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SOIL VAPOR EXTRACTION WORK PLAN

Vibratech, Inc.
Buffalo, New York

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CONESTOGA-ROVERS & ASSOCIATES

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1.0 INTRODUCTION

1.1 BACKGROUND AND PROJECT OVERVIEW

Vibratech, Inc. (Vibratech) owns and operates a facility (Site) at 537 East Delavan Avenue in Buffalo, New York which manufactures vibration dampers and rotary shock absorbers for the trucking and railroad industries.

In anticipation of the sale of the property, Conestoga-Rovers & Associates (CRA) was retained by Vibratech to conduct environmental investigations of the Site to assess the existing environmental conditions resulting from current and former operations at the facility. In August 1992, CRA performed a Phase I Environmental Assessment at the Site. The results of this assessment are presented in the report entitled, "Phase I Environmental Assessment Report, Vibratech, Inc., Buffalo, New York", dated September 10, 1992. Based on the Phase I assessment results, it was recommended that soil sampling be performed to better assess the environmental condition of the Site soils. CRA was retained to conduct the soil sampling program, the results of which are presented in the report entitled, "Phase II Environmental Investigation Report, Vibratech, Inc., Buffalo, New York", dated February 9, 1994. CRA subsequently recommended a supplemental investigation that included additional soil sampling on the south side of the property along the railroad spur to better delineate the extent of contamination. The results of this supplemental investigation are presented in the report entitled, "Supplemental Investigation, Vibratech, Inc., Buffalo, New York", dated June 1994.

Based on the results of these investigations, CRA delineated an area of approximately 6,250 square feet on the south side of the property along the railroad spur where elevated concentrations of volatile organic compounds (VOCs) were measured in soil samples (refer to Table 3.1 of the Supplemental Investigation Report). The VOCs of concern are: 1,1-dichloroethane; 1,2-dichloroethane; cis-1,2-dichloroethene; trans-1,2-dichloroethene; toluene; 1,1,1-trichloroethane; trichloroethene;

vinyl chloride; and total xylenes. The area of soil contamination (Area of Concern) is shown on Figure 1.1.

Based on a review of Plant records, materials which had been stored in metal racks on a concrete pad in the vicinity of the Area of Concern include: Tescol®, mineral spirits, 1551 Solvent®, TRC Oil®, Pratt and Lambert #77 thinner and #1405 lacquer thinner, and kerosene. It is believed that the soil contamination resulted from incidental spillage of degreasing solvents containing VOCs.

Vibratech retained CRA to prepare a Work Plan for remediation of the soil VOC contamination. Prior to preparation of the Work Plan, CRA recommended additional soil sampling in the southern portion of the Site to improve the delineation of the contaminated area. The results of this sampling event are presented and discussed in the report entitled, "Supplemental Soil Sampling Program", Vibratech, Inc., Buffalo, New York, April 1995, prepared by CRA.

The supplemental soil sampling program concluded that the levels of VOCs measured in the soil borings did not warrant a major expansion of the planned remedial activities. However, it was recommended that some limited localized remediation of soil in the immediate vicinity of BH2-95 (see Figure 1.1) be conducted at the same time as the soil from the area delineated on Figure 1.1 is remediated.

Ex situ soil vapor extraction (SVE) has been identified as being a viable method for on-Site treatment of the VOC-contaminated soil. This Work Plan provides information regarding the design and construction of the ex situ SVE remedial system and the procedures and protocols to be followed during performance of the ex situ SVE remediation of the VOC-contaminated soil. A Quality Assurance Project Plan (QAPP) and Health and Safety Plan (HASP) are attached to this Work Plan as Appendices A and B, respectively. The QAPP contains the procedures and protocols required to:

i) track the operational efficiency of the SVE system; and

ii) collect confirmatory samples of the soil pile at the end of treatment to verify that the cleanup criteria have been met.

The HASP contains information regarding the health and safety protocols to be followed during:

i) excavation and piling of contaminated soil;
ii) decontamination of the excavation equipment;
iii) operation of the SVE system; and
iv) collection of confirmatory soil samples.

Copies of this Work Plan will be made available for public review at a document repository to be established at a suitable location in the community.

1.2 AIR PATHWAY ANALYSES

This section evaluates the potential impacts to the air during the remedial process which includes the excavation of impacted soils and the construction and operation of the ex situ SVE system. This analysis is consistent with New York State Department of Environmental Conservation (NYSDEC) guidance documents entitled "Air Pathway Requirements During Remedial Process", dated April 15, 1991, "Air Pathway Analysis Requirements in the Remedial Investigation", dated April 12, 1991; and appropriate United States Environmental Protection Agency (USEPA) guidance documents.

The chemicals of concern (COCs) can migrate into the air during remedial activities by volatilization and fugitive dust generation. The COCs are naturally volatile in the environment. During the investigative test pit excavation and borehole installation activities, the organic vapor levels were measured using a photoionization detector (PID). Organic vapors were not detected above background levels in the worker breathing zone during any of the test excavations or drilling.

During excavation and construction activities, appropriate health and safety precautions (including implementation of an employee and community air monitoring program) will be initiated prior to and during all remedial activities involving the handling of contaminated soil. Realtime organic vapor and fugitive dust monitoring will be conducted during performance of the remedial process. If there are exceedances of action levels established in the HASP, appropriate air pollution controls (i.e., fugitive dust and volatile contaminant suppression) will be implemented.

Fugitive dust will be monitored during handling of contaminated soil. If unacceptable amounts of dust are generated, appropriate dust suppression techniques will be implemented. However, it is expected that the presence of moisture in the soil will limit generation of dust.

During operation of the ex situ SVE system, appropriate air pollution controls (i.e., venting through vapor-phase carbon treatment units prior to discharge to the atmosphere and covering the soil pile) will be used to treat and control any organic vapors or dust which may be generated during the treatment process. As such, little or no impact to the ambient air quality is expected during operation of the SVE treatment system.

Since volatilization of COCs and fugitive dust emission are expected to be minimal and appropriate monitoring and controls will be performed, the proposed remedial activities will not result in unacceptable human exposure of the Site COCs via the air pathway. Therefore, further quantitative analyses are not required.

2.0 REMEDIAL SYSTEM CONSTRUCTION

This Work Plan provides the details for a soil excavation program to remove VOC-contaminated soil, the construction of a soil pile, construction and operation of the SVE system, collection of confirmatory samples, and final disposition of the treated soil. These activities are discussed in detail in the following sections.

2.1 EXCAVATION OF VOC-CONTAMINATED SOIL

Prior to excavating the VOC-contaminated soil, an area will be prepared for the creation of three soil treatment piles as shown on Figure 1.1. The area will be visually inspected and all surface debris and objects will be removed. A ground sheet consisting of a single piece of 12-mil polyethylene will be placed on top of the asphalt. Caution will be taken during handling and placement of the polyethylene ground sheet to avoid possible tearing or punctures.

Prior to commencing with the soil excavation, the area containing the contaminated soil that is covered with rubble and gravel will be cleared by grading. All railroad spur line materials will be removed, decontaminated, and scrapped. All other debris will be disposed of by approved methods.

It is expected that approximately 500 to 700 cubic yards of contaminated soil will be excavated from the Area of Concern. An additional 10 to 20 cubic yards will be removed from the immediate vicinity of BH2-95 and added to one of the ex situ soil treatment piles. The approximate limits of the area of contaminated soils requiring excavation have been determined during previous soil sampling programs. The southern limit and vertical extent of the excavation will be determined in the field. During excavation, the soils will be screened for organic vapors using a PID. Excavation will cease when the bedrock is observed or when the PID indicates levels less than one ppm above background, whichever occurs first.

Excavation of the VOC-contaminated soil will be performed using a backhoe. Excavation will proceed by first locating and exposing any utilities which exist within the area of soil contamination. This will likely require some hand digging. Caution will be exercised to prevent damage to any utilities. Excavation will begin at the north end of the proposed excavation area and will proceed south to minimize tracking of contaminated material.

It is not expected that groundwater will be encountered during excavation. In the event that groundwater is observed during excavation activities, excavation will cease and the situation will be evaluated.

Caution will be observed while handling contaminated soil during the excavation process. The excavation will proceed in a manner such that soil handling will be kept to a minimum. Care will be taken during excavation and soil pile construction to minimize the potential for volatilization of the VOCs from the contaminated soil due to soil handling activities. Monitoring for VOCs will be performed at the Site perimeter and downwind of the excavation as required by the HASP (Appendix B, Section 8.0).

At the completion of the excavation process, the excavation will be barricaded with temporary fencing and posted with appropriate warning signs. The excavation shall be left open for the duration of soil treatment (at least three months).

2.2 SOIL PILE CONSTRUCTION

Three SVE soil piles of approximately 200 cubic yards each will be constructed to the approximate dimensions shown on Figure 2.1. As shown, the piles will be placed on a 12-mil polyethylene underliner and covered with a 6-mil polyethylene cover. The cover, along with a temporary berm to be constructed around the perimeter of each pile, will preclude water

infiltration, erosion of the piles, and potential leaching of water from the piles. The berm will be constructed and the cover secured as practicable.

Three 2-inch diameter corrugated, perforated high density polyethylene (HDPE) pipes will be installed within each pile as the pile is created. The pipes will extend the full length of the piles to within 1 to 2.5 feet of the sides of the piles. Valving will be arranged to allow flexible operation of the SVE system whereby the three pipes may be operated in any combination of air extraction and passive injection in order to maximize the rate of contaminant removal from the pile. During placement of the soil in the piles, care will be taken not to penetrate the liner. The center of the pile shall be built up first to the proposed installation height of the middle SVE pipe as shown in Figure 2.1. The SVE pipe will be installed as the pile is being formed. After the middle pipe is installed, the center of the pile shall be continued to its final height as shown in Figure 2.1. The pile will then be built outward on each side and the two outside SVE pipes shall be installed as the sides of the pile are being formed. After the remaining two SVE pipes are installed, the sides of the pile shall be sloped as shown in Figure 2.1.

2.3 SVE EQUIPMENT

The SVE system will be installed as shown schematically on Figure 2.2 and will consist of the following equipment:

i) vapor/liquid separator tank (55-gallon capacity with high level switch);
ii) mist/particulate filter;
iii) vacuum blower capable of 200 standard cubic feet per minute (scfm) at 5 inches H_2O vacuum;
iv) vacuum and pressure gauges;
v) process control panel;
vi) air flow meter;
vii) all necessary piping valves and appurtenances; and
viii) four 175-pound activated carbon units arranged in two parallel streams each consisting of two units in series.

All process equipment will be installed and secured in a treatment shed located adjacent to the soil piles.

3.0 SVE SYSTEM OPERATION AND MONITORING

3.1 SYSTEM OPERATION

At startup, the SVE system will be operated continuously. As VOC levels in the influent vapor stream begin to level off, there are a variety of operational options which can be performed using the proposed equipment. The system can be operated intermittently, employing the use of a timer to cycle the blower on and off. Blower shutdown will allow the VOCs to diffuse into the soil pore space and then be removed when vacuum extraction is turned back on again. The valves on the three vacuum extraction pipes located within each pile can be switched to allow for various combinations of vacuum extraction and passive or active air injection flow schemes. This will create varying patterns of air flow within the piles which will enhance the rate of VOC removal. Active air injection will be performed only after all other vacuum or passive venting configurations are observed to have a minimal effect on further VOC removal from the piles.

Based upon the expected soil/vapor equilibrium concentrations, and the cleanup objectives (see Section 3.3), the SVE system will be operated for three months or until it is determined, based on system monitoring results, that further treatment will not result in any significant further removal of VOCs from the soils. At that time, confirmatory soil samples will be collected from the soil pile and analyzed for the Target Compound List (TCL) VOCs. The procedures to be used to collect the soil pile confirmation samples are discussed in Section 3.3.

3.2 SYSTEM MONITORING

During the operation of the SVE treatment, the system will be monitored daily at startup (a period of five days) and weekly thereafter. Monitoring will consist of the following activities:

i) read and record the air flow rate indicated by the flow meter;

ii) read and record the hour meter reading from the control panel. This will document the actual running times for system operation;

iii) check the air/water separator for the presence of accumulated condensate. Drain and contain the water as necessary;

iv) monitor the effluent organic vapor concentrations from the soil pile to the carbon drums using a PID. The PID results will be used to estimate VOC removal rates and to monitor the system efficiency. Air samples will be collected once during startup from system sample ports in new one-liter Tedlar bags and analyzed for TCL VOCs. PID readings will be correlated with actual results;

v) monitor organic vapor concentrations before and after each of the activated carbon drums using a PID. Breakthrough will be determined to have occurred when the difference between the two readings is less than 25 percent. When breakthrough occurs on the primary carbon drum, the system will be shutdown, the spent drum will be changed out, the secondary drum will be placed in the primary position, and a new 175-pound activated carbon drum will be added to the system in the secondary position. When breakthrough occurs on the secondary carbon drum, the system will be shutdown and the spent carbon drum will be replaced with a new 175-pound activated carbon drum;

vi) check the general conditions of the remainder of the equipment and make any required repairs or adjustments; and

vii) check the soil piles, making sure the covers are intact. Repair or replace as required.

Weekly monitoring of the SVE system may be performed by Vibratech or TreaTek-CRA. Any system operation problems noted will be reported immediately to TreaTek-CRA.

3.3 SOIL PILE CONFIRMATORY SAMPLING

At the completion of treatment by SVE, confirmatory soil samples will be collected from the soil piles in accordance with the NYSDEC Spill Technology and Remediation Series (STARS) Memo #1, Petroleum Contaminated Soil Guidance Policy. Although the STARS Memo was developed to address petroleum contaminated soil, the document provides guidance information for sampling and characterizing soil waste piles which is applicable to the SVE soil pile. The STARS Memo further provides recommended sampling frequencies based upon the volume of the soil pile. For a soil pile with a volume of 200 to 300 cubic yards, the STARS Memo recommends the collection of four grab samples.

Four confirmatory samples will be collected from each SVE soil pile. The grab samples will be collected from random depths at four random locations, and will be collected at depths between one foot below the top of the pile and one foot above the bottom of the pile.

Confirmatory samples will be collected using a stainless steel bucket auger. The soil will be placed directly into laboratory-supplied glassware. The bucket auger will be cleaned between sampling locations using the decontamination procedure described in Section 5.2.

The confirmatory samples will be analyzed for TCL VOCs in accordance with the USEPA SW-846 Method 8240. The NYSDEC recommended soil cleanup objective is taken from the NYSDEC's "Technical Administrative Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels", dated January 24, 1994. As per this TAGM, the total VOCs must be less than 10 ppm. The analytical results from confirmatory samples will be compared with the NYSDEC recommended cleanup objective of total VOCs concentration less than 10 ppm. If the analytical results indicate that each of the sampled soils has total VOC concentrations below 10 ppm, or the average of total VOCs concentration of all samples is less than 5 ppm, the soil will be considered clean. Otherwise, the SVE treatment will be resumed and additional confirmatory samples will be collected and analyzed until the analytical

results for all the confirmatory samples indicate that the cleanup criteria as described above have been achieved or until it is determined that further treatment will not result in any significant further removal of VOCs from the soils.

4.0 PROJECT CLOSURE

Treated soil will be backfilled into the original excavation after results of confirmatory sampling and analysis indicate that VOC levels meet or exceed the cleanup criteria. The treated soil will be backfilled in one-foot lifts and compacted within the previously excavated area. Percent compaction will be determined in the field based upon anticipated future use of the area.

5.0 DECONTAMINATION

5.1 LARGE EQUIPMENT

A temporary decontamination pad will be constructed of a polyethylene ground sheet overlain with plywood. A "cow tub" or similar suitably sized vessel will be used to contain the decontamination fluid. The collected decontamination water will be transferred into drums for future disposal.

At the completion of the excavation activities, the backhoe bucket and any other equipment used to excavate or transport contaminated soil will be decontaminated prior to leaving the Site. Decontamination for large equipment will consist of:

i) remove as much loose soil as possible using a shovel;

ii) using a scrub brush and 5-gallon pail of water, scrub soiled areas on backhoe;

iii) rinse equipment using potable water; and

iv) contain all decontamination water into a 55-gallon drum and store on Site pending disposal by approved methods.

5.2 SOIL SAMPLING EQUIPMENT

Any sampling equipment used to collect confirmatory soil samples will be decontaminated according to the following procedures:

i) remove as much loose soil as possible using a wire brush, towel, etc.;

ii) scrub with scrub brush and a warm solution of potable water and laboratory soap;

iii) rinse with copious quantities of potable water;

iv) rinse with distilled water;

v) allow to air dry for ten minutes;

vi) wrap in aluminum foil for storage/transport, if required; and

vii) contain all decontamination water in a 55-gallon drum pending future disposal by approved methods.

5.3 HANDLING OF GENERATED WASTE MATERIALS

Waste materials which are anticipated to be generated at the Site during the SVE treatment program include decontamination water, spent carbon, and spent personal protective equipment (PPE). The following will describe how each type of waste generated will be handled and disposed:

i) decontamination water will be contained in 55-gallon drums. At the completion of the sampling activities, the decontamination water will be sampled and analyzed for halogenated compounds by USEPA SW-846 Method 8240. The decontamination water will be disposed of properly based upon the analytical results. If possible, the decontamination water will be discharged to the ground surface, pending NYSDEC approval;

ii) spent carbon drums will be shipped back to the vendor in accordance with all Department of Transportation (DOT) regulations. The carbon will be properly disposed of or regenerated by the vendor; and

iii) spent PPE will be disposed of in accordance with all applicable State and Federal regulations.

6.0 PROJECT SCHEDULE

It is estimated that the construction activities will take approximately six weeks to implement after authorization to proceed. The operation of the SVE system is estimated at approximately three months. A more definitive estimate of the necessary operating time frame can be provided after system startup when air quality data becomes available.

When appropriate, confirmatory samples will be collected. Project closure will be executed and a final report will subsequently be issued. It is expected that six weeks will be required to complete all post-treatment activities. The following table outlines the estimated duration of each activity.

Activity	*Estimated Duration*
Remedial System Construction	6 weeks
System Operation and Monitoring	3 months
Project Closure and Reporting	6 weeks

FIGURES

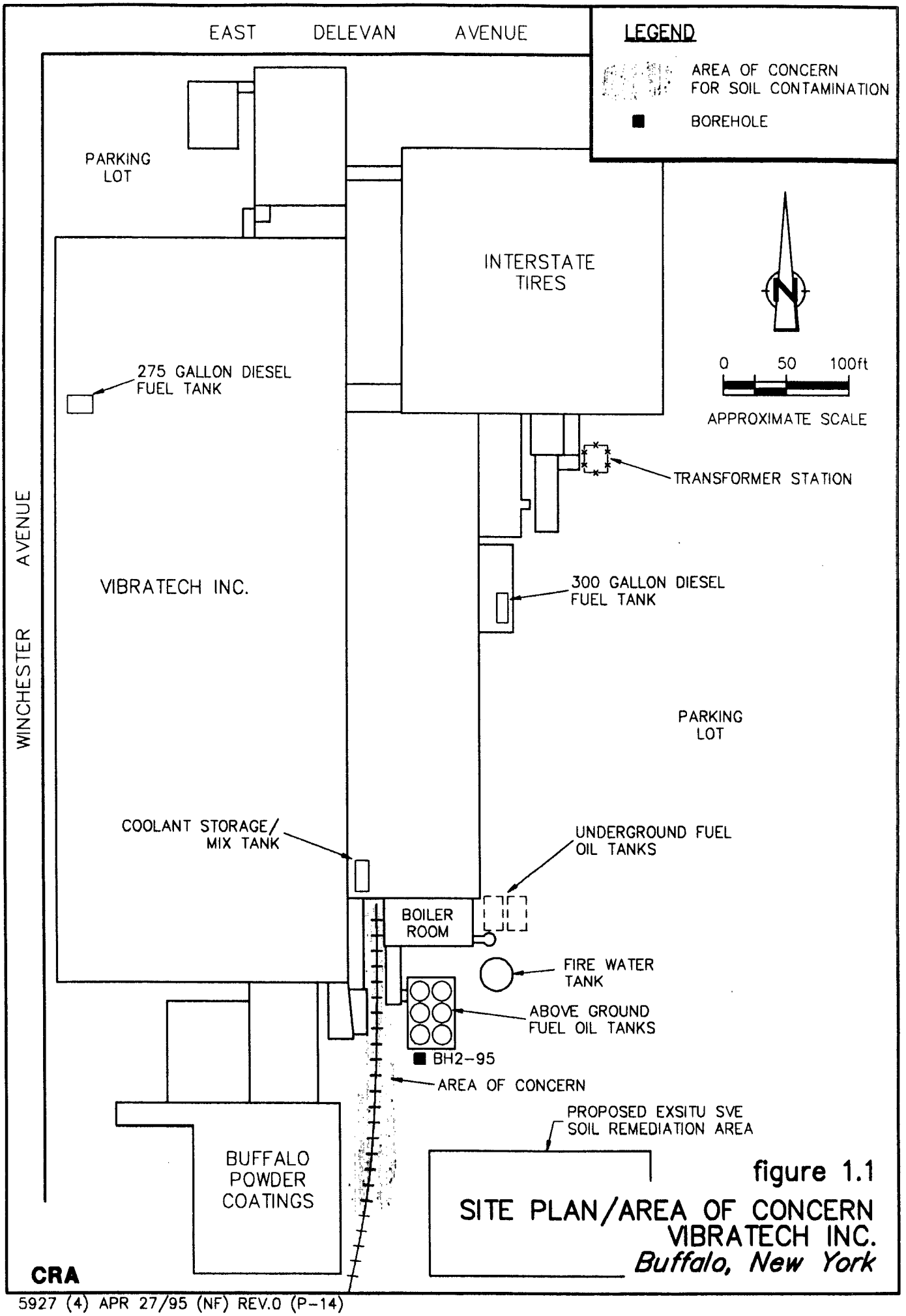
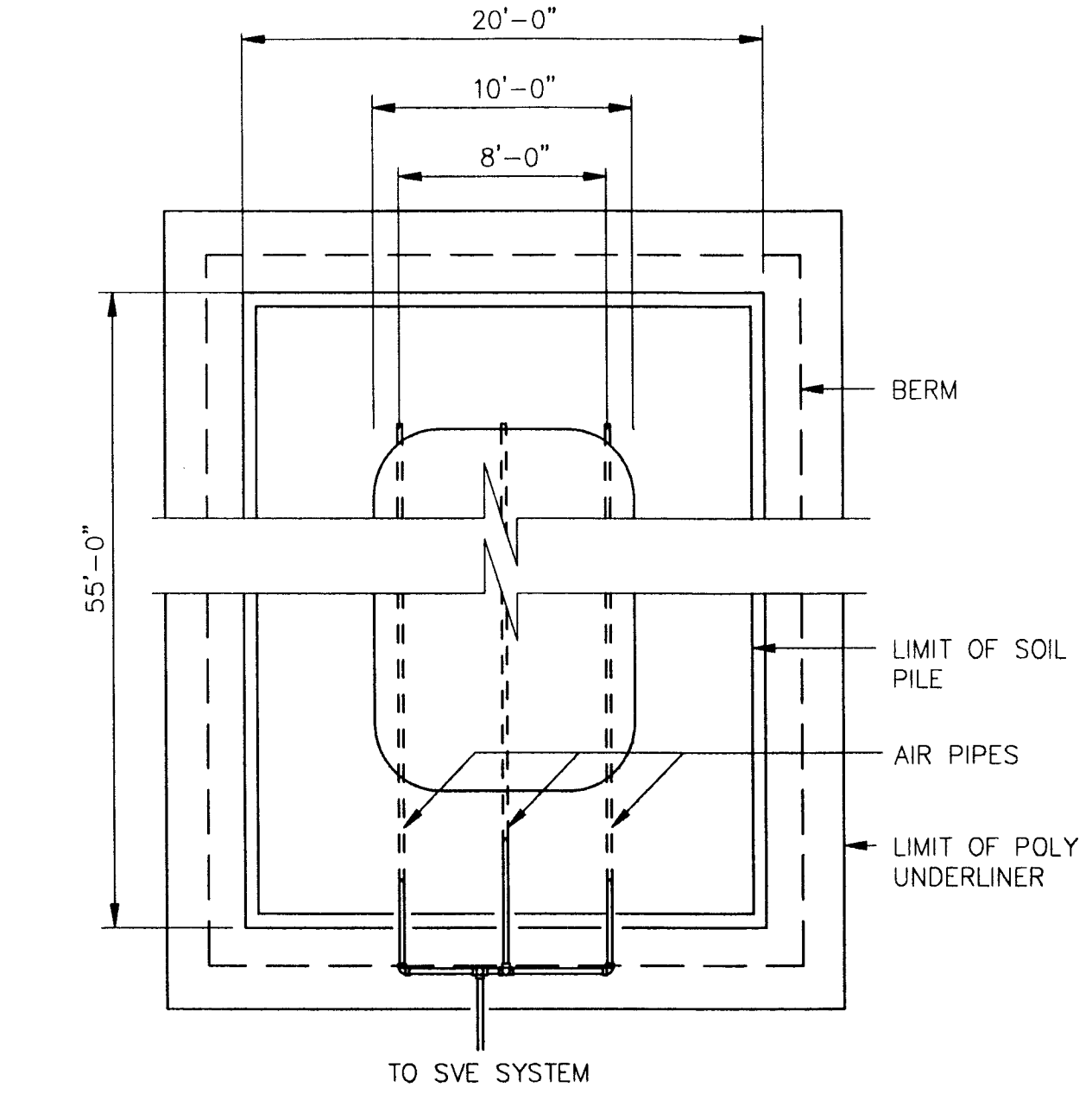


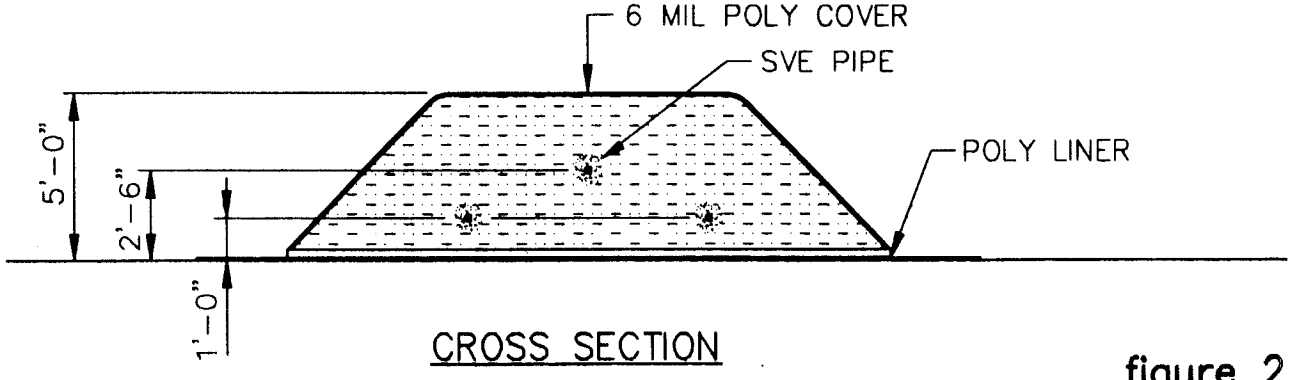
figure 1.1

SITE PLAN/AREA OF CONCERN
VIBRATECH INC.
Buffalo, New York

5927 (4) APR 27/95 (NF) REV.0 (P-14)



PLAN



CROSS SECTION

figure 2.1

SOIL PILE DETAILS
VIBRATECH, INC.
Buffalo, New York

CRA

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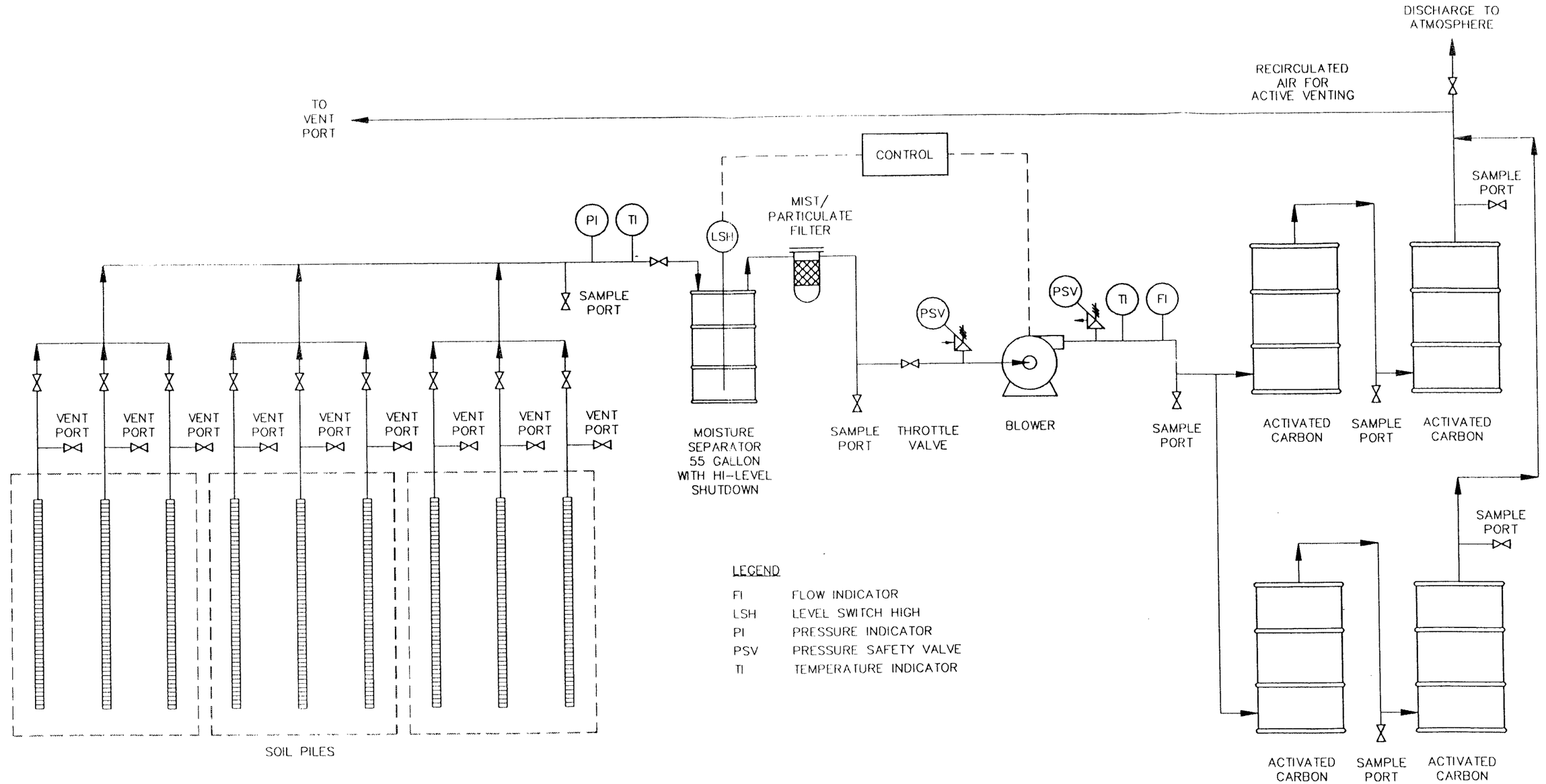

figure 2.2
SVE PROCESS SCHEMATIC
VIBRATECH, INC.
Buffalo, New York

APPENDIX A

QUALITY ASSURANCE PROJECT PLAN

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1.0 PROJECT ORGANIZATION AND RESPONSIBILITY

TreaTek-CRA Company (TreaTek-CRA) will have overall responsibility for the installation and operation of the soil vapor extraction (SVE) system.

1.1 FIELD OPERATIONS RESPONSIBILITIES

Operational responsibilities are those involving execution and direct management of the technical and administrative aspects of the project.

Project Manager
Mr. Kelly McIntosh, Conestoga-Rovers & Associates

Project Design/Construction Engineer
Mr. Brian Kramer, TreaTek-CRA

1.2 QUALITY ASSURANCE RESPONSIBILITIES

Quality assurance (QA) responsibilities are those involving monitoring and reviewing all aspects of the project including data collection, analytical service, data assessment and corrective action, and QA report preparation.

Field QA Activities Coordinator
Kevin D. Sullivan, TreaTek-CRA

Analytical QA Activities Coordinator
Mr. Paul McMahon, TreaTek-CRA

2.0 QUALITY ASSURANCE OBJECTIVE

The purpose of data QA is to assure that data generated under the program are accurate and consistent with the program objectives. The quality of the data will be assessed based on precision, accuracy, and completeness. Precision is the degree to which a measurement is reproducible and is generally assessed by review of duplicate analyses. Accuracy is a determination of how close the measurement is to the true value and is generally assessed via spike recovery in sample matrices. Completeness is a measure of the amount of valid data obtained compared to the amount that was expected under normal conditions.

3.0 SAMPLING PROCEDURES

3.1 SOIL SAMPLES

Confirmatory soil samples will be obtained via hand auger sampling or scooped with a trowel or hand shovel. The samples will be logged, packed in a cooler with ice, and shipped to a certified laboratory.

3.2 DECONTAMINATION

All sampling equipment will be decontaminated between each sampling location to prevent cross-contamination. Decontamination shall be carried out as stated in Section 5.0 of the Work Plan.

4.0 SAMPLE CUSTODY

Sample Chain of Custody procedures as described generally in the United States Environmental Protection Agency (USEPA) Contract Lab Program Statement of Work for Inorganic and Organic Analyses, Multi-Media Multi-Concentration, SOW 787, July 1987, will be followed from initial field sampling through completion of laboratory analyses. Procedures for field sampling operations include:

i) all information required on the sample label will be filled out in the field; and

ii) prior to relinquishing samples for packaging and shipment, the sampling team will transfer all data on the sample label to field Chain of Custody record. The record will include Site sample numbers, analyses to be performed, shipper's airbill number, and designated laboratory. Field personnel will make sure that Chain of Custody forms are enclosed with sample shipments. The sample number, cross-referenced to Chain of Custody forms, will be maintained in field logbooks. The sample numbers will consist of four parts:

a) Project Identifier - a two letter code used to identity the Site,
b) Sample Location - a two digit number for the sample location,
c) Sample Date - a six digit number indicating the data of sample collection, and
d) Samplers Initials - a three letter code used to identify the sampler.

To ensure the integrity of the sample, each sample received by the laboratory will be assigned a laboratory sample number in the order of receipt. The laboratory sample number will be assigned in a numerical sequence and written on all the sample bottles comprising the sample, and the laboratory sample number is recorded in a bound logbook or within a computer database. All pertinent data, including name of the client, sample information (such as source, type of sample, date and time of

collection, etc.), method of delivery, analyses requested, date, time, and initials of the person receiving the sample, will be recorded.

Sample integrity is the responsibility of the laboratory supervisor. Individual analysts are responsible for maintaining sample integrity as analyses are assigned and performed. As analysis is completed, the analyst initials, in the logbook, a record of the parameter which they have completed. Additionally, for any parameter, when quality control analysis is performed, the analyst marks with red pen in the logbook or on the database, indicating that quality control analysis has been performed for a particular parameter. This provides, in a single location, all pertinent information regarding the samples for the Laboratory Manager and Project Manager to review.

5.0 ANALYTICAL PROCEDURES

USEPA SW-846 Method 8240 will be used to analyze the soil samples for Target Compound List (TCL) Volatile Organic Compounds (VOCs).

6.0 DATA REDUCTION, VALIDATION, AND REPORTING

Data reduction refers to the process of converting raw data to reportable units. The analytical detector's linearity for each parameter should be demonstrated by generation of a linearity curve. The concentration of calibration standards is determined by the analytical method and the manufacturer's guidelines. All sample calculations are made from responses which fall in the linearity range. During the course of analysis, standards must be interspersed at frequent intervals to check the calibration. All raw data will be reviewed and validated against calibration records to ensure that data are reliable, and that the data are in compliance with Quality Assurance/Quality Control (QA/QC) objectives. Data are maintained from sample receipt through reporting by use of project clipboards or computer database and will be reported in the laboratory report.

Raw data from field measurements and sample collection activities that are used in project reports will be appropriately identified. Where data have been reduced or minimized, the method of reduction will be documented in the report.

7.0 PERFORMANCE AND SYSTEM AUDITS

Performance and system audits will be conducted by project QA personnel. These audits are intended primarily for analytical and data generation systems and not typically conducted by the use of performance valuation samples, randomly submitted by QA personnel.

A system audit will be conducted on all components of the measuring systems including field and laboratory procedures. The Site Manager and the Laboratory Manager typically conduct the system audit prior to implementation by key sections of the data gathering and measurement program with the objective of reviewing overall system integrity and conformance with the sampling plan.

8.0 PREVENTATIVE MAINTENANCE PROCEDURES AND SCHEDULE

The laboratory will follow routine preventative maintenance on equipment as recommended by the manufacturer. In addition, blanks will be checked to determine the absence of carryover or background contamination. If problems are discovered, the instrument will be adjusted or arrangements for servicing will be made. A reasonable supply of spare parts and supplies for laboratory equipment for in-house repair will be maintained. Maintenance service contracts with a one or two day response time for the majority of the equipment are also available.

9.0 DATA ASSESSMENT PROCEDURES

An outline of typical laboratory data assessment procedures is given below.

1. Calibration of instruments will be accomplished according to the protocols given in the appropriate USEPA methods. Generally, every twentieth sample should be a calibration check standard.

2. Method blanks will be analyzed at a nominal rate of 10 percent to assess possible laboratory contamination.

3. Ten percent of the total number of samples will be method spikes and matrix spikes. The recovery is used as a measure of the accuracy of the sample preparation analysis procedures. If accuracy limits are exceeded successively, then the results are invalid and the problem must be identified and corrected.

4. Ten percent of the total number of samples will be replicates. By definition, replicates are matrix extracts which are analyzed twice to assess analytical precision.

5. Quality control records, showing accumulated precision and accuracy data, will be maintained in the laboratory. Poor quality results require that the problem be determined and corrected.

10.0 CORRECTIVE ACTION

If quality control, systems, or performance audits result in the detection of conditions or data that do not meet QC requirements, corrective action will be initiated. The nature of the action will depend on the circumstances unique to each situation and may include:

i) reanalyzing the samples, if holding time criteria permit;
ii) resampling and analyzing;
iii) evaluating and amending sampling and analytical procedures; and
iv) accepting data, acknowledging level of uncertainty.

APPENDIX B

HEALTH AND SAFETY PLAN

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1.0 INTRODUCTION

The Health and Safety Plan (HASP) presented herein describes the health and safety procedures and emergency response guidelines to be implemented during the remedial action activities for the Vibratech, Inc. facility (Site) in Buffalo, New York. Section 1.0 of the Soil Vapor Extraction Work Plan (Work Plan) presents a summarized Site description and Site history. Figure 1 of the Work Plan presents a Site layout.

The scope of work to be completed during the performance of the remedial action activities includes the following:

i) mobilization and demobilization of labor, materials, and equipment to the Site;

ii) excavation of contaminated soils and building of the soil pile;

iii) performance monitoring (i.e., photoionization detector [PID] readings of influent and effluent vapors);

iv) confirmatory soil sampling activities;

v) backfilling and grading activities; and

vi) decontamination activities.

During remedial activities personnel may come in contact with soils which potentially contain hazardous waste or hazardous waste constituents. This HASP has been developed to ensure the following:

i) that Site personnel are not adversely exposed to the compounds of concern;

ii) that public health and the environment are not adversely impacted by contaminated materials which may potentially migrate off-Site during work activities at the Site;

iii) compliance with applicable governmental and non-governmental (American Conference of Governmental Industrial Hygienists) regulations and guidelines. In particular, the amended rules of the Occupational Safety and Health Act (OSHA) for Subpart H of Part 1910 (Title 29 Code of Federal Regulations (CFR) Part 1910.120) will be implemented for all Site work; and

iv) initiation of proper emergency response procedures to minimize the potential for any adverse impact to Site workers, the general public or the environment.

For the purpose of this HASP, all remedial activities performed on Site involving contact with potentially contaminated materials will be considered contaminated operations requiring personal protective equipment (PPE). A detailed description of the PPE required is presented in Section 6.1.

The applicability of this HASP extends to all personnel who will be on-Site, including TreaTek-CRA Company® (TreaTek-CRA) employees, contractors, subcontractors, and visitors to the Site. Remedial contractors who are contracted to conduct remedial work at the Site will also be required to prepare and implement a HASP for their Site personnel.

All remedial activities at the Site will be conducted in accordance with the provisions of the approved Site-specific HASP and employer-specific Standard Operating Procedures (SOPs). A copy of this HASP will be maintained on-Site whenever remedial activities are in progress.

1.1 PROJECT ORGANIZATION

The remedial construction project will be organized as follows: TreaTek-CRA Project Managers will direct the project. TreaTek-CRA

and an environmental contractor(s) will conduct the remedial work activities.

Site personnel will include a TreaTek-CRA Site Engineer who will be responsible for ensuring that all Contract Specifications will be met, including those related to Site health and safety. The TreaTek-CRA Health and Safety Officer (HSO) will be primarily responsible for ensuring that the HASP is implemented and adhered to for the duration of the remedial activities. The HSO or their qualified alternate will be present as necessary at the Site to ensure compliance with each contractor's Site-specific HASP.

2.0 POTENTIALLY HAZARDOUS COMPOUNDS

In addition to the Site description and history (Site Characterization) which is presented in the Work Plan, this section of the HASP is intended to identify the potentially hazardous compounds which have been previously identified at the Site. The known compounds of concern at the Site are volatile organic compounds (VOCs): 1,1-dichloroethane, 1,2-dichloroethane, cis-1,2-dichloroethene, trans-1,2-dichloroethene, toluene, 1,1,1-trichloroethane, trichloroethene, vinyl chloride, and total xylene. The air monitoring action levels which have been established for the Site are based on the presence of the known Site contaminants. The exposure routes and regulatory Time Weighted Average (TWA) exposure levels for the contaminants are listed in Table B2.1. These levels are set to protect the health of workers.

3.0 BASIS FOR DESIGN

Regulations set forth by OSHA in Title 29, Code of Federal Regulations, Parts 1910 and 1926 (29 CFR 1910 and 1926) form the basis of this HASP. Emphasis is placed on Sections 1910.120 (Hazardous Waste Operations and Emergency Response), 1910 Subpart I (Personal Protective Equipment), and 1910 Subpart Z (Toxic and Hazardous Substances). In addition, current Threshold Limit Values (TLVs) formulated by the American Conference of Governmental Industrial Hygienists (ACGIH) have been considered in the development of the selection of PPE. Some of the specifications within this section are in addition to the OSHA regulations, and reflect the positions of the United States Environmental Protection Agency (USEPA), the National Institute for Occupational Safety and Health (NIOSH), and the United States Coast Guard (USCG) regarding safe operating procedures at hazardous waste sites.

The health and safety of the public and Site personnel and the protection of the environment will take precedence over cost and scheduled considerations for all project work.

4.0 RESPONSIBILITIES AND ADMINISTRATION

An on-Site Engineer will be assigned to this project and shall be responsible, along with the remedial contractor's HSO, for all decisions regarding operations and work stoppage due to health and safety considerations. The remedial contractor's HSO will have prior experience in working at hazardous waste sites and will be audited by TreaTek-CRA's HSO as necessary.

The on-Site HSO's responsibilities include:

i) supervising and enforcing safety equipment usage, including the required use of extra equipment if appropriate;

ii) supervising and inspecting equipment cleaning;

iii) supervising decontamination;

iv) conducting the on-Site personnel safety indoctrination session in potential hazards, personal hygiene principles, safety equipment usage, and emergency procedures;

v) maintaining Exclusion Zone (EZ) and Contaminant Reduction Zone (CRZ) work areas;

vi) reviewing and modifying the HASP as more information becomes available or conditions warrant;

vii) authority to suspend work activity due to unsafe working conditions;

viii) coordinating emergency procedures;

ix) maintaining the on-Site Hazard Communication Program;

x) being responsible for performing air monitoring; and

xi) ensuring that all on-Site personnel have obtained the required medical examination prior to arrival at the Site and have met the OSHA training requirements.

5.0 WORKER TRAINING AND EDUCATION

Prior to commencing Site activities, a Health and Safety/Site Indoctrination Session will be presented. Attendance is mandatory for all personnel who will be or are expected to be involved with the program at the Site.

The training program will stress the importance that each attendee understands the basic principles of personnel protection and safety, be able to perform their assigned job tasks in a safe and environmentally responsible manner, and be prepared to respond in an appropriate manner to any emergency which may arise. A brief history of the Site will be included and the various components of the project HASP will be presented followed by an opportunity to ask questions to ensure that each attendee understands the HASP. Personnel not successfully completing this training program will not be permitted to enter or work in potentially contaminated areas of the Site. Personnel successfully completing this training program shall sign an acknowledgment form, a copy of which is presented in Appendix B-1.

This training will be given in addition to the basic training required under OSHA and is not intended to meet the requirements of 29 CFR 1910.120. Prior to working in or entering an EZ environment (as defined in Section 6.0), all personnel will be required to provide documentation to the Site Engineer indicating successful completion of the training requirements of 29 CFR 1910.120.

6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

This section of the HASP describes the requirements for PPE and the specific levels of protection required for each work task to be conducted at the Site during remedial activities. Basic PPE in all Site areas will consist of hard hats, safety glasses, and safety boots/shoes.

6.1 PROTECTION LEVELS

Personnel will wear protective equipment when remedial activities involve potential exposure to contaminants from vapors, gases or particulates that may be generated on-Site or when direct contact with potentially hazardous substances may occur. Chemical resistant clothing protects the skin from contact with skin-destructive and absorbable contaminants. Respirators protect lungs, the gastrointestinal tract, and if a full-face respirator is worn, the eyes, against airborne toxicants. Respiratory protection levels will be based on the real-time air monitoring results and the action levels that are presented in Section 6.5.

Protection levels are selected based upon the following:

i) measured concentrations of the Site contaminants and expected concentrations in the ambient atmosphere compared to allowable exposure levels (Table B2.1);

ii) potential for exposure to contaminants in air, splashes of liquids, or other contact due to the nature of work tasks; and

iii) Site contaminants' toxicity, routes of exposure, and contaminant matrix.

The specific protection levels to be employed at the Site for each work task are listed in Table B6.1. All remedial activities conducted at the Site will require the use of one of the following levels of PPE.

Level C:

i) tyvek coveralls (polycoated tyvek when handling or working with liquids (e.g., decontamination));
ii) steel toe work boots and disposable boot covers or rubber boots;
iii) disposable inner gloves - chemical resistant;
iv) outer work gloves - chemical resistant;
v) half-face or full-face air purifying respirator (APR), equipped with combination cartridges for organic vapors and particulates; and
vi) hard hat.

Modified Level D:

i) tyvek coveralls (polycoated tyvek when handling or working with liquids);
ii) steel toe work boots;
iii) disposable inner gloves - chemical resistant;
iv) outer work gloves - chemical resistant;
v) safety glasses;
vi) splash shields as necessary; and
vii) hard hat.

Level D:

i) standard work uniform or coveralls;
ii) steel toe work boots;
iii) gloves as necessary;
iv) safety glasses;
v) splash shield as needed; and
vi) hard hat.

PPE will be maintained in a clean sanitary condition and ready for use. Disposable coveralls shall be discarded when torn and as an employee leaves the contaminated work zone. Hard hats shall be thoroughly cleaned after leaving the contaminated work zone. Respirators shall be cleaned after each day's use and cartridges discarded. A sufficient quantity of

potable water shall be supplied for washing, cleaning PPE, and drinking. A potable water supply for washing and cleaning PPE will be maintained adjacent to the decontamination area described in Section 9.0. Fresh potable water for drinking will be supplied on a daily basis and maintained at a location removed from the active work area.

6.2 REASSESSMENT OF PROTECTION LEVELS

Protection levels provided by PPE selection shall be upgraded or downgraded based upon a change in Site conditions or the review of the results of monitoring.

When a significant change occurs, the hazards should be reassessed. Some indicators of the need for reassessment are:

i) commencement of a new work phase;
ii) change in job tasks during a work phase;
iii) change of season/weather;
iv) when temperature extremes or individual medical considerations limit the effectiveness of PPE;
v) contaminants other than those expected to be encountered are identified;
vi) change in ambient levels of contaminants; and
vii) change in work scope which affects the degree of contact with potentially contaminated areas.

All proposed changes to protection levels and PPE requirements will be reviewed and approved prior to their implementation by the on-Site HSO and Site Engineer.

6.3 DURATION OF WORK TASKS

The duration of remedial activities involving the usage of PPE will be established by the HSO or his designee based upon ambient

temperature and weather conditions, the capacity of personnel to work in the designated level of PPE (heat stress and cold stress, see Section 12.3 Environmental Control), and limitations of the protective equipment (i.e. ensemble permeation rates, life expectancy of air-purifying respirator cartridges, etc.). As a minimum, rest breaks will be observed at the following intervals:

i) 15 minutes midway between shift startup and lunch;
ii) one-half to one hour for lunch; and
iii) 15 minutes in the afternoon, between lunch and shift end.

All rest breaks will be taken in a clean area (e.g., support zone) after full decontamination and PPE removal. Additional rest breaks will be observed, based upon the heat stress monitoring guidelines presented in Appendix B-3.

6.4 LIMITATIONS OF PROTECTIVE CLOTHING

PPE ensembles designated for use during remedial activities have been selected to provide protection against contaminants at known or anticipated concentrations in the soil. However, no protective garment, glove or boot is chemical-proof, nor will it afford protection against all chemical types. Permeation of a given chemical through PPE is a complex process governed by contaminant concentrations, environmental conditions, physical condition of the protection garment, and the resistance of a garment to a specific contaminant; chemical permeation may continue even after the source of contamination has been removed from the garment.

In order to obtain optimum usage from PPE, the following procedures are to be followed by all Site personnel using PPE:

i) when using disposable coveralls, don a clean, new garment after each rest break or at the beginning of each shift;

ii) inspect all clothing, gloves and boots both prior to and during use for:

a) imperfect seams;
b) non-uniform coatings;
c) tears; and
d) poorly functioning closures; and

iii) inspect reusable garments, boots, and gloves both prior to and during use for:
a) visible signs of chemical permeation;
b) swelling;
c) discoloration;
d) stiffness;
e) brittleness;
f) cracks;
g) any sign of puncture; and
h) any sign of abrasion.

Reusable gloves, boots or coveralls exhibiting any of the characteristics listed above will be discarded. PPE used in areas known or suspected to exhibit elevated concentrations of contaminants will not be reused.

Additional PPE usage guidelines are as follows:

i) ankles/wrists will be secured tightly with the use of duct tape;

ii) prescription eyewear used on-Site shall be safety glasses equipped with side shields when full-face respirators are not required. Contact lenses shall not be used;

iii) all EZ workers will have received training in the usage of full-face air purifying respirators and self-contained breathing apparatus (SCBA) which may be required in an emergency;

iv) steel toe leather footwear shall be covered with neoprene overboots prior to entering the EZ and immediately upon entering the CRZ; and

v) safety footwear and hard hats are to be worn by Site personnel at all times.

EZ personnel also carry certain responsibilities for their own health and safety, and are required to observe the following safe work practices:

i) familiarize themselves with this HASP;

ii) use the "buddy system" when working in a contaminated operation;

iii) use the safety equipment in accordance with training received, labeling instructions, and common sense;

iv) maintain safety equipment in good condition and proper working order;

v) refrain from activities that would create additional hazards (i.e. smoking, eating, etc., in restricted areas, leaning against dirty, contaminated surfaces);

vi) smoking and eating will be prohibited except in designated areas. These designated areas may change during the duration of the project to maintain adequate separation from the active work area(s). Designation of these areas will be the responsibility of the HSO; and

vii) soiled disposable outerwear shall be removed and placed into a covered container prior to washing hands and face, eating, using lavatory facilities or leaving the Site.

6.5 RESPIRATORY PROTECTION PROGRAM

Prior to arriving at the Site, all on-Site personnel will have received training in the use of, and have been fit tested for, either half- or full-facepiece respirators. All on-Site personnel will be required to comply

with their employer-specific written respiratory protection program developed in accordance with OSHA 29 CFR 1910.134.

Respiratory protection may be required during some of the remedial activities. This is to ensure worker protection from potentially contaminated particulates and volatile organic vapors generated by the presence of the contaminants.

A PID and real-time particulate monitor (respirable fraction) will be used to determine if organic vapors and elevated levels of particulates are present. A background reading will be established prior to commencing work activities at each active work area.

Action levels to determine the level of respiratory protection necessary during remedial activities are based on the concentration of the known Site contaminants measured within the breathing zone. The action levels and appropriate respiratory protection for the Site activities are as follows:

Sustained Organic Vapor Reading Above Background within Worker Breathing Zone	*Particulate Level Worker Breathing Zone*	*Action Taken*
<1 ppm	<5 mg/m^3	half- or full-face respirator available
1 - 10 ppm	>5 mg/m^3	wear half-face or full-face respirator
10 - 50 ppm	-	must wear full-face respirator
>50 ppm	-	shutdown activities, implement additional engineering controls as 50 ppm represents the established immediately dangerous to life and health level

The appropriate air purifying respirator cartridge to be used at the Site is a combination organic vapor particulate cartridge. The cartridge used must be of the same manufacturer as the respiratory facepiece.

6.6 SITE CONTROL

Designated work areas will be set up as appropriate during the Site field activities, as required. The purpose of these procedures is to limit access to potentially contaminated areas, and prevent the migration of potentially hazardous materials into adjacent non-contaminated areas. These areas are described as follows.

i) The Exclusion Zone (EZ) is the area immediately surrounding the active work area and containerized contaminated soil. Sufficient area will be provided for efficient movement of personnel and equipment as well as contaminant control. Boundaries are modifiable depending on operational requirements. The HSO will be responsible for maintaining the boundaries of this area. Personnel entering this area are required to wear the PPE as defined previously. A wind direction indication device (i.e. flagging, windsock, etc.) will be mounted in the area of any EZ during Site activities.

All personnel (including visitors) entering the EZ or CRZ using respiratory protection must have successfully passed a qualitative respirator FIT test in accordance with OSHA 29 CFR 1910.134. Documentation of FIT testing is the responsibility of each employer.

In the event that unauthorized personnel enter the EZ, work will stop. Work will not resume until the unauthorized personnel have been removed from the EZ or until they have been moved to an acceptable on-Site area. A log of all visitors to the Site, including those entering the EZ, will be maintained.

ii) The Contaminant Reduction Zone (CRZ) will provide a location for removal of contaminated PPE and final removal and decontamination of personnel and equipment. Supplemental safety equipment, such as fire extinguishers, portable eyewash, and extra quantities of PPE, may be stored in this area. The order in which safety equipment is to be donned is as follows:

a) tyvek suit;
b) over boot;
c) gloves;
d) respirator; and
e) hard hat.

The following order applies when removing safety equipment:

a) wash off boots and outer gloves prior to removal;
b) tyvek suit;
c) hard hat;
d) respirator; and
e) inner gloves.

iii) The Support Zone (SZ) is situated in clean areas where there is a minimal risk of encountering hazardous materials or conditions. PPE beyond standard construction safety equipment is therefore not required.

7.0 ACTIVITY HAZARD/RISK ANALYSIS

This section identifies the general hazards associated with specific remedial activities and presents the documented or potential health and safety hazards that exist at the Site. Every effort will be made to reduce or eliminate these hazards. Those which cannot be eliminated must be guarded against by use of engineering controls and/or PPE. Table B7.1 presents the anticipated hazards/risks and appropriate precautions.

In addition to the chemical hazards presented in Section 2.0 of this HASP, physical hazards including uneven terrain, slippery surfaces, the use of heavy equipment, the use of decontamination equipment, and potential heat and cold stress exist at the Site. It will be the responsibility of each on-Site remedial contractor and their personnel to identify the physical hazards posed by the various Site remedial activities and implement preventative and corrective action.

7.1 CHEMICAL EXPOSURE

Preventing exposure to toxic chemicals is a primary concern. Chemical substances can enter the unprotected body by inhalation, ingestion, and skin absorption. A contaminant can cause damage at the point of contact or can act systematically, causing a toxic effect at a part of the body distant from the point of initial contact.

The effects of exposure not only depend on the chemical, its concentration, route of entry, and duration of exposure, but may also be influenced by personal factors such as the individual's smoking habits, alcohol consumption, medication use, nutrition, age, and sex.

An important exposure route of concern at the Site is inhalation. The lungs are extremely vulnerable to chemical agents. Even substances that do not directly affect the lungs may pass through lung tissue into the bloodstream, where they are transported to other vulnerable areas of the body. Some toxic chemicals present in the atmosphere may not be

detected by human senses (i.e., they may be colorless, odorless, and their toxic effects may not produce any immediate symptoms). Respiratory protection is therefore extremely important if there is a possibility that the work site atmosphere may contain such hazardous substances.

Direct contact of the skin and eyes by hazardous substances is another important route of exposure. Some chemicals directly injure the skin. Some pass through the skin into the bloodstream where they are transported to vulnerable organs. Skin absorption is enhanced by abrasions, cuts, heat, and moisture. The eye is particularly vulnerable because airborne chemicals can dissolve in its moist surface and be carried to the rest of the body through the bloodstream (capillaries are very close to the surface of the eye). Wearing protective equipment, not using contact lenses in contaminated atmospheres (since they may trap chemicals against eye surface), keeping hands away from the face, and minimizing contact with liquid and solid chemicals can help protect against skin and eye contact.

Although ingestion should be the least significant route of exposure at the Site, it is important to be aware of how this type of exposure can occur. Deliberate ingestion of perchloroethylene is unlikely, however, personal habits such as chewing gum or tobacco, drinking, eating, smoking cigarettes, and applying cosmetics at the Site may provide a route of entry for chemicals.

Wearing appropriate PPE, avoiding physical hazards, and taking common sense precautions are important protective measures against chemical exposure.

8.0 AIR MONITORING

During the progress of remedial activities, periodic monitoring of particulate levels and organic vapors will be conducted by the HSO. Monitoring for particulates only will be required during those work activities which potentially may lead to contaminant excursions from the Site (e.g., ground-invasive activities). A Community Air Monitoring Program will be implemented in addition to the air monitoring requirements of this section. The Community Air Monitoring Program is presented in Section 14.0 of this HASP.

The following air monitoring instrumentation will be used for this purpose:

i) a PID detector; and
ii) a real-time digital particulate monitor (respirable fraction).

All monitoring equipment will be calibrated in accordance with the manufacturer's guidelines, and such calibrations will be recorded in the Site daily log book. Results of all daily air monitoring will also be recorded in the Site daily log book and copies are to be given to the Site Engineer.

Air monitoring will be conducted in the breathing zone of workers in the EZ and at the downwind perimeter of the Site on an hourly basis or as deemed necessary by the HSO based on Site-specific conditions. Background measurements immediately upwind of the EZ will be taken before activities commence. Work activities generating particulate levels in excess of 150 $\mu g/m^3$ (based on a 15-minute average), or organic vapor levels greater than 5 ppm above background at the downwind Site perimeter, will temporarily be halted until alternate work methods or engineering controls are in place to maintain particulate levels below 150 $\mu g/m^3$ and organic vapor levels below 5 ppm above background at the downwind Site perimeter.

Respiratory action levels for organic vapors are discussed in Section 6.5.

Immediately upon identifying sustained elevated levels of organic vapors (greater than 50 parts per million (ppm)) within the Work Zone, the air monitoring results will be reported to the Site Engineer and work activities will be shutdown. The HSO will determine the cause of the sustained elevated levels of organic vapors and alternate work methods or engineering controls will be implemented to rectify the release of elevated concentrations of organic vapors, or upgrade levels of PPE as required.

9.0 DECONTAMINATION PROCEDURES

In general, everything that enters the EZ at this Site must either be decontaminated properly discarded upon exit from the EZ. All personnel, including any State and local officials, must enter and exit the EZ through the decontamination area. Prior to demobilization, potentially contaminated equipment will be decontaminated and inspected by the Site Engineer or Site Engineer's designate before it is moved into the clean zone. Any material that is generated by decontamination procedures will be stored in a designated area in the EZ until disposal arrangements are made.

The type of decontamination solution to be used is dependent on the type of chemical hazards. The decontamination solution for this Site is Alconox (soap) for equipment and for any reusable PPE.

9.1 EQUIPMENT DECONTAMINATION PROCEDURES

All equipment must be decontaminated within the CRZ by a pressure water cleaner upon exit from the EZ. Decontamination procedures are outlined in Section 5.0 of the Work Plan. Personnel shall wear Level C protection when decontaminating equipment. Runoff will be collected and stored until appropriate disposal arrangements have been made. Following decontamination and prior to exit from the EZ, the Site Engineer or a designated alternate, shall be responsible for ensuring that the item has been sufficiently decontaminated. This inspection shall be included in the Site log.

9.2 PERSONNEL DECONTAMINATION PROCEDURES

The following describes the procedures to be followed by all personnel when leaving the EZ.

Station 1: Equipment Drop

Deposit equipment used on-Site (tools, sampling devices and monitoring instruments, radios, etc.) on plastic drop cloths. These items must be decontaminated or discarded as waste prior to removal from the EZ.

Station 2: Outer Boot and Outer Glove Wash and Rinse

Scrub outer boots, outer gloves and/or splash suit with decontamination solution or detergent wash. Rinse off using water.

Station 3: Outer Boot and Glove Removal

Remove outer boots and gloves. If outer boots are disposable, deposit in a covered container. If non-disposable, store in a clean dry place.

Station 4: Outer Garment Removal

Remove outer garments and deposit in a covered container. Decontaminate or dispose of splash suits as necessary.

Station 5: Respiratory Protection Removal

Remove hard hat and facepiece, and deposit on a clean surface. Air purifying respirator cartridges will be discarded as appropriate. Wash and rinse respirator at least daily. Wipe off and store respiratory gear in a clean, dry location.

Station 6: Inner Glove Removal

Remove inner gloves. Deposit in a covered container.

Station 7: Field Wash

Thoroughly wash hands and face with soap and water.

10.0 GENERAL SAFETY AND PERSONAL HYGIENE

1. Eating at the Site is prohibited except in specifically designated areas. Designation of eating areas will be the responsibility of the HSO. The location of these areas may change during the duration of the project to maintain adequate separation from the active work area(s).

2. Smoking at the Site is prohibited except in specifically designated areas.

3. Individuals getting wet to the skin with effluent from the washing operation must wash the affected area immediately. If clothes in contact with skin are wet, then these must be changed.

4. Hands must be washed with soap and water before eating, drinking, smoking, and before using toilets.

5. All disposable coveralls and soiled gloves will be disposed of in a covered container at the end of every shift or sooner, if deemed necessary by the HSO. Waste will be stored until such time that it is properly disposed of during completion of remedial activities.

11.0 MEDICAL SURVEILLANCE

In accordance with the requirements detailed in 29 CFR 1910.120 and 29 CFR 1910.134, all Site personnel who will come in contact with potentially contaminated materials will have received, within one year prior to starting field activities, medical surveillance by a licensed physician or physician's group.

Medical records for all on-Site personnel will be maintained by their respective employers. The medical records will detail the tests that were taken and will include a copy of the consulting physician's statement regarding the tests and the employee's suitability for work.

The medical records will be available to the employee or his designated representative upon written request, as outlined in 29 CFR 1910.120, Section (f).

Each employer will provide certifications to the Site Engineer that its personnel involved in Site activities will have all necessary medical examinations prior to commencing work which requires respiratory protection or potential exposure to hazardous materials. Personnel not obtaining medical certification will not perform work within contaminated areas.

Interim medical surveillance will be completed if an individual exhibits poor health or high stress responses due to any Site activity or when accidental exposure to elevated concentrations of contaminants occur.

12.0 ENVIRONMENTAL CONTROL PROGRAM

This section of the HASP outlines measures to be implemented at the Site to prevent hazards associated with environmental conditions.

12.1 WEATHER MONITORING

The HSO or Site Engineer will be responsible for checking weather forecasts for the next day and week of work to provide advance notification of any severe weather conditions. Severe weather conditions (e.g., heavy rain) may cause unsafe conditions at the Site and in some situations work may have to be stopped.

12.2 RAIN AND SNOW

Excessive amounts of precipitation may cause potential safety hazards for all work tasks. The hazards would be most commonly associated with slipping, tripping or falling due to slippery surfaces. Further hazards are detailed by work task (Table B7.1).

Severe weather conditions will result in work stoppage and the implementation of further emergency measures, as described in Appendix B-2 of the HASP.

12.3 TEMPERATURE

The remedial actions are expected to be conducted through at least two seasons. Low and high temperatures may be experienced which require measures to be implemented to prevent health and safety hazards from occurring. Potential hazards arising from temperature extremes are heat stress and cold exposure.

The potential hazard due to worker heat stress is particularly important if high protection levels of PPE are in use (e.g., respirators). A detailed monitoring program and prevention measures to implement to reduce heat stress are detailed in Appendix B-3. It is the responsibility of the HSO to determine which measures are appropriate to implement to prevent heat stress; these will depend largely on daily Site conditions.

Exposure to cold is similar to heat stress in that the HSO must determine the appropriate preventative measures to implement. Some of the measures which may be implemented include: more frequent breaks, additional clothing, and partial enclosure of work areas. Detailed cold exposure prevention measures are also included in Appendix B-3.

12.4 WIND

High winds may be encountered at the Site and these can cause hazards that may affect Site personnel health and safety. Preventative measures that will be implemented, if necessary, are as follows:

i) restricted Site activity;
ii) battening down light equipment or building materials;
iii) partially enclosing work areas; and
iv) reduction or stoppage of work activities.

13.0 EMERGENCY CONTINGENCIES

It is essential that Site personnel be prepared in the event of an emergency. Emergencies can take many forms: illnesses or injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather. The following sections outline the general procedures for emergencies. Emergency information should be posted as appropriate.

13.1 EMERGENCY CONTACTS

Fire:	911
Police:	911
Ambulance:	911
Hospital:	Erie County Medical Center (ECMC) 462 Grider Street Buffalo, NY Telephone: 716-898-3000
Poison Control Center:	Buffalo, New York - 716-878-7654

Directions from Site to Hospital: (see Figure B13.1)

1. Leave the Site and proceed east on East Delevan Street for several blocks to Grider Street.
2. Turn left on Grider Street and proceed for two blocks to the Hospital.
3. ECMC will be on the left side of the street.

Note: Maps and directions to the hospitals will be posted or distributed at the Site and discussed at the initial Site safety meeting.

13.2 ADDITIONAL EMERGENCY NUMBERS

Erie County Sheriff Department	716-662-5554
New York State Police	716-542-2245
National Response Center (NRC)	800-424-8802
Agency for Toxic Substances and Disease Registry	404-488-4100 (24-Hour)
Poison Control Center, Buffalo	716-878-7654
NYSDEC, Albany	800-457-7362

Erie County Health Department	716-858-7690
New York State Department of Health (NYSDOH), Buffalo	716-847-4500
NYSDEC Buffalo	716-851-7220
Conestoga-Rovers & Associates Project Manager (Kelly McIntosh)	716-297-6150

13.3 EMERGENCY EQUIPMENT AVAILABLE ON SITE

Communication Equipment	*Location*
Portable Telephone	Site Vehicle
Emergency Alarms/Horns	Support Vehicles
Medical Equipment	OSHA approved first aid kit sized for a minimum of ten people. Portable emergency eyewash.
Fire Fighting Equipment	One 20-pound ABC type dry chemical fire extinguisher in decontamination area.

13.4 PROJECT PERSONNEL RESPONSIBILITIES DURING EMERGENCIES

HEALTH AND SAFETY OFFICER (HSO)

As the administrator of the project, the HSO has primary responsibility for responding to and correcting emergency situations. The HSO will:

i) take appropriate measures to protect personnel including: withdrawal from the EZ, total evacuation and securing of the Site, or upgrading or down-grading the level of protective clothing and respiratory protection;

ii) take appropriate measures to protect the public and the environment including isolating and securing the Site, preventing runoff to surface waters, and ending or controlling the emergency to the extent possible;

iii) ensure that appropriate Federal, State, and local agencies are informed, and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be summoned immediately. In the event of an air release of toxic materials, the local authorities should be informed in order to assess the need for evacuation. In the event of a spill, sanitary districts and drinking water systems may need to be alerted;

iv) ensure that appropriate decontamination treatment or testing for exposed or injured personnel is obtained;

v) determine the cause of the incident and make recommendations to prevent the recurrence; and

vi) ensure that all required reports have been prepared.

13.5 MEDICAL EMERGENCIES

Any person who becomes ill or injured in the EZ must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. If the patient's condition is serious, at least partial decontamination should be completed as much as possible without causing further harm to the patient. First aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must immediately be reported to the HSO and Site Engineer.

Any person transporting an injured/exposed person to a clinic or hospital for treatment should take with them directions to the hospital and a list of any potential compound to which they may have been exposed.

Any vehicle used to transport contaminated personnel will be cleaned or decontaminated as necessary.

13.6 FIRE OR EXPLOSION

In the event of a fire or explosion, the local fire department should be summoned immediately. Upon their arrival, the HSO or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on-Site.

If it is safe to do so, Site personnel may:

i) if hazardous, report to the Agency On-Scene Coordinator and/or Project Manager;

ii) use fire fighting equipment available on-Site; or

iii) remove or isolate flammable or other hazardous materials which may contribute to the fire.

13.7 SPILL OR LEAKS

In the event of a spill or leak, Site personnel will:

i) report minor off-Site spills and releases to the Agency On-Scene Coordinator and/or Project Manager;

ii) report major off-Site spills and releases to the NRC and State Environmental Agency (emergency management);

iii) locate the source of the spillage and stop the flow if it can be done safely; and

iv) begin containment and recovery of the spilled materials.

14.0 COMMUNITY AIR MONITORING

Air monitoring will be performed during performance of the remedial activities to ensure that the community will not be adversely impacted during Site activities. The Community Air Monitoring Plan is described below.

Air monitoring for worker health and safety will be performed as specified in the Section 8.0 of this HASP.

14.1 COMMUNITY AIR MONITORING PLAN

This Community Air Monitoring Plan will be implemented during all ground-intrusive activities at the Site. Real-time air monitoring for VOCs, and respirable dust levels will be performed at the perimeter of the EZ. Monitoring will be conducted on a continuous basis during all ground-invasive activities and during any other activities which may result in the release of Site-related contaminants to the air (i.e., stockpiling and grading of soil). The air monitoring readings will be recorded every hour. In addition, any reading above background will also be recorded.

Community air monitoring will be conducted in accordance with the following:

i) VOCs will be monitored continuously at the downwind perimeter of the EZ. Readings will be recorded at hourly intervals or sooner if an action level has been exceeded. If the organic vapor level exceeds 5 ppm above background, work activities will be halted and monitoring continued under the provisions of the Vapor Emission Response Plan (see Section 14.2). All monitoring readings will be recorded and available for the NYSDEC and NYSDOH for review; and

ii) a fugitive dust suppression and particulate monitoring program will be conducted in accordance with the procedures established in the

Division of Hazardous Waste Remediation's Technical and Administrative Guidance Memorandum (TAGM) #4031. These procedures are presented in Section 14.5.

14.2 STEP 1 VAPOR EMISSION MONITORING

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the downwind perimeter of the EZ, activities will be halted and monitoring at the perimeter of the EZ will be continued. If the organic vapor level decreases below 5 ppm above background at the downwind perimeter of the EZ, work activities can resume. If the organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the downwind perimeter of the EZ, activities can resume provided the organic vapor level 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

If the organic vapor level is above 25 ppm at the downwind perimeter of the EZ, activities will be shut down. When work shutdown occurs, downwind air monitoring at 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, will be performed to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Step 2 Vapor Emission Monitoring section (Section 14.3).

14.3 STEP 2 VAPOR EMISSION MONITORING

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

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

If efforts to abate the emission source are unsuccessful and if any of organic vapor levels persist at 5 ppm above background or greater for more than 30 minutes in the 20 Foot Zone, then the Vapor Emission Response Plan (see Section 14.4) will automatically be placed into effect.

However, the Vapor Emission Response Plan will be immediately placed into effect if organic vapor levels are greater than 10 ppm above background at the 20 Foot Zone for any one time.

14.4 VAPOR EMISSION RESPONSE PLAN

Upon activation, the following activities will be undertaken:

i) all emergency response contacts, as listed in the HASP and/or Emergency Response Plan, will go into effect;

ii) the contaminated soil will be wet down and covered. If the vapors are a result of an open excavation, the excavation will be backfilled; and

iii) frequent air monitoring will be conducted at 30 minute intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the HSO.

14.5 FUGITIVE DUST SUPPRESSION AND PARTICULATE MONITORING PROGRAM

The following fugitive dust suppression and particulate monitoring program will be employed at the Site during ground-intrusive activities or during other activities which may potentially create an airborne hazard:

i) reasonable fugitive dust suppression techniques will be employed during all Site activities which may generate fugitive dust;

ii) particulate monitoring will be employed during ground-invasive activities or activities which may generate fugitive dust;

iii) particulate monitoring will be performed using a real-time particulate monitor that is capable of monitoring particulate matter less than 10 microns in size. Particulate levels will be monitored at the downwind side of the EZ. Readings will be based on the 15 minute average concentration;

iv) the particulate monitoring will be performed by a trained technician who fully understands the operation of the monitoring equipment and necessary calibration procedure. The technician will be responsible for keeping the air monitoring logbook which will contain records of equipment calibration and all air monitoring readings;

v) the action level will be set at 150 $\mu g/m^3$ based on a 15 minute average. If particulate levels are detected in excess of 150 $\mu g/m^3$, the upwind background level will be measured immediately using the same portable monitor. If the working site particulate measurement is greater than 100 $\mu g/m^3$ above the background level, additional dust suppression techniques will be implemented to reduce the generation of fugitive dust and corrective action will be taken to protect Site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal

protection and implementing additional dust suppression techniques. These may include:

a) applying water on haul road(s),

b) wetting equipment and excavation faces,

c) spraying water on buckets during excavation and dumping,

d) hauling materials in tarped containers,

e) restricting vehicle speed,

f) immediately covering excavation areas or materials upon completion, and

g) reducing the size and/or number of excavations;

vi) if dust is observed leaving the working site, additional dust suppression techniques will be employed; and

vii) if the dust suppression techniques being utilized at the Site do not lower particulates to an acceptable level (below 150 $\mu g/m^3$) work will be suspended until appropriate corrective measures are approved to remedy the situation.

15.0 RECORDKEEPING

The HSO shall establish and maintain records of all necessary and prudent monitoring activities as described below:

i) name, social security number, and job classification of the employees involved on specific tasks;

ii) records of qualitative fit testing and physical examination results for Site personnel;

iii) records of all OSHA training certification for Site personnel;

iv) records of training acknowledgment forms; and

v) emergency report sheets describing any incidents or accidents.

9.0 DECONTAMINATION PROCEDURES

In general, everything that enters the EZ at this Site must either be decontaminated properly discarded upon exit from the EZ. All personnel, including any State and local officials, must enter and exit the EZ through the decontamination area. Prior to demobilization, potentially contaminated equipment will be decontaminated and inspected by the Site Engineer or Site Engineer's designate before it is moved into the clean zone. Any material that is generated by decontamination procedures will be stored in a designated area in the EZ until disposal arrangements are made.

The type of decontamination solution to be used is dependent on the type of chemical hazards. The decontamination solution for this Site is Alconox (soap) for equipment and for any reusable PPE.

9.1 EQUIPMENT DECONTAMINATION PROCEDURES

All equipment must be decontaminated within the CRZ by a pressure water cleaner upon exit from the EZ. Decontamination procedures are outlined in Section 5.0 of the Work Plan. Personnel shall wear Level C protection when decontaminating equipment. Runoff will be collected and stored until appropriate disposal arrangements have been made. Following decontamination and prior to exit from the EZ, the Site Engineer or a designated alternate, shall be responsible for ensuring that the item has been sufficiently decontaminated. This inspection shall be included in the Site log.

9.2 PERSONNEL DECONTAMINATION PROCEDURES

The following describes the procedures to be followed by all personnel when leaving the EZ.

Station 1: Equipment Drop

Deposit equipment used on-Site (tools, sampling devices and monitoring instruments, radios, etc.) on plastic drop cloths. These items must be decontaminated or discarded as waste prior to removal from the EZ.

Station 2: Outer Boot and Outer Glove Wash and Rinse

Scrub outer boots, outer gloves and/or splash suit with decontamination solution or detergent wash. Rinse off using water.

Station 3: Outer Boot and Glove Removal

Remove outer boots and gloves. If outer boots are disposable, deposit in a covered container. If non-disposable, store in a clean dry place.

Station 4: Outer Garment Removal

Remove outer garments and deposit in a covered container. Decontaminate or dispose of splash suits as necessary.

Station 5: Respiratory Protection Removal

Remove hard hat and facepiece, and deposit on a clean surface. Air purifying respirator cartridges will be discarded as appropriate. Wash and rinse respirator at least daily. Wipe off and store respiratory gear in a clean, dry location.

Station 6: Inner Glove Removal

Remove inner gloves. Deposit in a covered container.

Station 7: Field Wash

Thoroughly wash hands and face with soap and water.

10.0 GENERAL SAFETY AND PERSONAL HYGIENE

1. Eating at the Site is prohibited except in specifically designated areas. Designation of eating areas will be the responsibility of the HSO. The location of these areas may change during the duration of the project to maintain adequate separation from the active work area(s).

2. Smoking at the Site is prohibited except in specifically designated areas.

3. Individuals getting wet to the skin with effluent from the washing operation must wash the affected area immediately. If clothes in contact with skin are wet, then these must be changed.

4. Hands must be washed with soap and water before eating, drinking, smoking, and before using toilets.

5. All disposable coveralls and soiled gloves will be disposed of in a covered container at the end of every shift or sooner, if deemed necessary by the HSO. Waste will be stored until such time that it is properly disposed of during completion of remedial activities.

11.0 MEDICAL SURVEILLANCE

In accordance with the requirements detailed in 29 CFR 1910.120 and 29 CFR 1910.134, all Site personnel who will come in contact with potentially contaminated materials will have received, within one year prior to starting field activities, medical surveillance by a licensed physician or physician's group.

Medical records for all on-Site personnel will be maintained by their respective employers. The medical records will detail the tests that were taken and will include a copy of the consulting physician's statement regarding the tests and the employee's suitability for work.

The medical records will be available to the employee or his designated representative upon written request, as outlined in 29 CFR 1910.120, Section (f).

Each employer will provide certifications to the Site Engineer that its personnel involved in Site activities will have all necessary medical examinations prior to commencing work which requires respiratory protection or potential exposure to hazardous materials. Personnel not obtaining medical certification will not perform work within contaminated areas.

Interim medical surveillance will be completed if an individual exhibits poor health or high stress responses due to any Site activity or when accidental exposure to elevated concentrations of contaminants occur.

12.0 ENVIRONMENTAL CONTROL PROGRAM

This section of the HASP outlines measures to be implemented at the Site to prevent hazards associated with environmental conditions.

12.1 WEATHER MONITORING

The HSO or Site Engineer will be responsible for checking weather forecasts for the next day and week of work to provide advance notification of any severe weather conditions. Severe weather conditions (e.g., heavy rain) may cause unsafe conditions at the Site and in some situations work may have to be stopped.

12.2 RAIN AND SNOW

Excessive amounts of precipitation may cause potential safety hazards for all work tasks. The hazards would be most commonly associated with slipping, tripping or falling due to slippery surfaces. Further hazards are detailed by work task (Table B7.1).

Severe weather conditions will result in work stoppage and the implementation of further emergency measures, as described in Appendix B-2 of the HASP.

12.3 TEMPERATURE

The remedial actions are expected to be conducted through at least two seasons. Low and high temperatures may be experienced which require measures to be implemented to prevent health and safety hazards from occurring. Potential hazards arising from temperature extremes are heat stress and cold exposure.

The potential hazard due to worker heat stress is particularly important if high protection levels of PPE are in use (e.g., respirators). A detailed monitoring program and prevention measures to implement to reduce heat stress are detailed in Appendix B-3. It is the responsibility of the HSO to determine which measures are appropriate to implement to prevent heat stress; these will depend largely on daily Site conditions.

Exposure to cold is similar to heat stress in that the HSO must determine the appropriate preventative measures to implement. Some of the measures which may be implemented include: more frequent breaks, additional clothing, and partial enclosure of work areas. Detailed cold exposure prevention measures are also included in Appendix B-3.

12.4 WIND

High winds may be encountered at the Site and these can cause hazards that may affect Site personnel health and safety. Preventative measures that will be implemented, if necessary, are as follows:

i) restricted Site activity;
ii) battening down light equipment or building materials;
iii) partially enclosing work areas; and
iv) reduction or stoppage of work activities.

13.0 EMERGENCY CONTINGENCIES

It is essential that Site personnel be prepared in the event of an emergency. Emergencies can take many forms: illnesses or injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather. The following sections outline the general procedures for emergencies. Emergency information should be posted as appropriate.

13.1 EMERGENCY CONTACTS

Fire:	911
Police:	911
Ambulance:	911
Hospital:	Erie County Medical Center (ECMC) 462 Grider Street Buffalo, NY Telephone: 716-898-3000
Poison Control Center:	Buffalo, New York - 716-878-7654

Directions from Site to Hospital: (see Figure B13.1)

1. Leave the Site and proceed east on East Delevan Street for several blocks to Grider Street.
2. Turn left on Grider Street and proceed for two blocks to the Hospital.
3. ECMC will be on the left side of the street.

Note: Maps and directions to the hospitals will be posted or distributed at the Site and discussed at the initial Site safety meeting.

13.2 ADDITIONAL EMERGENCY NUMBERS

Erie County Sheriff Department	716-662-5554
New York State Police	716-542-2245
National Response Center (NRC)	800-424-8802
Agency for Toxic Substances and Disease Registry	404-488-4100 (24-Hour)
Poison Control Center, Buffalo	716-878-7654
NYSDEC, Albany	800-457-7362

Erie County Health Department	716-858-7690
New York State Department of Health (NYSDOH), Buffalo	716-847-4500
NYSDEC Buffalo	716-851-7220
Conestoga-Rovers & Associates Project Manager (Kelly McIntosh)	716-297-6150

13.3 EMERGENCY EQUIPMENT AVAILABLE ON SITE

Communication Equipment	*Location*
Portable Telephone	Site Vehicle
Emergency Alarms/Horns	Support Vehicles
Medical Equipment	OSHA approved first aid kit sized for a minimum of ten people. Portable emergency eyewash.
Fire Fighting Equipment	One 20-pound ABC type dry chemical fire extinguisher in decontamination area.

13.4 PROJECT PERSONNEL RESPONSIBILITIES DURING EMERGENCIES

HEALTH AND SAFETY OFFICER (HSO)

As the administrator of the project, the HSO has primary responsibility for responding to and correcting emergency situations. The HSO will:

i) take appropriate measures to protect personnel including: withdrawal from the EZ, total evacuation and securing of the Site, or upgrading or down-grading the level of protective clothing and respiratory protection;

ii) take appropriate measures to protect the public and the environment including isolating and securing the Site, preventing runoff to surface waters, and ending or controlling the emergency to the extent possible;

iii) ensure that appropriate Federal, State, and local agencies are informed, and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be summoned immediately. In the event of an air release of toxic materials, the local authorities should be informed in order to assess the need for evacuation. In the event of a spill, sanitary districts and drinking water systems may need to be alerted;

iv) ensure that appropriate decontamination treatment or testing for exposed or injured personnel is obtained;

v) determine the cause of the incident and make recommendations to prevent the recurrence; and

vi) ensure that all required reports have been prepared.

13.5 MEDICAL EMERGENCIES

Any person who becomes ill or injured in the EZ must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. If the patient's condition is serious, at least partial decontamination should be completed as much as possible without causing further harm to the patient. First aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must immediately be reported to the HSO and Site Engineer.

Any person transporting an injured/exposed person to a clinic or hospital for treatment should take with them directions to the hospital and a list of any potential compound to which they may have been exposed.

Any vehicle used to transport contaminated personnel will be cleaned or decontaminated as necessary.

13.6 FIRE OR EXPLOSION

In the event of a fire or explosion, the local fire department should be summoned immediately. Upon their arrival, the HSO or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on-Site.

If it is safe to do so, Site personnel may:

i) if hazardous, report to the Agency On-Scene Coordinator and/or Project Manager;

ii) use fire fighting equipment available on-Site; or

iii) remove or isolate flammable or other hazardous materials which may contribute to the fire.

13.7 SPILL OR LEAKS

In the event of a spill or leak, Site personnel will:

i) report minor off-Site spills and releases to the Agency On-Scene Coordinator and/or Project Manager;

ii) report major off-Site spills and releases to the NRC and State Environmental Agency (emergency management);

iii) locate the source of the spillage and stop the flow if it can be done safely; and

iv) begin containment and recovery of the spilled materials.

14.0 COMMUNITY AIR MONITORING

Air monitoring will be performed during performance of the remedial activities to ensure that the community will not be adversely impacted during Site activities. The Community Air Monitoring Plan is described below.

Air monitoring for worker health and safety will be performed as specified in the Section 8.0 of this HASP.

14.1 COMMUNITY AIR MONITORING PLAN

This Community Air Monitoring Plan will be implemented during all ground-intrusive activities at the Site. Real-time air monitoring for VOCs, and respirable dust levels will be performed at the perimeter of the EZ. Monitoring will be conducted on a continuous basis during all ground-invasive activities and during any other activities which may result in the release of Site-related contaminants to the air (i.e., stockpiling and grading of soil). The air monitoring readings will be recorded every hour. In addition, any reading above background will also be recorded.

Community air monitoring will be conducted in accordance with the following:

i) VOCs will be monitored continuously at the downwind perimeter of the EZ. Readings will be recorded at hourly intervals or sooner if an action level has been exceeded. If the organic vapor level exceeds 5 ppm above background, work activities will be halted and monitoring continued under the provisions of the Vapor Emission Response Plan (see Section 14.2). All monitoring readings will be recorded and available for the NYSDEC and NYSDOH for review; and

ii) a fugitive dust suppression and particulate monitoring program will be conducted in accordance with the procedures established in the

Division of Hazardous Waste Remediation's Technical and Administrative Guidance Memorandum (TAGM) #4031. These procedures are presented in Section 14.5.

14.2 STEP 1 VAPOR EMISSION MONITORING

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the downwind perimeter of the EZ, activities will be halted and monitoring at the perimeter of the EZ will be continued. If the organic vapor level decreases below 5 ppm above background at the downwind perimeter of the EZ, work activities can resume. If the organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the downwind perimeter of the EZ, activities can resume provided the organic vapor level 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

If the organic vapor level is above 25 ppm at the downwind perimeter of the EZ, activities will be shut down. When work shutdown occurs, downwind air monitoring at 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, will be performed to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Step 2 Vapor Emission Monitoring section (Section 14.3).

14.3 STEP 2 VAPOR EMISSION MONITORING

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

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

If efforts to abate the emission source are unsuccessful and if any of organic vapor levels persist at 5 ppm above background or greater for more than 30 minutes in the 20 Foot Zone, then the Vapor Emission Response Plan (see Section 14.4) will automatically be placed into effect.

However, the Vapor Emission Response Plan will be immediately placed into effect if organic vapor levels are greater than 10 ppm above background at the 20 Foot Zone for any one time.

14.4 VAPOR EMISSION RESPONSE PLAN

Upon activation, the following activities will be undertaken:

i) all emergency response contacts, as listed in the HASP and/or Emergency Response Plan, will go into effect;

ii) the contaminated soil will be wet down and covered. If the vapors are a result of an open excavation, the excavation will be backfilled; and

iii) frequent air monitoring will be conducted at 30 minute intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the HSO.

14.5 FUGITIVE DUST SUPPRESSION AND PARTICULATE MONITORING PROGRAM

The following fugitive dust suppression and particulate monitoring program will be employed at the Site during ground-intrusive activities or during other activities which may potentially create an airborne hazard:

i) reasonable fugitive dust suppression techniques will be employed during all Site activities which may generate fugitive dust;

ii) particulate monitoring will be employed during ground-invasive activities or activities which may generate fugitive dust;

iii) particulate monitoring will be performed using a real-time particulate monitor that is capable of monitoring particulate matter less than 10 microns in size. Particulate levels will be monitored at the downwind side of the EZ. Readings will be based on the 15 minute average concentration;

iv) the particulate monitoring will be performed by a trained technician who fully understands the operation of the monitoring equipment and necessary calibration procedure. The technician will be responsible for keeping the air monitoring logbook which will contain records of equipment calibration and all air monitoring readings;

v) the action level will be set at 150 $\mu g/m^3$ based on a 15 minute average. If particulate levels are detected in excess of 150 $\mu g/m^3$, the upwind background level will be measured immediately using the same portable monitor. If the working site particulate measurement is greater than 100 $\mu g/m^3$ above the background level, additional dust suppression techniques will be implemented to reduce the generation of fugitive dust and corrective action will be taken to protect Site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal

protection and implementing additional dust suppression techniques. These may include:

a) applying water on haul road(s),

b) wetting equipment and excavation faces,

c) spraying water on buckets during excavation and dumping,

d) hauling materials in tarped containers,

e) restricting vehicle speed,

f) immediately covering excavation areas or materials upon completion, and

g) reducing the size and/or number of excavations;

vi) if dust is observed leaving the working site, additional dust suppression techniques will be employed; and

vii) if the dust suppression techniques being utilized at the Site do not lower particulates to an acceptable level (below 150 $\mu g/m^3$) work will be suspended until appropriate corrective measures are approved to remedy the situation.

15.0 RECORDKEEPING

The HSO shall establish and maintain records of all necessary and prudent monitoring activities as described below:

i) name, social security number, and job classification of the employees involved on specific tasks;

ii) records of qualitative fit testing and physical examination results for Site personnel;

iii) records of all OSHA training certification for Site personnel;

iv) records of training acknowledgment forms; and

v) emergency report sheets describing any incidents or accidents.

FIGURES

N.T.S.

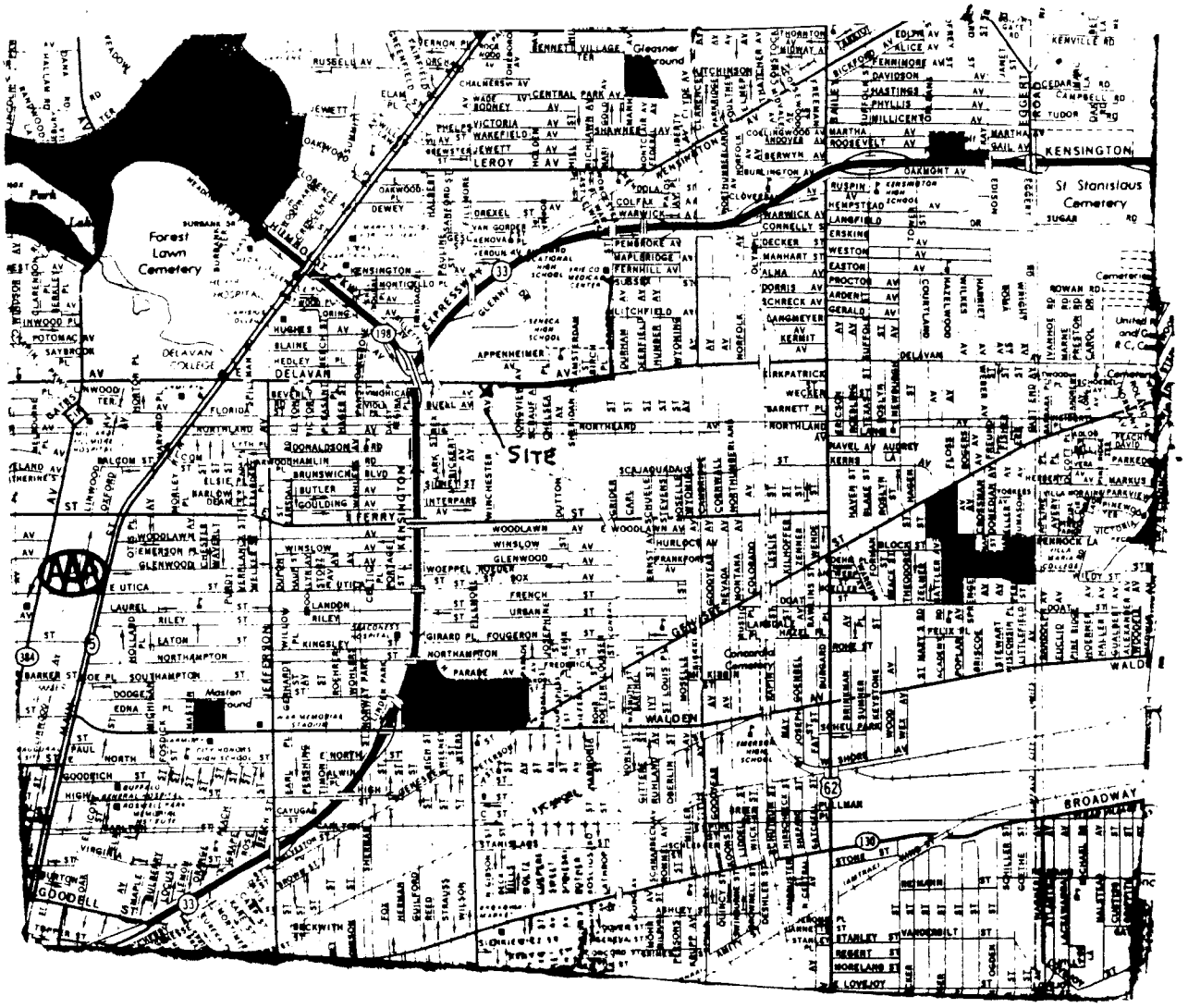

figure B13.1

EMERGENCY HOSPITAL ROUTE
VIBRATECH, INC.
Buffalo, New York

CRA

5927 (4) Apr 27/95 (NF) REV. 0 (M-01)

TABLE B2.1

EXPOSURE ROUTES AND EXPOSURE LEVELS FOR THE COMPOUNDS OF CONCERN
VIBRATECH, INC. SITE
BUFFALO, NEW YORK

Contaminant	*Ionization Potential*	*Exposure Routes*	*Acceptable Exposure Levels in Air*
1,1-Dichloroethane	11.1	Inhalation, Ingestion	100 ppm (1) 100 ppm (2) 4000 ppm (3)
1,2-Dichloroethane	11.1	Inhalation, Ingestion	10 ppm 50 ppm 1000 ppm
total-1,2-Dichloroethene (cis- and trans-)	9.7	Inhalation, Ingestion	200 ppm 200 ppm 4000 ppm
Toluene	8.7	Inhalation, Ingestion Skin absorption	50 ppm 200 ppm 2000 ppm
1,1,1-Trichloroethane	11.0	Inhalation, Ingestion	350 ppm 350 ppm 1000 ppm
Trichloroethene	9.5	Inhalation, Ingestion	50 ppm 100 ppm 1000 ppm
Vinyl chloride	10.0	Inhalation, Ingestion Human carcinogen	5 ppm 1 ppm NE
total Xylene	8.5	Inhalation, Ingestion	100 ppm 100 ppm 1000ppm

Notes:

(1) 1994-1995 Values, American Conference of Governmental Industril Hygienists (ACGIH), Threshold Limit Value (TLV).

(2) Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL)

(3) Immediately Dangerous to Life and Health (IDLH)

NE Not Established

TABLE B6.1

SPECIFIC PERSONAL PROTECTION LEVELS
VIBRATECH, INC. SITE
BUFFALO, NEW YORK

Work Task	*Maximum Protection Level*(1)	*Alternate Protection Level*(2)
Mobilization and Demobilization Activities	Modified D	D
Excavation of Contaminated Soils and Building of the Soil Pile	C	Modified D
Performance Monitoring	Modified D	D
Confirmatory Soil Sampling	Modified D	D
Backfilling, Grading, and Seeding Activities	D	D
Decontamination Activities	C	Modified D

Notes:
Specific requirements of protection levels are detailed in Section 6.1.

(1) Level C: To be worn when the criterion for using air-purifying respirators (APRs) are met and a lesser level of skin protection is needed.
Modified Level D: To be worn when dermal protection is required, however, no respiratory hazards are present. It provides minimal protection against chemical hazards.

(2) Alternate protection levels will be used if monitoring indicates that conditions are appropriate or the Health and Safety Officer (HSO) and Site Engineer agree that there is a reduced potential of exposure.

TABLE B7.1

ANTICIPATED HAZARDS/RISKS AND APPROPRIATE PRECAUTIONS
VIBRATECH, INC. SITE
BUFFALO, NEW YORK

Activity	*Anticipated Hazards/Risks*	*Appropriate Precautions*
1. Mobilization and Demobilization Activities and Backfilling, Grading, and Seeding Activities	• slip/trip/fall hazards • potential back injuries from lifting heavy objects • cuts to hands from working on wire fencing or with sharp objects • potential heat or cold stress • severe weather • electrical hazards from power sources • moving or backing vehicles	• Level D personal protection • practice safe lifting techniques • wear appropriate gloves while working on the fence • participate in on-Site training programs • practice good personal hygiene principles • use a spotter around moving or backing equipment • work activities will be reduced or suspended during severe weather conditions • grounded plugs should be used to reduce the hazard of electrical shock. Do not stand in water when handling equipment. Electrical equipment will be approved. • keep first aid supplies readily available
2. Excavation of Contaminated Soils and Building of the Soil Pile, Performance Monitoring, Confirmatory Soil Sampling, and Decontamination Activities	• slip/trip/fall hazards • potential back injuries from lifting heavy objects • potential heat or cold stress • severe weather • electrical hazards from power sources • moving or backing vehicles and equipment • personnel injuries from sharp objects, falling debris or pinch points • direct contact with potentially contaminated soils or groundwater • hazards presented by the use of heavy equipment • hazards presented by open excavations • overhead and underground hazards (i.e., electrical lines, gas lines) • potential burns from hot equipment • hazards presented by the use of specialized equipment (e.g., decontamination equipment) • reduced field of vision from wearing full-face respirators	• Level C, Modified Level D, based on realtime air monitoring • practice safe lifting techniques • participate in all on-Site training programs • be trained with all appropriate equipment standard operating procedures • practice good personal hygiene principles • install fencing around all open excavations • only essential personnel allowed in work area • use a spotter around moving or backing equipment • identify all high temperature objects or equipment • work activities will be reduced or suspended during severe weather conditions • grounded plugs should be used to reduce the hazard of electrical shock. Do not stand in water when handling equipment. Electrical equipment will be approved. • keep first aid supplies readily available.

APPENDIX B-1

TRAINING ACKNOWLEDGEMENT FORM

TRAINING ACKNOWLEDGEMENT FORM

Please Print:

NAME: _____

ADDRESS: _____

SOCIAL SECURITY NUMBER: _____

EMPLOYER: _____

JOB SITE: Vibratech, Inc., Buffalo, NY

I have attended and understood the mandatory Site-specific initiation session for the above referenced job site. This program referenced the following topics:

i) known potential hazards on-Site;

ii) level of personal protection equipment required;

iii) emergency procedures for the Site; and

iv) the basics of the Site-specific Health and Safety Plan.

I further confirm that I have the required 40 hours of training to comply with 29 CFR 1910.120, have a respirator for which I have been fit tested and have been thoroughly trained on the standard operating procedures of equipment I will be operating or procedures (e.g., confined space) which I will be participating in.

_____ _____

(Date) (Signature)

APPENDIX B-2

SEVERE WEATHER PROCEDURES

SEVERE WEATHER

When projects are conducted outside, the potential for severe weather must be considered. Thunderstorms, tornadoes and winter storms can develop quickly, jeopardizing Site safety. The following emergency procedures are to be followed in the event of severe weather.

Thunderstorms and Lightning

1. Monitor weather conditions at all times while working. At a sign of an impending storm - increased cloudiness, darkened skies, increased wind - listen to a radio for the latest weather information.

2. When a thunderstorm accompanied by lightning is in the project area, reduce activities or cease work immediately.

3. Perform decontamination as quickly and orderly as possible, if work stoppage is necessary.

4. Seek shelter inside nearest building or Site trailer.

5. If you are caught in an open area and you feel your hair stand on end, lightning may be about to strike you. Drop to your knees and bend forward, putting your hands on your knees. DO NOT LIE FLAT ON THE GROUND.

6. If someone has been struck by lightning, monitor life signs and begin administering mouth-to-mouth resuscitation or cardiopulmonary resuscitation as needed. Send for help.

7. Check conscious victims for burns, especially at the fingers and toes and next to buckles and jewelry. Administer first aid for shock. Do not let the victim walk around.

Tornadoes

1. Tornadoes usually develop from thunderstorms and normally occur at the trailing edge of the storm. Most tornadoes occur in the months of April, May, June and July in the late afternoon and early evening hours.

2. When storms are predicted for the project area, monitor weather conditions on a radio. A tornado watch is issued when favorable conditions exist for the development of a tornado. A tornado warning is issued by the local weather service office whenever a tornado has actually been sighted or is strongly indicated by radar.

3. If a tornado warning is issued, seek shelter immediately.

4. If a tornado warning is issued and you are in a vehicle or a Site trailer, leave and go to the nearest building.

5. Once a tornado has passed the Site, Site personnel are to assemble at the designated SZ area to determine if anyone is missing. Administer first aid and seek medical attention as needed.

APPENDIX B-3

TEMPERATURE STRESS PREVENTION AND MONITORING

HEAT STRESS PREVENTION AND MONITORING[1]

Heat stress may occur at any time work is being performed at elevated temperatures. Wearing of chemical protective clothing, which may result in decreasing natural body ventilation, increases the risk of heat stress.

If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur, ranging from mild (such as fatigue, irritability, anxiety, and decreased concentration, dexterity movement) to fatal. Because heat stress is one of the most common and potentially serious illnesses at hazardous waste sites, regular monitoring and other preventative measures are vital.

Site workers must learn to recognize and treat the various forms of heat stress. The best approach is preventative heat stress management. In general, if possible:

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

2. acclimate workers to Site work conditions by slowly increasing workloads (e.g., do not begin Site work activities with extremely demanding activities);

3. provide cooling devices to aid natural body ventilation. These devices, however, add weight and their use should be balanced against worker efficiency. An example of a cooling aid is long cotton underwear which acts as a wick to absorb moisture and protect the skin from direct contact with heat-absorbing protective clothing;

4. in extremely hot weather, conduct field activities in the early morning and evening;

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(1) Sources: (USEPA, 1985) 29 United States Code of Federal Regulations, 1910.29

5. ensure that adequate shelter is available to protect personnel against heat as well as cold, rain, snow, etc., which can decrease physical efficiency and increase the probability of both heat and cold stress. If possible, set up the command post in the shade;

6. in hot weather, rotate shifts of workers wearing impervious clothing; and

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

The following is a discussion of specific results of heat stress.

Heat Stroke

Heat stroke is an acute and dangerous reaction to heat stress caused by failure of heat regulating mechanisms of the body; the individual's temperature control system that causes sweating stops working correctly. Body temperature rises so high that brain damage and death will result if the person is not cooled quickly.

- Symptoms - Red, hot, dry skin, although person may have been sweating earlier; nausea; dizziness; confusion; extremely high body temperature; rapid respiratory and pulse rate; unconsciousness or coma.

- Treatment - Cool the victim quickly. If the body temperature is not brought down fast, permanent brain damage or death will result. Soak the victim in cool, but not cold water; sponge the body with cool water or pour water on the body to reduce the temperature to a safe level (102°F). Observe the victim and obtain medical help. Do not give coffee, tea or alcoholic beverages.

Heat Exhaustion

Heat exhaustion is a state of every definite weakness or exhaustion caused by the loss of fluids from the body. The condition is much less dangerous than heat stroke, but it nonetheless must be treated.

- Symptoms - Pale, clammy, moist skin; profuse perspiration and extreme weakness. Body temperature is normal, pulse is weak and rapid, breathing is shallow. The person may have a headache, may vomit and may be dizzy.

- Treatment - Remove the person to a cool, air conditioned place, loosen clothing, place in a head-low position and provide bed rest. Consult physician, especially in severe cases. The normal thirst mechanism is not sensitive enough to ensure body fluid replacement. Have patient drink one to two cups of water immediately, and every 20 minutes thereafter until

symptoms subside. Total water consumption should be about one to two gallons per day.

Heat Cramps

Heat cramps are caused by perspiration that is not balanced by adequate fluid intake. Heat cramps are often the first sign of a condition that can lead to heat stroke.

- Symptoms - Acute painful spasms of voluntary muscles (e.g., abdomen and extremities).

- Treatment - Remove victim to cool area and loosen clothing. Have patient drink one to two cups of water immediately and every 20 minutes thereafter until symptoms subside. Total water consumption should be one to two gallons per day.

Heat Rash

Heat rash is caused by continuous exposure to heat and humid air and is aggravated by chafing clothes. The condition decreases ability to tolerate heat.

- Symptoms - Mild red rash, especially in areas of the body that come into contact with protective gear.

- Treatment - Decrease amount of time in protective gear and provide powder to help absorb moisture and decrease chafing.

Heat Stress Monitoring and Work Cycle Management

For strenuous field activities that are part of on-going Site work activities in hot weather, the following procedures shall be used to monitor the body's physiological response to heat, and to manage the work cycle, even if workers are not wearing impervious clothing. These procedures are to be instituted when the temperature

exceeds 70°F. If possible these measures will be supplemented by the use of automatic monitoring equipment which can be worn by the workers under their PPE.

- Measure Heart Rate - Heart rate (HR) should be measured by the radial pulse for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats/minute. If the HR is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same. If the pulse rate still exceeds 110 beats/minute at the beginning of the next rest period, the following work cycle should be further shortened by 33 percent. The procedure is continued until the rate is maintained below 110 beats/minute.

- Measure Body Temperature - When ambient temperature is over 90°F, body temperatures should be measured with a clinical thermometer as early as possible in the resting period. If oral temperature (OT) at the beginning of the rest period exceeds 99.6°F, the next work period should be shortened by 33 percent, while the length of the rest period stays the same. If the OT exceeds 99.6°F at the beginning of the next rest period, the following work cycle should be further shortened by 33 percent. The procedure is continued until the body temperature is maintained below 99.6°F.

- Physiological Monitoring Schedule - The following Suggested Frequency of Physiological Monitoring Schedule for Fit and Acclimated Workers shall be used as a guideline.

Temperature (Adjusted)	*(Level D)*	*(Level C)*
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5°F (30.8°-32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5°-87.5°F (28.1°-32.2°C)	After each 90 minutes of work	After each 60 minutes of work
77.5°-82.5°F (25.3°-28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5°-77.5°F (22.5°-25.3°C)	After each 150 minutes of work	After each 120 minutes of work

Measure the air temperature with a standard thermometer. Estimate the fraction of sunshine by judging what percent of the sun is out.

100% sunshine = no cloud cover = 1.0
50% sunshine - 50% cloud cover = 0.5
0% sunshine - full cloud cover = 0.0
Adjusted temp. = actual temp. + 13 x (% sunshine factor).

The length of work period is governed by Frequency of Physiological Monitoring. The length of the rest period is governed by physiological parameters (heart rate and oral temperature). For example, if an individual's heart rate exceeds 110 beats/minute at the beginning of the rest period, that individual will remain on rest-time until his/her heart rate drops well below 110 beats/minute and their next work period (= duration of time before suggested physiological monitoring) is decreased by 33 percent.

COLD STRESS PREVENTION AND MONITORING

Persons working outdoors in low temperatures, especially at or below freezing are subject to cold stress. Exposure to extreme cold for a short time causes severe injury to the surface of the body, or results in profound generalized cooling, causing death. Areas of the body which have a high surface area-to-volume ratio such as fingers, toes, and ears, are the most susceptible.

Chemical protective clothing generally does not afford protection against cold stress. In many instances, it increases susceptibility. Hazardous waste Site workers must learn to dress carefully to provide chemical protection and thermal insulation while not dressing so warmly that exercise or strenuous activity will result in heat stress.

Provisions must also be made for the fact that after physical activity and accumulation of body heat, sudden chilling during decontamination and rest breaks may increase susceptibility to colds, etc.

Two factors influence the development of a cold injury: ambient temperature and the velocity of the wind. Wind Chill Indices describe the chilling effect of moving air in combination with low temperature.

As a general rule, the greatest incremental increase in wind chill occurs with a wind of 5 miles per hour (mph). Additionally, water conducts heat 240 times faster than air; thus, the body cools suddenly when chemical-protective equipment is removed if the clothing underneath is perspiration-soaked.

Frostbite

Local injury resulting from cold is included in the generic term frostbite. Frostbite of the extremities can be categorized into:

1. frost nip or incipient frostbite is characterized by sudden blanching or whitening of skin;

2. superficial frostbite is characterized by skin with a waxy or white appearance and is firm to the touch, but tissue beneath is resilient; and

3. deep frostbite is characterized by tissues that are cold, pale and solid.

To administer first aid for frostbite:

1. take the victim indoors and rewarm the areas quickly in water that is between 39°C and 41°C (102°F to 105°F);

2. give a warm drink - water or juices, no coffee, tea or alcohol. The victim must not smoke;

3. keep the frozen parts in warm water or covered with warm clothes for 30 minutes even though the tissue will be very painful as it thaws;

4. then elevate the injured area and protect it from injury;

5. do not allow blisters to be broken;

6. use sterile, soft, dry material to cover the injured areas; and

7. keep victim warm and get immediate medical care.

After thawing, the victim should try to move the injured areas a little, but no more than can be done alone, without help. Seek medical attention as soon as possible.

Note:

1. Do not rub the frostbitten part (this may cause gangrene).
2. Do not use ice, snow, gasoline or anything cold on the frostbitten area.
3. Do not use heat lamps or hot water bottles to rewarm the part.
4. Do not place the part near a hot stove.

Hypothermia

Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature. Its symptoms are usually exhibited in five stages:

1. shivering;
2. apathy, listlessness, sleepiness;
3. (sometimes) rapid cooling of the body to less than 95°F;
4. unconsciousness, glassy stare, slow pulse, slow respiration; and
5. death.

If hypothermia is suspected in any field personnel, move person to a warmer location until symptoms recede.