This responsiveness summary will include all relevant and significant questions and comments received on the PRAP and the NYSDEC/NYSDOH responses to this input.

The ROD and the PRAP, and all NYSDEC-approved reports, plans, and fact sheets on this project will be placed in the document repositories for public review. These documents may be distributed more widely, such as to interested local groups, if warranted.

5.1 Public Agency Contacts

The City of Troy has identified individuals knowledgeable of the proposed remedial investigation activities. These individuals are identified in Table 1, below.

Table 1: Public Agency Contacts

Rensselaer County and City of Troy Contacts		
Harry J. Tutunjian, Mayor Troy City	One Monument Square Troy, NY 12180	(518) 270-4401
Andrea Poley, Assistant Planner Troy City Planning	One Monument Square Troy, NY 12180	(518) 270-4557
Russ Reeves Troy City Engineer	One Monument Square Troy, NY 12180	(518) 270-4604
Bill Roehr, Deputy Planning Commissioner Troy City Planning	One Monument Square Troy, NY 12180	(518) 378-8439
Peter Kehoe, Chair Troy City Planning Board	One Monument Square Troy, NY 12180	(518) 270-4488
Linda VonderHeide, Principal Planner Rensselaer County Economic Development and Planning	1600 7th Avenue Troy, NY 12180	(518) 270-2921
NYS Department of Environmental Conservation		
Ian Beilby, Environmental Engineer Division of Environmental Remediation (Technical Assistance)	625 Broadway, 12th Floor Albany, NY 12233-7016	(518) 402-9768
Michael J. Komoroske, Environmental Engineer 3 Division of Environmental Remediation (Technical Assistance)	625 Broadway, 12th Floor Albany, NY 12233-7016	(518) 402-9768
New York State Department of Health		
Kate McLaughlin, Student Assistant	NYSDOH Flanigan Square 547 River Street Troy, NY 12180-2216	(518) 402-7850
Rensselaer County Public Health Department		
Mary Fran Wachunas, Public Health Director	Ned Pattison Government Center, 2nd Floor Troy, NY 12180	(518) 270-2625

5.2 Document Repositories

The public is encouraged to review the documents related to the site which are available for public review at the following locations:

City Hall
One Monument Square
Troy, NY 12180
Phone: (518) 664-4541

Troy Public Library
100 Second Street
Troy, New York 12180
Phone: (518) 274-7071
Fax: (518) 271-9154
Hours of Operation

Monday:	10-8pm
Tuesday	10-8pm
Wednesday	10-8pm
Thursday	10-8pm
Friday	9-5pm
Saturday	9-5pm

NYSDEC, Region 4
1130 North Westcott Road
Schenectady, NY 12306-2014
(518) 357-2068

NYSDEC, Central Office
625 Broadway
Albany, NY 12233
(518) 402-8013

Documents available will include the approved Work Plan for the RI process. As more documents are created during the remediation process, they will be placed in the repositories.

5.3 Site Contact List

A list of adjacent residents and/or interested parties is maintained in NYSDEC project files (Table 2). If residents with interest in the project would like to be added to the contact list, please contact the NYSDEC Project Manager, Mr. Ian Beilby. The City of Troy will produce and distribute Fact Sheets providing residents with timely information on project status, including notifications of upcoming activities on-site (e.g., fieldwork) or off-site (e.g., public availability sessions). Included in all Fact Sheets will be the list of individuals to be contacted by the public for additional information (see Table 1, above). In

addition to property owners, Fact Sheets will be mailed to the elected officials/ representatives, environmental groups, and media listed in Tables 3 and 4 below.

Table 2: Site Contact List

City of Troy and Rensselaer County Contacts		
Harry J. Tutunjian Mayor of Troy	One Monument Square Troy, NY 12180	(518) 270-4401
Peter Kehoe, Chair Troy City Planning Board	One Monument Square Troy, NY 12180	(518) 270-4488
Linda VonderHeide Principal Planner Rensselaer County Economic Development and Planning	1600 7th Avenue Troy, NY 12180	(518) 270-2921
NYS Department of Environmental Conservation		
Ian Beilby Environmental Engineer Division of Environmental Remediation (Technical Assistance)	625 Broadway, 12th Floor Albany, NY 12233-7016	(518) 402-9768
Rensselaer County Public Health Department		
Mary Fran Wachunas Public Health Director	Ned Pattison Government Center, 2nd Floor Troy, NY 12180	(518) 270-2625
Adjacent Property Owners		
New York Central Lines LLC	500 Water St Jacksonville, FL 32202	
Troy Slag Products Co Inc	PO Box 866 Troy, NY 12180	
K C Refrigeration	PO Box 545 Troy, NY 12180	
Bruno, Frances C	4 Bradhaven Rd Slingerlands, NY 12159	
Phoenix Metal Recycling, Inc	295 First St. Troy, NY 12180	
Interstate Commodities	7 Madison St Troy, NY 12180	

Table 3: Elected Officials/Representatives and Environmental Groups

Elected Officials / Public Agency Representatives	
Charles E. Schumer, United States Senate 313 Hart Senate Office Building District of Columbia 20510-3203 (202) 224-6542	Charles E. Schumer Leo W. O'Brien Federal Office Building Room 420 Albany, NY 12207 518-431-4070
Hillary Rodham Clinton, United States Senate 476 Russell Senate Office Building District of Columbia 20510-3204 (202) 224-4451	Hillary Rodham Clinton Leo W. O'Brien Federal Office Building Room 821 Albany, NY 12207 (518) 431-0120
Ron Canestrari, NYS Assembly 106th Assembly District LOB 926 Albany, NY 12248 518-455-4474	
Tim Gordon, NYS Assembly 108th Assembly District 1654 Columbia Turnpike Castleton-on-Hudson, NY 12033 (518) 479-0542	Tim Gordon 108th Assembly District LOB 529 Albany, NY 12248 (518) 455-5777
Roy McDonald, NYS Assembly 112th Assembly District 383 Broadway - Rm. 202 Fort Edward, NY 12828 (518) 747-7098	Roy McDonald 112th Assembly District LOB 402 Albany, NY 12248 (518) 455-5404
Michael McNulty, US House of Representatives 2210 Rayburn House Office Building Washington, DC 20515-3221 (202) 225-5076	Michael McNulty 33 Second Street Troy, New York 12180-3975 (518) 271-0822
Bob Mirch, Deputy Commissioner of Public Works One Monument Square Troy, NY 12180 (518) 270-4584.	Harry J. Tutunjian, Mayor of Troy New York City Hall, One Monument Square Troy, NY 12180 (518) 270-4401
Environmental Groups	
New York Public Interest Research Group (NYPIRG) State University College Campus Center 307 Albany, New York 12222	

5.4 Media Announcements

The City of Troy and the NYSDEC will make every reasonable effort to ensure that upcoming public meetings are announced in several media, for the purpose of encouraging public participation and comment. Announcements will be initially submitted to visual and sound media for broadcast as "Public Service Announcements" at least 14 calendar days prior to the day of the public meeting.

The media locations identified in Table 3 represent the minimum media where announcements will be placed.

Table 4: Media

Television	WNYA-CA (Channel 39) WYPX (Channel 55) WRGB (Channel 6) WNYT (Channel 13) WTEN (Channel 10) WMHT (Channel 17)
Radio	WABY (1160 AM) WPTR (1540 AM) WGY (810 AM) WABT (104.5 FM) WQAR (101.3 FM) WAMC-FM (90.3 FM)
Newspaper	The Record 501 Broadway Troy, NY 12180 (518) 270-1200 Times Union Mark E. Aldam, Publisher Times Union News Plaza Box 15000 Albany, N.Y. 12212

APPENDIX 1

Environmental Restoration Program Glossary and Acronyms

GLOSSARY

This glossary defines terms associated with New York's citizen participation program, and important elements of the Brownfield program. Words in **bold** in the definitions are defined elsewhere in the glossary.

Administrative Record	Part of a site's **Record of Decision** which lists and defines documents used in the development of NYSDEC's decision about selection of a remedial action.
Availability Session	A scheduled gathering of program staff and members of the public in a casual setting, without a formal presentation or agenda but usually focusing on a specific aspect of a site's remedial process.
Citizen Participation	A program of planning and activities to encourage communication among people affected by or interested in Brownfield sites and the government agencies responsible for investigating and remediating them.
Citizen Participation Plan	A document which must be developed at a site's **Site Investigation** stage. A CP Plan describes the citizen participation activities that will be conducted during a site's remedial process.

Citizen Participation Specialist	A staff member from an NYSDEC central office or regional office who has specialized training and experience to assist a **project manager** and other staff to plan, conduct and evaluate a site-specific citizen participation program.
Comment Period	A time period for the public to review and comment about various documents and DER actions. For example, a 45-day comment period is provided when DER issues a **Proposed Remedial Action Plan (PRAP)**.
Contact List	Names, addresses and/or telephone numbers of individuals, groups, organizations, government officials and media affected by or interested in a particular Brownfield site. The size of a contact list and the categories included are influenced by population density, degree of interest in a site, the stage of the remedial process and other factors. It is an important tool needed to conduct outreach activities.
Division of Environmental Remediation	A major program unit within the New York State Department of Environmental Conservation created to manage the hazardous waste site remedial program, the Brownfield program, and the Voluntary Cleanup program. Staff include: engineers, geologists, chemists, attorneys, citizen participation specialists, environmental program specialists and support staff.
Document Repository	A file of documents pertaining to a site's remedial and citizen participation programs which is made available for public review. The file generally is maintained in a public building near the Brownfield site to provide access at times and a location convenient to the public.

Fact Sheet	A written discussion about part or all of a site's remedial process, prepared and provided by DER to the public. A fact sheet may focus on: a particular element of the site's remedial program; opportunities for public involvement; availability of a report or other information, or announcement of a **public meeting** or **comment period**. A fact sheet may be mailed to all or part of a site's **contact list**, distributed at meetings, placed in a **document repository** and/or sent on an "as requested" basis.
Interim Remedial Measure (IRM)	A discrete action which can be conducted at a site relatively quickly to reduce the risk to people's health and the environment from a well-defined contamination problem. An IRM can involve removing contaminated soil and drums, providing alternative water supplies or securing a site to prevent access.
New York State Department of Health	Agency within the executive branch of New York State government which: performs health-related inspections at suspected contaminated sites; conducts health assessments to determine potential risk from environmental exposure; reviews Exposure Assessments prepared during the **Site Investigation/Remedial Alternatives Report**; conducts health-related community outreach around sites; and reviews remedial actions to assure that public health concerns are adequately addressed.
Operable Unit	A discrete part of an entire site that produces a release, threat of release, or pathway of exposure. An Operable Unit can receive specific investigation, and a particular remedy may be proposed. A **Record of Decision** is prepared for each Operable Unit.
Operation and Maintenance	A period in which remedial action may be conducted following construction at a site (for example, operation of a "pump and treat" system), or which is performed after a remedial action to assure its continued effectiveness and protection of people's health and the environment. Activities can include site inspections, well monitoring and other sampling.

Project Manager	An NYSDEC staff member within the **Division of Environmental Remediation** (usually an engineer, geologist or hydro geologist) responsible for the day-to-day administration of remedial activities at, and ultimate disposition of, an Environmental Restoration site. The Project Manager works with legal, health, **citizen participation** and other staff to accomplish site-related goals and objectives
.Proposed Remedial Action Plan (PRAP)	An analysis by DER of each alternative considered for the remediation of an Environmental Restoration site and a rationale for selection of the alternative it recommends. The PRAP is created based on information developed during the **Site Investigation/Remedial Alternatives Report**. The PRAP is reviewed by the public and other state agencies.
Public Meeting	A scheduled gathering of **Division of Environmental Remediation** staff with the affected/interested public to give and receive information, ask questions and discuss concerns about a site's remedial program. Staff from other NYSDEC divisions, legal and health staff, and staff from consultants and a responsible party often also attend. A public meeting, unlike an **availability session**, generally features a formal presentation and a detailed agenda.
Record of Decision (ROD)	A document which provides definitive record of the cleanup alternative that will be used to remediate an Environmental Restoration site. The ROD is based on information and analyses developed during the **Site Investigation/Remedial Alternatives Report** and public comment.
Remedial Construction	The physical development, assembly and implementation of the remedial alternative selected to remediate a site. Construction follows the **Remedial Design** stage of a site's remedial program.
Remedial Design	The process following finalization of a **Record of Decision** in which plans and specifications are developed for the **Remedial Construction** of the alternative selected to remediate a site.

Site Investigation/ Remedial Alternatives Report (SI/RAR)	The SI fully defines and characterizes the type and extent of contamination at the site. The RAR, which may be conducted during or after the SI, uses information developed during the SI to develop alternative remedial actions to eliminate or reduce the threat of contamination to public health and the environment.
Responsiveness Summary	A written summary of major oral and written comments received by DER during a **comment period** about key elements of a site's remedial program, such as a **Proposed Remedial Action Plan**, and DER's response to those comments.

APPENDIX D

RESUMES

Jeffrey R. Sotek, PE, CSP, CIH
Senior Project Manager

AREAS OF EXPERTISE

- Environmental Site Assessment
- Site Investigations
- Remedial Action Projects
- Environmental Engineering and Permitting
- Tank Inspections
- Project Management

EDUCATION

B.S., Civil Engineering
Worcester Polytechnic Institute, 1990

PROFESSIONAL REGISTRATIONS/ CERTIFICATIONS

Registered Professional Engineer, New York, Vermont

Certified Safety Professional, Comprehensive Practice

Certified Industrial Hygienist, Comprehensive Practice

Former NYS Licensed Asbestos Inspector

PROFESSIONAL SUMMARY

Mr. Sotek is a registered Professional Engineer and Certified Safety Professional, with over 16 years of experience on a wide range of environmental, health, and safety projects. During the past several years, Mr. Sotek has focused on the completion and management of environmental assessments/investigations, remedial action projects and Brownfields redevelopment. Mr. Sotek has completed or supervised over 500 Phase Is and 100 Phase IIs. He also serves as primary client contact for two of the top ten largest financial institutions in the United States, coordinating projects between HRP's five offices. In addition, in his capacity, Mr. Sotek has obtained closure from federal or state agencies for over 20 sites impacted by petroleum and chemical products.

RELEVANT EXPERIENCE

Brownfield ERP Remedial Investigation

Mr. Sotek was responsible for managing the project activities for a remedial investigation at a former shirt factory in which a small portion of the property was utilized as a manufactured gas plant. The remedial investigation included the installation of soil borings, groundwater wells, and soil vapor points as well as the analysis of soil, groundwater and vapor samples. The initial work plan was approved by the NYSDEC. During implementation of the work plan, low levels of petroleum contamination in soils were detected. Currently, a remedial alternatives analysis is being developed.

Brownfield Redevelopment

Mr. Sotek has recently managed Brownfield Voluntary Cleanup projects located in Glens Falls and Canton, New York. He was responsible for the preparation of Site Work, Quality Assurance, and Health and Safety Plans and remedial feasibility reviews. In addition, Mr. Sotek directed field personnel that completed various activities including UST removals, soil borings and monitoring well installation, field sampling, soil excavation, soil venting system design and installation, pilot tests, and ORC injection. The Glens Falls site has received a record of Decision and No Further Action. The Potsdam site is currently under review

Inactive Hazardous Waste Management Remedial Investigation

Mr. Sotek has recently managed a remedial investigation conducted at New York State Inactive Hazardous Waste site in Hudson Valley, New York. He was responsible for the preparation of the work plan and site-specific Health and Safety Plans and remedial feasibility reviews. Mr. Sotek oversaw the preparation and reviewed quality assurance and community air monitoring, and community

PROFESSIONAL AFFILIATIONS

American Industrial Hygiene Association

Business Council of New York State

Environmental Bankers Association

PROFESSIONAL TRAINING/EDUCATION

- OSHA 40HR Hazardous Waste Operations & Emergency Response (HAZWOPER), 1990
- OSHA Annual 8HR HAZWOPER Refresher (1991 to Present)
- OSHA 10 Hour Voluntary Compliance Course – General Industry Standards

participation plans. In addition, Mr. Sotek directed field personnel that completed various activities including geoprobe boring installation and field sampling. The final report was submitted to the NYSDEC and a Record of Decision has been issued.

Phase I ESA Portfolio, Port Chester, NY

HRP was retained to complete Phase I Environmental Site Assessments in accordance with ASTM E1527-05 on eleven industrial and office properties and rank each site for the client in accordance with each site environmental risk and estimated liabilities. Mr. Sotek was responsible for client interaction, project management, and report review.

Subsurface Investigations, Plastic Bag Manufacturer, Orangeburg, New York

Mr. Sotek supervised the completion of a comprehensive subsurface investigation of a 53 acre site utilized by a plastic bag manufacturer in Rockland County, New York. Areas of concern included a 246,000 aboveground fuel oil tank, a 10,000 gallon underground oil water separator, a 2,500 gallon aboveground solvent tank, a historical, outside barrel storage area, and several historical spills/releases. Although it was determined that no significant sources of contamination, which could significant impair human health or the environment, were present on-site, low-level petroleum-related compounds were detected and the state was notified of a petroleum release on-site. Mr. Sotek coordinated the removal of 40 cubic yards of soil and successfully argued that with protective asphalt cap over the soils near the loading dock would not pose a threat to the environment or ground waters of the State. The NYSDEC has officially granted closure to this site with no further action necessary. This action enabled the client to proceed and obtain the 10 million dollar loan from an area financial institution.

Portfolio Management, Site Assessments and Environmental Risk Analysis for National Lending Institution

Due to a pending $120,000,000 loan, HRP was retained to perform Phase I Site Assessments at fourteen industrial properties located throughout the United States and prepare a quantification of environmental risk analysis. The properties, consisting of dye houses, textile mills, warehouses, etc., ranged from one acre to over fifty acres and were improved by buildings ranging from 300,000 ft^2 to over 1,000,000 ft^2. Mr. Sotek coordinated with personnel from three HRP offices to ensure these projects were completed on time, on budget, and at the highest level of quality assurance in order for the portfolio manager to evaluate environmental risks to the portfolio value and make informed prudent business decisions.

Cailyn E. Dinan

Senior Project Geologist

AREAS OF EXPERTISE

- Environmental Site Assessments
- Remedial Investigations
- Remedial Design
- Soil Vapor Extraction
- Environmental Insurance Reimbursement

EDUCATION

B.S., Geology,
Tulane University, 1999

PROFESSIONAL REGISTRATIONS/ CERTIFICATIONS

"Health and Safety Operations at Hazardous Materials Sites," 40-Hour Course, August, 1999, Refreshers 2000 through 2008

Ms. Dinan, a Senior Project Geologist for HRP Associates, Inc., has over seven years of experience in providing environmental consulting services to various private industries, municipalities and lenders. Her current responsibilities include the implementation of environmental site assessments, site investigations and remedial design. Ms. Dinan is well versed in all aspects of site investigations including soil, groundwater, vapor, bedrock, sediment and surface water sampling. In addition, Ms. Dinan has a working knowledge of field instrumentation including PIDs, Air Monitors, as well as various groundwater and vapor sampling methods. Other projects completed by Ms. Dinan include Remedial Investigations, Health and Safety Plans, and Phase I/II Environmental Site Assessments.

RELEVANT EXPERIENCE

Ms. Dinan has been responsible for the management and preparation of a variety of projects including:

- Remedial investigations at several retail gasoline service stations within New York State
- Phase I Environmental Site Assessments and Phase II and Subsurface Investigations
- Installation of soil vapor extraction systems and product recovery wells
- Environmental Insurance Reimbursement Program Management

Specific projects include:

Various Retail Gasoline Service Stations New York

These projects entailed the investigation of soil, groundwater, bedrock, vapor, surface water and sediment affected by contamination from various gasoline service stations. Ms. Dinan supervised the drilling, remedial system installation, tank pulls and sampling at these sites. In addition, responsibilities included extensive note taking and training of junior staff as well as close contact and communication with NYSDEC representatives.

Residential PCB sites. Glen Falls, NY

This project entailed the characterization of soils and groundwater contaminated with PCBs from buried transformers in residential neighborhoods. Ms. Dinan supervised the collection of groundwater and soil samples and conducted amino assay field tests to indicate highly contaminated areas.

Environmental Insurance Reimbursement Program, NY, ME, NH, MA, CT, NJ, PA, MD

This project entailed creating and managing an Environmental Reimbursement Program for a national retail gasoline company. As Project Manager, Ms. Dinan acted as the liaison between her client and their environmental insurance carrier. Tasks included review of all environmental reports, regulatory correspondence, invoices historical information, Petroleum Bulk Storage information, and maintenance information for the sites which were eligible for environmental reimbursement.

NANCY E. GARRY, P.E.
Senior Project Engineer

SUMMARY OF EXPERIENCE

Mrs. Garry is a Senior Project Engineer for HRP Associates, Inc. As a Senior Project Engineer, she is responsible for support and facilitation of environmental due diligence and compliance projects. In her capacity, she is responsible for the following tasks:

- Phase I Environmental Site Assessments
- Phase II Subsurface Investigations
- Remedial Design
- Tank System Design
- Air and Wastewater Permitting
- Environmental Compliance Plans

In addition, to her tenure at HRP, Mrs. Garry has four years experience working as a Project Manager with the New York State Department of Environmental Conservation on NYS Inactive Hazardous Waste Sites and three years experience in environmental engineering while she worked for the Department of Navy, Facilities Engineering Command, Northern Division, Environmental Engineering Department in Philadelphia, Pennsylvania. During this time, Mrs. Garry oversaw consultants, reviewed work plans and Records of Decisions, supervising remediation projects and ensured compliance with all federal, state and local regulations; ensuring the project proceeded on-time and within budget.

SPECIFIC EXPERIENCE

Preliminary Environmental Site Assessments

Mrs. Garry has completed numerous Preliminary Environmental Site Assessments for various types of sites. As part of the assessment Mrs. Garry performs a historical review of a site to determine if past or present site operations (e.g. storage of fuel oil) are potential sources of contamination. Specific tasks performed by Mrs. Garry include: site inspection, interviews with site personnel, review of regulatory databases and information available at state and local offices, and preparation of a reports.

Remedial Action Supervision

Mrs. Garry has performed remedial action supervision, including the excavation of contaminated soils and post excavation sampling of several underground storage tank sites, dry cleaner site, and listed NYS inactive hazardous waste sites in New York State.

Design

Mrs. Garry has designed several underground storage tank systems. Tanks system were designed to meet USEPA 1998 upgrade requirements as well as NYS DEC Petroleum Bulk Storage Requirements.

NANCY E. GARRY, P.E.
Senior Project Engineer

Asbestos

Historically, Mrs. Garry was a licensed NYS Asbestos Inspector, Management Planner, and Project Designer. She has, in her capacity, completed several asbestos building surveys and operation and maintenance manuals. Mrs. Garry has also designed asbestos abatement projects.

EDUCATION

1993 Masters of Engineering, Rensselaer Polytechnic Institute, Environmental Engineering
1990 B.A. College of St. Rose, Chemistry/Biology

REGISTRATIONS

State of New York, Professional Engineer

CERTIFICATIONS

OSHA 40-hour Hazardous Waste Training, Albany, New York, 1993.
OSHA 8-hour Hazardous Waste Training Refresher, Department of the Navy, 1994, 1995, 1996, HRP Associates, Inc. 1997-2001; 2005-2008, NYSDEC 2002 – 2004

SEMINARS

EPA 40-hour Asbestos Project Designer Course, Temple University, PA, 1996.
EPA 40-hour Asbestos Contract/Supervisor Course, Environmental Support Systems, Albany, NY, June 1997.
EPA 24-hour Asbestos Building Inspector Course, Environmental Support Systems, Albany, NY, March 1997.
EPA 16-hour Asbestos Management Planner Course, Institute for Environmental Education (IEE), Albany, NY, January 1998.
EPA 8-hour Asbestos Project Designer Refresher Course, PSI, Albany, NY, February 1997.
EPA 8-hour Asbestos Building Inspector Refresher Course, IEE, Albany, NY, September 1997.

Lyman C. Tinc

Project Engineer

AREAS OF EXPERTISE

- Environmental Site Assessments
- Environmental Permitting and compliance
- EHS Compliance

EDUCATION

B.S., Civil & Environmental Engineering, Clarkson University, 2005

PROFESSIONAL REGISTRATIONS/ CERTIFICATIONS

Engineer-in-Training, New York

PROFESSIONAL AFFILIATIONS

Air and Waste Management Association: Eastern New York Chapter

American Society of Civil Engineers: Mohawk Hudson Section

PROFESSIONAL TRAINING/EDUCATION

- OSHA 40HR Hazardous Waste Operations & Emergency Response (HAZWOPER), 2004
- OSHA Annual 8HR HAZWOPER Refresher (2005 to Present)

Mr. Tinc is a Project Engineer for HRP. In his position as a Project Engineer, he is responsible for the following:

- Environmental Permitting and Compliance;
- Environmental Site Assessments; and
- Environmental, Health, and Safety Compliance.

RELEVANT EXPERIENCE

U.S. NAVY, EFANE Northeast Region

Mr. Tinc completed environmental liabilities assessments for the naval bases in New London CT; Portsmouth, NH; Brunswick, ME; and several reserve centers in NY. The assessments included field reviews to identify recognized environmental liabilities, interviews with site personnel, identification of permitting requirements, and preparation of cost estimates for removing the environmental concerns.

Compliance Coordination, Gasket Manufacturer, NY

Mr. Tinc assessed the facility's operations and identified the necessary environmental tasks to keep the facility in compliance with state and federal regulations. Mr. Tinc also developed a system for the client to ensure the proper personnel were notified of impending due dates and properly addressed to maintain compliance.

On-call services, various clients

Mr. Tinc has provided on-call services to several large clients to keep them in compliance with state and federal regulations. The services included answering environmental questions, identification of permitting requirements, preparation of Tier II forms, Form Rs, Slug discharge control plans, Spill Prevention Reports (SPR), Spill Prevention, Control, and Countermeasure (SPCC) Plans, Air Audits, Air certifications, and Air Permits.

Site Investigation, North Greenbush, New York

Mr. Tinc preformed an Environmental Review at this site, during which several environmental risks including water intrusion, off-site spills with the potential to impact the site, and the possibility for elevated metal levels in the surrounding soil due to the legacy of an on-site septic tank and x-ray developer. A Phase II ESA was recommended, which consisted of the installation of soil borings in areas of concern, the collection, description, and interpretation of representative soil samples, and the interpretation of analytical results. In addition a water intrusion survey was performed which consisted of a visual inspection and collection of moisture readings in building materials and the ambient air. Based on the investigation several areas of concern were identified, and cost estimates to mitigate them were provided to the client.

Form R submissions, various clients

Mr. Tinc has been responsible for coordinating with several companies to calculate their reportable quantities of toxic chemicals for their Form R submissions. This included the analysis of production and purchase orders to identify chemicals that may be over the reporting thresholds, calculations of toxic chemicals, and completion of the necessary reporting forms.

Metal finisher, New Jersey

Mr. Tinc has also aided in the performing air quality testing to determine if the facility was in compliance with OSHA permissible exposure limits to ensure worker safety. Data collected in the field was then analyzed by a lab. The results of which was compared to OSHA regulations to identify what if any exceedances were present which might pose a risk to worker safety.

Zoé A. Belcher, LG, RBP
Senior Project Geologist

AREAS OF EXPERTISE

- Connecticut Remediation Standard Regulations
- Subsurface Investigations
- Data Interpretation
- Soil and Groundwater Remediation Design and Implementation
- Bid Specifications
- Connecticut Tank Fund
- Proposal Preparation
- Client Coordination
- EPA Brownfields Program
- Brownfield Quality Assurance Project Plans (QAPPs)

EDUCATION

M.S., Environmental and Engineering Geosciences, Radford University, Radford, Virginia, 2002

B.S., Geology with specialty in Engineering, Radford University, Radford, Virginia, 1998

PROFESSIONAL CERTIFICATIONS/ AFFILIATIONS

Registered Brownfield Professional, #RBP00072

Professional Geologist, State of Washington, #2283

OSHA 40-Hour Hazardous Waste Operations and Emergency Response, 2000, 8 hr. refreshers annually

Environmental Professional's Organization of Connecticut

Ms. Belcher is a Senior Project Geologist and has been with HRP Associates, Inc. for over 7 years. In her capacity as a Senior Project Geologist, she is responsible for the following tasks:

- Subsurface and degree/extent investigations
- Interpretation of geologic/hydrogeologic data and soil/groundwater quality data as it relates to the Connecticut Remediation Standard Regulations (RSRs)
- Evaluation of Significant Environmental Hazard Notification
- Proposal and report preparation and client coordination
- Soil and Groundwater Remediation
- Oversight of soil vapor and groundwater remediation systems
- Preparation of remediation bid packages and specifications
- Supervision of project teams on site with long-term groundwater monitoring programs
- Generating and maintaining project budgets
- Oversight of EPA Funded Brownfields Projects
- Preparation of Brownfield Quality Assurance Project Plans (QAPPs)

SPECIFIC EXPERIENCE

Subsurface Investigations, Groundwater Monitoring, Site Remediation

- Owner and subcontractor coordination
- Supervision of field work and field staff
- Review of field and lab data to evaluated site conditions and develop appropriate remedial strategies
- Delineation of contaminant distribution
- Design and supervision of soil, groundwater, and soil vapor remediation projects
- Oversee the long-term monitoring of groundwater and soil vapor extraction projects
- Review project staff reports
- Oversee daily activities conducted by project staff
- Prepare periodic client status reports

Specifically, she has been responsible for the above-mentioned responsibilities during the following projects:

Former Junk Yard, Southern Connecticut (2000-present)

This former junk yard site is slated for residential development. Contaminants of concern at this site include volatile organic compounds (VOCs) and metals. Ms. Belcher's responsibilities on this project included:

- Supervised the installation of 8 bedrock monitoring (3 nested pairs) wells to evaluate groundwater quality

PROFESSIONAL CERTIFICATIONS/ AFFILIATIONS

Association of Engineering Geologists

Geological Society of America

Institute of Brownfields Professionals

Geo-Institute

Institute of Brownfield Professionals

Professional Women in Construction

American Institute of Professional Geologists

CONTINUING EDUCATION

Remediation Standard Regulations (RSRs), Fundamental Review, EPOC, 2000

Quantitative Hydrogeology: Design of Groundwater Extraction Systems, EPOC, 2001

Advances in Characterizing Groundwater Movement Through Glacial Sequences, University of Massachusetts and Midwest Geosciences Group, 2002

- Maintains direct contact with the CT DEP and local health department
- Preparing documentation for local planning and zone board for lot subdivision approval
- Supervision of water supply sampling
- Review of all data

Former Mattress Assembly Facility, Central Connecticut (2001-present)

This site is a former mattress assembly facility with petroleum and VOC contamination. Ms. Belcher's responsibilities on this project included:

- Scheduled and supervised the installation of test pits
- Supervising removal of petroleum contaminated soil and septic waste
- Design of an 65 point interior soil gas survey
- Design of a subslab depressurization system
- Overseeing field staff during system installation
- Review of quarterly reports generated by staff members

Former Electronics Manufacturing Facility, Central Connecticut (2001-present)

Historical electronic manufacturing operations resulted in VOC and metals impact to the soil and groundwater. A remediation in 1999 removed 15,000 tons of soil. Cadmium concentrations in the groundwater remained elevated after remediation. Ms. Belcher's responsibilities on this project included:

- Supervision of 6 years of post remediation groundwater monitoring
- Design of subsurface investigation (20 borings, 65 soil samples) - determine if residual cadmium remained below water table
- Review of analytical results (no cadmium by Synthetic Precipitation Leachate Procedure, hazardous levels by Toxicity Characteristic Leachate Procedures)
- Review of remedial alternatives
- Design and preparation of Remedial Action Plan - excavation (7,000 tons), ex-situ stabilization (1,000 tons), off-site disposal (4,000 tons), soil reuse (2,500 cubic yards)
- Removal of soil to 8 ft below water table (dewatering)
- Review confirmation samples for excavation limits
- Supervision of subcontractors and HRP field staff.

Oil Company, Northern Connecticut (2005-present)

Groundwater monitoring is conducted for this site under the CT Tank Fund. Ms. Belcher responsibilities include:

- Overseeing work conducted by staff
- Review all documents prior to issuance.
- Preparation of state tank fund submission for client reimbursement

Former Manufacturing Facility, Western Connecticut (2002-present)

Large scale groundwater contamination has occurred at the former battery manufacturing facility. Ms. Belcher's responsibilities include:

- Oversight of monitoring of a multiphase extraction system (soil vapor extraction, liquid ring pump, groundwater extraction/treatment) – to date over 10,000 pounds of VOCs removed
- Review of data, monthly/semi-annual reports, monthly client updates prepared by staff
- Supervision of field and office staff during in-situ chemical oxidation pilot study.
- Review of pilot study data

Former Railroad Station Soil Remediation, Central Connecticut (complete 2001)

The former railroad property was redeveloped to house the new police facility. Mrs. Belcher supervised the on-site remedial activities which included:

- Excavation of 5,000 tons of soil
- Use of geotextiles and clean fill (imported from on-site) tp create a 25 ft. buffer zone to compile with state regulations

Former Manufacturing Facilities, Western Connecticut (2002-present)

The former manufacturing site was impacted with VOCs. Ms. Belcher has been responsible for the following:

- Oversight of soil vapor extraction (SVE) system operations (removal of 10,700 pounds of VOCs)
- Post-remediation soil vapor monitoring
- Preparation of groundwater monitoring variance documents
- Preparation of final verification and site closer documents

Brownfield Experience

6 Brownfields Properties, Central Connecticut (completed 2005)

EPA awarded the City funds to complete work on six properties. The project involved completing Quality Assurance Project Plans (QAPP),

Phase I and II Environmental Assessments, conceptual remediation strategies, and Community Outreach and Education. Ms. Belcher was responsible for the following:

- Conducting Phase I's on 5 properties
- Identification of Areas of Concern
- Preparation of 4 QAPPs
- Design of non-invasive investigation (ground penetrating radar and passive soil gas survey)
- Design of soil and groundwater investigations (test pits, macro-core sampling, well installation)
- Lateral and vertical delineation of contaminant impact to the soil
- Preparation of isopleths maps and cross-sections
- Preparation of report documenting findings
- Preparation of potential remedial options

Brownfields Quality Assurance Project Plans (QAPPs)

Mrs. Belcher was responsible for preparing QAPPs for three Brownfield sites in southeastern Connecticut, two sites in southwestern Connecticut, and five sites in western Connecticut. All ten QAPPs involved the preparation of information concerning Project Management and Objectives, Measurement/Data Acquisition, Assessment/Oversight, and Data Validation and Usability. These elements of a QAPP consist of twenty-one individual sections designed to address everything from standard operating procedures for fieldwork to laboratory data validation procedures for verifying data completeness and accuracy. To date all ten of the QAPPs have been approved by the EPA.

Bid Package Preparation

Ms. Belcher has prepared bid documents and specifications for 4 remediation projects. She has prepared specifications for site clearing, erosion and sedimentation controls, excavation (clean and hazardous soil), backfill and compaction, soil vapor extraction and subslab depressurization system installation, concrete floor cutting and repair, and site restoration.

OTHER EXPERIENCE

In the course of her career, Ms. Belcher has also performed the following duties:

- Phase I Environmental Site Assessments
- Well Receptor Surveys
- Environmental Condition Assessment Forms (ECAFs)
- Preparation of erosion and sediment control plans
- Geotechnical lab analyses

Edward Bell

Project Geologist

AREAS OF EXPERTISE

- Phase I Environmental Site Assessments
- Phase II Subsurface Investigations
- Asbestos Surveys

EDUCATION

B.S., Geology,
St. Lawrence University,
2004

PROFESSIONAL REGISTRATIONS/ CERTIFICATIONS

NYS Licensed Asbestos Inspector

PROFESSIONAL TRAINING/EDUCATION

OSHA 40-Hour HAZWOPER Trained, 2008

Mr. Bell is a Project Geologist for HRP and responsible for the following:

- Phase I environmental site assessments;
- Phase II subsurface investigations;
- Environmental Restoration Projects; and
- Asbestos Surveys

SPECIFIC EXPERIENCE

Phase I Environmental Site Assessments (ESAs)

Mr. Bell has completed numerous ESAs for various types of sites, including: commercial buildings, offices, and light manufacturers. A Phase I Site Assessment is a historical review of a site conducted to determine if past or present site operations (e.g. storage of fuel oil) are potential sources of contamination. Specific tasks performed by Ms. Burke include: site inspection, interviews with site personnel, review of regulatory databases and information available at state and local offices, and preparation of Phase I reports in accordance with ASTM requirements and specific institutional requirements.

Phase II Subsurface Investigation

Mr. Bell has acted as a Project Geologist for a Phase II Investigation in Wallkill, New York, to evaluate the potential impact of historical operations upon underlying soils and groundwater. Project responsibilities included the installation of direct push boring installations, soil and groundwater sampling, data interpretation and report preparation.

Environmental Restoration Program (ERP)

Mr. Bell acted as Health and Safety Officer at an Environmental Restoration Program (ERP) Sites in Mechanicville and Troy, New York. Tasks included plan communication, air monitoring, site security, and PPE policy enforcement. Also Mr. Bell assisted in sampling events, as needed.

Asbestos Inspection, Commercial Building, New York

Mr. Bell has performed an asbestos building survey of a commercial building in Great Neck, New York. This included the collection of bulk samples of numerous suspect materials in accordance with USEPA guidelines, as well as collection of the necessary data (friability, condition assessments and quantity estimations) for the surveys. In addition, Mr. Bell was involved in the interpretation of analytical results and the preparation of project reports.

Matthew Finkenbinder

Project Geologist

AREAS OF EXPERTISE

- Phase I Environmental Site Assessments
- Phase II Subsurface Investigations
- Fluvial Geomorphology
- Bedrock and Surficial Geology Mapping

EDUCATION

B.S., Geoenvironmental Studies,
Shippensburg University, 2005

M.S., Geology,
West Virginia University, 2008

CERTIFICATIONS

OSHA 40-Hour HAZWOPER Trained, Saratoga Safety, 2008

AFFILIATIONS

Geological Society of America
Hudson-Mohawk Professional Geologists Association

Mr. Finkenbinder is a Project Geologist for HRP and responsible for the following:

- Phase I environmental site assessments; and
- Phase II subsurface investigations.

SPECIFIC EXPERIENCE

Phase I Environmental Site Assessments

Mr. Finkenbinder has completed numerous ESAs for various types of sites, including: commercial buildings, offices, and light manufacturers. A Phase I Site Assessment is a historical review of a site conducted to determine if past or present site operations (e.g. storage of fuel oil) are potential sources of contamination. Specific tasks performed by Mr. Finkenbinder include: site inspection, interviews with site personnel, review of regulatory databases and information available at state and local offices, and preparation of Phase I reports in accordance with ASTM requirements and specific institutional requirements.

Phase II Subsurface Investigation

Mr. Finkenbinder has acted as a Project Geologist for a Phase II Investigation in New York, to evaluate the potential impact of historical operations upon underlying soils and groundwater. Project responsibilities included the installation of direct push boring installations, soil and groundwater sampling, data interpretation and report preparation.

OTHER EXPERIENCE

Mr. Finkenbinder has taught an undergraduate level Geomorphology lecture course and numerous Geoscience and Geomorphology laboratory courses at West Virginia University. In addition, he has assisted in teaching West Virginia University's Summer Geology Field Camp, a 6-week course in the middle and northern Rocky Mountain Physiographic Provinces. He also has carried out independent fluvial geomorphology research in the central Appalachian Mountains, where he specifically studied the hydraulic geometry of high-gradient, Mountain Rivers.

APPENDIX E

EXAMPLE FIELD LOGS

Project: HRP Job #: Contractor:				**HRP ASSOCIATES, INC. ENGINEERING & GEOLOGY DRILLING LOG**		Hole # Well # Sheet	
Type: I.D.: Location:				Date Rig Type:		Start: Finish: Driller: HRP Rep:	
Depth (6" intervals)	**Macro-core Samples**	**Sample Interval**	**Recovery (ft)**	**Density or Consistency/ Moisture**	**Profile Change**	**Remarks (color, structure, grain size, staining, odor, PID)**	**PID (ppm)**
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

GROUNDWATER OBSERVATIONS				SAMPLE PENETRATION RESISTANCE 140 lb. Wt. Falling 30" on 2" O.D. Sampler		Proportions
Depth	Date	Casing/ Screen	Stability Time	Cohesionless Density	Cohesive Consistence	
				0 - 4 very loose	0 - 2 very soft	trace 0-10%
				5 - 9 loose	3 - 4 soft	little 10-20%
				10 - 29 med. dense	5 - 8 m/stiff	some 20-35%
				30 - 49 dense	9 - 15 stiff	and 30-50%
				50+ very dense	16 - 30 v/stiff	
					31+ hard	

GROUNDWATER SAMPLING DATA SHEET

Filed Personnel: _____

_____

WELL ID _____

Date: _____

Job #: _____

Location: _____

Total Well Depth (from top of casing): _____ feet

Depth to Water Surface Before Purging (from top of casing): _____ feet

Height of Water Column: _____ feet

Well Diameter (d): _____inches Gals per ft: (d^2x.0408)=_____ gallons

Volume of Water Column Before Purging: _____ gallons

Purging Method:_____ **Meter #**_____

Time	Volume Purged (liters)	Depth to Water (feet)	Sp. Cond. (mmhos/cm)	Temp. (ºC)	pH (SU)	Dissolved Oxygen (mg/l)	ORP (mV)	Turbidity (NTU)

Total Volume of water Purged: _____ liters

Sampling Data:

Sampling Method: _____

Depth of Pump Intake _____ feet

Color: _____ Odor: _____ Sheen/Appearance: _____

Notes: _____

APPENDIX F

QUALITATIVE LIMITS - ANALYTICAL PARAMETERS

CHEMTECH

284 Sheffield Street Mountainside, NJ 07092

Current MDLs for WATER

		8260	
Compound	Units	RDL	MDL
1,1,1,2-Tetrachloroethane	ug/L	5.0	0.305
1,1,1-Trichloroethane	ug/L	5.0	0.324
1,1,2,2-Tetrachloroethane	ug/L	5.0	0.299
1,1,2-Trichloroethane	ug/L	5.0	0.407
1,1,2-Trichlorotrifluoroethane	ug/L	5.0	1.294
1,1-Dichloroethane	ug/L	5.0	0.38
1,1-Dichloroethene	ug/L	5.0	0.417
1,1-Dichloropropene	ug/L	5.0	0.618
1,2,3-Trichlorobenzene	ug/L	5.0	0.448
1,2,3-Trichloropropane	ug/L	5.0	0.584
1,2,4-Trichlorobenzene	ug/L	5.0	0.458
1,2,4-Trimethylbenzene	ug/L	5.0	0.443
1,2-Dibromo-3-Chloropropane	ug/L	5.0	0.377
1,2-Dibromoethane	ug/L	5.0	0.324
1,2-Dichlorobenzene	ug/L	5.0	0.437
1,2-Dichloroethane	ug/L	5.0	0.339
1,2-Dichloropropane	ug/L	5.0	0.404
1,3,5-Trimethylbenzene	ug/L	5.0	0.416
1,3-Dichlorobenzene	ug/L	5.0	0.497
1,3-Dichloropropane	ug/L	5.0	0.315
1,4-Dichlorobenzene	ug/L	5.0	0.535
2,2-Dichloropropane	ug/L	5.0	0.246
2-Butanone	ug/L	5.0	1.144
2-Chloroethyl vinyl ether	ug/L	5.0	3.373
2-Chlorotoluene	ug/L	5.0	0.413
2-Hexanone	ug/L	5.0	1.675
4-Bromofluorobenzene	ug/L	5.0	2.84
4-Chlorotoluene	ug/L	5.0	0.48
4-Isopropyltoluene	ug/L		
4-Methyl-2-Pentanone	ug/L	5.0	1.619
Acetone	ug/L	5.0	2.256
Acrolein	ug/L	5.0	1.162
Acrylonitrile	ug/L	5.0	1.825
Allyl Chloride	ug/L		
Benzene	ug/L	5.0	0.386
Bromobenzene	ug/L	5.0	0.4
Bromochloromethane	ug/L	5.0	0.381
Bromodichloromethane	ug/L	5.0	0.334
Bromoform	ug/L	5.0	0.315
Bromomethane	ug/L	5.0	0.412
Carbon disulfide	ug/L	5.0	0.402
Carbon Tetrachloride	ug/L	5.0	1.132
Chlorobenzene	ug/L	5.0	0.467
1-Chlorobutane	ug/L		
Chloroethane	ug/L	5.0	0.826
Chloroform	ug/L	5.0	0.333
Chloromethane	ug/L	5.0	0.343
cis-1,2-Dichloroethene	ug/L	5.0	0.291
cis-1,3-Dichloropropene	ug/L	5.0	0.358
cyclohexane	ug/L	5.0	0.364

CHEMTECH

284 Sheffield Street Mountainside, NJ 07092

Current MDLs for WATER

		8260	
Compound	Units	RDL	MDL
Dibromochloromethane	ug/L	5.0	0.263
Dibromofluoromethane	ug/L	5.0	4.103
Dibromomethane	ug/L	5.0	0.426
Dichlorodifluoromethane	ug/L	5.0	0.17
Diethyl Ether	ug/L	5.0	0.413
Ethyl Acetate	ug/L		
Ethyl Benzene	ug/L	5.0	0.453
Ethyl Methacrylate	ug/L		
Hexachloroethane	ug/L		
Hexachlorobutadiene	ug/L	5.0	0.416
Iodomethane	ug/L		
Isopropylbenzene	ug/L	5.0	0.439
Isopropyl Alcohol	ug/L		
Isopropyl Ether			
Isopropyl Acetate			
m/p-Xylenes	ug/L	5.0	1.185
Methacrylonitrile	ug/L		
Methyl Acrylate	ug/L		
Methyl Acetate	ug/L	5.0	0.202
Methyl Methacrylate	ug/L	5.0	0.433
Methyl tert-butyl Ether	ug/L	5.0	0.279
Methylcyclohexane	ug/L	5.0	0.338
Methylene Chloride	ug/L	5.0	0.426
Naphthalene	ug/L	5.0	0.341
n-amyl Acetate			
n-Butylbenzene	ug/L	5.0	0.494
N-propylbenzene	ug/L	5.0	0.493
o-Xylene	ug/L	5.0	0.455
pentachloroethane	ug/L		
p-Isopropyltoluene	ug/L	5.0	0.488
propionitrile	ug/L		
Sec-butylbenzene	ug/L	5.0	0.436
Styrene	ug/L	5.0	0.41
t-1,3-Dichloropropene	ug/L	5.0	0.317
t-1,4-Dichloro-2-butene	ug/L		
Tert butyl alcohol	ug/L	5.0	4.495
tert-Butylbenzene	ug/L	5.0	0.394
Tetrachloroethene	ug/L	5.0	0.481
Tetrahydrofuran	ug/L		
Toluene	ug/L	5.0	0.363
trans-1,2-Dichloroethene	ug/L	5.0	0.402
Trichloroethene	ug/L	5.0	0.461
Trichlorofluoromethane	ug/L	5.0	0.219
Vinyl Acetate	ug/L	5.0	2.015
Vinyl chloride	ug/L	5.0	0.328
1,4-Dioxane			

CHEMTECH

284 Sheffield Street Mountainside, NJ 07092

Volatile Organic Soil MDLs

		8260	
Compound	Units	RDL	MDL
1,1,1,2-Tetrachloroethane	ug/kg	5.0	0.414
1,1,1-Trichloroethane	ug/kg	5.0	0.418
1,1,2,2-Tetrachloroethane	ug/kg	5.0	0.311
1,1,2-Trichloroethane	ug/kg	5.0	0.294
1,1,2-Trichlorotrifluoroethane	ug/kg	5.0	0.665
1,1-Dichloroethane	ug/kg	5.0	0.269
1,1-Dichloroethene	ug/kg	5.0	0.573
1,1-Dichloropropene	ug/kg	5.0	0.393
1,2,3-Trichlorobenzene	ug/kg	5.0	1.019
1,2,3-Trichloropropane	ug/kg	5.0	0.334
1,2,4-Trichlorobenzene	ug/kg	5.0	0.683
1,2,4-Trimethylbenzene	ug/kg	5.0	0.38
1,2-Dibromo-3-Chloropropane	ug/kg	5.0	0.942
1,2-Dibromoethane	ug/kg	5.0	0.402
1,2-Dichlorobenzene	ug/kg	5.0	0.386
1,2-Dichloroethane	ug/kg	5.0	0.307
1,2-Dichloropropane	ug/kg	5.0	0.397
1,3,5-Trimethylbenzene	ug/kg	5.0	0.494
1,3-Dichlorobenzene	ug/kg	5.0	0.558
1,3-Dichloropropane	ug/kg	5.0	0.373
1,4-Dichlorobenzene	ug/kg	5.0	0.545
1,4-Dichlorobutane-2-butene	ug/kg	5.0	0.508
2,2-Dichloropropane	ug/kg	5.0	0.335
2-Butanone	ug/kg	5.0	2.823
2-Chloroethyl vinyl ether	ug/kg	5.0	1.515
2-Chlorotoluene	ug/kg	5.0	0.41
2-Hexanone	ug/kg	5.0	3.608
4-Bromofluorobenzene	ug/kg	5.0	1.562
4-Chlorotoluene	ug/kg	5.0	0.445
4-Methyl-2-Pentanone	ug/kg	5.0	1.974
Acetone	ug/kg	5.0	3.36
Acrolein	ug/kg	5.0	5.165
Acrylonitrile	ug/kg	5.0	1.895
Benzene	ug/kg	5.0	0.399
Bromobenzene	ug/kg	5.0	0.411
Bromochloromethane	ug/kg	5.0	0.575
Bromodichloromethane	ug/kg	5.0	0.335
Bromoform	ug/kg	5.0	0.31
Bromomethane	ug/kg	5.0	2.027
Carbon disulfide	ug/kg	5.0	0.368
Carbon Tetrachloride	ug/kg	5.0	0.443
Chlorobenzene	ug/kg	5.0	0.362
Chloroethane	ug/kg	5.0	2.133
Chloroform	ug/kg	5.0	0.348
Chloromethane	ug/kg	5.0	0.853
cis-1,2-Dichloroethene	ug/kg	5.0	0.325
cis-1,3-Dichloropropene	ug/kg	5.0	0.331

CHEMTECH

284 Sheffield Street Mountainside, NJ 07092

Volatile Organic Soil MDLs

		8260	
Compound	Units	RDL	MDL
Cyclohexane	ug/kg	5.0	0.324
Dibromochloromethane	ug/kg	5.0	0.23
Dibromofluoromethane	ug/kg	5.0	2.189
Dibromomethane	ug/kg	5.0	0.264
Dichlorodifluoromethane	ug/kg	5.0	0.856
Diethyl Ether	ug/kg	5.0	0.69
Ethyl Benzene	ug/kg	5.0	0.354
Hexachlorobutadiene	ug/kg	5.0	0.398
Isopropylbenzene	ug/kg	5.0	0.416
m/p-Xylenes	ug/kg	5.0	0.865
Methyl Acetate	ug/kg	5.0	0.865
Methyl tert-butyl Ether	ug/kg	5.0	0.368
Methyl cyclohexane	ug/kg	5.0	0.42
Methylene Chloride	ug/kg	5.0	1.825
Methyl Methacrylate	ug/kg	5.0	0.347
Naphthalene	ug/kg	5.0	0.585
n-Butylbenzene	ug/kg	5.0	0.338
N-propylbenzene	ug/kg	5.0	0.536
o-Xylene	ug/kg	5.0	0.384
p-Isopropyltoluene	ug/kg	5.0	0.425
Sec-butylbenzene	ug/kg	5.0	0.418
Styrene	ug/kg	5.0	0.46
t-1,3-Dichloropropene	ug/kg	5.0	0.363
Tert butyl alcohol	ug/kg	5.0	1.637
tert-Butylbenzene	ug/kg	5.0	0.715
Tetrachloroethene	ug/kg	5.0	0.73
Toluene	ug/kg	5.0	0.405
trans-1,2-Dichloroethene	ug/kg	5.0	0.639
Trichloroethene	ug/kg	5.0	0.308
Trichlorofluoromethane	ug/kg	5.0	1.247
Vinyl Acetate	ug/kg	5.0	1.305
Vinyl chloride	ug/kg	5.0	0.823

CHEMTECH

284 Sheffield Street Mountainside, NJ 07092

SVOA WATER Criteria

		8270	
Compound	**RDL**	**MDL**	**Units**
1,1-Biphenyl	10	1.398	ug/L
1,2,4-Trichlorobenzene	10	1.382	ug/L
1,2-Dichlorobenzene	10	1.218	ug/L
1,3-Dichlorobenzene	10	1.202	ug/L
1,4-Dichlorobenzene	10	1.224	ug/L
2,2-oxybis(1-Chloropropane)	10	1.213	ug/L
2,4,5-Trichlorophenol	10	1.216	ug/L
2,4,6-Trichlorophenol	10	1.142	ug/L
2,4-Dichlorophenol	10	1.422	ug/L
2,4-Dimethylphenol	10	1.179	ug/L
2,4-Dinitrophenol	10	3.497	ug/L
2,4-Dinitrotoluene	10	1.207	ug/L
2,6-Dinitrotoluene	10	1.25	ug/L
2-Chloronaphthalene	10	1.389	ug/L
2-Chlorophenol	10	1.144	ug/L
2-Methylnaphthalene	10	1.089	ug/L
2-Methylphenol	10	1.495	ug/L
2-Nitroaniline	10	1.065	ug/L
2-Nitrophenol	10	1.353	ug/L
3,3-Dichlorobenzidine	10	1.042	ug/L
3+4-Methylphenols	10	1.308	ug/L
3-Nitroaniline	10	1.014	ug/L
4,6-Dinitro-2-methylphenol	10	1.604	ug/L
4-Bromophenyl-phenylether	10	1.474	ug/L
4-Chloro-3-methylphenol	10	1.352	ug/L
4-Chloroaniline	10	0.858	ug/L
4-Chlorophenyl-phenylether	10	1.357	ug/L
4-Nitroaniline	10	1.113	ug/L
4-Nitrophenol	10	3.102	ug/L
Acenaphthene	10	1.337	ug/L
Acenaphthylene	10	1.294	ug/L
Acetophenone	10	1.233	ug/L
Aniline	10	0.707	ug/L
Anthracene	10	1.398	ug/L
Atrazine	10	1.254	ug/L
Azobenzene	10	1.497	ug/L
Benzidine	10	1.354	ug/L
Benzo(a)anthracene	10	1.155	ug/L
Benzo(a)pyrene	10	1.167	ug/L

CHEMTECH

284 Sheffield Street Mountainside, NJ 07092

SVOA WATER Criteria

	8270		
Compound	**RDL**	**MDL**	**Units**
Benzo(b)fluoranthene	10	0.749	ug/L
Benzo(g,h,i)perylene	10	1.084	ug/L
Benzo(k)fluoranthene	10	1.886	ug/L
Benzoic Acid	10	1.139	ug/L
Benzyl Alcohol	10	0.831	ug/L
Benzylaldehyde	10	1.64	ug/L
bis(2-Chloroethoxy)methane	10	1.371	ug/L
bis(2-Chloroethyl)ether	10	1.437	ug/L
bis(2-Ethylhexyl)phthalate	10	1.523	ug/L
Butylbenzylphthalate	10	1.434	ug/L
Caprolactam	10	1.25	ug/L
Carbazole	10	1.276	ug/L
Chrysene	10	1.673	ug/L
Dibenz(a,h)anthracene	10	0.866	ug/L
Dibenzofuran	10	1.294	ug/L
Diethylphthalate	10	1.328	ug/L
Dimethylphthalate	10	1.251	ug/L
Di-n-butylphthalate	10	1.302	ug/L
Di-n-octyl phthalate	10	1.286	ug/L
Fluoranthene	10	1.204	ug/L
Fluorene	10	1.404	ug/L
Hexachlorobenzene	10	1.225	ug/L
Hexachlorobutadiene	10	1.359	ug/L
Hexachlorocyclopentadiene	10	1.161	ug/L
Hexachloroethane	10	1.169	ug/L
Indeno(1,2,3-cd)pyrene	10	0.828	ug/L
Isophorone	10	1.268	ug/L
Naphthalene	10	1.382	ug/L
Nitrobenzene	10	1.572	ug/L
N-nitrosodimethylamine	10	2.63	ug/L
N-Nitroso-di-n-propylamine	10	1.386	ug/L
N-Nitrosodiphenylamine	10	1.25	ug/L
Pentachlorophenol	10	1.577	ug/L
Phenanthrene	10	1.418	ug/L
Phenol	10	1.277	ug/L
Pyrene	10	1.451	ug/L
Pyridine	10	0.976	ug/L

CHEMTECH

284 Sheffield Street Mountainside, NJ 07092

SVOA Soil MDLs

	8270		
Compound	**RDL**	**MDL**	**Units**
1,1-Biphenyl	330	54.5	ug/Kg
1,2,4-Trichlorobenzene	330	56.5	ug/Kg
1,2-Dichlorobenzene	330	49.8	ug/Kg
1,3-Dichlorobenzene	330	51.8	ug/Kg
1,4-Dichlorobenzene	330	58.2	ug/Kg
2,2-oxybis(1-Chloropropane)	330	53.3	ug/Kg
2,4,5-Trichlorophenol	330	50.6	ug/Kg
2,4,6-Trichlorophenol	330	48.6	ug/Kg
2,4-Dichlorophenol	330	61.2	ug/Kg
2,4-Dimethylphenol	330	52.5	ug/Kg
2,4-Dinitrophenol	830	283.1	ug/Kg
2,4-Dinitrotoluene	330	48.6	ug/Kg
2,6-Dinitrotoluene	330	46.8	ug/Kg
2-Chloronaphthalene	330	54.9	ug/Kg
2-Chlorophenol	330	52.8	ug/Kg
2-Methylnaphthalene	330	55.3	ug/Kg
2-Methylphenol	330	55	ug/Kg
2-Nitroaniline	330	42	ug/Kg
2-Nitrophenol	330	50.9	ug/Kg
3,3-Dichlorobenzidine	330	56.6	ug/Kg
3+4-Methylphenols	330	52.2	ug/Kg
3-Nitroaniline	330	43.1	ug/Kg
4,6-Dinitro-2-methylphenol	330	64.2	ug/Kg
4-Bromophenyl-phenylether	330	49.4	ug/Kg
4-Chloro-3-methylphenol	330	45.7	ug/Kg
4-Chloroaniline	330	39.4	ug/Kg
4-Chlorophenyl-phenylether	330	52.3	ug/Kg
4-Nitroaniline	330	56.5	ug/Kg
4-Nitrophenol	330	41	ug/Kg
Acenaphthene	330	58.9	ug/Kg
Acenaphthylene	330	53.7	ug/Kg
Acetophenone	330	48.4	ug/Kg
Anthracene	330	49.9	ug/Kg
Atrazine	330	50.7	ug/Kg
Aniline	330	36.6	ug/Kg
Azobenzene	330	66.8	ug/Kg
Benzidine	330	27.2	ug/Kg
Benzo(a)anthracene	330	46.3	ug/Kg
Benzo(a)pyrene	330	52.9	ug/Kg

SVOA Soil MDLs

	8270		
Compound	RDL	MDL	Units
Benzo(b)fluoranthene	330	36.4	ug/Kg
Benzo(g,h,i)perylene	330	54.7	ug/Kg
Benzo(k)fluoranthene	330	72.8	ug/Kg
Benzoic acid	330	79.3	ug/Kg
Benzyl Alcohol	330	34.4	ug/Kg
Benzalaldehyde	330	67.9	ug/Kg
bis(2-Chloroethoxy)methane	330	54.4	ug/Kg
bis(2-Chloroethyl)ether	330	52.3	ug/Kg
bis(2-Ethylhexyl)phthalate	330	63.5	ug/Kg
Butylbenzylphthalate	330	53.5	ug/Kg
Caprolactam	330	53.2	ug/Kg
Carbazole	330	50.5	ug/Kg
Chrysene	330	59.4	ug/Kg
Dibenz(a,h)anthracene	330	41.5	ug/Kg
Dibenzofuran	330	54.7	ug/Kg
Diethylphthalate	330	57.1	ug/Kg
Dimethylphthalate	330	53.2	ug/Kg
Di-n-butylphthalate	330	50.4	ug/Kg
Di-n-octyl phthalate	330	56.3	ug/Kg
Fluoranthene	330	49.2	ug/Kg
Fluorene	330	55.8	ug/Kg
Hexachlorobenzene	330	52.9	ug/Kg
Hexachlorobutadiene	330	50.9	ug/Kg
Hexachlorocyclopentadiene	330	52.8	ug/Kg
Hexachloroethane	330	56.2	ug/Kg
Indeno(1,2,3-cd)pyrene	330	42	ug/Kg
Isophorone	330	49.7	ug/Kg
Naphthalene	330	56.5	ug/Kg
Nitrobenzene	330	72.2	ug/Kg
N-Nitroso-di-n-propylamine	330	54.8	ug/Kg
N-Nitrosodiphenylamine	330	54.5	ug/Kg
N-Nitrosodimethylamine	330	62.7	ug/Kg
Pentachlorophenol	330	76.6	ug/Kg
Phenanthrene	330	52.7	ug/Kg
Phenol	330	50.1	ug/Kg
Pyridine	330	52.6	ug/Kg
Pyrene	330	58.5	ug/Kg

CHEMTECH

284 Sheffield Street Mountainside, NJ 07092

Pesticides WATER Criteria

	8081		
Compound	RDL	MDL	Units
4,4'-DDD	0.050	0.00703	ug/L
4,4'-DDE	0.050	0.00717	ug/L
4,4'-DDT	0.2	0.00641	ug/L
Aldrin	0.050	0.02991	ug/L
alpha-BHC	0.050	0.0063	ug/L
alpha-Chlordane	0.050	0.00761	ug/L
beta-BHC	0.2	0.00702	ug/L
Chlordane	0.50	0.191376	ug/L
delta-BHC	0.050	0.06523	ug/L
Dieldrin	0.050	0.00734	ug/L
Endosulfan I	0.050	0.00757	ug/L
Endosulfan II	0.050	0.00725	ug/L
Endosulfan sulfate	0.050	0.00864	ug/L
Endrin	0.050	0.00691	ug/L
Endrin aldehyde	0.050	0.00882	ug/L
Endrin ketone	0.050	0.00777	ug/L
gamma-BHC (Lindane)	0.050	0.0071	ug/L
gamma-Chlordane	0.050	0.00778	ug/L
Heptachlor	0.050	0.02269	ug/L
Heptachlor epoxide	0.050	0.0121	ug/L
Methoxychlor	0.050	0.00715	ug/L
Toxaphene	0.50	0.090	ug/L

CHEMTECH

284 Sheffield Street Mountainside, NJ 07092

Pesticides Soil MDLs

	8081 soil		
Compound	**RDL**	**MDL**	**Units**
4,4'-DDD	3	0.702	ug/kg
4,4'-DDE	3	0.787	ug/kg
4,4'-DDT	3	0.721	ug/kg
Aldrin	3	1.228	ug/kg
alpha-BHC	3	0.64	ug/kg
alpha-Chlordane	3	0.837	ug/kg
beta-BHC	3	0.876	ug/kg
Chlordane	17	4.080	ug/kg
delta-BHC	3	1.629	ug/kg
Dieldrin	3	0.826	ug/kg
Endosulfan I	3	0.88	ug/kg
Endosulfan II	3	0.946	ug/kg
Endosulfan sulfate	3	1.079	ug/kg
Endrin	3	0.852	ug/kg
Endrin aldehyde	3	1.004	ug/kg
Endrin ketone	3	0.824	ug/kg
gamma-BHC (Lindane)	3	0.719	ug/kg
gamma-Chlordane	3	0.873	ug/kg
Heptachlor	3	0.93	ug/kg
Heptachlor epoxide	3	1.062	ug/kg
Methoxychlor	3	0.861	ug/kg
Toxaphene	17	3.580	ug/kg

CHEMTECH

284 Sheffield Street Mountainside,NJ 07092

PCB water Criteria

8082

Compound	RDL	MDL	Units
AROCLOR 1016	0.5	0.145	ug/L
AROCLOR 1221	0.5	0.170	ug/L
AROCLOR 1232	0.5	0.109	ug/L
AROCLOR 1242	0.5	0.083	ug/L
AROCLOR 1248	0.5	0.042	ug/L
AROCLOR 1254	0.5	0.037	ug/L
AROCLOR 1260	0.5	0.156	ug/L

CHEMTECH

284 Sheffield Street Mountainside,NJ 07092

PCB Soil MDLs

8082

Compound	RDL	MDL	Units
AROCLOR 1016	17	2.538	ug/Kg
AROCLOR 1221	17	3.943	ug/Kg
AROCLOR 1232	17	5.894	ug/Kg
AROCLOR 1242	17	5.242	ug/Kg
AROCLOR 1248	17	2.550	ug/Kg
AROCLOR 1254	17	1.660	ug/Kg
AROCLOR 1260	17	4.218	ug/Kg

CHEMTECH

284 Sheffield Street Mountainside,NJ 07092

Metals 6010B MDL water

6010B& 7470

Compound	RDL	MDL	Units
Mercury	0.200	0.083	ug/L
Aluminum	50.00	5.309	ug/L
Antimony	20.00	3.17	ug/L
Arsenic	10.00	3.317	ug/L
Barium	20.00	0.723	ug/L
Beryllium	4.00	0.09	ug/L
Cadmium	5.000	0.327	ug/L
Calcium	1000.00	1.168	ug/L
Chromium	5.00	0.343	ug/L
Cobalt	10.00	0.37	ug/L
Copper	5.00	3.64	ug/L
Iron	40.00	26.973	ug/L
Lead	3.000	2.181	ug/L
Magnesium	500.00	8.297	ug/L
Manganese	5.00	0.106	ug/L
Nickel	10.00	1.561	ug/L
Potassium	1000.00	61.759	ug/L
Selenium	30.00	3.035	ug/L
Silver	5.00	1.639	ug/L
Sodium	1000.00	332.002	ug/L
Thallium	10.000	3.053	ug/L
Vanadium	10.00	0.701	ug/L
Zinc	20.000	0.611	ug/L
Titanium	20.00	0.19	ug/L
Molybdenum	20.00	4.51	ug/L
Silicon	50.00	13.25	ug/L
Tin	20.00	3.29	ug/L
Boron	20.00	12.02	ug/L

CHEMTECH

284 Sheffield Street Mountainside,NJ 07092

Metals 6010B MDL

6010B & 7471

Compound	RDL	MDL	Units
Mercury	0.01	0.0028	mg/Kg
Aluminum	5.00	0.585	mg/Kg
Antimony	2.00	0.328	mg/Kg
Arsenic	1.00	0.392	mg/Kg
Barium	2.00	0.072	mg/Kg
Beryllium	0.40	0.006	mg/Kg
Cadmium	0.50	0.033	mg/Kg
Calcium	100.00	0.037	mg/Kg
Chromium	0.50	0.088	mg/Kg
Cobalt	1.00	0.097	mg/Kg
Copper	5.00	0.065	mg/Kg
Iron	10.00	1.534	mg/Kg
Lead	0.30	0.288	mg/Kg
Magnesium	50.00	0.952	mg/Kg
Manganese	0.50	0.028	mg/Kg
Nickel	2.00	0.122	mg/Kg
Potassium	100.00	5.300	mg/Kg
Selenium	3.00	0.341	mg/Kg
Silver	0.50	0.079	mg/Kg
Sodium	100.00	25.809	mg/Kg
Thallium	1.00	0.527	mg/Kg
Vanadium	1.00	0.060	mg/Kg
Zinc	2.00	0.072	mg/Kg
molybdenum	2.00	0.163	mg/Kg
Titanium	2.00	0.054	mg/Kg
Boron	2.00	0.531	mg/kg
Silicon	5.00	0.839	mg/kg
Tin	2.00	0.469	mg/kg