Work Plan for Soil Vapor Intrusion Evaluation AL Tech Specialty Steel Site Dunkirk, NY

Work Assignment Number D004435-23
Site Number 9-07-022

November 2007

Prepared for:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7013

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List of Acronyms

ADR	automated data review
AL Tech	AL Tech Specialty Steel
Aztech	Aztech Technologies, Inc.
AOC	Area of Concern
ASP	Analytical Services Protocol
bgs	below ground surface
COC	chain-of-custody
Con-Test	Con-Test Analytical Laboratories
DOT	U.S. Department of Transportation
DPT	Direct Push Technology
DUSR	Data Usability Summary Report
EDD	electronic data deliverable
EEEPC	Ecology and Environment Engineering, P.C.
ELAP	Environmental Laboratory Approval Program
EPA	Environmental Protection Agency
GC/MS	Gas Chromatography/Mass Spectrometry
IDW	investigation-derived waste
IRM	Interim Remedial Measure
Kemron	Kemron Environmental Services, Inc.
L	liter

List of Acronyms (Cont.)

LAP	Lucas Avenue Plant
LOE	level of effort
MBE/WBE	Minority-owned Business Enterprise/Woman-owned Business Enterprise
$\mu g/m^3$	microgram per cubic meter
mL/min	milliliters per minute
NTU	nephlometric turbidity units
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PID	photoionization detector
PM	Project Manager
PPE	personal protective equipment
ppm	parts per million
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
RealCo	RealCo, Inc.
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
SCGs	Standards, Criteria, and Guidelines
SF	square feet
SOP	Standard operating procedure
SWMU	Solid waste management unit
TCE	Trichloroethylene

List of Acronyms (Cont.)

TCL	Target Compound List
UFPO	Underground Facility Protection Organization
VOC	Volatile Organic Compound
WA	Work Assignment
WP	Work Plan

1 Introduction

Pursuant to Work Assignment (WA) No. D004435-23 received on November 14, 2007, Ecology and Environment Engineering, P.C. (EEEPC) is submitting to the New York State Department of Environmental Conservation (NYSDEC), Division of Environmental Remediation, this Work Plan (WP) for a Soil Vapor Intrusion Evaluation at the AL Tech Specialty Steel Site located in Dunkirk, Chautauqua County, New York (NYSDEC Site #9-07-022).

Section 2 of this WP summarizes the site background and the WP scope. Section 3 details the major tasks and subtasks and provides a discussion of planned methodologies. Section 4 presents a discussion of major milestones of the project and a project schedule. Section 5 discusses opportunities for subcontracting within this WA. Section 6 provides a detailed budget prepared in accordance with contractual reporting requirements, including the 2.11 Forms. Section 7 provides our staffing plan for key team members. Section 8 presents the Minority-owned Business Enterprise/Woman-owned Business Enterprise (MBE/WBE) utilization plan.

2 Background/Scope of Work

This section provides information on the background and scope of the investigation activities to be performed at the former Lucas Avenue Plant (LAP) at the AL Tech Specialty Steel site (AL Tech).

2.1 Site Background

The LAP is a one-story, approximately 178,000 square-foot (SF) former manufacturing facility located in the City of Dunkirk, Chautauqua County. The LAP was formerly a part of the larger adjoining AL Tech site, an approximately 90-acre industrial site. The original LAP facility was constructed in 1909, with additions constructed in 1920, 1936, 1940, and 1968.

The LAP was primarily used for cold drawing stainless steel to produce wire. Related activities included lime coating, pickling, bright annealing, and copper and lead plating. Manufacturing activities at the LAP were then ceased in 1997 and the building has been vacant since.

In 1992, AL Tech submitted a Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) in accordance with the RCRA, Corrective Action Program. Information obtained during this assessment identified 24 Solid Waste Management Units (SWMUs) and 11 Areas of Concern (AOCs) throughout the site. Over the period of 1995 through 1997, AL Tech conducted an RCRA Facilities Investigation (RFI), which documented hazardous waste disposal in areas of the LAP. A Phase II RFI conducted in October 2003 and a Supplemental Site Assessment in 2006 determined that there was disposal of hazardous waste at levels that are impacting the groundwater, surface water, and sediments.

In 2006, an Interim Remedial Measure (IRM) was conducted by EEEPC. The focus of the IRM was the remediation of chromium-contaminated soils and groundwater identified at the west end of the LAP. Primary elements of the IRM included the partial demolition of the LAP battery room; excavation and disposal of approximately 9,000 tons of chromium and lead contaminated soils; containment and treatment of construction water; and excavation backfill. Studies have also identified a likely source and shallow groundwater contamination in the eastern portion of the LAP. Groundwater monitoring has identified exceedances for metals and chlorinated solvents.

After AL Tech filed for bankruptcy in 1999, RealCo, Inc. (RealCo) assumed title of the LAP site. RealCo was responsible for management of an environmental remediation trust to implement RCRA corrective actions at the LAP and a similar site in Watervliet. RealCo performed a soil investigation at the north end of the West Pickle Process Area at the LAP in order to delineate the nature and extent of contamination as a result of pickling operations. This investigation identified chromium and lead-contaminated soils that have the potential to further impact the groundwater quality.

To date, monies from the established trust have been fully obligated. No further funding is anticipated from RealCo and any further investigation and/or remedial efforts have been assumed by the State Superfund.

2.2 Soil Vapor Intrusion Evaluation Scope of Work

The site characterization activities are intended to determine whether groundwater contamination previously identified in the eastern LAP area has the potential to impact on-site and off-site soil vapor. The elements of the site characterization, as selected by NYSDEC and identified in the WA, include:

- WP development;
- Soil Vapor sampling at up to five off-site locations;
- Groundwater sampling at eight locations from both existing monitoring wells and from selected direct push locations;
- LAP air sampling including indoor and outdoor air and subslab vapor; and
- Data validation and reporting for soil vapor, groundwater, and structure sampling.

This WP addresses the methodology, analytical requirements, level of effort (LOE), associated costs, and schedule to complete the work activities listed above.

3 Major Tasks and Subtasks

This WA was split into three separate and independent tasks. Task 1 is designated to describe project scoping and WP development; Task 2 describes the proposed field activities and associated methodologies for completing these activities; and Task 3 describes the reporting requirements summarizing field investigation activities.

3.1 Task 1: Work Plan

EEEPC's Contract Manager, Project Manager (PM), and Task Manager have reviewed components of the WA and the required scope. An LOE estimate (hours and staffing) and associated cost for completing the tasks and associated deliverables has been submitted with this WP (see Section 7). The purpose of this WP is to:

1. Provide detail to the scope of work, where necessary, to support EEEPC's LOE estimates and project budget;

2. A complete budget package, including Schedule 2.11 forms;

3. A progress schedule for the WA, including milestones and submission of deliverables;

4. A project staffing plan with identifying key management and technical staff assigned to the WA; and

5. An MBE/WBE utilization plan and a proposed list of subcontractors.

The "Tentative Project Schedule with Project Milestones" included in the WA letter shows submission of a single WP. EEEPC understands that it is the goal of NYSDEC to formally approve the WP and issue a Notice to Proceed within 90 calendar days of issuing the WA.

3.1.1 Site Meeting

EEEPC has not included any budget for a site meeting during the WP phase, as discussed between the EEEPC and NYSDEC project managers. EEEPC has site familiarity based upon completing previous WAs at this site, and proposed sample locations were provided in the WA. The EEEPC PM and/or task manager will further coordinate and verify sample locations with the NYSDEC project manager prior to the start of sampling activities.

3.2 Task 2: Field Investigation Activities

This section contains detailed descriptions of procedures or includes standard operating procedures (SOPs) for the field activities anticipated under this WA. Soil Vapor Intrusion Investigation SOPs developed by EEEPC are included as Appendix A.

The primary field tasks associated with this WA will include the collection of soil vapor and/or groundwater samples at five locations throughout the project area using Direct Push Technology (DPT) and structure sampling. DPT locations are classified into two groups: soil vapor collection points and groundwater collection points. Each is described in the following subsections.

3.2.1 Soil Vapor Investigation

Soil vapor investigations will be performed in accordance with New York State Department of Health's (NYSDOH) *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, Final* (October 2006). Analysis will be by Environmental Protection Agency (EPA) Compendium Method TO-15 (*Determination of Volatile Organic Compounds [VOCs] in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry [GC/MS]*).

Five temporary soil vapor locations will be completed at locations presented in the WA. At each location, two soil vapor probes will be installed using DPT. Proposed sampling locations are as shown in the WA scope of work but may be adjusted based on actual field conditions and/or direction from NYSDEC. A drilling subcontractor will advance a stainless steel sample probe (Geoprobe mill-slotted screen, Geoprobe PRT system, or equivalent) to the desired depth. Soil vapor samples will be collected from a depth of approximately 8 feet below ground surface (bgs) for foundation-level soil vapor samples. The second sample will be collected approximately 1 to 2 feet above the water table or bedrock, whichever is encountered first. If the water table or bedrock is less than 12 feet bgs, then one sample probe at that location will be sufficient. If the water table is less than 5 feet bgs, then a decision will be made by NYSDEC whether to install a soil vapor probe at that location.

Based on the results of soil vapor sampling, an additional two sampling locations may be added by NYSDEC. Additional soil sampling will be conducted under a separate mobilization.

3.2.1.1 Soil Vapor Sampling Procedures

Once the desired depth is reached, a 6-inch sampling screen will be exposed, by retracting the drive rods. The screen will be attached to Teflon tubing to be used for collecting the sample. The borehole annulus will be backfilled with coarse sand extending at least six inches above the sample screen. The remaining annulus will be filled to ground surface with bentonite and immediately hydrated. At least 24 hours will be allowed for hydration.

Prior to sample collection, soil vapor probes will be purged in accordance with NYSDOH guidance. Purging will consist of at least three to five implant volumes at a rate less than 0.2 liters per minute. A tracer gas (e.g., helium) will be used to test for short circuiting of the sampling zone with ambient air at all soil vapor sampling locations.

Samples will be collected using laboratory-certified clean SUMMA canisters with two hour regulators and dedicated Teflon tubing. To minimize outdoor air infiltration, the sample flow rate will not exceed 0.2 liters per minute. Soil vapor samples will be analyzed by an NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory for VOCs using EPA Method TO-1, with a minimum reporting limit of 1 microgram per cubic meter ($\mu g/m^3$). Laboratory turn around time for preliminary results will be 10 business days.

Upon completion of soil vapor sampling, all sampling equipment will be removed, and the borehole backfilled with bentonite. Each location will be staked or flagged with the sample identification so that it can be located later. Borings completed in asphalt or concrete areas will be refinished at ground surface with cold patch or concrete.

For additional information regarding soil vapor sampling, refer to EEEPC's soil vapor intrusion investigation SOP for soil vapor sampling (see Appendix A).

3.2.1.2 Equipment and Supplies

Refer to EEEPC's soil vapor intrusion investigation SOP for soil vapor sampling (see Appendix A).

3.2.2 Groundwater Sampling

Two different types of groundwater sampling may be conducted during this investigation. This includes sampling of existing groundwater monitoring wells and collection of groundwater samples using DPT.

3.2.2.1 Existing Monitoring Well Sampling

Groundwater samples will be collected from three existing monitoring wells as selected by NYSDEC. These wells include RFI-27 and the shallow wells from the RFI 26/34 and RFI 32/34 well clusters, all located along Lucas Avenue. All groundwater samples will be tested for Target Compound List (TCL) VOCs by EPA Method 8260B. Groundwater sampling will be performed using the equipment and procedures described below. Purged water will be handled as described in Section 3.2.7.

Equipment and Supplies

- Electronic interface probe graduated to 0.01 foot;
- Submersible pump equipped with polyethylene tubing and power source (i.e., Grundfos Rediflow 2 pump and generator or 12-volt pump [Whale Purging Pump, or equivalent] and battery);
- Disposable, dedicated, polyethylene bailers and new polypropylene line;
- pH/temperature/conductivity meter;
- Turbidity meter;
- Appropriate sample containers;
- Sample collection paperwork (labels, chain-of-custody [COC] forms, etc.); and
- Coolers with ice.

Groundwater Sampling Procedures

- Slowly lower the interface probe of the instrument until the indicator light illuminates and/or the alarm sounds and record the depth to water from a marked reference point in the logbook;
- Lower the probe to the bottom of the well casing and record the total depth of the well from a marked reference point in the logbook;
- Calculate the volume of water in the well using the formula provided on the well development form (e.g., a 2-inch well contains 0.16 gallon per foot of water);
- Place the pump within the screened interval of the well and pump water from the well at a uniform rate. Pump at the maximum rate that will not draw the water level down to the pump;
- Begin to purge three to five times the volume of water standing in the well casing;
- Record the temperature, pH, conductivity, and turbidity initially and every 5 to 10 minutes, or at the removal of each well volume;

- Purge until pH, specific conductance, and temperature have stabilized over three consecutive readings, turbidity of the discharge is 50 nephlometric turbidity units (NTUs) or less, and at least three well volumes have been removed;

- If 50 NTUs cannot be obtained after five well volumes, proceed with sample collection; filtered and unfiltered portions will be collected for metals sample portions, if applicable;

- Collect VOC sample portions first using a bailer to minimize disturbance of the water column; and

- Place samples in a cooler maintained with ice at 4°C upon collection.

3.2.2.2 Direct Push Groundwater Grab Sampling

A total of five groundwater grab samples will be collected from locations from which soil vapor samples will also be collected. Soil vapor collection will be conducted first, using the approach described in Section 3.2.1. Following collection of the soil vapor sample, the canister will be removed from the tubing and the tubing will be removed from the DPT rods. A groundwater collection device (Geoprobe Screen Point Sampler or equivalent) will then be advanced to a depth 1 foot below the apparent water table depth (estimated total depth of less than 20 feet bgs). A peristaltic pump and dedicated Teflon-lined polyethylene tubing will be used to collect a grab sample of groundwater. The samples will be submitted for analysis of VOCs by EPA Method 8260B. Additional volume will also be collected for in-field water quality parameter (pH, temperature, and specific conductance) measurement.

Groundwater Grab Sampling Procedures

- Advance a Screen Point Sampler or similar screened/slotted rod to a depth of approximately 1 foot below the water table depth using DPT. Expose approximately 2 feet of the sampling screen or inlet.

- Record the water level within the sampling rods prior to sampling.

- Insert tubing to approximately the middle of the exposed screen and connect to the peristaltic pump. Purge three to five rod-volumes of groundwater prior to sample collection. During purging, record pH, temperature, and conductivity readings at least every volume. Purge until these parameters are stable (±5%), up to five volumes. If the rods become dry before purging three volumes, collect the sample as soon as sufficient water returns. If the depth of sample collection precludes the use of a peristaltic pump, use a dedicated bailer and cord or tubing and check valve to manually purge the rods.

- Fill appropriate sample jars. Vials for VOC analysis will be filled first, leaving no headspace.

- Upon collection, immediately place the sample containers into a cooler maintained with ice at approximately 4°C.

3.2.3 Structure Sampling

One structure sample from the former LAP building will be conducted as part of this WA. The sample location will be selected by NYSDEC. Structure sampling will include the collection of subslab soil vapor, indoor air, and outdoor air. Structure sampling will be conducted in accordance with NYSDOH's *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, Final* (October 2006). Analysis will be by EPA Compendium Method TO-15 (*Determination of Volatile Organic Compounds [VOCs] in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry [GC/MS]*). The turnaround time for preliminary sample results will be 14 calendar days.

Prior to the LAP structure air sampling, an inspection of general site conditions will be made to determine the locations for indoor and outdoor air sampling. The inspection will include ambient air photoionization detector (PID) readings using a VOC monitor capable of detecting compounds in the parts-per-billion range. If structure sampling is deemed warranted at adjacent buildings by NYSDEC, the pre-inspection for other buildings will include a chemical product inventory and completion of a property owner questionnaire in addition to the PID ambient air screening.

Detection limits for all analytes in all sample types will be approximately 1 $\mu g/m^3$ except for Trichloroethylene (TCE) in indoor and outdoor air, which will be 0.25 $\mu g/m^3$. All samples will be collected over a 24-hour period in 1-liter (L) canisters (SUMMA type) equipped with a pressure gauge and mass flow controller set at the appropriate rate (0.69 milliliters per minute [mL/min] for 1-L canisters).

Additional structure sampling may be required by NYSDEC at an adjacent building (City of Dunkirk Municipal Garage). If required, additional structure sampling will be conducted under a separate mobilization utilizing the procedures outlined in this WP.

3.2.3.1 Sampling Procedures

Field sampling procedures for sub-slab vapor, indoor air, and outdoor air are described in EEEPC's soil vapor intrusion investigation SOP (see Appendix A).

In general, each subslab structure sample will consist of four individual sampling points. Three of these points will be centrally located within the structure, while the fourth sample will be located approximately three feet from the "source side" perimeter wall. After inspection of the building slab, utility clearance, and screening of ambient air, a hammer drill will be used to advance a boring approximately three to six inches beneath the slab. Sample tubing will be inserted into the boring, and the annulus sealed with bentonite water paste to seal the tubing intake beneath the floor slab. Approximately 1 liter of air will be purged from the subsurface probe using a PID. PID readings will be recorded during the purging process. Following purging, the PID will be disconnected, and the tubing connected directly to the SUMMA canister's regulatory intake valve.

3.2.4 Analytical Program

Laboratory analyses of groundwater samples will be performed by Kemron Environmental Services, Inc. (Kemron) of Marietta, Ohio. Kemron is a New York State (NYS)-registered MBE and is certified by the NYSDOH ELAP for environmental analysis of water, solid and hazardous wastes, and air. Groundwater samples will be analyzed for VOCs using EPA method 8260. Groundwater samples will be shipped to:

Kemron Environmental Services, Inc.
Attn: Sample Custody
156 Starlite Drive
Marietta, OH 45750
(800) 548-6938

Laboratory analyses of air samples (soil vapor and indoor and outdoor air) will be performed by Con-Test Analytical Laboratories (Con-Test) of East Longmeadow, Massachusetts. Con-Test is a NYS-registered WBE and is certified by the NYSDOH ELAP for environmental analysis of water, solid and hazardous wastes, and air. Air samples will be analyzed for VOCs using EPA method TO-15. Air samples will be shipped to:

Con-Test Analytical Laboratory
Attn: Sample Custody
39 Spruce Street
East Longmeadow, MA 01028
(413) 525-2332

The laboratories will follow the NYSDEC Analytical Services Protocol (ASP) of July 2005 (or most current update when implemented) for all analytical methods, quality assurance (QA)/quality control (QC), holding times, and reporting requirements. Laboratory data will be reported with full data package (Level B) and a standard laboratory electronic data deliverable (EDD) consistent with the automated data review (ADR) program and EPA Region 2 multimedia electronic data deliverable MEDD format. Sample analysis results for the site characterization will by reviewed by an EEEPC chemist using the ADR program. The data reviewer will follow the NYSDEC Guidance for the Development of Data Usability Summary Reports (DUSRs), June 1999.

3.2.4.1 Quality Assurance/Quality Control

Field QC samples will include field duplicates, trip blanks, rinsate blanks, and additional volume for laboratory matrix spike/matrix spike duplicate analyses. Field duplicates will be collected from aqueous, and air samples at a frequency of 1 per 20 samples. Trip blanks for water samples will be filled at the laboratory and transported to the site with the bottles for each day that water samples are collected for VOC analysis. Trip blanks for vapor samples will consist of one evacuated canister, subjected to the same laboratory cleaning and QC process as the sample canisters, transported to the field with the empty sample canisters and returned without opening the canister valve. One trip blank will be processed for both water and vapor samples for each sample batch shipped to the laboratory. Rinsate blanks will be collected from any non-dedicated or non-disposable sampling equipment. Rinsate blanks will be collected by passing deionized water over the equipment after decontamination is completed. One rinsate blank will be collected from each set of equipment for every 20 samples collected. The use of non-dedicated equipment is not currently planned.

3.2.5 Underground Utility Notification

EEEPC's drilling subcontractor will contact the Underground Facilities Protection Organization (UFPO) (1-800-962-7962) at least five days in advance of any subsurface field investigation activities to alert them that subsurface investigation will take place. A natural gas well and associated piping is known to exist on-site that is either owned or maintained by Cotton Well Drilling (716-672-2788). Cotton Well Drilling is not a member of the UFPO. EEEPC and/or the drilling subcontractor will contact Cotton Well Drilling directly to mark out this utility. Once utilities on-site have been marked, EEEPC will modify any subsurface exploration points.

3.2.6 Decontamination

All decontamination will be performed in accordance with NYSDEC-approved procedures. Sampling methods and equipment have been chosen to minimize decontamination requirements and prevent the possibility of cross-contamination. All intrusive and non-dedicated groundwater sampling equipment will be decontaminated before and after each location is drilled and sampled. Special attention will be given to all downhole tooling, which will be decontaminated prior to and following each use.

The following procedure will be used for smaller equipment and may also be employed for downhole tooling such as sampling screens and Geoprobe rods:

- Initially remove all foreign matter;
- Scrub with brushes in a laboratory-grade detergent solution (e.g., Alconox);
- Rinse with potable water with a final deionized or distilled water rinse; and

- Allow to air dry.

3.2.7 Investigation Derived Waste

The following types of investigation-derived waste (IDW) may be generated: decontamination water; groundwater from development, purging, and sampling; spent personal protective equipment (PPE); and used sampling equipment.

Investigation-derived water will be field-screened for organic vapors with a PID and visually inspected to initially determine whether these wastes are potentially contaminated. In order to minimize the generation of drummed wastes and the costs associated with storage, testing, transportation, and disposal of drums, IDW will be handled in the following manner:

- **Development and purge waters from monitoring wells and decontamination water:** It is assumed that all water will be collected and discharged to the adjacent Dunkirk Specialty Steel site via the on-site water transfer vault for permitted treatment and discharge. Otherwise, water that is not significantly contaminated (PID readings of 5 parts per million [ppm] or less, lack of sheen, etc.) will be discharged to the surface in the area where it was generated only if the area is suitably undeveloped (e.g., not paved and not on residential property). If the water cannot be discharged to the surface because of observed contamination, then that water will be placed in United States Department of Transportation (DOT) approved 55-gallon drums and stored at a central storage location selected by NYSDEC.

- **Used sampling equipment and PPE:** Unless field screening indicates that PPE and other solid wastes are contaminated to the level that they can not be disposed of as non-hazardous waste, this material will be double-bagged and disposed of off-site as non-regulated solid waste.

3.2.8 Field Documentation and Sample Identification

Field notebooks will be maintained by EEEPC field personnel through out all on-site work. In addition, field data sheets including, but not limited to, field sampling forms, COC records, and daily activity logs may also be used during site activities and will be included with the final report. Photographs in electronic format will also be taken to document field activities and will be included in the final report.

Samples will be identified using the format described below. Each sample will be labeled, chemically preserved (if required), and sealed immediately after collection. To minimize handling of sample containers, labels will be completed prior to sample collection as practicable. The sample label will be completed using waterproof ink and will be firmly affixed to sample containers and protected with clear tape. The sample label will give the following information:

- Date of collection;

- Unique sample number;
- Analyses requested; and
- Preservation.

Each sample will be referenced by sample number in the logbook and on the COC record.

Individual samples will be identified by a unique alphanumeric code. Normal field samples (non-quality-control) will be numbered according to the following convention:

For soil vapor samples:
Hw907022-V-xxS-sample date (for shallow locations)
Hw907022-V-xxD-sample date (for deep locations)

For groundwater samples:
Hw907022-GW-xx-sample date (for temporary locations)
Hw907022-GW-MWID-sample date (for existing monitoring wells)

For structure sampling:
Hw907022-SS-xx-sample date (for subslab locations)
Hw907022-IA-xx-sample date (for indoor ambient air)
Hw907022-OA-xx-sample date (for outdoor ambient air)

A typical field sample would be: hw907022-V-01S-012307.

Where:

hw907022	=	hazardous waste site number
V	=	oil vapor
01	=	sequential sample number
S	=	shallow
012307	=	January 23, 2007

Duplicate samples will be submitted to the laboratory "blind" with a fictitious sequential sample number. The sample number will be recorded in the field log book and cross-referenced with the COC.

3.3 Task 3: Reporting

EEEPC will publish a draft and final site characterization report summarizing the results of the field investigation activities and data gathered. No conclusions or interpretations will be included in the report. The report will include the results for all media sampled including soil vapor, groundwater, subslab, and indoor and outdoor air. DUSRs for all laboratory chemical analytical data will also be included in the report. Preliminary data will be reported to NYSDEC in the form of progress reports as soon as the data becomes available.

The analytical data will be screened against NYS Standards, Criteria, and Guidelines (SCGs) including NYSDEC Ambient Water Quality Standards and Guidance Values for groundwater. Soil vapor results will be used for site characterization and selection of potential future vapor intrusion sampling locations; however, soil vapor results will not be screened against SCGs because none currently exist. The data screening will be presented in the form of data summary tables. Analytical results will be presented illustratively on sample location maps.

4 Progress Schedule

The schedule below (Table 4-1) provides tentative dates for completing work activities. Actual dates may vary depending on notice to proceed.

Table 4-1 Schedule

Task	Start Date	End Date
Prepare and submit draft WP	November 14, 2007	December 5, 2007
Field work	January 14, 2008	January 21, 2008
Additional sampling	TBD	TBD
Submit draft report[1]	—	April 14, 2008
NYSDEC report review	April 14, 2008	April 29, 2008
Submit final report	—	May 14, 2008

[1]Actual report date will depend on the need for additional sampling.

5 Subcontracting Plan

The following sections of the WP represents EEEPC's costing plan to provide site characterization services requested in WA D004435-23 for AL Tech Specialty Steel, Site No. 907022. This includes subcontracting requirements, the project budget estimate, and MBE and WBE utilization.

5.1 Subcontracting Requirements

The following is a summary of the proposed EEEPC subcontracted professional services for this project:

- Drilling Services: Aztech Technologies, Inc. (Aztech) of Ballston Spa, New York (WBE);
- Air Laboratory Analysis: Con-Test Analytical Laboratory, of East Long-meadow, Massachusetts (WBE); and
- Water Analytical Services: Kemron Environmental Services, Inc. of Marietta, Ohio (MBE).

6 Cost Assumptions and Budget

EEEPC's proposed budget is $59,822. This budget is predicated on the following assumptions:

- All fieldwork will be performed in 10-hour days, not including travel, and assumes five field days to complete the initial scope of work and two field days for additional sampling if necessary;
- Field team members will be staffed from EEEPC's Lancaster, New York, office. Field teams will travel to the site on a daily basis, with travel from Lancaster to Dunkirk approximately a 1-hour drive each way;
- EEEPC will coordinate with the NYSDEC project manager, to assure that NYSDEC personnel will be on-site to verify sample locations prior to the start of sampling. A separate site visit outside the assumed duration of field work has not been included in the budget. EEEPC personnel will conduct a site visit with NYSDEC at an agreed upon time to confirm sampling locations;
- Property access to the AL Tech site has been pre-arranged by NYSDEC. EEEPC has keys to the site;
- In the event that additional structure sampling is required (e.g., City of Dunkirk Municipal Garage) site access will be coordinated by NYSDEC;
- A draft WP submittal will be prepared for review by NYSDEC. A final submission will be made approximately two weeks after receipt of NYSDEC comments;
- Fieldwork for the site characterization will be conducted by two-person teams. The cost estimate assumes a total of five field days to complete five soil vapor probe locations (2 points each) and collect a groundwater grab sample at each location; sample three existing groundwater monitoring wells; and conduct structure sampling in one building;
- The cost estimate includes budget to collect soil vapor samples at two additional off-site locations and conduct additional structure sampling at one

building, if directed by NYSDEC. EEEPC assumes that these sampling activities will both be conducted as part of a second mobilization of the drilling subcontractor and EEEPC field personnel and that this effort will take two additional field days;

- EEEPC assumes that groundwater depth is less than 25 feet and samples from groundwater grab locations can be sampled using a peristaltic pump;

- EEEPC assumes field work will begin mid January 2008;

- Subslab vapor samples shall be located in reasonably accessible areas (e.g., concrete is less than 1-foot thick without rebar and utilities);

- Analytical turnaround time will be 14 calendar days for air and water samples;

- No costs have been included in the budget for IDW disposal. It is assumed that IDW water can be discharged to the on-site transfer vault or the ground surface. EEEPC will be prepared to containerize IDW water should the need arise;

- A Quality Assurance Project Plan (QAPP) will not be required for this WA;

- Samples located on the opposite side of Lucas Avenue, as identified in the WA, are within the public right-of-way. Costs for access permits, if applicable, are not included in the cost estimate; and

- It is assumed that prevailing wages will not be in effect for the drilling subcontractor for this project.

Schedule 2.11 forms and the MBE/WBE utilization plan are on the following pages in this section.

Schedule 2.11(a) Summary of Work Assignment Price

ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.
State Superfund Standby Contract #D004435 (ID)
Work Assignment #: D004435-23
Project Name: Al Tech Specialty Steel Intermediate Investigation

1.	Direct Salary Costs (Schedule 2.11(b))		$11,883
2.	Indirect Costs		$22,935
3.	Direct Non-Salary costs (Schedules 2.11(c) and (d-1) and (d-3))		$5,078

Subcontract Costs

Cost-Plus-Fixed-Fee Subcontracts (Schedule 2.11(e))

	Name of Subcontractor	Services to be Performed	Subcontract Price
A			
B			
C			
D			

4. Total Cost-Plus-Fixed-Fee Subcontracts — $0

Unit Price Subcontracts (Schedule 2.11(f))

	Name of Subcontractor	Services to be Performed	Subcontract Price
A	Kemron Environmental Service	Analytical Services - water	1,095
B	Aztech Technologies, Inc.	Drilling	7,258
C	Con-Test	Analytical Services - air	8,798
D			

5.	Total Unit Price Subcontracts		$17,151	
6.	Subcontract Management Fee	(4% on Unit Price Subcontract > $10,000)	686	
7.	Total Subcontract Costs (Lines 4+5+6)			17,837
8.	Fixed Fee	(6.0% on Labor + Indirect)		2,089
9.	Total Work Assignment Price (Lines 1+2+3+7+8)			59,822

NOTE: Rates are in accordance with Section 2.10 of the State Superfund Standby Contract #D004435 (ID)

Schedule 2.11(b) Direct Labor Hours Budgeted

ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.
State Superfund Standby Contract #D004435 (ID)
Work Assignment #: D004435-23
Project Name: Al Tech Specialty Steel Intermediate Investigation

DIRECT LABOR HOURS BUDGETED - BY NSPE GRADE

Projected Rates for Year Ending January 31, 2009

NSPE Grade	IX	VIII	VII	VI	V	IV	III	II	I	Total	Labor	Overhead		Fee	
Rate/Hour	$66.07	$48.33	$42.12	$38.46	$32.09	$27.31	$24.70	$20.10	$15.30	Hours	Cost	**193.0%**	SUBTOTAL	**6.00%**	TOTAL
TASK DESCRIPTION															
Task 1: Work Plan	0	2	4	34	0	6	0	16	0	62	$2,058	$3,972	$6,030	$362	$6,392
Task 2: Field Investigation	2	2	2	34	0	112	0	88	0	240	6,448	12,445	18,893	1,134	20,027
Task 3: Reporting	2	2	2	16	12	48	6	24	8	120	3,377	6,518	9,895	594	10,489
Task 4:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Task 5:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Task 6:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Task 7:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Task 8:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Est. Direct Labor Hours	4	6	8	84	12	166	6	128	8	422					
Est. Direct Labor Cost	$264	$290	$337	$3,231	$385	$4,533	$148	$2,573	$122	**TOTALS**	$11,883	$22,935	$34,818	$2,089	$36,907

State Superfund Standby Contract #D004435 (ID) **Date Prepared:**

Project Name: Al Tech Specialty Steel Intermediate Investigation

Work Assignment #: D004435-23

Schedule 2.11(b-1)
Direct Administrative Labor Hours Budgeted

NSPE Labor Classification	IX	VIII	VII	VI	V	IV	III	II	I	Total No. of Direct Administrative Labor Hrs. Budgeted
Task 1		1	2	2						5
Task 2		1	2	4						7
Task 3		1		2						3
Task 4										
Task 5										
Task										
Task										
Task										
Total Hours		3	4	8						15

Contract/Project administrative hours would include (subject to contract allowability) but not necessarily be limited to the following activities:

1. Work Plan Development:
Conflict of Interest Check
Develop budget schedule sand supporting

2. Review Work Assignment Progress:
Conduct progress reviews
Prepare monthly project report
Update WA progress schedule
Prepare monthly M/WBE Utilization Report

3. Review Work Assignment Costs:
Prepare monthly cost control report
Cost control reviews

4. CAP Preparation:
Oversee and prepare monthly CAP
Respond to payment issues/ disallowables
NSPE list updates
Equipment Inventory

5. Manage Subcontracts

6. Implement & Manage Program Management & Staffing Plans

7. Conduct Health and Safety Reviews

8. Word Processing and Graphic Artists

9. Report Editing

Contract/Project administration hours woul include activities such as:
1. QA/QC reviews;
2. Technical oversight by management;
3. Develop subcontracts;
4. Work plan development; or
5. Review of deliverables.

Schedule 2.11(c) Direct Non-Salary Costs

ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.
State Superfund Standby Contract #D004435 (ID)
Work Assignment #: D004435-23
Project Name: Al Tech Specialty Steel Intermediate Investigation

ITEM	Reimbursement Rate	Unit	Estimated No. of Units		Total Estimated Costs
A. IN-HOUSE COSTS*					
Communication Costs	$ 5.00	Call	10		$50.00
Reproduction Costs - Color Copies	$ 0.30	Page	-		$0.00
Blueprinting	$ 1.75	Page	-		$0.00
			-		$0.00
Protective Clothing: Level D	$ 10.00	Day	10		$100.00
Protective Clothing: Level C	$ 35.00	Day	-		$0.00
Protective Clothing: Level B	$ 110.00	Day	-		$0.00
Shipping: Lab Samples	$ 68.00	50lbs.	10		$680.00
Shipping: Equipment	$ 79.00	75lbs.	2		$158.00
Shipping: Other Fedex Priority	$ 22.00	5 lbs.	4		$88.00
Postage (FED-EX PRIORITY)	$ 17.00	2 lbs.	-		$0.00
Purchased Items - Incidentals	(see Form 2.11 d-5)	Lump Sum	6		$210.00
Outside Equipment Rental	(See Form 2.11 d-3)	Lump Sum	1		$2,624.00
Equipment Purchase Under Contract	(See Form 2.11 d-1)	Lump Sum	-		$0.00
Miscellaneous Field Supplies/ODCs		Lump Sum	-		$250.00
Miscellaneous Field Supplies/ODCs		Lump Sum	-		$0.00
Low Value Equipment	$ 0.80	per Field Hr	168		$134.40
				Subtotal	4,294.40
B. MISCELLANEOUS					
1. TRAVEL					
Airfare: Buffalo/Destination 1		RT	-		-
Airfare: Buffalo/Destination 2		RT	-		-
Per Diem: Destination 1		Day	-		-
Per Diem: Destination 2		Day	-		-
Lodging: Destination 1		Night	-		-
Lodging: Destination 2		Night	-		-
Local Tax on Lodging (Dest.1)	0.00%	Night	-		-
Local Tax on Lodging (Dest.2)	0.00%	Night	-		-
Auto Rental	$ 50.00	Day	-		-
Mini Van Rental	$ 70.00	Day	7		490.00
Local Mileage	$ 0.445	Mile	110		48.95
Parking		Day	-		-
Gasoline/Tolls	$ 35.00	RT	7		245.00
				Subtotal	$783.95
TOTAL DIRECT NON-SALARY COSTS					**$ 5,078.35**

Schedule 2.11(d-3) Vendor Rented Equipment

ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.
State Superfund Standby Contract #D004435 (ID)
Work Assignment #: D004435-23
Project Name: Al Tech Specialty Steel Intermediate Investigation

ITEM	VENDOR	Rental Rate	Time Period	Estimated No. of Periods	Estimated No. of Units	Total Estimated Cost
Mini RAE ppm	Ashtead Technology	$240.00	week	2	1	$ 480
Mini RAE ppb	Ashtead Technology	$500.00	week	2	1	$ 1,000
Myron 6P meter	Ashtead Technology	$100.00	week	1	1	$ 100
Lamotte 2020 Turbidity meter	Ashtead Technology	$100.00	week	1	1	$ 100
Heron Oil / Water interface probe	Ashtead Technology	$160.00	week	1	1	$ 160
MGD 2002 detector for helium	Ashtead Technology	$392.00	week	2	1	$ 784
				0	1	
TOTAL EQUIPMENT USAGE						**$ 2,624**

Work Assignment #: D004435-23

Schedule 2.11(d) 5

Consumable Supplies

Item	Estimated Quantity	Unit Cost ($)	Total Budgeted Cost (Col. 2 x 3) ($)
Miscelaneous field supplies	6	$35	$210
		TOTAL $	$210

Schedule 2.11(f) **Unit Price Subcontractors**

Work Assignment #: D004435-23

Project Name: Al Tech Specialty Steel Intermediate Investigation

Name of Subcontractor	Services to be Performed		Subcontract Price ($)	Management Fee ($)
Con-Test Labs	Air Analytical Sample Analysis		$8,798	$351.90
				$0.00
				$0.00

Item	Analysis/Method	**Maximum Reimbursement** Rate (Specify Unit) ($)	**Estimated** Number of Units	**Turn-Around** Mark-up ($)	**Total Estimated** Cost ($)
Air analytical analysis	TO-15	$259	34		$8,798
				Total Analytical Cost:	**$8,798**

SUBTOTAL SUBCONTRACT		**$8,798**
SUBCONTRACT MANAGEMENT FEE	4.00%	**$352**
TOTAL		**$9,149**

Schedule 2.11(f) **Unit Price Subcontractors**

Work Assignment #: D004435-23

Project Name: Al Tech Specialty Steel Intermediate Investigation

Name of Subcontractor	Services to be Performed		Subcontract Price ($)	Management Fee ($)
Aztech Technologies, Inc.	Drilling		$7,258	$290.32
				$0.00
				$0.00

Item		**Maximum Reimbursement**	**Estimated**	**Turn-Around**	**Total Estimated**
	Analysis/Method	Rate (Specify Unit)	Number of	Mark-up	Cost
		($)	Units	($)	($)
Drilling Services		$7,258	1		$7,258
				Total Analytical Cost:	**$7,258**

SUBTOTAL SUBCONTRACT **$7,258**

SUBCONTRACT MANAGEMENT FEE 4.00% **$290**

TOTAL **$7,548**

Schedule 2.11(f) **Unit Price Subcontractors**

Work Assignment #: D004435-23

Project Name: Al Tech Specialty Steel Intermediate Investigation

Name of Subcontractor	Services to be Performed		Subcontract Price ($)	Management Fee ($)
Kemron Environmental Services	Water analytical services		$1,095	$43.80
				$0.00
				$0.00

Item		**Maximum Reimbursement**	**Estimated**	**Turn-Around**	**Total Estimated**
	Analysis/Method	Rate (Specify Unit)	Number of	Mark-up	Cost
		($)	Units	($)	($)
Water analytical analysis	8260	$ 91.25	12		$1,095
				Total Analytical Cost:	**$1,095**

SUBTOTAL SUBCONTRACT		**$1,095**
SUBCONTRACT MANAGEMENT FEE	4.00%	**$44**
TOTAL		**$1,139**

Schedule 2.11(f) - 1 **Unit Price Subcontractors (Summary)**

Work Assignment #: D004435-23

Project Name: Al Tech Specialty Steel Intermediate Investigation

SUBCONTRACTOR	Services to be Performed	Subcontract Price ($)
Kemron Environmental Services, Inc.	Analytical Services - water	$1,095
Aztech Technologies, Inc.	Drilling	$7,258
Con-Test	Analytical Services - air	$8,798

SUBTOTAL SUBCONTRACT		$17,151
SUBCONTRACT MANAGEMENT FEE	4.00%	$686
TOTAL		**$17,837**

Schedule 2.11(g) Monthly Cost Control Report/Summary of Fiscal Information

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Date Prepared ___________
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Invoice No. _____________

ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.
State Superfund Standby Contract #D004435 (ID)
Work Assignment #: D004435-23
Project Name: Al Tech Specialty Steel Intermediate Investigation

SUMMARY SCHEDULE

Expenditure Category	A Costs Claimed This Period	B Paid to Date	C Total Disallowed to Date	D Total Costs Incurred to Date (A+B+C)	E Estimated Costs to Completion	F Estimated Total Work Assignment Price (A+B+E)	G Approved Budget	H Estimated Under/Over (G-F)
1. Direct Salary Costs							$11,883	
2. Indirect Costs (193 %)							$22,935	
3. Subtotal Direct Salary & Indirect Costs							$34,818	
4. Travel							$784	
5. Other Non-Salary Costs							$4,294	
6. Subtotal Direct Non-Salary Costs							$5,078	
7a. Subcontractors							$17,151	
7b. Subcontract Management Fee							$686	
8. Total Work Assignment Cost							$57,733	
9. Fixed Fee							$2,089	
10. Total Work Assignment Price							$59,822	

Schedule 2.11(g) Monthly Cost Control Report/Summary of Fiscal Information

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ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.
State Superfund Standby Contract #D004435 (ID)
Work Assignment #: D004435-23
Project Name: Al Tech Specialty Steel Intermediate Investigation

Task 1: Work Plan

Expenditure Category	A Costs Claimed This Period	B Paid to Date	C Total Disallowed to Date	D Total Costs Incurred to Date (A+B+C)	E Estimated Costs to Completion	F Estimated Total Work Assignment Price (A+B+E)	G Approved Budget	H Estimated Under/Over (G-F)
1. Direct Salary Costs							$2,058	
2. Indirect Costs (193 %)							$3,972	
3. Subtotal Direct Salary & Indirect Costs							$6,030	
4. Travel							$0	
5. Other Non-Salary Costs							$44	
6. Subtotal Direct Non-Salary Costs							$44	
7a. Subcontractors							$0	
7b. Subcontract Management Fee							$0	
8. Total Work Assignment Cost							$6,074	
9. Fixed Fee							$362	
10. Total Work Assignment Price							$6,436	

Schedule 2.11(g) Monthly Cost Control Report/Summary of Fiscal Information

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ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.
State Superfund Standby Contract #D004435 (ID)
Work Assignment #: D004435-23
Project Name: Al Tech Specialty Steel Intermediate Investigation

Task 2: Field Investigation

Expenditure Category	A Costs Claimed This Period	B Paid to Date	C Total Disallowed to Date	D Total Costs Incurred to Date (A+B+C)	E Estimated Costs to Completion	F Estimated Total Work Assignment Price (A+B+E)	G Approved Budget	H Estimated Under/Over (G-F)
1. Direct Salary Costs							$6,448	
2. Indirect Costs (193 %)							$12,445	
3. Subtotal Direct Salary & Indirect Costs							$18,893	
4. Travel							$784	
5. Other Non-Salary Costs							$4,206	
6. Subtotal Direct Non-Salary Costs							$4,990	
7a. Subcontractors							$17,151	
7b. Subcontract Management Fee							$686	
8. Total Work Assignment Cost							$41,720	
9. Fixed Fee							$1,134	
10. Total Work Assignment Price							$42,854	

Schedule 2.11(g) Monthly Cost Control Report/Summary of Fiscal Information

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ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.
State Superfund Standby Contract #D004435 (ID)
Work Assignment #: D004435-23
Project Name: Al Tech Specialty Steel Intermediate Investigation

Task 3: Reporting

Expenditure Category	A Costs Claimed This Period	B Paid to Date	C Total Disallowed to Date	D Total Costs Incurred to Date (A+B+C)	E Estimated Costs to Completion	F Estimated Total Work Assignment Price (A+B+E)	G Approved Budget	H Estimated Under/Over (G-F)
1. Direct Salary Costs							$3,377	
2. Indirect Costs (193 %)							$6,518	
3. Subtotal Direct Salary & Indirect Costs							$9,895	
4. Travel							$0	
5. Other Non-Salary Costs							$44	
6. Subtotal Direct Non-Salary Costs							$44	
7a. Subcontractors							$0	
7b. Subcontract Management Fee							$0	
8. Total Work Assignment Cost							$9,939	
9. Fixed Fee							$594	
10. Total Work Assignment Price							$10,532	

Schedule 2.11(g) - Supplemental

Cost Control Report for Subcontracts

Engineer: Ecology and Environment Engineering, P.C.
Contract No. D004435____
Project Name AL Tech Steel Site Characterization
Work Assignment No. . 23

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Subcontract Name	*A* *Subcontract Costs Claimed this Application Inc. Resubmittals*	*B* *Subcontract Costs Approved for Payment on Previous Applications*	*C* *Total Subcontract Costs to Date (A plus B)*	*D* *Subcontract Approved Budget*	*E* *Management Fee Budget*	*F* *Management Fee Paid*	*G* *Total Costs to Date (C plus F)*
1.Aztech Technologies, Inc.				$7,258.00			
2. Kemron Environmental Services, Inc.				$1,095.00			
3. Con-Test Analytical Laboratory				$8,798.00			
4.							
5.							
6. **TOTALS**							

Project Manager ___________________________ Date ______________________

NOTES:

1) Costs listed in Columns A, B, C & D do not include any management fee costs.
2) Management fee is applicable to only properly procured, satisfactorily completed, unit price subcontracts over $10,000.
3) Line 11, Column G should equal Line 7 (Subcontractors), Column D of Summary Cost Control Report.

Schedule 2.11(h) Summary of Labor Hours

ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.
State Superfund Standby Contract #D004435 (ID)
Work Assignment #: D004435-23
Project Name: Al Tech Specialty Steel Intermediate Investigation

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Projected Rates for Year Ending January 31, 2009

NSPE Grade	IX		VIII		VII		VI		V		IV		III		II		I		TOTAL	
Rate/Hour	$66.07		$48.33		$42.12		$38.46		$32.09		$27.31		$24.70		$20.10		$15.30		HOURS	
TASK	EXP./	EST.	EXP./	EST.	EXP./	EST.	EXP./	EST.	EXP./	EST.	EXP./	EST.	EXP./	EST.	EXP./	EST.	EXP./	EST.	EXP./	EST.
Task 1: Work Plan	0	0	0	2	0	4	0	34	0	0	0	6	0	0	0	16	0	0	0	62
Task 2: Field Investigation	0	2	0	2	0	2	0	34	0	0	0	112	0	0	0	88	0	0	0	240
Task 3: Reporting	0	2	0	2	0	2	0	16	0	12	0	48	0	6	0	24	0	8	0	120
Task 4:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Task 5:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Task 6:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Task 7:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL HOURS		4		6		8		84		12		166		6		128		8		422
TOTAL COST		$264		$290		$337		$3,231		$385		$4,533		$148		$2,573		$122		$11,883

7 Staffing Plan

EEEPC proposes the following primary staffing plan for completion of this WA.

Program Manager: Thomas Heins, P.E.
Project Manager: Andrew Murphy, P.E.
Task Manager: George Lukert, P.G.

Task 1: Work Plan
T. Heins, P.E. – Senior Engineer Review
A. Murphy, P.E. – Project Management
G. Lukert, P.G. – Task Manager, Preparation

Task 2: Field Investigation
A. Murphy, P.E. – Project Manager
G. Lukert, P.G. – Task Manager
M. Werth – Field Team Leader

Task 3: Reporting
T. Heins, P.E. – Senior Engineer Review
A. Murphy, P.E. – Project Manager
G. Lukert, P.G. – Report Review
M. Werth – Report Preparation

8 MBE/WBE Utilization Plan

8.1 Introduction/Objective

EEEPC fully subscribes to the NYS policy that MBE/WBE firms be afforded the maximum opportunity to participate in contracts offered by NYS agencies. As a prime contractor to NYSDEC, EEEPC is committed to full compliance with Executive Law Article 15-A and pertinent federal regulations to further MBE/WBE goals and to achieve significant participation of MBE/WBE firms to a level commensurate with their capabilities and responsibilities.

In this section, EEEPC's MBE/WBE Utilization Plan is described, including goals for this WA, and details regarding the services, firms, and portion of work scheduled to be provided by MBE/WBE firms.

8.1.1 Contract Goals

EEEPC fully expects to commit to the following established percentage goals. Actual dollar amounts will be contingent upon the total dollar value of the awarded contract (see Table 8-1).

Table 8-1 MBE/WBE Contract Goals

	Percentage	Dollar Amount
Total Percentage of MBE/WBE Work	**20**	**$11,964**
Total percent of MBE work goal	15	$8,973
Total percent of WBE work goal	5	$2,991
Total Project Amount		**$59,822**

8.2 General MBE/WBE Utilization Strategy

EEEPC maintains an up-to-date Affirmative Action Plan and MBE/WBE hiring plan to ensure equal opportunity for all job applicants, employees, and subcontractors. For the NYS Superfund standby contract, EEEPC will use the following procedures and resources to meet established MBE/WBE goals:

- The EEEPC PM will consult with the EEEPC MBE/WBE subcontracting coordinator to identify and evaluate work that requires subcontractor services.

The subcontracting opportunities will then be divided into discrete tasks that may be completed by MBE or WBE firms.

- Following identification of discrete tasks, the MBE/WBE subcontracting coordinator will review the New York State Directory of Certified Minority- and Women-Owned Business Enterprises and EEEPC's MBE/WBE database.

- EEEPC has developed a database to facilitate the acquisition of qualified MBE and WBE firms for work on various state and federal government contracts. This database consists of the following:

  – MBE and WBE firms listed in the current New York State Department of Commerce Directory of Minority- and Women-Owned Businesses, entered and cross-referenced by nine categories of services most frequently used by EEEPC. The categories are as follows:

Environmental Consulting	Engineering
Drilling/Geophysics	Laboratories
Community Relations	Construction Management
Supplier/Equipment	Miscellaneous Services
General Contractors	

  This listing and cross-referencing facilitates EEEPC's rapid identification of potentially qualified MBE/WBE firms for use in various projects.

  – Firms identified in the database as performing environmental consulting, engineering/geophysical, or drilling services were sent questionnaires requesting detailed information regarding the background of each firm. Any firm responding to this first-tier questionnaire was requested to submit additional information in a supplemental questionnaire that provided EEEPC with adequate information in a standardized format enabling comparison and selection of potential firms using methodical and consistent evaluation criteria.

- Following identification of qualified, potential MBE/WBE contractors, the PM will solicit firms for bids as delineated below under Criteria for Selection.

8.3 Typically Subcontracted Services

Typically, EEEPC has found that opportunities exist for MBE/WBEs in the following work categories:

- Site security fencing;

- Protective services;

- Drilling and monitoring well installation;

- Soil borings;
- Physical soil tests;
- Site and topographical surveys;
- Title searches;
- Engineering services;
- Structural engineering;
- Geophysical engineering;
- Geophysical surveys;
- Photographic services;
- Heavy equipment;
- Laboratory data validation; and
- Photocopying report reproduction services.

EEEPC has developed “standby” agreements with several subcontractors commonly used on NYSDEC projects including drillers and analytical laboratories.

8.4 Criteria for Selection

8.4.1 Subcontractors (Nonprofessional Services)

Criteria described below are used to obtain and evaluate bids for other nonprofessional services. Following identification of discrete tasks and potential MBE/WBE firms by the PM and MBE/WBE subcontracting coordinator, bid solicitations will be requested from qualified firms and, to the extent possible, one or more MBE/WBE firms will be requested to bid on each task. If the bids exceed $20,000, at least five bids will be obtained. If the bids range between $10,000 and $20,000, three bids will be obtained. If the bid is less than $10,000, EEEPC may enlist a sole-source procurement from an MBE/WBE firm if the cost is reasonable, or obtain at least three bids. In either case, based on the bids submitted, an award will be made to the most responsible MBE/WBE bidder.

For this project, EEEPC has selected Aztech of Ballston Spa, New York, to provide drilling services. Aztech is a standby subcontractor and a NYS-registered WBE. EEEPC anticipates a subcontracted dollar value of approximately $7,258 for drilling services

8.4.2 Subconsultants (Professional Services)

Professional services will be subcontracted to MBE/WBE firms pursuant to applicable NYS regulations. EEEPC has selected Kemron to provide analytical services for groundwater samples collected for this project. Kemron is a NYS-registered MBE. In addition, EEEPC proposes to use Con-Test of East Longmeadow, Massachusetts, to provide analytical services for air samples collected as part of the AL Tech project. Con-Test is a standby subcontractor and a NYS-registered WBE. EEEPC anticipates total subcontracted dollar values of $1,095 and $8,797 for groundwater and air analytical analysis, respectively.

8.5 Proposed MBE/WBE Utilization

For this project, drilling services and groundwater and air sample analytical services were subcontracted items in EEEPC's cost estimate. EEEPC screened all reasonably available MBE/WBE subcontractors for these tasks and included all viable MBE/WBE firms in the bidding or selection process. Analytical services for both groundwater and air analysis were subcontracted to Kemron and Con-Test, respectively. Kemron is a NYS-certified MBE, while Con-Test is a NYS-tate-registered WBE firm, both of which are standby subconsultants to EEEPC.

The value of MBE/WBE work subcontracted for the entire project is identified on Table 8-2. The scope of work and price quotes for the subcontracted services are included in Appendix B. As shown below, the MBE goal of 15% was not met, with only 1.9 % of subcontracted work being awarded to an MBE. However, the WBE goal of 5% was exceeded (28.1%). The total of 30% also exceeds the combined goal for MBE/WBE contract goal of 20%. EEEPC is fully committed achieving MBE/WBE participation goals.

Table 8-2 MBE/WBE Subcontractor Information

Task	Task Description	Subcontract or Scope of Work	MBE/WBE Subcontractor	Value
2	Field Investigation	Drilling services	Aztech Technology, Inc. (WBE)	$7,258
2	Field Investigation / Groundwater Sampling	Groundwater analytical services	Kemron Environmental Services, Inc. (MBE)	$1,095
2	Field Investigation / Soil Gas Survey	Air analytical services	Con-Test Analytical Laboratory (WBE)	$8,798
Total MBE Subcontract				$1,095
Total WBE Subcontract				$16,056
Total MBE/WBE Contract				$17,151
Percent Total Work Assessment (MBE)				1.8%
Percent Total Work Assessment (WBE)				26.8%
Percent Total Work Assessment Combined MBE/WBE				28.6%

9 Reference

New York State Department of Health (NYSDOH), 2006, *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, Final*, October 2006.

A Standard Operating Procedure for Soil Vapor Intrusion Investigation

Title:	**SOIL VAPOR INTRUSION INVESTIGATION**
Category:	ENV 3.30
Revised:	November 2006

STANDARD OPERATING PROCEDURE

Soil Vapor Intrusion Investigation in New York State

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1. Introduction

This Standard Operating Procedure (SOP) describes procedures for sample collection and evaluation for a soil vapor intrusion investigation in the State of New York. It incorporates guidance provided by the New York State Department of Health (NYSDOH) on the general steps and strategies that should be applied when conducting a soil vapor intrusion investigation. This SOP may be applied in other states; however, New York State guidance includes some specific procedures and excludes use of vapor intrusion modeling and collection of some samples that may be applicable elsewhere. Therefore, this SOP **must** be confirmed and discussed with the appropriate regulatory agencies, even in New York State, prior to the investigation start date, to verify that it has been accepted by the reviewing agency. This SOP must be used in combination with an appropriate analytical method (e.g., USEPA TO-15).

2. Scope

Included in this SOP are the sample collection procedures for the following sample media:

1. Subsurface Soil Vapor Samples (collected outdoors, typically at foundation level directly from the soil);
2. Sub-slab Vapor Samples (collected beneath a structure's slab);
3. Indoor Air Samples (collected from ambient air within a structure); and
4. Outdoor Air Samples (collected from ambient air outside of a structure).

The purpose of this investigation is to identify soil vapor intrusion pathways and determine if any migrating contaminant vapors have the potential to adversely impact humans that are exposed to these vapors. It is recommended that this investigation be conducted during the heating season because it is the period where the greatest impact is anticipated - when a building's heating system is in operation typically causing a pressure gradient into the building and vapors may be drawn into the building. Heating season dates will vary with locale, but is generally defined by NYSDOH as November 15 through March 31.

3. Equipment

The survey will be performed using the equipment listed below.

- Hammer drill;
- Hand auger or post digger;
- Vacuum with high efficiency particulate air (HEPA) filtration for dust and debris cleanup;
- Dustpan and brush;
- ½-inch bottle brush;
- Drill bits, 1-inch diameter x 6 inches long (typical, minimum usable length);
- Drill bits, ½-inch diameter x 12 inches long (typical, minimum usable length);
- Building power source, generator, or batteries for hammer drill;
- Bentonite (fine granular or powder);
- Glass beads or coarse sand;
- Water;
- Inert laboratory- or food-grade-quality tubing (e.g., polyethylene, Teflon-lined polyethylene, or stainless steel), typically ¼- to ⅜-inch ID;
- Organic vapor monitor that reads in the parts per billion range (e.g., ppbRAE) <*to be used only when product inventories or indoor air sampling are conducted*>;
- Enclosure such as a small bucket (5-gallon, typical) and three, ⅜-inch holes with rubber grommets (typical) <*for leak detection testing during soil vapor sampling only*>;
- Helium (ultra-pure, when possible) gas tank < *for leak detection testing during soil vapor sampling only*>
- Portable helium detector < *for leak detection testing during soil vapor sampling only*>
- Syringe without needle (100-cc volume, typical);

- Tedlar bag for vapor purge collection <*for use only during sub-slab vapor sampling when indoor air sampling will be conducted concurrently*>;

- Adjustable wrench and screwdriver/nutdriver;

- Hydraulic cement and mixing tools; and

- Digital camera.

Samples are collected using canisters with vacuum gauges and flow controllers. The sampling equipment is provided by a laboratory certified to perform EPA Method TO-14 or TO-15 by New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP). NYSDOH ELAP will certify the sampling canister preparation procedure and equipment. Canisters may be 1-liter (L) or 1.4-L “Mini-Cans” or 6-L Summa canisters. The choice of canister depends on the sampling conditions and laboratory availability. Canisters must be certified clean (in accordance with EPA Method TO-15) and under a vacuum pressure of no more than -25 inches of mercury (in Hg). Batch cleaning is acceptable as long as the cleaning process is certified by NYSDOH. Flow controllers must be set for the appropriate collection period (1- or 24-hour, typical) (flow rate dependent upon size of canister). Flow controllers must maintain a constant flow over the sampling period. Note the method description below:

> “With a critical orifice flow restrictor, there will be a decrease in the flow rate as the pressure approaches atmospheric. However, with a mass flow controller, the subatmospheric sampling system can maintain a constant flow rate from full vacuum to within about 7 kPa [kilopascals] (1.0 psi [pound per square inch) or less below ambient pressure.”

The laboratory must be notified at least two weeks in advance of sampling to ensure the canisters are available. The laboratory should provide enough canisters for one week of sampling with an extra 10% to account for added samples (e.g. multiple sub-slab samples in one structure) and regulator/canister failures (e.g., sampling rate incorrect, initial canister pressure too high).

4. Multimedia Sampling Procedures

4.1 Soil Vapor Samples

4.1.1 Selection of Sampling Locations

1. **To evaluate the potential for current on-site or off-site exposures, collect soil vapor samples:**

    - In the vicinity of a building’s foundation at a point located between the building and the contaminant source or along the site’s perimeter. <*For buildings with no surrounding surface confining layer (e.g., pavement or sidewalk), samples should* *be located in native or undisturbed soils away from fill material surrounding the building (approximately 10 feet away from the building) to avoid sampling in an area that may be influenced by the building's operations. For example, operation of HVAC systems, fireplaces, or mechanical equipment (e.g., clothes dryers or exhaust fans/vents) in a building may exacerbate the infiltration of outdoor air into the vadose zone adjacent to the building. As a result, soil vapor samples collected in uncovered areas adjacent to the building may not be representative>*; and

- At a depth of approximately 8 feet below grade or comparable to the depth of foundation footings (determined on a building-specific or site-specific basis). <*In areas where the groundwater table is less than 6 feet below grade, collect soil vapor samples at least 1 foot above the water table but no shallower than 4 feet below grade*>.

2. **To evaluate the potential for future exposures if development on a known or suspected contaminated area on-site or off-site is possible, collect soil vapor samples:**

   - In areas with either known or suspected subsurface sources of volatile chemicals, where elevated readings were obtained with field equipment during previous investigations, or where volatile organic compound contamination is reported to be present in the upper groundwater. <*If information is limited for the area, collect soil vapor samples in a grid pattern across the area at an appropriate spacing interval relative to the size of the area*>; and

   - At multiple depths from the suspected subsurface source (no deeper than 1 foot above the water table), or former source, to a depth comparable to the expected depth of foundation footings.

3. **To evaluate the potential for off-site vapor contamination, collect soil vapor samples:**

   - Along the site's perimeter or in areas of potential subsurface sources of vapor contamination (e.g., a groundwater source that has migrated off-site); and

   - At a depth comparable to the depth of foundation footings (determined on a site-specific basis). <*In areas where the groundwater table is less than 6 feet below grade, collect soil vapor samples at least one foot above the water table but no shallower than 4 feet below grade* >.

4. **To evaluate on-site and off-site preferential migration pathways in areas with low permeability soils, collect soil vapor samples:**

   - Along preferential soil vapor flow paths, such as sewer lines, utility corridors, trenches, pipelines, and other subsurface structures that are likely to be bedded with higher permeability materials; and

   - At depths corresponding to these subsurface features (depends on site-specific conditions).

5. **To characterize on-site or off-site contamination in the vadose zone, collect soil vapor samples:**

   - In areas with either known or suspected subsurface sources of volatile chemicals, where elevated readings were obtained with field equipment (eg; PID) during previous investigations, or where volatile chemical contamination is reported to be present in the upper groundwater; and

   - At appropriate depths associated with these areas (depends on site-specific conditions).

6. **To investigate the influence of contaminated groundwater or soil on soil vapor and to characterize the vertical profile of contamination, collect soil vapor samples:**

   - From clusters of soil vapor probes at varying depths in the vadose zone (no deeper than 1 foot above the water table) and preferably in conjunction with the collection of groundwater or soil samples.

4.1.2 Preparation

For **permanent soil vapor sampling probes**, the following sampling preparation procedure is to be followed:

- Create a hole in the soil of at least 1-inch diameter using direct push or an auger to the desired sampling depth (typically 8 feet below grade).

- Insert rigid tubing (e.g., stainless steel) of the appropriate size (typically ⅛- to ¼-inch inner diameter) into the constructed soil probe hole, keeping the bottom of the tubing at least 6 inches off the bottom of the hole and extend it to the surface. Alternatively, install a soil gas implant such as that manufactured by Geoprobe Systems. The Geoprobe Soil Gas Implant consists of double-woven stainless steel screen available in 6-, 14-, and 21-inch lengths. The implant is installed through the bore after the Geoprobe rods have been driven to depth. Flexible tubing (e.g., polyethylene or Teflon-lined polyethylene) is connected to the top of the implant and extended to the surface. Cap the tubing at the surface.

- Place porous backfill material (e.g., glass beads or coarse sand) into soil probe hole around the tubing/implant to create a sampling zone of 1 to 2 feet in length.

- Place a minimum of 6 to 12 linear inches of granular bentonite above the glass beads/sand pack and hydrate with potable water.

- Mix and install at least 3 linear feet of grout (Portland cement with 5% bentonite by weight or a premixed non-shrinking grout) in the annular space around the tubing to prevent direct infiltration of air from the surface. Backfill the remainder of the hole with clean material. For multiple probe depths in one borehole, the annular space should be grouted with bentonite between the probes to create discrete sampling zones.

- Install a protective casing around the top of the probe tubing and grout (e.g., concrete) in place.

For **temporary soil vapor sampling probes**, the installation procedures are identical to those described above with the following exceptions:

- A system such as the Geoprobe Post-Run Tubing (PRT) System may be used to eliminate the need for soil vapor implants, porous backfill, bentonite, and grout. Instead, soil vapor samples are collected using flexible tubing connected directly to a fitting at the bottom of the direct push rods after they have been advanced to depth and withdrawn approximately 6 inches. Soil vapor is drawn in from the open space beneath the rods.

- The interface between the rods and the soil must be sealed at the surface by excavating a small (1 to 3 inches deep) hole around the rods and packing it with hydrated bentonite, forming a slight mound at the surface.

- Direct-push rods and associated tooling must be decontaminated between locations.

4.1.3 Purging and Pre-Sample Testing

Prior to completing probe construction or attempting sample collection, the sample probe should be tested to determine if it will yield vapor for sampling (this is particularly important at sites with low permeability soils). Connect a syringe to the sample tubing and attempt to draw vapor into the syringe several times, sealing the sample tubing between draws. If a vacuum pressure is generated, the syringe plunger will be drawn back in when released and vapor sample collection will not proceed. Alternatively, the pump of an organic vapor or helium detector may be used by connecting the inlet of the operating device to the sample tubing and observing the ability of the pump to operate without creating a vacuum and stopping.

To purge ambient air from the sample tubing and to ensure that representative samples are being collected that are not affected by ambient air, the following steps should be followed:

- Connect the helium detector to the sample tubing to obtain "background" helium concentrations (helium is unlikely to be present in the subsurface at a detectable concentration; however, water vapor and certain organic vapors can interfere with the helium detector yielding a false detection).

- Place the bucket over the sample tube, gasket side down, and slip the sample tube through one of the predrilled holes. Insert a tube from the helium tank through another of the predrilled holes with the tubing outlet just above the ground surface (bottom of the inverted bucket). If a good seal cannot be obtained between the bucket gasket and the ground surface, place a hydrated bentonite seal around the bucket.

- Connect the helium detector to a test port installed near the base of the bucket and release helium into the bucket. The target concentration within the bucket is at least 25% helium.

- Disconnect the helium detector and plug the sample port. Connect the helium detector to the sample tube and measure the helium concentration in the soil vapor. Purge approximately 3 volumes of the tubing using the helium detector (approximately 10 milliliters [ml] per foot for ¼-inch inner diameter tubing).

- If the purge vapor is greater than 1% helium above background, reseal the probe hole with bentonite and repeat the purge/helium test process again. If after two successive attempts, the sample tube penetration cannot be thoroughly sealed, move to a new location or eliminate the soil vapor sample.

- Disconnect the helium detector from the sample tubing and reconnect to the test port in the bucket to ensure that helium was maintained with the test chamber throughout the duration of the test.

- Remove the bucket and helium supply when purging is complete.

- Begin sample collection.

4.1.4 Sample Collection

Soil vapor samples will be collected in specially prepared canisters equipped with a flow controller pre-set for a 1-hour sampling duration. For preparation of the canister and collection of the sample, the following procedure is to be followed:

- Place canister on a stable surface (ground) adjacent to the sample tube.

- Record the canister's serial number on the chain of custody (COC) and field notebook/sample form.

- Assign sample identification on canister ID tag and record on COC and field notebook/sample form.

- Samples should be assigned an ID according to the following convention:

  SID-###-SC/Q

  - SID - Three letter code identifying the site (note that private property information such as street address must not be used in the sample identifier);
  - ### - Sequential location number (note that all samples from a single structure should have the same location ID for grouping of sample types by location ID);
  - SC – Sub-code identifying type of sample (note that additional numeric characters may be added for multiple samples of one type in a single structure);
  - Q - Quality control sample code such as D for duplicate.

  - The matrix codes are as follows:
    - BA - Indoor Air from Basement or Crawlspace
    - FA - Indoor Air, First Floor (not basement)
    - OA - Outdoor Air
    - SS - Sub-slab Vapor
    - SV - Soil vapor
    - TB - Trip Blank

- Remove plug from canister fitting, if equipped.

- Connect the sample tubing to the pressure gauge/flow controller.

- Install pressure gauge/metering valve on canister valve fitting if not already installed. *<For compression fittings [e.g., Swagelok], ensure the ferrule is properly seated, tighten the nut by hand, and complete tightening the nut ¼-turn with a wrench.>*

- Open and close the canister valve, if so equipped. *<Some flow controllers do not include valves and sample collection is initiated immediately when the controller is connected to the canister. In this case, it is important to ensure that the sample tubing is properly connected to the flow controller prior to connecting the flow controller to the sample canister.>*

- Record gauge pressure; vacuum gauge pressure must read -25 in Hg or less or the canister cannot be used without verification from the laboratory that the canister did not leak during transport (i.e., the laboratory should supply the vacuum pressure for the canister when it was measured prior to shipment).

- Open canister valve to initiate sample collection. Observe the gauge pressure after approximately 1 to 2 minutes. The pressures should increase by approximately 1 in Hg per 2 minutes. If the pressure increases too rapidly, there may be a leak in the system and sample collection should be terminated. Identify the leak and recollect the sample using a new cylinder and flow controller.

- Take digital photograph of canister setup and surrounding area.
- Record the start time on COC and in the field notebook/sample form.

Procedure for termination of sample collection:

- Close the canister valve.
- Record the stop time on COC and in the field notebook/sample form. The date of the stop time will be considered the date of sampling for QC purposes.
- Record the final gauge pressure; vacuum gauge pressure should read between approximately -5 and 0 in Hg.
- Disconnect the sample tubing and pressure gauge/flow controller from canister, if applicable.
- Install plug on canister inlet fitting <*and on sample tubing for permanent probes*>.
- Place the sample container in the original box.
- For temporary sampling locations, remove the sample tubing and rods and backfill the hole with clean material.
- Fill in the sample collection log with the appropriate information; including, sample identification, date and time of sample collection, sampling depth, identity of samplers, sampling methods and devices, purge volumes, volume of soil vapor extracted, canisters used, the vacuum before and after samples collected, apparent moisture content (dry, moist, saturated, etc.) of the sampling zone, and log each sample on the COC form.
- All canisters will be returned at the completion of the field sampling to the laboratory by overnight shipment or courier. No work or shipment of samples will be expected on weekends or holidays, without prior notice.

4.2 Sub-slab Vapor Samples

4.2.1 Selection of Sampling Locations

To evaluate the potential for current human exposure within a building, collect sub-slab vapor samples:

- In structures with a concrete slab or other flooring from a central location away from foundation footings and within the soil or aggregate immediately below the basement slab or slab-on-grade. <*The number of sub-slab vapor samples required in a building depends upon the number of slabs (e.g., multiple slabs-on-grade in a large ware-*

house) and foundation types (e.g., combined basement and slab-on-grade in a residence). At least one sub-slab sample should be collected from each representative area. In structures within partial slabs or utility pads, collect the sub-slab vapor sample from beneath the pad>.

- In structures with dirt floors (basement or crawlspaces), sub-slab samples are not collected but indoor air samples in the basement or crawlspace will be collected.

4.2.2 Preparation

For the sub-slab vapor sampling, the following sampling preparation procedure is to be followed for concrete basement/floor slabs:

- Drill a ½-inch diameter hole (or appropriate size for the sample tubing to be used) completely through the concrete floor slab using an electric rotary hammer drill and masonry bit; brush the concrete dust away from the hole. Record the approximate thickness of the slab.

- Drill a 1-inch diameter hole (nominal diameter) 1 to 2 inches into the concrete floor centered on the ½-inch hole. *<The 1-inch diameter hole may be drilled first at the discretion of the field team leader>.*

- Sweep excess concrete dust away from the drill hole and clean the hole with a ½-inch bottle brush.

- Insert flexible tubing through the hole with the bottom no more than 2 inches below the bottom of the slab.

- Mix a paste of bentonite and water. Place the bentonite paste at the bottom of the 1-inch diameter drill hole around the tubing and form a small mound over the area to seal the interface between the tubing and the concrete.

- Concrete dust can be cleaned up with a vacuum equipped with a HEPA filter only after the sample tubing is properly sealed and sample collection has begun.

4.2.3 Purging and Pre-Sample Testing

To purge ambient air from the sample tubing and to ensure that representative samples are being collected from beneath the slab, the following steps should be followed:

- Attach the syringe to the sample tubing and withdraw approximately 3 volumes of the sample tubing (approximately 10-ml per foot for ¼-inch inner diameter tubing). *<Note the difficulty with which the air is withdrawn; if it is very difficult to withdraw the purge volume, then the sample tube may be plugged at the bottom and should be reinstalled and repurged. If indoor air sampling is to be conducted, then the purged vapor should be discharged outside to prevent cross-contamination (either cap the syringe or discharge to a Tedlar bag and empty the Tedlar bag outside). Prior to*

discharge, measure the organic vapor concentration of the purged air using a photoionization detector (PID) and record the reading. A PID may be used to purged the sample tubing; however, the exhaust must be captured for discharge outside if indoor air sampling is planned>.

- Begin sample collection.

4.2.4 Sample Collection

For preparation of the canister and collection of the sub-slab vapor sample, the procedure described in Section 4.1.4 is to be followed with the following exceptions:

- Flow controllers must be set for a **24-hour** collection period.

- Upon initiation of sample collection, the pressure should not appear to change in a short period. If the pressure increases too rapidly, there may be a leak in the system and sample collection should be terminated. Identify the leak and recollect the sample using a new cylinder and flow controller.

- When possible, return to the sample location after approximately 1 hour to verify that sample collection is progressing (the gauge pressure should increase by approximately 1 in Hg per hour).

4.3 Indoor Air Samples

4.3.1 Selection of Sampling Locations

To characterize contaminant concentration trends and potential exposures within a building, collect indoor air samples

- From the crawlspace area;

- From the basement (where vapor infiltration is suspected or in a central location) at a height approximately 3 feet above the floor to represent a height at which occupants normally are seated and/or sleep;

- From the lowest level living space (in centrally-located, high-use areas) at a height approximately 3 feet above the floor to represent a height at which occupants normally are seated and/or sleep; and

- If in a commercial setting (e.g., a strip mall), from multiple tenant spaces at a height approximately 3 feet above the floor to represent a height at which occupants normally are seated.

4.3.2 Preparation

- Conduct a pre-sampling inspection prior to each sampling event to identify conditions that may affect or interfere with the proposed testing including the type of structure, floor layout, physical conditions, and airflows of the building(s) being studied. <*Many State health departments provide reporting forms for this information. For example, in New York State use the NYS Department of Health Indoor Air Quality Questionnaire and Building Inventory form. This form is attached for reference and may be modified for use outside of New York.*>

- Conduct a product inventory to identify potential air sampling interference by characterizing the occurrence and use of chemicals and products throughout the building, keeping in mind the goal of the investigation and site-specific contaminants of concern. <*For example, it is not necessary to provide detailed information for each individual container of like items. However it is necessary to indicate that "20 bottles of perfume" or "12 cans of latex paint" were present with containers in good condition*>.

- Take inventory of each room on the floor of the building being tested and on lower floors, if possible. <*This is important because even products stored in another area of a building can affect the air of the room being tested. For example, when testing for a petroleum spill, all indoor sources of petroleum hydrocarbons should be scrutinized. These can include household and commercial products containing volatile organic compounds (VOCs), petroleum products including fuel from gasoline-operated equipment, unvented space heaters and heating oil tanks, storage and/or recent use of petroleum-based finishes and paints or products containing petroleum distillates. This information should be detailed on the Product Inventory Form*>.

- Draw plot sketches of the building interior (crawlspace, basement, and/or first floor) that includes sample locations, possible indoor air pollution sources, floor types, footings that create separate foundation sections, and vapor intrusion pathways into the building (cracks, utility penetrations, sumps, etc.).

- If the inventory identifies indoor sources of air contamination that may interfere with the objectives of the investigation, the following measures should be implemented:

- Remove products or eliminate activities that may result in the release of volatile chemicals from the indoor environment prior to testing.

- Make sure all containers storing volatile chemicals are tightly sealed.

- Ventilate building by operating the building's heating ventilation and air conditioning (HVAC) system to maximize outside air intake or open windows/doors and operate exhaust fans if the building has no HVAC system.

- Note any measures taken to control indoor air interferences on the building inspection form.

- Do not begin sample collection for at least 24 hours after implementing these measures.

FOR 24 HOURS PRIOR TO SAMPLING, ALL REASONABLE MEASURES SHOULD BE TAKEN TO AVOID:

- Opening any windows, fireplace dampers, openings, or vents;
- Operating ventilation fans unless special arrangements are made;
- Smoking in the house;
- Painting;
- Using wood stoves, fireplaces or other auxiliary heating equipment (e.g., kerosene heaters);
- Operating or storing automobiles in an attached garage;
- Allowing containers of gasoline or oil to remain within the house, except for fuel oil tanks;
- Cleaning, waxing, or polishing furniture or floors with petroleum- or oil-based products;
- Using air fresheners or odor eliminators;
- Engaging in any hobbies that use materials containing volatile organic chemicals;
- Using cosmetics, including hairspray, nail polish, nail polish removers, perfume/cologne, etc.;
- Applying pesticides; and
- Storing recently dry-cleaned clothing and materials.

4.3.3 Purging and Pre-Sample Testing

- Use portable vapor monitoring equipment readings (e.g., PIDs for VOCs, Mercury Vapor Analyzer for mercury) to evaluate potential sources of chemical products stored in the building. Due to the low detection limits typically achieved for air sampling, a PID capable of measuring VOCs in the parts-per-billion (ppb) range is recommended. However, the ionization potential of the chemicals of interest must be considered when selecting a PID.
- Take inventory of products stored in buildings **every time** air is tested. <*If available, chemical ingredients of interest should be recorded for each product. If the ingredi-*

ents are not listed on the label, record the product's exact and full name, and the manufacturer's name, address and phone number, if available. In some cases, Material Safety Data Sheets may be useful for identifying confounding sources.>

4.3.4 Sample Collection

For preparation of the canister and collection of the indoor air sample, the procedure described in Section 4.2.4 is to be followed with the following exceptions:

- The canister may be placed on a stable surface approximately 3 feet above the floor or it may be placed on the floor with flexible sample tubing extended from the canister to a collection height of approximately 3 feet.

4.4 Outdoor Air Samples

4.4.1 Selection of Sampling Locations

To characterize "background" contaminant concentrations in ambient air, collect outdoor air samples from a representative upwind location:

- Whenever indoor air sampling is being conducted;
- Away from wind obstructions (e.g., trees or bushes); and
- At a height above the ground to represent breathing zones (3 to 5 feet).

A representative sample is one that is not biased toward obvious sources of volatile chemicals (e.g., automobiles, lawn mowers, oil storage tanks, gasoline stations, industrial facilities, etc.). Outdoor ambient air samples should be collected at the rate of one per day in the vicinity of indoor air sample locations.

4.4.2 Preparation

The following actions should be taken to document conditions during outdoor air sampling and ultimately to aid in the interpretation of the sampling results:

- Draw a plot sketch of the sampling area that includes sample locations, buildings and other nearby structures, possible sources of outdoor air pollution (industries, gas stations, repair shops, etc.), and wind direction.
- Record weather (e.g., precipitation, temperature, and barometric pressure); and
- Record any pertinent observations, such as odors, readings from field instrumentation, and significant activities in the vicinity (e.g., operation of heavy equipment or dry cleaners).

4.4.3 Purging and Pre-Sample Testing

None.

4.4.4 Sample Collection

For preparation of the canister and collection of the outdoor air sample, the procedure described in Section 4.3.4 is to be followed.

5. Quality Assurance

5.1 Quality Assurance/Quality Control Samples

Field quality control (QC) samples may include duplicates and trip blanks, as determined on a site-specific basis. Duplicate samples provide insight as to the homogeneity of the sample matrix and establish a degree of confidence that the sample represents site conditions. The relative percent difference between the concentrations in the original and duplicate samples measure the overall precision of the field sampling and analytical method. Field duplicates must be collected at a rate that satisfies the data quality objectives of the program and can be project specific. In the absence of project-specific requirements, collect duplicates at the rate of one duplicate per 20 original samples (5%).

Trip blanks are collected to establish that the transport of sample canisters to and from the field does not result in the contamination of the sample from external sources. Trip blanks consist of an unopened, precleaned, certified canister shipped from the laboratory with the sample collection canisters, stored on site with the sample collection canisters, and returned to the laboratory unopened. Typically, trip blanks are submitted for analysis with each sample shipment. However, the applicability of trip blanks must be determined on a site-specific basis since they are not required by the analytical method (typically TO-15). It is not possible to mimic round-trip shipping conditions with a single trip blank since sample canisters are shipped from the lab under vacuum pressure and are returned to the lab at or close to ambient pressure.

Field QC sample results must be assessed during data review.

5.2 Sample Analysis

All air and vapor samples will be analyzed using USEPA Method TO-15 or another approved method suitable to meet the data quality objectives of the project. Analyses must be performed by a laboratory certified for the particular analysis in the State or Federal program in which the project is being conducted. In New York State, laboratories must be certified by the NYSDOH ELAP. The analyte list must be selected to comply with the data quality objectives of the project. For example, chlorinated solvents may be selected for drycleaner sites and aromatic/petroleum hydrocarbons may be selected for fuel spill sites. Reporting limits should be approximately 1 microgram per cubic meter ($\mu g/m^3$) for all compounds, unless otherwise specified to meet data quality objectives. For example, in New York State, a reporting limit of 0.25 $\mu g/m^3$ must be met for trichloroethene in indoor and outdoor air samples.

6. Health and Safety

The type of personnel protective equipment (PPE) to be used during sampling is outlined in the site-specific Health and Safety Plan (HASP) and is contaminant specific. The HASP should be reviewed with specific emphasis placed on the safety procedures to be followed. Standard safe operating practices should be followed, such as minimizing contact with potential contaminants in both the vapor phase and liquid matrix through the use of respirators and protective clothing during soil vapor sampling. Typically, exposure to contaminants is minimal during sub-slab vapor, indoor air, and outdoor air sampling and PPE is not required; however, this must be determined on a site- and location-specific basis.

7. References

New York State Department of Health, February 2005, *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, Public Comment Draft.

United States Environmental Protection Agency, November 2002, *OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)*, EPA530-D-02-004.

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name ________________________________ Date/Time Prepared _________________

Preparer's Affiliation ____________________________ Phone No.________________________

Purpose of Investigation____

Property Address:____

Location/Sample ID:____

1. OCCUPANT: Interviewed: Y / N

Last Name: ________________________ First Name: ________________________

Address: ____

County: ________________

Home Phone: ___________________ Office Phone: ___________________

Number of Occupants/persons at this location _______ Age of Occupants _____________________

2. OWNER OR LANDLORD: (Check if same as occupant ___) **Interviewed: Y / N**

Last Name: ________________________First Name: __________________________

Address: ____

County: ________________

Home Phone: ___________________ Office Phone: ___________________

3. BUILDING CHARACTERISTICS -Type of Building: (Circle appropriate response)

Residential	School	Commercial / Multi-use
Industrial	Church	Municipal / Government

Other (Describe): _______________________

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_______________

If multiple units, how many? ________

If the property is commercial, type?

Business Type(s) ____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? ______

Other Building Characteristics:

Number of floors______ Approx. building age______

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

4. AIRFLOW

Qualitatively describe:

Airflow between floors

____
____
____

Airflow near source

____
____
____

Outdoor air infiltration

____
____
____

Infiltration into air ducts

____
____
____

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick	other ________
b. Basement type:	full	crawlspace	slab	other ________	
c. Basement floor:	concrete	dirt	stone	other ________	
d. Basement floor:	uncovered	covered	covered with _______________		
e. Concrete floor:	unsealed	sealed	sealed with ________________		
f. Foundation walls:	poured	block	stone	other ________	
g. Foundation walls:	unsealed	sealed	sealed with ________________		
h. The basement is:	wet	damp	dry	moldy	
i. The basement is:	finished	unfinished	partially finished		
j. Sump present?	Y / N				
k. Water in sump?	Y / N / NA				
l. Sump covered/sealed?	Y / N / NA				
m. Floor drains present?	Y / N / NA				
n. Perimeter trench drains present?	Y / N / NA				
o. Indoor cisterns/drywell?	Y / N / NA				
p. Laundry chute to 1st or 2nd Floors?	Y / N / NA				

Basement/Lowest level depth below grade: ________(feet)

Identify and describe potential soil vapor entry points and approximate size (e.g., floor cracks, utility ports, floor drains, wall cracks, weeps, or indoor wells)

____

____

____

Other Comments: ____

____

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply) **Type of heating system(s) used in this building: (circle all that apply – note primary)**

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other ___________

Approximate age of heating system(s): _____________________

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: ____________________________

Fuel oil storage location/condition/size, if applicable:____

Boiler/furnace located in: Basement Outdoors Main Floor Other ____________________

Storage wood or coal: Basement Outdoors Main Floor Other __________________

Fireplace(s) located in: Basement Main Floor Other ______________

Air conditioning: Central Air Window units Open Windows None

Dehumidification: Stand alone unit Located on central air system

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

____

____

____

____

7. OCCUPANCY Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	General Use of Each Floor (e.g., family room, bedroom, laundry, workshop, storage)
Basement	______________________________________
1st Floor	______________________________________
2nd Floor	______________________________________
3rd Floor	______________________________________
4th Floor	______________________________________

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. **Is there an attached garage?** Y / N

b. **Does the garage have a separate heating unit?** Y / N / NA

c. **Are petroleum-powered machines or vehicles stored in the garage** (e.g., lawnmower, atv, car, boat) Y / N / NA
Please specify______________________

d. **Has the building ever had a fire?** Y / N When?____________________

e. **Is a kerosene or unvented gas space heater present?** Y / N Where? __________________

f. Is there a workshop or hobby/craft area? Y / N Where & Type? ______________________

g. Is there smoking in the building? Y / N How frequently? ______________________

h. Have cleaning products been used recently? Y / N When & Type? ______________________

i. Have cosmetic products been used recently? Y / N When & Type? ______________________

j. Has painting/staining been done in the last 6 months? Y / N Where & When? ______________________

k. Is there new carpet, drapes or other textiles? Y / N Where & When? ______________________

l. Have air fresheners been used recently? Y / N When & Type? ______________________

m. Is there a kitchen exhaust fan? Y / N If yes, where vented? ______________________

n. Is there a bathroom exhaust fan? ☐ Basement ☐ First floor Y / N If yes, where vented? ______________________

o. Is there a clothes dryer? ☐ Gas ☐ Electric Y / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / N When & Type? ______________________

q. Basement windows? Type: Casement Awning Glass block Condition: ______________________

r. Are there exterior doors in the basement (e.g. "Bilco") Y / N / NA

Are there odors in the building? Y / N

If yes, please describe: ____

Do any of the building occupants use solvents at work? Y / N (e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? ____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No

Yes, use dry-cleaning infrequently (monthly or less) Unknown

Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: ________________

Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply: Public Water Drilled Well Driven Well Dug Well Other: _______

Sewage Disposal: Public Sewer Septic Tank Leach Field Dry Well Other: _______

11. OTHER ENVIRONMENTAL HAZARDS OBSERVED
Note factors that may impact vapor mitigation system installation or other construction activities:

A. Asbestos: **Yes** **No** **Suspected**

1. Location & Estimated Quantity: ____

____

2. General Condition: Good Fair Poor

3. Other Comments: ____

____

B: Lead Paint: **Yes** **No** **Suspected**

1. Location & Estimated Quantity: ____

____

2. General Condition: Good Fair Poor

3. Other Comments: ____

____

12. Photographs

Photograph the basement and first floor of the building including possible air sampling locations and/or possible indoor air pollution sources. Include photo ID, compass direction, date, and subject.

Photo ID:	**Direction:**	**Date/Time:**
Subject:		

Photo ID:	**Direction:**	**Date/Time:**
Subject:		

Photo ID:	**Direction:**	**Date/Time:**
Subject:		

13. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note. Include compass orientation or reference to street or front of house.

Basement:

First Floor:

14. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.

15. PRODUCT INVENTORY FORM **Page ___ of ___**

Make & Model of field instrument used: ___________________________________

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition *	Chemical Ingredients	Field Instrument Reading (units)	Photo Y / N **

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**

** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

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Soil Vapor Intrusion/Indoor Air Sampling Data Collection Form

Site Name:	Project No.:

Sample Location Information

Location ID/Description:

Address:	City:	State:

Sampler Names (Print):

Building Inspection & Inventory Performed? ☐ Yes ☐ No

Organic Vapor Meter Used: ☐ PID ☐ FID Model:

		Sub-slab Vapor	Basement Air	First-floor Air	Outdoor Air			
Sample ID								
Canister No.								
Regulator No.								
Duration (hours)								
Start	Date							
	Time							
	Pressure							
End	Date							
	Time							
	Pressure							
Quality Control								
OVM (ppb)								
Analysis Method								

Laboratory:	Date Shipped to Lab:

Associated Trip Blank Sample ID:

Comments:

Key:
FID = flame-ionization detector
OVM = organic vapor meter
PID = photo-ionization detector
ppb = parts per billion
Pressure measured in inches of mercury, gauge (in Hg)

Implants Operation

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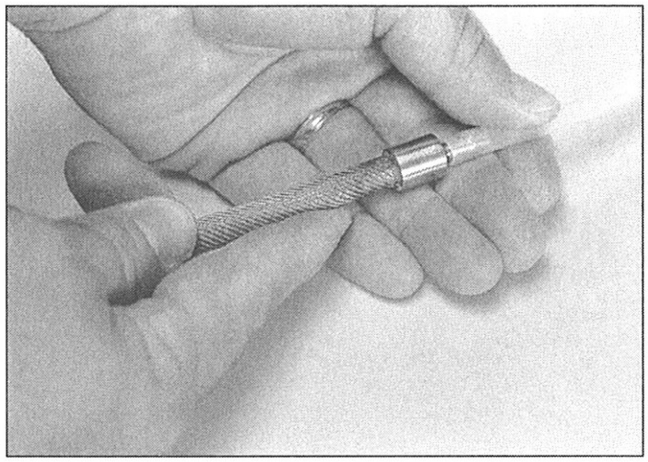


Attaching polyethylene tubing to the sampling implant.

Sampling Implants – Operation

Installation Instructions for Soil Gas Implants

1. Drive probe rods to the desired depth using a Point Holder (AT-13B) and an Implant Anchor/Drive Point (PR-14). DO NOT disengage the drive point when depth has been reached.

2. Attach appropriate tubing to the implant **(Figure 1)**. If tubing is pre-cut, allow it to be approximately 48 in. (1219 mm) longer than the required depth of the implant. Cover or plug the open end of the tubing.

3. Remove pull cap and lower the implant and tubing down inside the diameter of the probe rods until the implant hits the top of the Anchor/Drive Point. Note the length of the tubing to assure that proper depth has been reached.

4. Rotate tubing counterclockwise while exerting a gentle downward force to engage the PRT threads **(Figure 2)**. Pull up on the tubing lightly to test the connection. DO NOT cut excess tubing.

5. Position a Probe Rod Pull Plate or Manual Probe Rod Jack on the top probe rod. Exert downward pressure on the tubing while pulling the probe rods up. Pull up about 12 in. (305 mm).

6. If using 1/4-in. (6,4 mm) O.D. tubing or smaller, thread the excess tubing through the Implant Funnel and position it over the top probe rod. If using larger tubing, it may not be possible to install the glass beads.

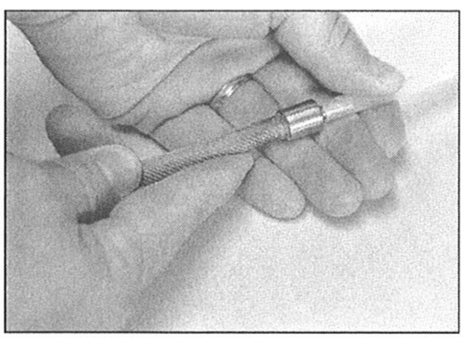


Figure 1. Attaching tubing to the sampling implant.

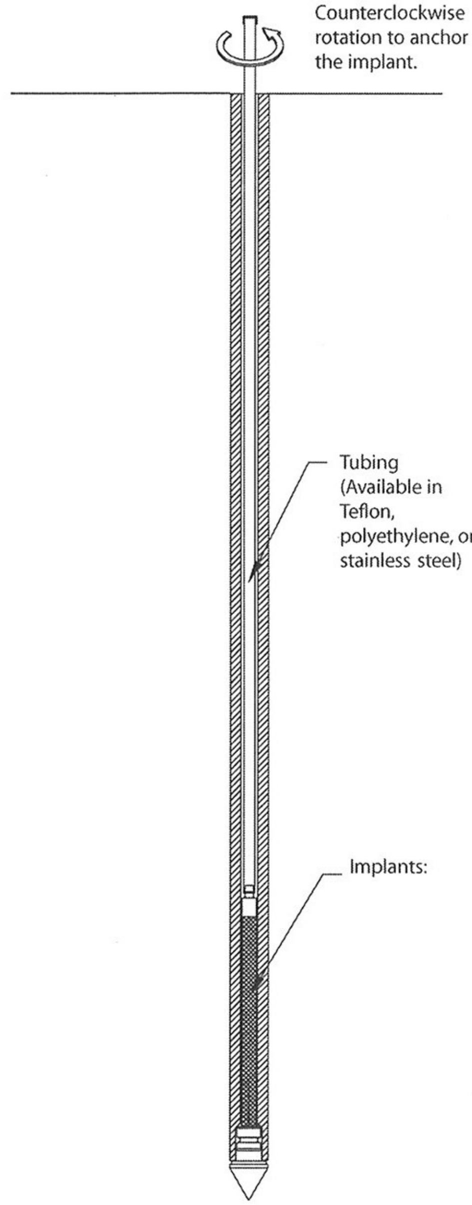


Figure 2. Once depth is achieved, the selected implant and tubing are inserted through the rods. The tubing is rotated to lock the implant into the drive point.

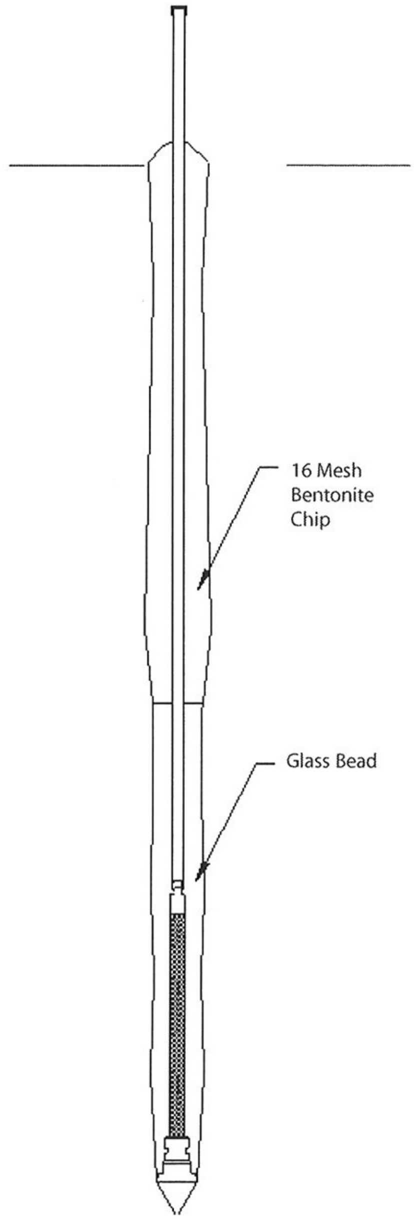


Figure 4. After the implant has been secured, the rods are removed and the annulus backfilled as appropriate.

7. Pour glass beads down the inside diameter of the probe rods around the outside of the tubing. Use the tubing to "stir" the glass beads into place around the implant. Do not lift up on tubing. It should take less than 150 mL of glass beads to fill the space around the implant.

   NOTE: Backfilling through the rods with glass beads or glass beads/bentonite mixes can only be performed in the Vadose Zone, not below the water table.

8. Lift up an additional 18 to 24 in. (457 to 610 mm) and pour the bentonite seal mixture into place as in Step 7. The volume to be filled is about 154 mL per foot. It may be necessary to "chase" the seal mixture with distilled water to initiate the seal.

9. Pull the remaining rods out of the hole as in Step 5. Backfilling with sackcrete (cement/sand) or bentonite/sand may be done while removing the rods **(Figure 4)**. If the PR-14 Implant Anchor is used, the tubing may be cut flush with the top probe rod and a regular pull cap may be used to remove the remaining probe rods after Step 8.

10. After the probe rods have been removed, cut the tubing at the surface, attach a connector or plug, and mark the location with a pin flag or stake. The point is ready for sampling now.

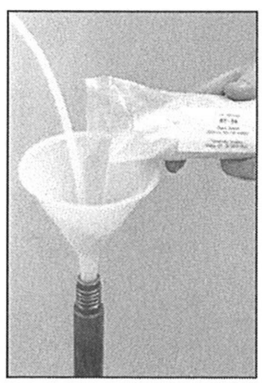
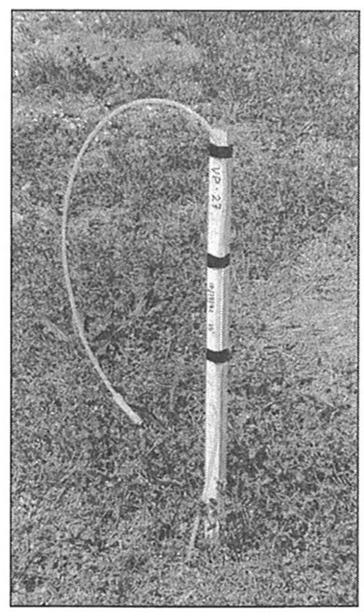
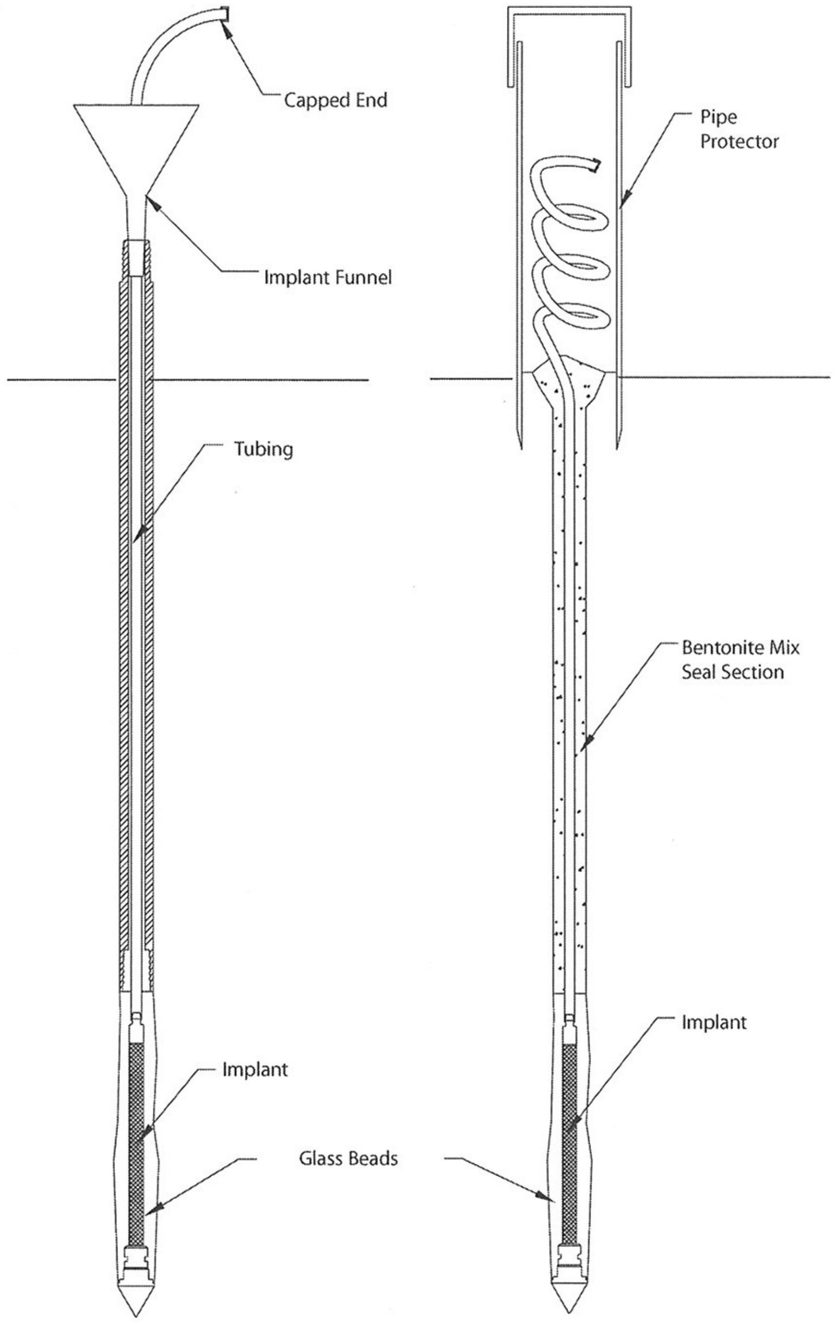


Figure 3. Glass Beads create a permeable layer around vapor sample implants.



A vapor implant location.

Sampling Implants – Operation



Backfill materials include glass beads and bentonite sealants.

Example of completed permanent soil gas monitoring point.

Soil Gas Sampling – PRT System Operation

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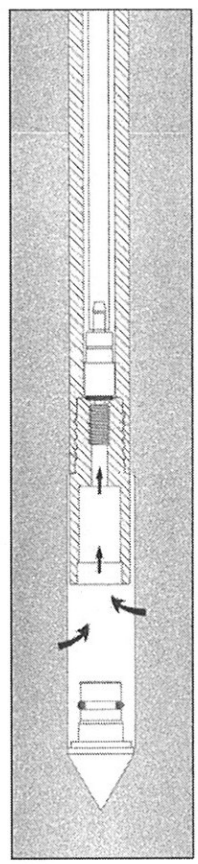


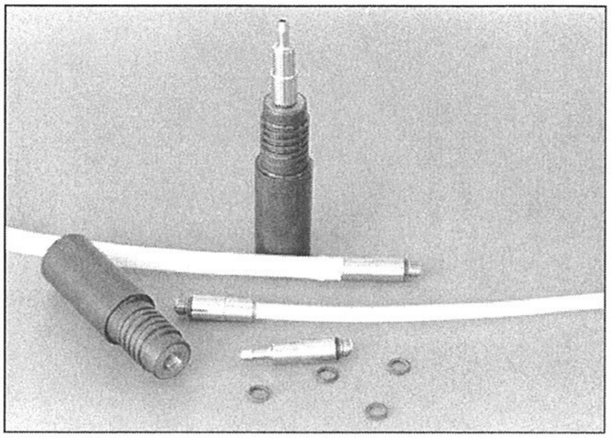
Soil Gas Sampling using the Post-Run Tubing (PRT) System.

Soil Gas Sampling — PRT System Operation

Basics

Using the Post-Run Tubing System, one can drive probe rods to the desired sampling depth, then insert and seal an internal tubing for soil gas sampling. The usual Geoprobe probe rods and driving accessories and the following tools are required:

- PRT Expendable Point Holder
- PRT Adapter
- Selected PRT Tubing



PRT SYSTEM PARTS
PRT Expendable Point Holder, PRT Adapters, Tubing, and O-rings.

Preparation

1. Clean all parts prior to use. Install O-rings on the PRT Expendable Point Holder and the PRT adapter.

2. Inspect the probe rods and clear them of all obstructions.

3. TEST FIT the adapter with the PRT fitting on the expendable point holder to assure that the threads are compatible and fit together smoothly.

   NOTE: PRT fittings are left-hand threaded.

4. Push the adapter into the end of the selected tubing. Tape may be used on the outside of the adapter and tubing to prevent the tubing from spinning freely around the adapter during connection – especially when using Teflon tubing **(Figure 1)**.

   REMEMBER: The sample will not contact the outside of the tubing or adapter.

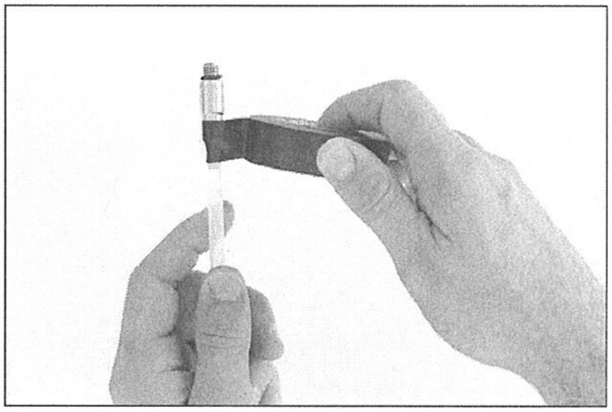


Figure 1. Securing adapter to tubing with tape. NOTE: Tape does not contact soil gas sample.

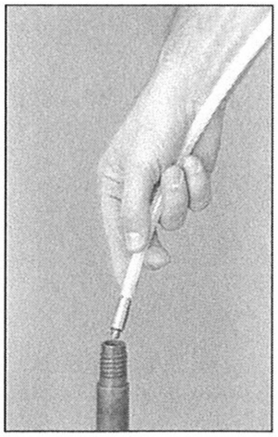


Figure 2. Insertion of tubing and PRT adapter.

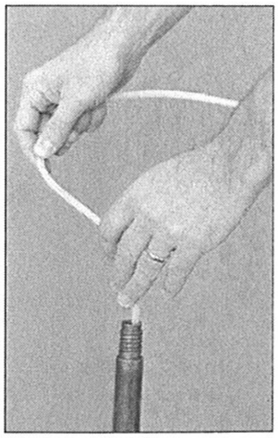
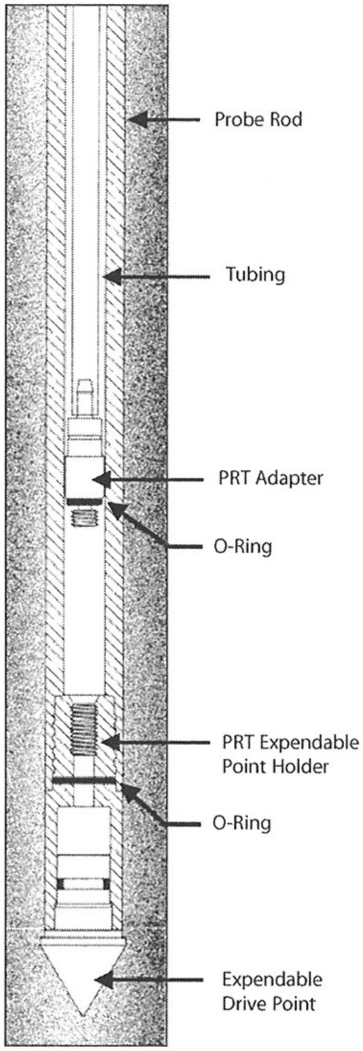


Figure 3. Engaging threads by rotating tubing.



A cross section of probe rods driven to depth and then retracted to allow for soil gas sampling. The PRT adapter and tubing are now fed through the rods and rotated to form a vacuum-tight connection at the point holder. The result is a continuous run of tubing from the sample level to the surface.

Probing

Drive the PRT tip configuration into the ground. Connect probe rods as necessary to reach the desired depth. After depth has been reached, disengage the expendable point by pulling up on the probe rods. Remove the pull cap from the top probe rod, and position the Geoprobe unit to allow room to work.

Connection

1. Insert the adapter end of the tubing down the inside diameter of the probe rods **(Figure 2)**.

2. Feed the tubing down the rod bore until it hits bottom on the expendable point holder. Allow about 2 ft. (610 mm) of tubing to extend out of the hole before cutting it.

3. Grasp the excess tubing and apply some downward pressure while turning it in a counterclockwise motion to engage the adapter threads with the expendable point holder **(Figure 3)**.

4. Pull up lightly on the tubing to test engagement of the threads. (Failure of adapter to thread could mean that intrusion of soil may have occurred during driving of probe rods or disengagement of drive point.)

Sampling

1. Connect the outer end of the tubing to the Silicone Tubing Adapter and vacuum hose (or other sampling apparatus).

2. Follow the appropriate sampling procedure for collecting a soil gas sample **(Figure 1)**.

Removal

1. After collecting a sample, disconnect the tubing from the vacuum hose or sampling system.

2. Pull up firmly on the tubing until it releases from the adapter at the bottom of the hole. (Taped tubing requires a stronger pull.)

3. Remove the tubing from the probe rods. Dispose of polyethylene tubing or decontaminate Teflon tubing as protocol dictates.

4. Retrieve the probe rods from the ground and recover the expendable point holder with the attached PRT adapter.

5. Inspect the O-ring at the base of the PRT adapter to verify that proper sealing was achieved during sampling. The O-ring should be compressed. This seal can be tested by capping the open end of the point holder applying vacuum to the PRT adapter.

6. Prepare for the next sample.

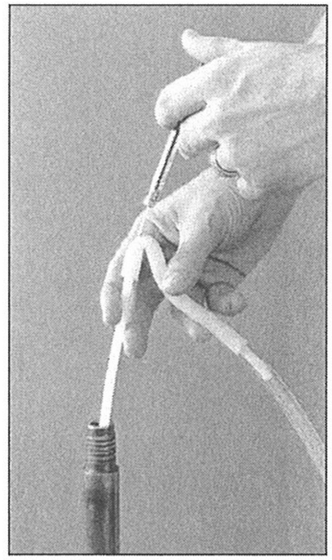


Figure 1. Taking a soil gas sample for direct injection into a GC with the PRT system.

Soil Gas Sampling – PRT System Operation

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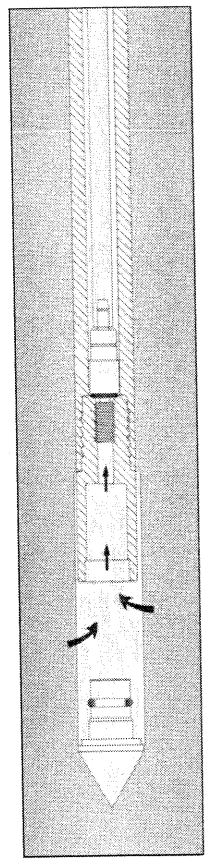

Soil Gas Sampling using the Post-Run Tubing (PRT) System.

Soil Gas Sampling — PRT System Operation

Basics
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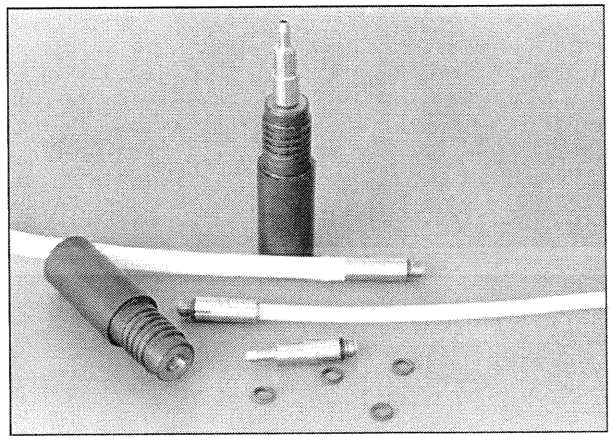
- PRT Expendable Point Holder
- PRT Adapter
- Selected PRT Tubing

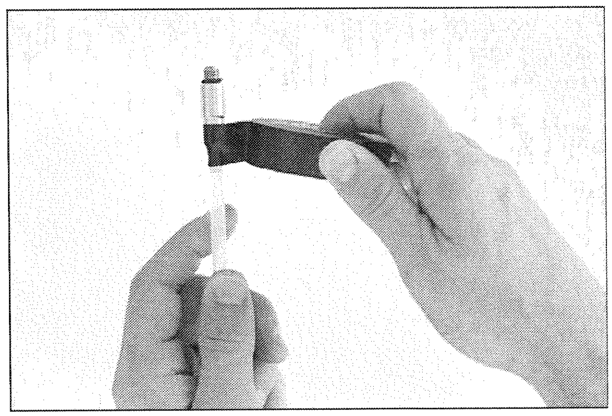
Preparation
1. Clean all parts prior to use. Install O-rings on the PRT Expendable Point Holder and the PRT adapter.
2. Inspect the probe rods and clear them of all obstructions.
3. TEST FIT the adapter with the PRT fitting on the expendable point holder to assure that the threads are compatible and fit together smoothly.

   NOTE: PRT fittings are left-hand threaded.
4. Push the adapter into the end of the selected tubing. Tape may be used on the outside of the adapter and tubing to prevent the tubing from spinning freely around the adapter during connection – especially when using Teflon tubing **(Figure 1)**.

   REMEMBER: The sample will not contact the outside of the tubing or adapter.



PRT SYSTEM PARTS
PRT Expendable Point Holder, PRT Adapters, Tubing, and O-rings.



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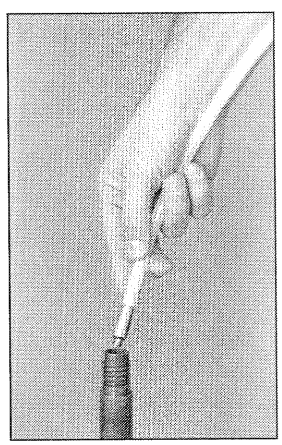


Figure 2. Insertion of tubing and PRT adapter.

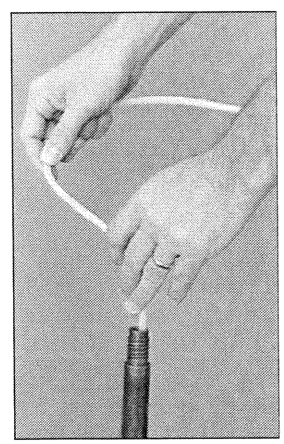
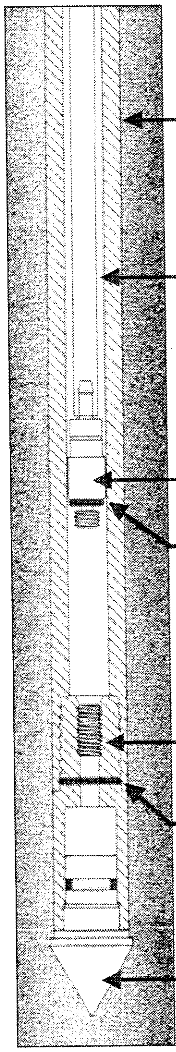


Figure 3. Engaging threads by rotating tubing.



A cross section of probe rods driven to depth and then retracted to allow for soil gas sampling. The PRT adapter and tubing are now fed through the rods and rotated to form a vacuum-tight connection at the point holder. The result is a continuous run of tubing from the sample level to the surface.

Probing

Drive the PRT tip configuration into the ground. Connect probe rods as necessary to reach the desired depth. After depth has been reached, disengage the expendable point by pulling up on the probe rods. Remove the pull cap from the top probe rod, and position the Geoprobe unit to allow room to work.

Connection

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2. Feed the tubing down the rod bore until it hits bottom on the expendable point holder. Allow about 2 ft. (610 mm) of tubing to extend out of the hole before cutting it.

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4. Pull up lightly on the tubing to test engagement of the threads. (Failure of adapter to thread could mean that intrusion of soil may have occurred during driving of probe rods or disengagement of drive point.)

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2. Follow the appropriate sampling procedure for collecting a soil gas sample (**Figure 1**).

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6. Prepare for the next sample.

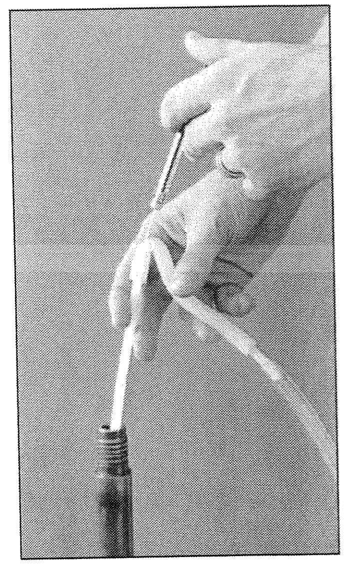

Figure 1. Taking a soil gas sample for direct injection into a GC with the PRT system.

B Subcontractor Quotations

Exhibit 2
Subcontractor Price Schedule
Former Al Tech Specialty Steel
Dunkirk, New York

EEEPC Reference Number 002699.ID23

Subcontractor Name: Aztech Technologies

Task 1. Mobilization & Health and Safety Plan

Item	Standby Unit Price	Non-Standby Unit Price	Units	Est. # Units	Extended Cost
Site-Specific Health and Safety Plan for all subcontractor activities	NA	150	Lot	1	$ 150.00
Mobilize DPT Rig, equipment, and crew to site (including all setup procedures)	NA	1385	Lot	2	$ 2,770.00
Other: Per Diem	NA	170	Days	3	$ 510.00
Task 1 Subtotal:					**$ 3,430.00**

Task 2. DPT Soil Vapor and Groundwater Sampling

Item	Standby Unit Price	Non-Standby Unit Price	Units	Est. # Units	Extended Cost
GEOPROBE - Install soil gas collection points at five (5) locations to a depths of 8 feet and 16 to 20 feet at each location (total of 10 points). Install groundwater collection point at five (5) locations to depths of approx. 20 feet. Provide tubing and collection tools per Exhibit 1 (sample containers to be provided by EEEPC).	900	NA	Days	2	$ 1,800.00
GEOPROBE - Install two (2) additional soil gas collection points to depths of 8 feet and 16-20 feet at each location (total of 4 probes). Provide tubing and collection tools (sample canisters to be provided by EEEPC).	900	NA	Days	1	$ 900.00
Vapor Sampling Points (Expendible point, 6" Stainless Steel Screen, Filter sand, Teflon Tubing, and Bentonite Seal)	NA	65	Each	14	$ 910.00
Task 2 Subtotal:					**$ 3,610.00**

Other Unit Costs

Item	Standby Unit Price	Non-Standby Unit Price	Units	Est. # Units	Extended Cost
Geoprobe standby time	60	NA	hour	2	$ 120.00
Rate for upgrading to Level C respiratory protection	50	NA	hour	1	$ 50.00
55 gallon DOT steel drum for decontamination water	48	NA	each	1	$ 48.00
Other:					$ -
Other:					$ -
Other Cost Subtotal:					$ 218.00

TOTAL NOT-TO-EXCEED PRICE: **$ 7,258.00**

Number of days to complete Task 2: **3.0** *formula*

Exhibit 2A - Total Cost for

Project Name: **Altech Speciality Steel 002699.ID.23.01**

Laboratory Name: **Contest**

Method and Matrix	Item	Parameter	Method	Number of Samples(2)	Base Unit Rate	Adjustment Factor	Total Task Order Cost
Air Analysis							
Air Analyses	**123**	Volatile Organics in Ambient Air	TO-15	2	$ 225.00	1.15	$ 517.50
Air Analyses	**124**	VOCs in Indoor Air by - Low Level	TO-15	2	$ 225.00	1.15	$ 517.50
Air Analyses	**125**	VOCs in Soil Gas	TO-15	30	$ 225.00	1.15	$ 7,762.50
Total Air Samples							$ 8,797.50
Adjustment Factor	**167**	14 Day Turnaround	Premium Factor X Base Rate		1.15		

Exhibit 2a - Cost for NYSDEC Standby AL Tech Specialty Steel Site

Laboratory Name: KEMRON

Method and Matrix	Item	Parameter	Method	Number of Samples(2)	Base Unit Rate	Adjustment Factor	Total Task Order Cost
Environmental Analysis							
SW-846 Methods - Aqueous	**46**	TCL Volatile Organics - Trace level	8260C(a)	12	$ 91.25	1	$ 1,095.00
Total Environmental Samples							$ 1,095.00
Adjustment Factor	**167**	14 Day Turnaround	Premium Factor X Base Rate		1.00		

Ashtead Technology Inc
1057 East Henrietta Rd
Rochester New York 14623
Tel 585-424-2140
Fax 585-424-2166
http://www.ashtead-technology.com

FACSIMILIE

To:	George Lukert	Fax:	
From:	Michael Arlauckas	Phone:	716-684-8060
Date:		Pages:	

Subject Your rental request

Dear George,

Please find attached the quotation as discussed earlier.

Please take an additional 15% odd the list price for your National Account Discount.

Please do not hesitate to call if you have any further questions or equipment requirements.

Best regards,

Michael Arlauckas

Quote No: 304735
16 November 2007

QUOTATION

Dear George,

Thank you for your recent enquiry concerning Ashtead Technology Rentals products. We are pleased to provide you with the following quotation based on your requirements and expected project duration of Days.

Qty	Description	Rental Price in $ per unit Daily	Weekly	4 Weekly
1	**RAE Systems MiniRAE 2000 plus IS** The RAE System MiniRAE 2000 PID rents with a 10.6eV lamp, download cable, PRO-RAE software, zero filter, probe tip, hydrophobic filter, charger, alkaline battery adapter, certificate of calibration, operating manual, case	60.00	240.00	600.00
1	**Geotech Series II Peristaltic Pump** Each rental unit includes the pump, one head, the pump head tubing, 8 foot AC power cord, 15 foot DC power cord with cigarette lighter adapter to battery clip adapter, manual and carrying case.	25.00	100.00	250.00
1	**Myron 6P Water Quality Meter with Six Parameters** The Myron 6P Ultrameter rents with three pH buffers, conductivity standard, quick reference card, carrying case and operating manual.	25.00	100.00	250.00
1	**Lamotte Model 2020 Portable Turbidity Meter** The Lamotte 2020 Turbidity Meter rents with an AC adapter 1.0 and 10.0 NTU standards, four optically-selected sample vials, operating manual and carrying case.	25.00	100.00	250.00
1	**Heron 100' Oil/Water I.F.** ECCN EAR-99 US ONLY	40.00	160.00	400.00
1	**Radiodetection MGD 2002 Multi-Gas Leak Locator Helium Detection** The Radiodetection MGD 2002 Multi-Gas Leak Locator can be used as a spot-checker or a continuous monitor for helium. Applications for this unit include locating leaks in a contained environment in which helium is used as a tracer gas, such as underground storage tanks, process piping and sewer or water lines. The MGD 2002 is designed for one-handed operation of all functions. It also is supplied with a built-in headphone jack for use with audio indicator. The MGD 2002 is equipped with a rechargeable NiMH battery pack that provides over 8 hours of use per charge, Each rental unit includes the MGD 2002 meter, probe, shoulder strap, battery charger, 12V auto adapter, moisture filter, headphones, carrying case and manual.	98.00	392.00	980.00

Qty	Description	Sale Price in $
1	**Masterflex Silicone Tubing #24 cost per foot** $3.00 per foot	3.00

This quotation should be read in conjunction with our standard terms and conditions, a copy of which is available on request. Please note the following statements:

Equipment Damage & Loss - Customers are responsible for lost or stolen equipment as well as any damage that is not attributed to normal wear and tear. Ashtead can offer limited Damage Loss Waiver coverage for the duration of the rental. It is optional and must be requested and agreed to prior to the commencement of the rental.

Tax and Shipping - Not included in the above rental rates

Customer Accounts - Must be set up prior to any equipment being shipped.

Quotation Validity - Valid for a period of 30 days.

T: 585-424-2140
F: 585-424-2166
E: rentals@ashtead-technology.com
W: www.ashtead-technology.com

Ashtead Technology Rentals
The Rental Specialists
800-242-3910

Invoices - Invoices produced at the end of the rental or 16th calendar rental day, which ever is soonest.

Export Control - The items being provided to you are subject to export controls by the U.S. government and an export license from the U.S. government may be required for export of these items from the United States, for reexport of the items from a third country, and/or for deemed exports or deemed reexports of related technology, depending upon the export classification of the item, the destination, the intended use of the item, and other factors. Additionally, it is our understanding that the U.S. government views shipments of these and other items to foreign-flagged vessels, including those operating in U.S. waters, as exports to the countries where the vessels are flagged, and other restrictions may also apply if there is foreign ownership of the vessel and/or depending upon the nationality(ies) of the Master and crew members. It is our understanding that these issues are currently under review by the U.S. government. Determining whether an export license is required, verifying ECCN classifications and obtaining such license(s) is your responsibility. Refer to www.bis.doc.gov if you require additional information.

Yours sincerely,

Michael Arlauckas

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Subject Your rental request

Dear George,

Please find attached the quotation as discussed earlier.

Please take an additional 15% off the list price for you National Account Discount.

Please do not hesitate to call if you have any further questions or equipment requirements.

Best regards,

Michael Arlauckas

Quote No: 304736
16 November 2007

QUOTATION

Dear George,

Thank you for your recent enquiry concerning Ashtead Technology Rentals products. We are pleased to provide you with the following quotation based on your requirements and expected project duration of Days.

		Rental Price in $ per unit		
Qty	Description	Daily	Weekly	4 Weekly
1	**PPB RAE RAE Parts-Per-Billion PID Surveyor Model PGM 7240**	125.00	500.00	1,250.00

This quotation should be read in conjunction with our standard terms and conditions, a copy of which is available on request. Please note the following statements:

Equipment Damage & Loss -	Customers are responsible for lost or stolen equipment as well as any damage that is not attributed to normal wear and tear. Ashtead can offer limited Damage Loss Waiver coverage for the duration of the rental. It is optional and must be requested and agreed to prior to the commencement of the rental.
Tax and Shipping -	Not included in the above rental rates
Customer Accounts -	Must be set up prior to any equipment being shipped.
Quotation Validity -	Valid for a period of 30 days.
Invoices -	Invoices produced at the end of the rental or 16th calendar rental day, which ever is soonest.
Export Control -	The items being provided to you are subject to export controls by the U.S. government and an export license from the U.S. government may be required for export of these items from the United States, for reexport of the items from a third country, and/or for deemed exports or deemed reexports of related technology, depending upon the export classification of the item, the destination, the intended use of the item, and other factors. Additionally, it is our understanding that the U.S. government views shipments of these and other items to foreign-flagged vessels, including those operating in U.S. waters, as exports to the countries where the vessels are flagged, and other restrictions may also apply if there is foreign ownership of the vessel and/or depending upon the nationality(ies) of the Master and crew members. It is our understanding that these issues are currently under review by the U.S. government. Determining whether an export license is required, verifying ECCN classifications and obtaining such license(s) is your responsibility. Refer to www.bis.doc.gov if you require additional information.

Yours sincerely,

Michael Arlauckas

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