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Environmental Restoration Program

Release Block R, Potential Release Site 129/130

B BUILDING SOLVENT STORAGE SHED ON SCENE COORDINATOR (OSC) REPORT

MOUND PLANT
MIAMISBURG, OHIO

February 1996

FINAL

(Revision 0)

Department of Energy
Ohio Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies

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DEPARTMENT OF ENERGY
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ENVIRONMENTAL RESTORATION PROGRAM
EG&G MOUND APPLIED TECHNOLOGIES

FINAL

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LIST OF ACRONYMS

DOE	U.S. Department of Energy
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration (Program)
FSP	Field Sampling Plan
IRA	Interim Remedial Action
MAT	Mound Applied Technologies
MRC	Monsanto Research Corporation
PARCC	precision, accuracy, representativeness, completeness, and comparability
PID	photoionization detector
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Program Plan
SOP	Standard Operating Procedure
VOC	volatile organic compound

UNITS

mg/Kg	milligrams per kilogram
ppm	parts per million

EXECUTIVE SUMMARY

SITE: EG&G Mound

LOCATION: Miamisburg, Ohio

PROJECT DATES: October 1993 - November 1995

INCIDENT DESCRIPTION: This On Scene Coordinator Report for the B Building Solvent Shed Area was prepared under prime contract DE-AC04-88DP43495, issued to EG&G Mound Applied Technologies (EG&G MAT), by the U.S. Department of Energy (DOE).

The report presents a summary of the removal operation and actions taken as specified in the Interim Remedial Action (IRA) Work Plan for the B Building Solvent Storage Shed Area (DOE, 1995a). A series of environmental soil borings and soil samples were used to characterize the nature and extent of chemical contamination. The results obtained from the sampling activities are presented in this report so that the effectiveness of the soil vapor extraction system (SVE) located at the B Building Solvent Storage Shed can be evaluated.

The soil vapor and soil samples collected to assess current subsurface soil conditions in the area of the B Building Solvent Storage Shed yielded results ranging from non-detected to 2.442 ppm in the soil vapor samples and non-detect to 58 mg/Kg for the soil samples. Freon was reported in several soil vapor samples between March 2 and April 13, 1995, the highest concentrations (Freon 113) was reported in Probe 8 on March 30, 1995.

The geometric mean and upper 95 percent limit of the soil concentrations were calculated for Freon 113, total 1.2-Dichloroethene (1,2-DCE), TCE, and Toluene and are listed in Section 7. The purpose of the statistical analysis is to compare the residual soil concentrations with soil concentrations which would be acceptable. This concentration value is referred to as the clean-up goal in this report. Trichloroethene (TCE) is the only contaminant found that is a carcinogen and was also found in the highest concentration. Included in the calculations are the direct pathways of ingestion and inhalation for the on-site office worker scenario. The guideline value for TCE is 41 mg/Kg. The geometric mean and the upper 95 percent confidence level of the geometric mean of the soil concentrations were below the clean-up goal for TCE, 1,2-DCE, and Toluene. Freon 113 does not have a guideline value, however, is relatively non-toxic based on its threshold limit value (TLV) of 1000 ppm in air.

In addition, all soil sample concentrations of TCE except one (58 mg/Kg) are below the cleanup goals. The soil samples collected resulted in residual concentrations of TCE that yield a risk of 10^{-6} or less. Based on the analytical results and the statistical comparison, the SVE is considered successful and the system has been removed.

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REPORT ORGANIZATION

This document contains the following sections:

- Section 1, Introduction, includes a discussion of the purpose of this document and a brief discussion of the site and past operations.

- Section 2, SVE System Configuration

- Section 3, Sampling Activities, provides an overview of the soil vapor and soil sampling activities, with a brief description of sampling procedures and the laboratory analysis requested.

- Section 4, Quality Assurance/Quality Control, discusses the data quality objectives and the sampling quality assurance activities.

- Section 5, Sampling Results, provides a summary of laboratory data from the soil vapor and soil sampling activities, with a brief discussion of observations made in the field.

- Section 6, Data Reduction and Validation, discusses in summary format the precision, accuracy, and useability of the data.

- Section 7, Data Analysis and Discussion, summarizes the data and provides a brief discussion of the results.

- Section 8, Conclusions and Recommendations, summarizes the usefulness of the data and provides recommendations for decisions affecting the SVE system.

- Section 9, References.

1. INTRODUCTION

1.1. PURPOSE AND SCOPE

This report presents a summary of the removal operation and action taken as specified in the IRA Work Plan for the B Building Solvent Storage Shed Area (DOE, 1995a). A series of environmental soil vapor samples and soil samples were used to evaluate the presence of volatile organic coumpound (VOC) contamination. The results obtained from the sampling activities are presented in this report so that the ER Program can document the effectiveness of the SVE system currently located at the B Building Solvent Storage Shed.

1.2. SITE HISTORY AND PAST OPERATIONS

Mound Plant originated as part of the Manhattan Engineer District in 1948; its purpose was to determine the chemical and metallurgical properties of polonium (DOE, 1993c). Early Mound Plant programs focused on the fabrication of neutron and alpha sources for weapon and nonweapon use. Over the years, investigations involving uranium, protactinium-231, and plutonium-239 were performed as part of the national civilian power reactor program; the separation of stable isotopes of noble gases were investigated; the development of heat sources fueled with plutonium-238 were developed and fabricated; and tritium-handling technology for weapons and nonweapons applications were performed (MRC 1985). Also, the processing of explosive powders and components were developed and performed.

1.3 SITE LOCATION AND DESCRIPTION

Mound Plant is located in west-central Ohio within the city limits of Miamisburg, Ohio (Figure 1.3.1). Mound Plant occupies an area of 306 acres and is situated on the highlands overlooking the Great Miami River. The topography consists of generally flatlying uplands, river valleys, and surficial glacial features such as kames and moraines. The dominant geomorphic features of the plant are two adjoining hills: Main Hill and SM/PP Hill. The two hills are separated by a tributary valley to the Great Miami River and the topographic relief is on the order of 200 feet. Land use within the vicinity of the site is primarily residential and woodland. Much of the installation has been altered through construction and use; however, heavily wooded areas do remain on and near Mound Plant (DOE, 1993c).

The B Building Solvent Storage Shed Area is located on the Main Hill, within the Building court yard between B, H, and OSW Buildings, as shown in Figure 1.3.2.

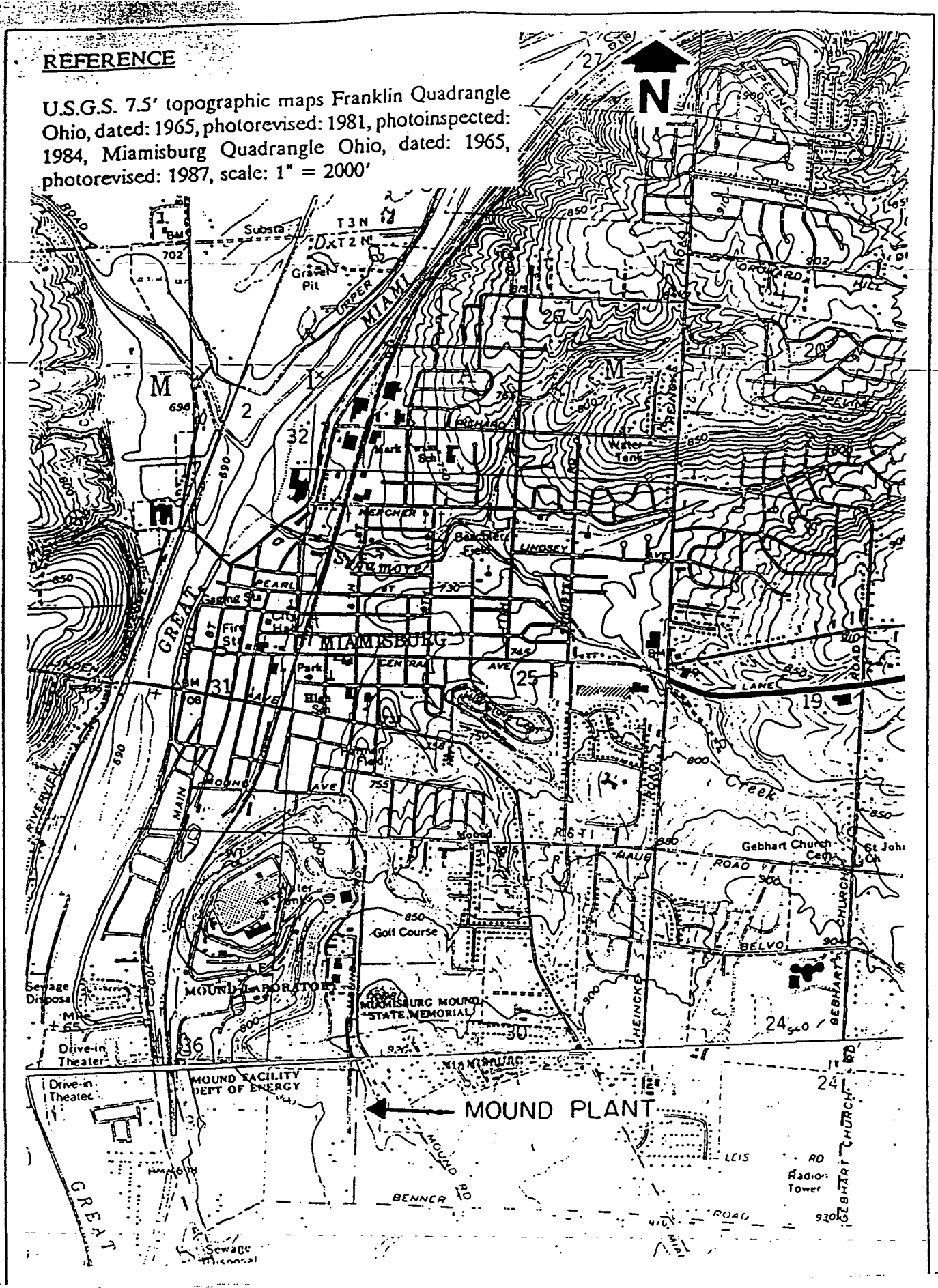


Figure 1.3.1 Location and Topographic Features of Mound Plant, Miamisburg, Ohio

1.4 SUMMARY OF EVENTS

A soil vapor survey was performed in 1992 near the B Building Solvent Storage Shed at DOE's Mound Plant, located in Miamisburg, Ohio. The survey detected VOCs in the shallow soils adjacent to the B Building Solvent Storage Shed (DOE 1992). The contaminants identified in 1992 included Freon 113, trans-1,2-dichloroethene (trans-12-DCE), 1,1,1-trichloroethane (111-TCA), trichloroethene (TCE), and toluene. Due to the presence of elevated VOCs, a removal action was initiated under the DOE Streamline Approach for Environmental Restoration (SAFER) program. The SAFER program is designed to conduct faster, cheaper, better, and safer environmental restorations.

An Action Memorandum was prepared in October 1993 to identify and evaluate potential remedial options. SVE was selected as the preferred IRA alternative for remediating the VOCs in the shallow soils at the B Building Solvent Storage Shed Area (DOE 1993b).

The B Building Solvent Shed was demolished in February 1994. This included the metal shed and and utility services associated with the shed. Also, the concrete slab and footer system supporting this shed was removed. Figures 1.4.1, 1.4.2, 1.4.3, and 1.4.4 shows the original shed and area and demolition activities.

A SVE system was installed in May of 1994, and consisted of 17 SVE wells, five soil probes, a clay cap, system piping, and a pumping unit. The SVE system was operated as a pilot test for one month; the results of the test are documented in an August, 1994 report (DOE 1994a).

Once the pilot test was completed, the SVE system was placed in operation. The Performance Summary Reports (DOE, 1994b and DOE, 1995b) document the sampling, operation, and maintenance activities performed during the period from June through December, 1994.

During the operational period of the SVE system, target VOC concentrations have decreased by over 99 percent based on estimates made from soil vapor concentrations. The SVE system has removed an estimated 40.60 pounds of contaminants by volatilization and an unknown amount of contaminants have been destroyed through biodegradation. The system has been shut down since around December 6, 1994, allowing soil conditions to return to equilibrium.

Figure 1.4.1
B Building
Solvent Shed

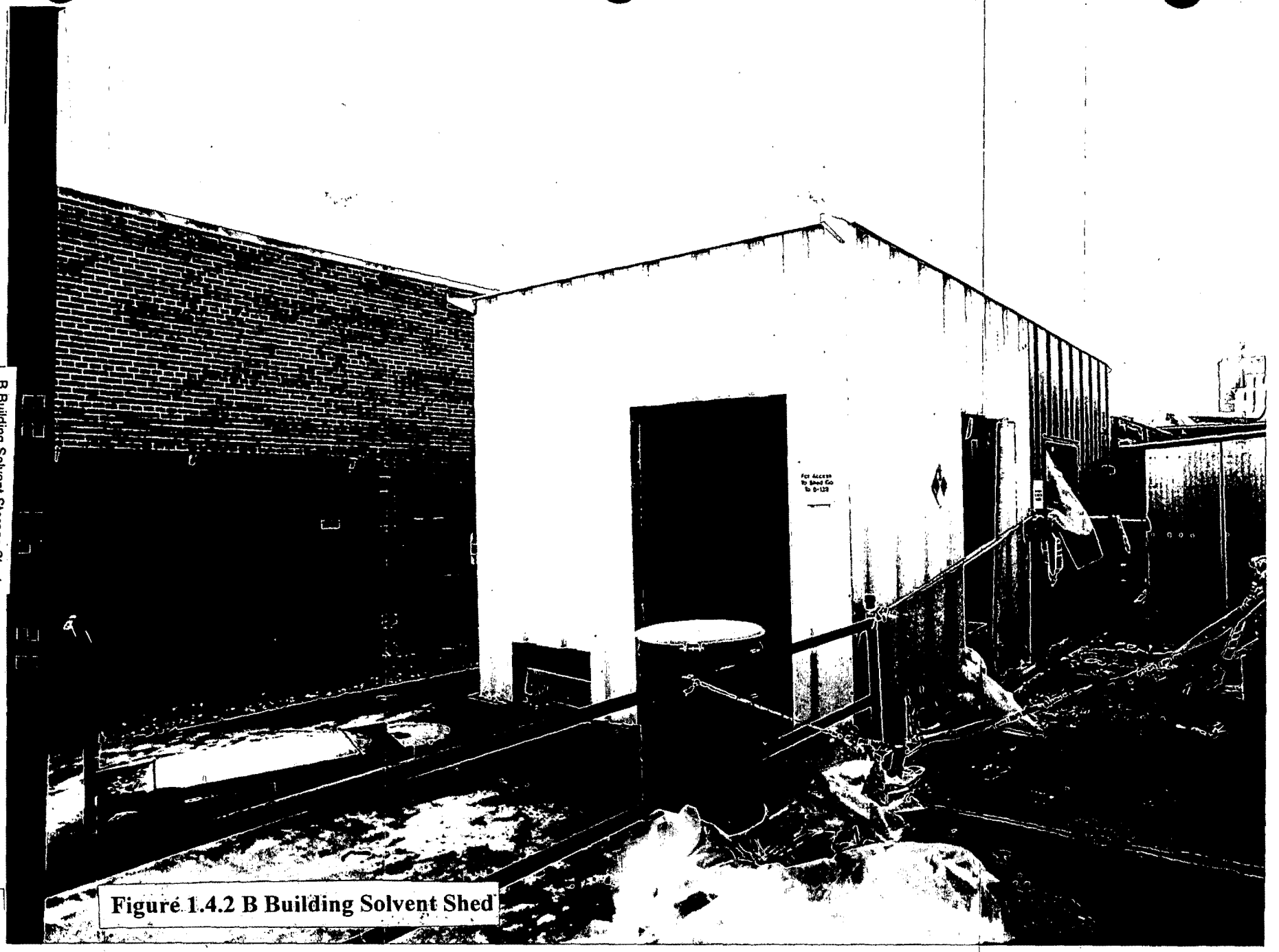


Figure 1.4.2 B Building Solvent Shed

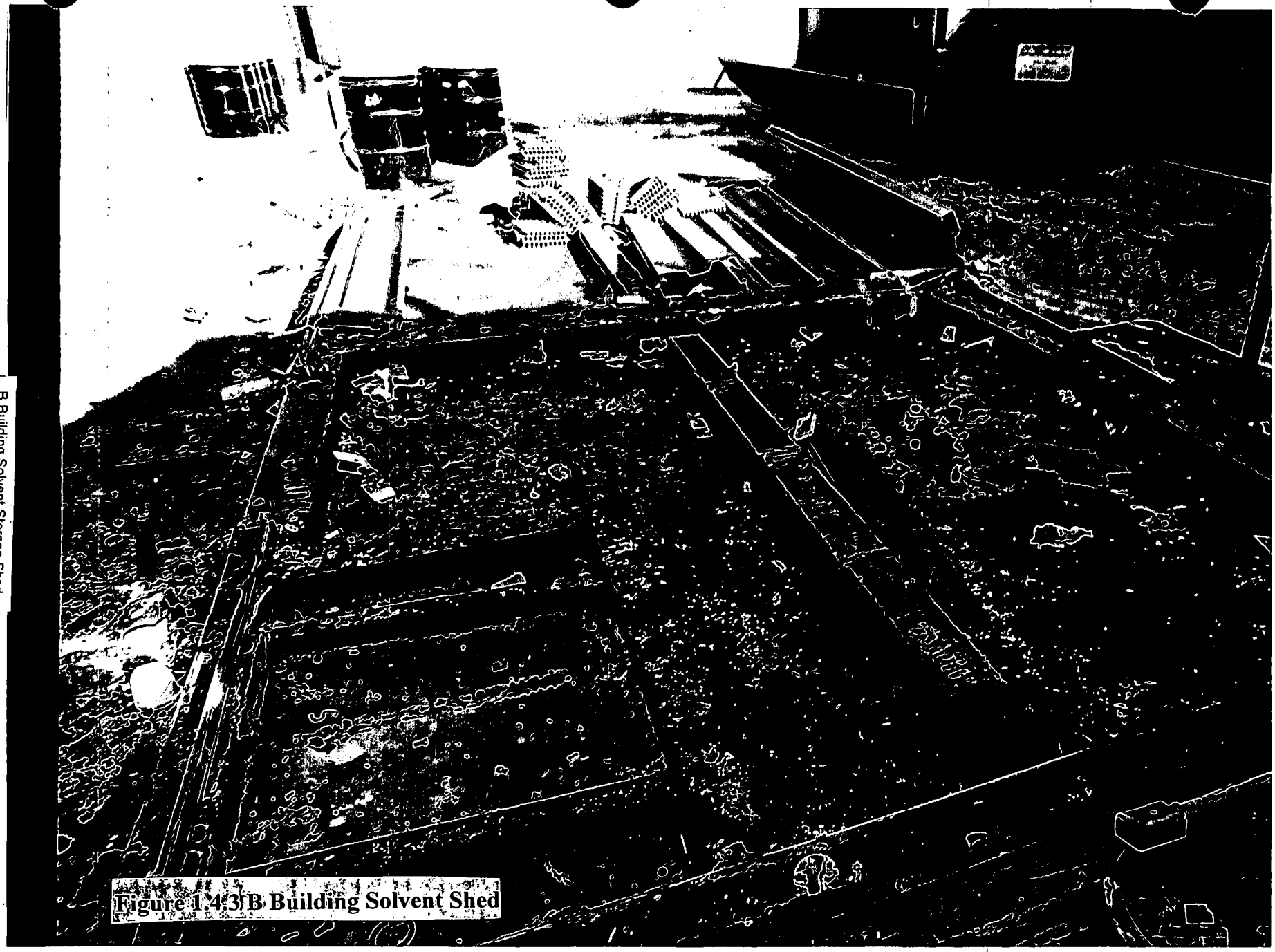


Figure 1.4.3 B Building Solvent Shed

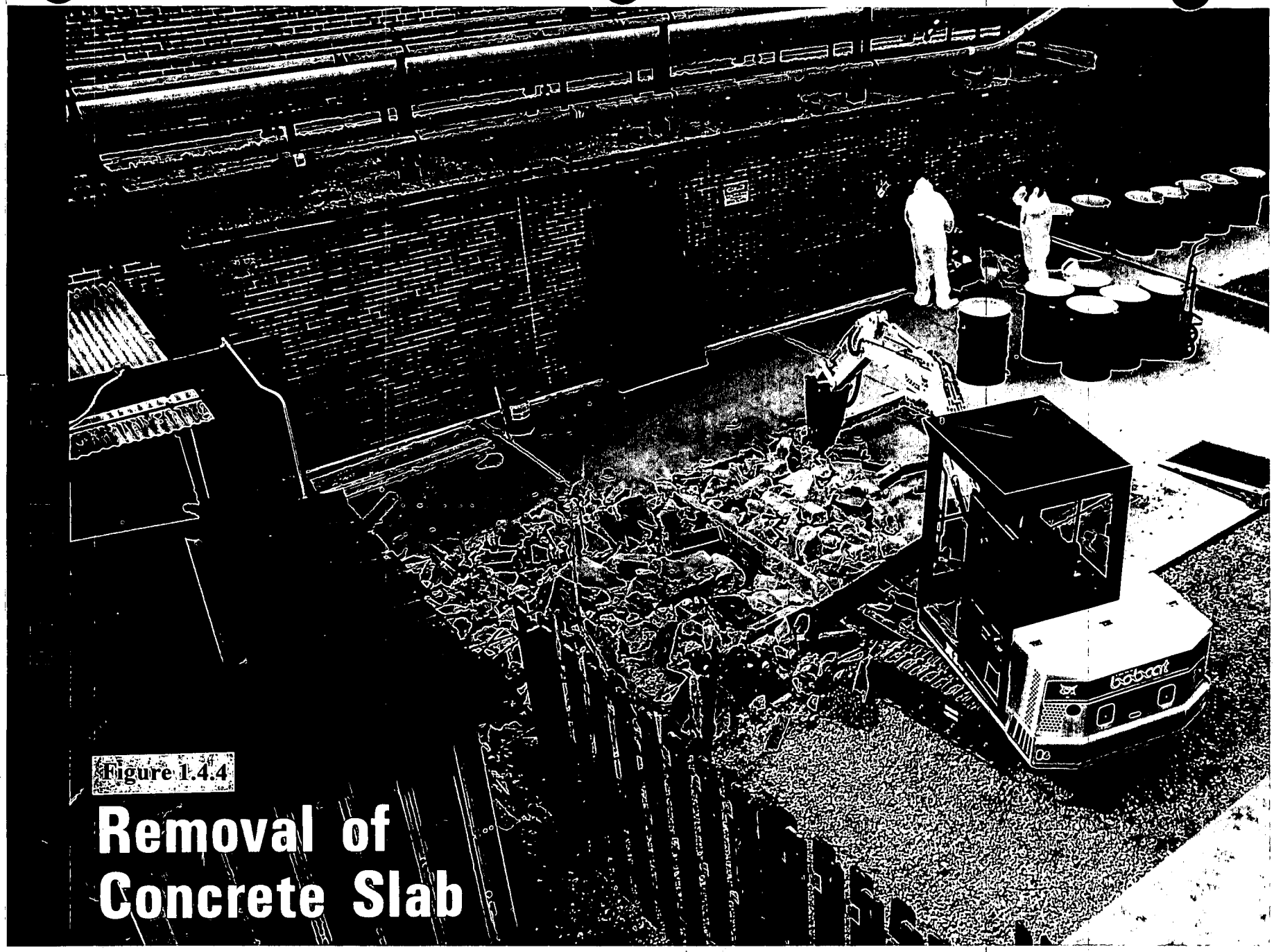


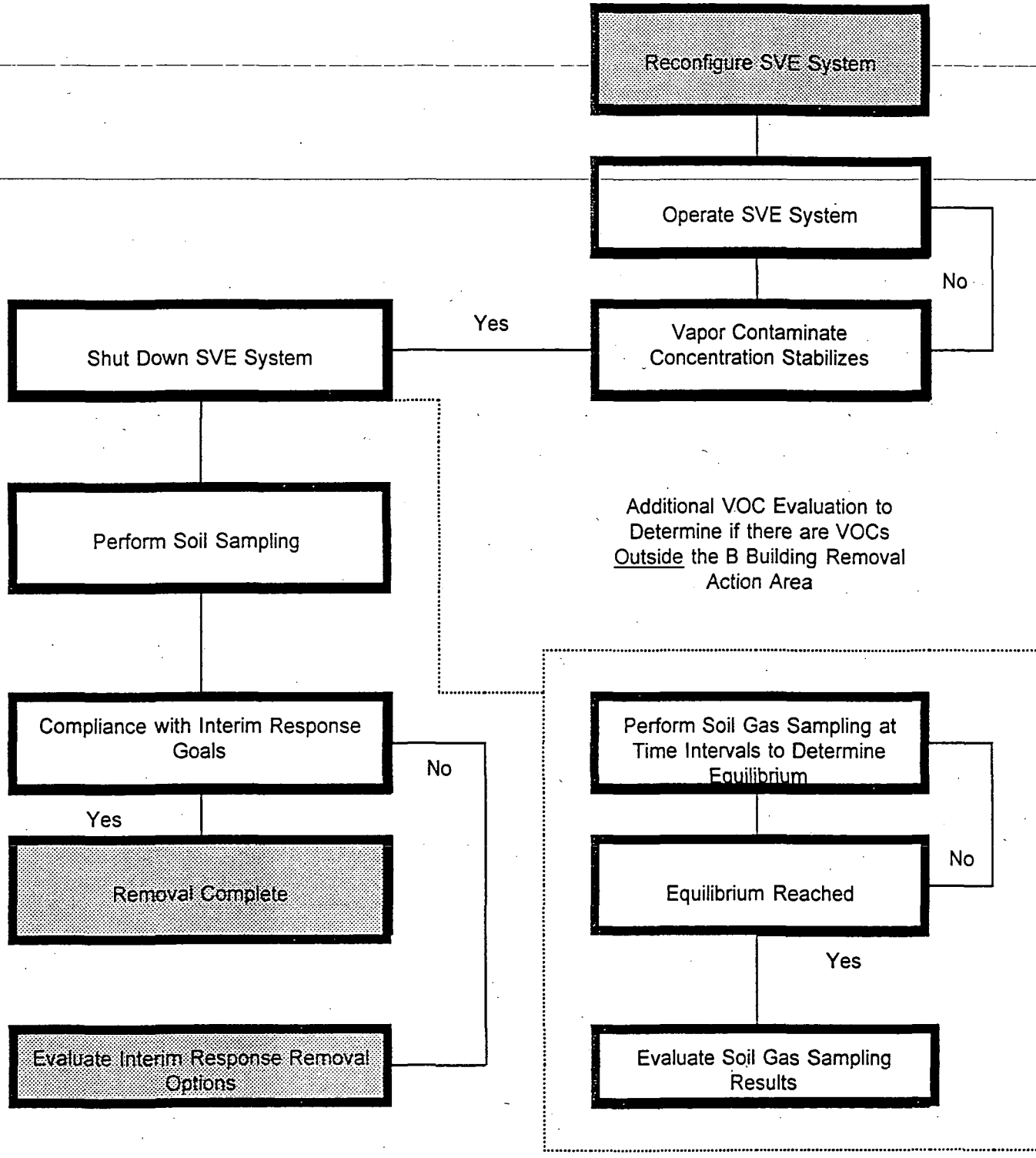
Figure 1.4.4

Removal of Concrete Slab

1.5 INTERIM REMEDIAL ACTION WORK PLAN

The IRA Work Plan provides a detailed description of the ER program and the activities that are to be performed. The data collection activities will be determined by a series of decisions. Figure 1.5.1 provides a decision flow chart that describes the SVE process.

Figure 1.5.1 B Buidling Solvent Storage Shed SVE System Decision Flow Chart



2. SOIL VAPOR EXTRACTION (SVE) SYSTEM CONFIGURATION

2.1. WELL AND PROBE INSTALLATION

17 SVE wells were installed and were constructed of 2-inch poly-vinyl chloride (PVC) pipe and pea gravel. Each of the SVE wells were installed with one foot bentonite seals and completed with concrete to the ground surface. Figure 2.1.1 and 2.1.2 show the well construction activities. The wells were installed at depths ranging from 2 to 6 feet below ground surface.

Five soil probes were installed to provide pressure distribution and VOC concentration data. The soil probes are constructed of 1/8-inch stainless steel and are connected to the ground surface with 1/4-inch polyethylene tubing.

In order to reduce the potential of the wells pulling air from the surface rather than the contaminated soils a 6 mil plastic cover was placed over the exposed soil and covered with a 12-inch clay cap. The clay was compacted in-place using a walk-behind sheep's foot roller. Figure 2.1.3 shows the Final SVE installation.

2.2. SVE CONFIGURATION

The SVE system configuration consisted of five extraction wells (Nos. 7, 9, 10, 12, and 14). The remaining 12 SVE wells operate as air injection wells. The configuration and areas of influence are shown in Figure 2.2.1. Air flows are supplied using an ETG Environmental, Inc. (ETG) pump station equipped with separate 5 hp blowers for injection and extraction. The extraction manifold collects water withdrawn from the wells. This water is held inside the SVE system shed and transferred automatically to a 475-gallon external holding tank when full. A schematic of the SVE system configuration is presented in Figure 2.2.2.

Figure 2.1.1 Well Construction Activities

Figure 2.1.2 Well Construction Activities

Figure 2.1.3 Final SVE Installation

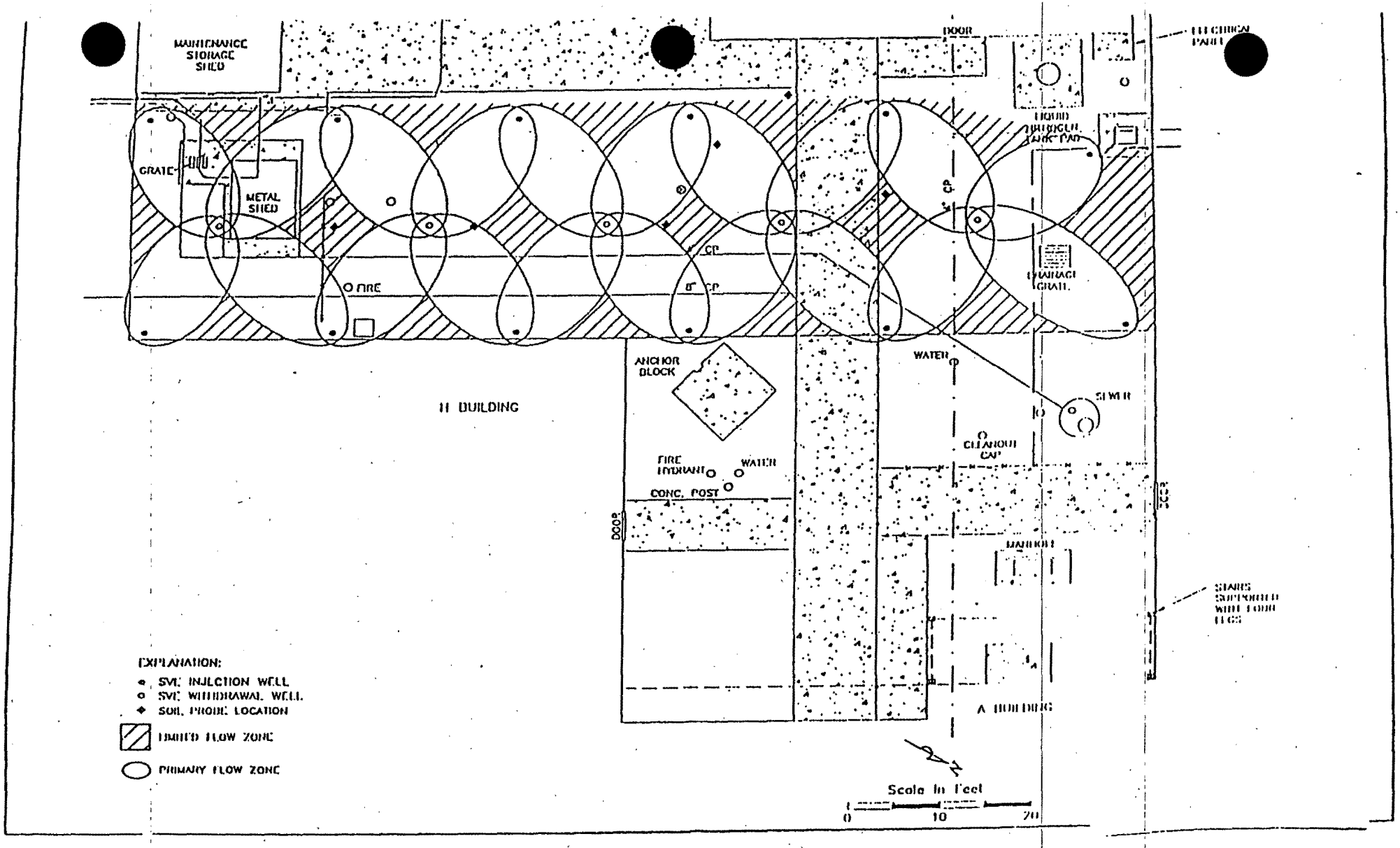


Figure 2.2.1 SVE System Configuration

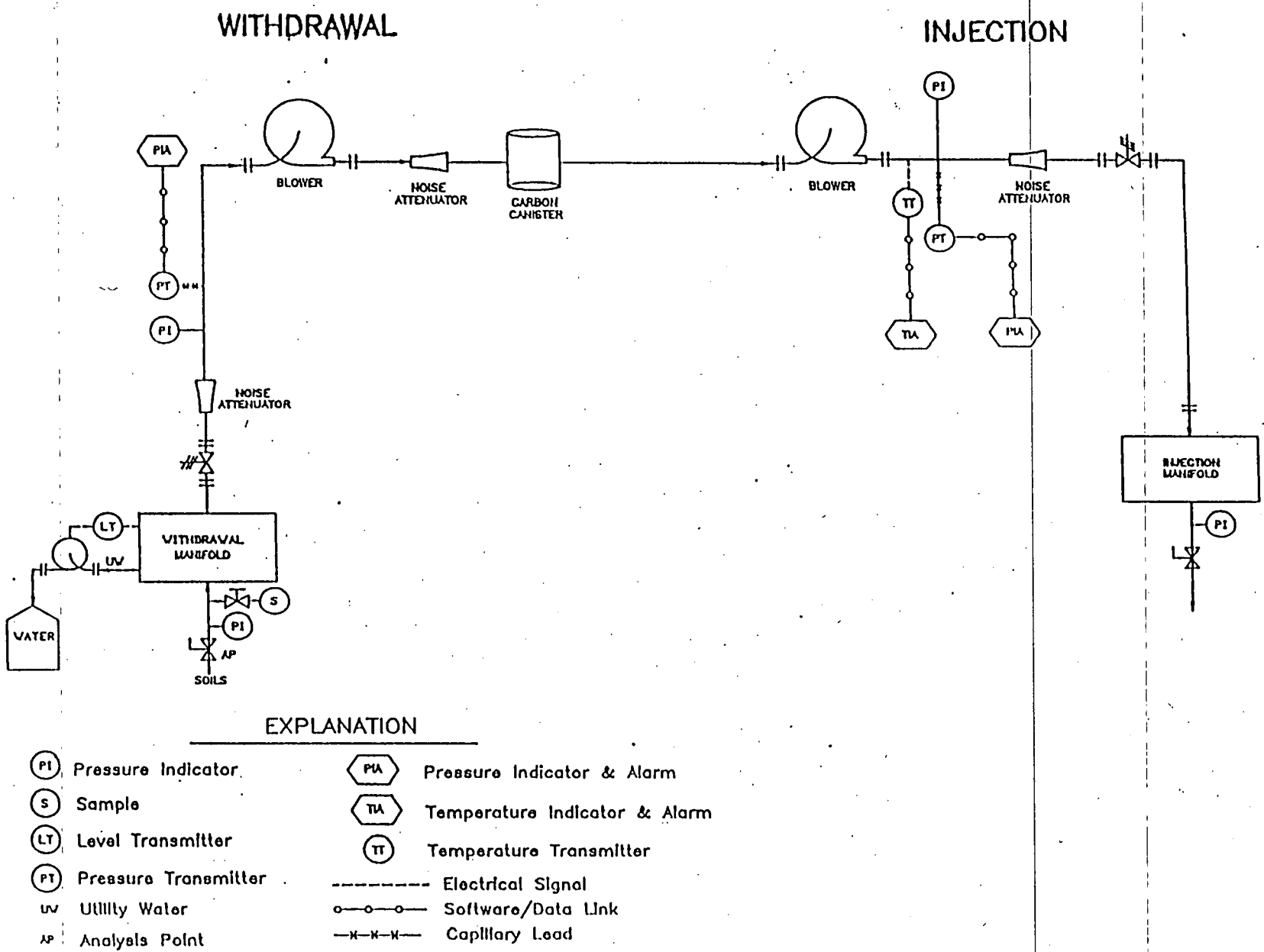


Figure 2.2.2 SVE System Schematic - Closed Loop Configuration

3. SAMPLING ACTIVITIES

3.1. OBJECTIVES

The objective of the sampling investigation was to collect and analyze soil samples and soil vapor samples for VOCs to evaluate the level of contamination in the soils beneath the B Building Solvent Storage Shed Area. Data collected will also be used to assess performance of the SVE system.

3.2. METHODOLOGY

Field sampling procedures were performed in accordance with the requirements of Mound ER Standard Operating Procedures (SOPs). The applicable SOPs included:

- SOP 1.1 General Instructions for Field Personnel
- SOP 1.3 Sample Control and Documentation
- SOP 1.5 Guide to Handling, Packaging and Shipping of Samples
- SOP 1.6 General Equipment Decontamination
- SOP 1.8 Personnel Decontamination - Level D Protection
- SOP 1.15 Guide to Waste Management
- SOP 4.1 Soil Boring
- SOP 5.3 Subsurface Soil Sampling with Hand Auger and Thin Wall Sampler
- SOP 6.2 Health and Safety Monitoring of Organic Vapors with Photoionization Detector

Work activities were based on the IRA Work Plan (DOE, 1995a). Sampling procedures were consistent with Section 6.0 (Confirmational Sampling) of the IRA Work Plan, the IRA Field Sampling Plan (FSP), and SOPS 4.1 and 5.1. Quality control samples for the confirmational sampling were based on the IRA Quality Assurance Project Plan (QAPP), SOP 1.3, and the OU-9, Site-Wide, Quality Assurance Project Plan (QAPP) (DOE 1993a).

3.3 Soil Vapor Sampling

Soil vapor samples were collected bi-monthly over a period of two months beginning on March 2, 1995. Vapor samples were collected from five soil probes as shown in Figure 3.3.1. The soil probes are constructed of ¼-inch polyethelyne tubing. A 6-inch section of flexible tygon tubing was placed over the exposed polyethelyne tubing. A 50 ml plastic syringe was inserted into the open end of the tygon tubing in order to purge vapor from the soil probes. Two to three probe volumes of vapor were removed by pulling the vapor into the syringe clamping the tubing and evacuating the syringe to the atmosphere and repeating the process.

A vapor sample was collected from each of the five probes by attaching a disposable needle to each syringe (one syringe was used per probe). The needle was then inserted into the open end of the tygon tubing, the

Figure 3.3.1 Soil Vapor Sampling

clamp released and a vapor sample drawn into the syringe. The vapor was immediately transferred in to an evacuated 40 ml glass vial by inserting the needle through the septum and pushing the vapor into the vial.

In addition to the vapor samples QA/QC samples were collected during each sampling event. One duplicate sample and one ambient blank were collected. The duplicate samples were collected as described above from one of the soil probes. An ambient blank was prepared by collecting a sample of ambient air.

Soil vapor samples were labeled with identification numbers (I.D.) in accordance with Mound Plants I.D. system (Appendix A), date, time, and the name of the sampler. The samples were transferred under USEPA chain-of-custody procedures to the analytical laboratory for analysis. The samples were analyzed by Microseeps laboratory Test Method AM4.02. Parameters tested for included Freon 11 and 113, trans-12-DCE, cis-12-DCE, 111-TCA, TCE, Toluene, and PCE. Figure depicts field sampling activities being performed.

3.4. Soil Sampling

Thirteen soil borings were drilled utilizing a hand held power auger with a 4¼-inch outside diameter auger. The borings were drilled to a depth of approximately one to four feet below ground surface (bgs).

Confirmatory soil samples were collected on March 20 and 21, 1995, using a hand operated hammer sampler and plastic liners. The hammer sampler collects 6-inch core samples by driving the sampler into undisturbed soil. Samples were collected at depths of 0 to 2 feet bgs and immediately above bedrock. Figure 3.4.1 shows the location of the soil borings.

Soil samples were removed from the sampler and then pushed from the liners. The soil samples were then placed into laboratory supplied 4 oz glass jars with teflon lined screw lids. Each sample was labeled with a sample I.D. number, date, time, sample location, and the name of the sampler. The samples were stored in a chilled cooler until shipping to the analytical laboratory.

Mound Plant Health Physics (HP) personnel were present throughout soil sampling activities. HP personnel screened the soil and sampling equipment for radioactivity. Laboratory samples and coolers were also screened before being allowed to leave the site. No radioactivity was detected during the sampling activities.

The samples were shipped to Ross Analytical Services on March 21, 1995 under USEPA chain-of-custody procedures. The soil samples were analyzed for VOCs by SW-846 Test Method 8240, modified to include Freon 11 and 113.

3.5. FIELD MODIFICATIONS TO THE FSP

During the kick-off meeting and subsequent field meetings, clarifications and changes to the SAP were made. The changes to the FSP consisted of determining the exact number of soil boring locations.

4. QUALITY ASSURANCE/QUALITY CONTROL

4.1. QA/QC OBJECTIVES

The principal goal of the Quality Assurance/Quality Control (QA/QC) program is to ensure that all data are scientifically valid, defensible, and of known precision and accuracy.

4.2. SUMMARY OF DQOs

Data Quality Objectives (DQOs) focus on the identification of the end use of the data to be collected and the degree of certainty with respect to precision, accuracy, reproducibility, completeness, and comparability (PARCC) necessary to satisfy the intended end use.

The sampling effort DQOs were to collect both qualitative and quantitative data. Field screening of samples by EG&G MAT provided qualitative data. At all the sample locations, EG&G MAT personnel split samples for the purpose of screening the samples prior to shipment off site. Off-site laboratory analyses were conducted to generate quantitative data for level III DQOs. The characterization of the B Building Solvent Storage Shed Area is based on these results.

4.3. QUALITY ASSURANCE

4.3.1. Field Control Samples

Quality assurance was maintained throughout the investigation through the use of specific quality control measures. Quality control samples for documenting accuracy and precision of the sampling and field/laboratory analytical process included:

- Trip Blank - One trip blank of deionized water was placed into each cooler containing samples submitted to the laboratory for analysis. The trip blanks were provided by the laboratory with the bottle shipment. The trip blanks were analyzed for VOCs only.
- Field Duplicates - Duplicate samples were collected by splitting samples for non-radiological analyses at a minimum frequency of one per matrix (soil samples).
- Equipment (Rinsate) Blank - One equipment rinsate blank was collected every day and laboratory analyzed for VOCs.

4.3.2. Sample Preservation, Labeling, Containerization and Holding Times

Sample packaging, labeling, and shipment procedures were implemented to 1) preserve sample quality so that the analyses would yield representative results, 2) protect and inform sample handlers including shippers and laboratory personnel, and 3) provide a paper trail to allow cross-referencing of sample collection locations with analytical results.

4.3.2.1. Sample Preservation and Containerization

All soil and QA/QC samples were containerized in laboratory supplied glassware with teflon-lined caps. All samples were kept in coolers with ice at approximately 4°C while at the site and during shipment to the laboratory. The QA/QC samples (trip and equipment rinsate blanks) were preserved as specified in Table III.4. of the IRA QAPP.

4.3.2.2. Sample Holding Times

Sample holding times for this investigation were defined as the period of time between sample containerization (field collection) and sample extraction by the analytical laboratory. The sample holding times for this investigation are presented in Table III.4. of the IRA QAPP. No analytical samples exceeded the corresponding holding times.

4.3.2.3. Sample Handling

Prior to shipment from the site, soil samples were screened in the field by EG&G MAT Health Physics technicians for radiological activity. Following the sample screening, the sample container (ice chest) was then packaged, sealed, and labelled by EG&G MAT for shipment to the analytical laboratory within 24 hours of sample collection. All samples were shipped by an overnight freight service.

4.3.2.4. Packaging

Packaging procedures used for the environmental samples included: cleaning the outside of the sample container; affixing a sample label; placing the sample containers in an ice chest with the appropriate packing material; completing the chain-of-custody forms; and shipping the sample containers.

4.3.2.5. Chain-of-Custody Seal

An adhesive chain-of-custody seal was used on the sampl cooler to show that no tampering had occurred between the time the sample left the field personnel to when it arrived at the laboratory. Three labels were was placed over the coler opening so that the lid could not be removed without breaking the seal. The seals contained the following information:

1. Date Sample date.
2. ID# Sample number for the event.
3. Signature Signature of the person sealing the container.

4.3.3. Decontamination

The IRA FSP specified that all sampling tools were to be decontaminated prior to, and after, sampling by washing the equipment with an alconox followed by rinsing with distilled water and allowed to air dry.

4.4. IDENTIFICATION OF NOTEBOOKS AND RECORDS FOR THE ACTIVITIES

4.4.1. Documentation in Field Notebooks

The field team was required to document all field activities in a field logbook. The logbook was a bound notebook with water resistant pages. Log book entries were dated, legible, and contain accurate and inclusive documentation of site activities. The following guidelines were used when entering information into the logbook:

- All time was reported as military time.
- There were no blank spaces in the logbook entries (if a line was not completely filled in, a line was drawn through the blank portion and initialed so comments could not be added at a later date).
- For any given day, the date would be recorded at the beginning of the logbook entry and below the last entry of that day.
- Each logbook entry was signed at the end of each day, or before someone else entered notes in the logbook.
- Any crossed out entry was initialed by the person who crossed it out.
- All pages in the logbook were numbered consecutively, and signed and dated (top of each page) by the person writing the day's log.

- At the beginning of each day, the following information was recorded: date, start time, and weather.

- The level of protection required for the sampling activity was noted including any changes to the level of protection as per the Health and Safety Plan (HASP) and or the site Health and Safety Officer/Designee.

- The location and time when samples were collected.

- Any deviation from the sampling plan and rationale for the deviation were explained.

- Individual(s) responsible for sample shipping included in their field notebooks all information in reference to shipping. Shipping information included:
  -- Sample identification number
  -- Time and date sampled
  -- Time and date shipped
  -- Name of commercial carrier
  -- Airbill number
  -- Name of laboratory(s)
  -- Type of analyses

- The location, time, and weather conditions when samples were collected.

- Track the coming and going of all personnel.

4.4.2. Sample Logsheets

After each matrix was sampled, sample data sheets were completed and referenced in the logbook. The sheets were numbered consecutively and placed in a three-ring binder for future reference. Sample data sheets acted as an initial chain-of-custody form to relinquish custody from the sampling personnel to the sample paperwork handlers. The sheets logged the following information:

- The appropriate EG&G MAT sample numbers. The sample logbook reflects the existence of the other sample documents such as the chain-of-custody forms and field data sheets;

- The airbill number if the samples were shipped via a commercial carrier;

- The analytical laboratory including the name of the laboratory contact; and

- Chain-of-custody forms, custody seals, traffic reports and other paperwork that were completed.

4.4.3. Chain-of-Custody

Field personnel completed chain-of-custody forms in the field prior to sample shipment. The information on the chain-of-custody form included:

- The sample identification, matrix, time of sample collection, number of sample containers, and preservations of samples (if any);

- Analysis requested per sample, which included radiological parameters (Gamma Spectrometry);
- Shipping carrier (Federal Express), airbill number, cooler number, and project number;
- Analytical parameters (VOCs)
- Mound Laboratory soil screening results (less than 100 pCi/gram); and
- Sampling personnel who completed paperwork and relinquished custody.

4.4.4. Equipment Calibration Logsheets

Sampling team members were required to keep Field Equipment Calibration logsheets to be used to document all non-radiological field calibration activities. The calibration logbook was a bound notebook with pages for specific HNu calibration information. Equipment logsheets entries were dated, legible, and contain calibration information such as type and configuration of equipment (i.e., Hnu with 11.7 eV probe), calibration standard used, adjustment made to instruments, initial and final calibration readings.

5. SAMPLING RESULTS

The results of the soil vapor and soil sampling are summarized in Tables IV.1 and IV.2. Soil sample location CO-12 could not be sampled due to shallow auger refusal (less than 6 inches). Soil vapor locations and depths are shown with the location number and probe depth separated by a hyphen (ex. Probe 15-3, were 3 is the depth of the probe in feet).

The results of the soil vapor sampling reported concentrations of Freon 11 and 113, cis-1,2-Dichloroethene (cis-1,2-DCE), and trichloroethene (TCE). Freon 11 was reported in Probe 8 at a concentration of 0.005 parts per million (ppm). Freon 113 was reported in Probes 6, 8, 11, and 20 with concentrations ranging from 0.005 to 2.442 ppm. Cis-1,2-DCE was reported at a concentration of 0.94 ppm in Probe 8. TCE was reported in Probe 8 at a concentration of 0.231 ppm.

The results of the soil sampling activities yielded reportable concentrations of TCE, toluene, total 1,2-DCE and Freon 113. TCE concentrations ranged from 0.006 to 58 mg/Kg in soil samples collected from CO-1, CO-2, CO-3, CO-4, CO-5, and CO-9. Toluene was reported at a concentration of 5.3 mg/Kg in the soil samples from CO-9. Total 1,2-DCE was reported in soil samples from CO-1, CO-2, CO-9, and CO-10 at concentrations ranging from 0.025 to 0.83 mg/Kg.

Table V.1 Soil Vapor Sampling Results

Sample Date	Sample Location and Depth	Analytical Parameters (ppm)							
		Freon 11	Freon 113	Trans-12-DCE	Cis-12-DCE	111-TCA	TCE	Toluene	PCE
3/2/95	Blank	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 15-3	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 15-1.5	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 20-6	<0.005	0.006	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 20-3	<0.005	0.047	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 11-1.5A	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 11-(D)	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 11-1.5B	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 8-3	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 8-1.5	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 6-3	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 6-1.5	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
3/16/95	Blank	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 6-3	<0.005	0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 8-3	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 11-1.5A	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 15-	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 15-(D)	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005

ppm = parts per million
DCE = Dicholoroethene
TCA = Trichloroethane
TCE = Trichloroethene
PCE = Tretrachloroethene
< = less than
(D) = Duplicate sample

Sample Date	Sample Location and Depth	Analytical Parameters (ppm)							
		Freon 11	Freon 113	Trans-12-DCE	Cis-12-DCE	111-TCA	TCE	Toluene	PCE
	Probe 20-	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
3/30/95	Probe 6-3	<0.005	0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 6-(D)	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	0.07	<0.005
	Probe 8-3	0.005	2.442	<0.1	0.94	<0.005	0.231	<0.07	<0.005
	Probe 11-1.5	<0.005	0.013	<0.1	<0.01	<0.005	<0.005	<0.7	<0.005
4/13/95	Probe 6-3	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 6-(D)	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
4/13/95	Probe 8-3	<0.005	<0.005	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005
	Probe 11-1.5	<0.005	0.148	<0.1	<0.01	<0.005	<0.005	<0.07	<0.005

ppm = parts per million
DCE = Dicholoroethene
TCA = Trichloroethane
TCE = Trichloroethene
PCE = Tretrachloroethene
< = less than
(D) = Duplicate sample

Table V.2 Soil Sampling Results

Sampling Date	Location	Depth	Analytical Parameters (mg/kg)					
			TCE	Toluene	1,1,1-TCA	Total 1,2-DCE	Freon 113	Freon 11
03/20/95	CO - 1	1.0'-1.5'	10	ND	ND	.79	ND	ND
03/20/95	CO - 1 Dup.	1.0'-1.5'	13	ND	ND	.83	ND	ND
03/21/95	CO - 2	1.5'-2.0'	.015	.004J	ND	.064	.002J	ND
		3.5'-4.0'	.004J	.003J	ND	.074	ND	ND
03/20/95	CO - 3	1.5'-2.0'	.003J	ND	ND	ND	ND	ND
		2.0'-2.5'	.014	ND	ND	.003J	ND	ND
03/21/95	CO - 4	4"-10"	.009	ND	ND	ND	ND	ND
03/21/95	CO - 5	9"-15"	.012	ND	ND	.001J	ND	ND
03/21/95	CO - 6	4"-10"	.002J	ND	ND	ND	ND	ND
03/21/95	CO - 7	1.5'-2.0'	.004J	ND	ND	ND	ND	ND
03/20/95	CO - 8	1.0'-1.5'	.001J	.001J	ND	.001J	ND	ND
		2.0'-2.5'	.001J	.0008J	ND	ND	ND	ND
03/20/95	CO - 9	1.0'-1.5'	58	5.3	ND	7.1	ND	ND
03/20/95	CO - 10	1.5'-2.0'	.006J	.001J	ND	.025	ND	ND
03/21/95	CO - 11	9"-15"	.002J	ND	ND	ND	ND	ND
No Samples Corrected		1.2'-1.8'	.006	ND	ND	ND	ND	ND
03/20/95	CO - 13	1.0'-1.5'	.004J	ND	ND	ND	ND	ND

ND = Non Detect
J = Estimated Value
C0-12 = Sample location not sampled due to auger refusal

6. DATA REDUCTION AND VALIDATION

6.1 DATA REDUCTION

The computation of analytical results from the raw data generated was performed in accordance with the analytical test method EPA SW-846 Method 8240. Sample results were not corrected for method blank results. All computations were performed by the laboratory conducting the analysis.

6.2. DATA VALIDATION

A 90/10 laboratory data validation strategy was performed for EPA Level III Data Quality Objective's. The evaluation of the data consisted of the following:

- Comparing sample collection procedures with the appropriate SOP;
- Checking sample handling procedures with the appropriate SOPs;
- Identifying whether the appropriate number and type of QC samples were collected;
- Checking the laboratory data package for completeness;
- Evaluating the field and laboratory QC checks for acceptance; and
- Noting any technical problems or corrective actions taken at the laboratory.
- Reviewing holding times
- Verified initial and continuing calibrations
- Confirmed the method blank results were acceptable
- Verified the matrix spike and matrix spike results were acceptable
- Confirmed the surrogate and internal standard results were acceptable

Ten percent of the data packages were validated as specified in the Quality Assurance Project Plan. If significant analytical problems were identified, the percentage of data validated would be increased. All of the field logs and data were reviewed.

6.2.1. Field Procedure Validation

Field procedures were reviewed by comparing the field logs with the appropriate SOPs, Quality Assurance Plan and the Field Sample Plan. No significant problems or deviations were found with the sampling or sample handling procedures. Quality control samples were collected at the rate defined by the Quality Assurance Project Plan and the Field Sample Plan. Results for field QC samples were acceptable for the compounds of concern.

6.2.2. Laboratory Data Validation

Data validation was performed for the confirmational soil samples but not for the soil vapor results. Soil samples were validated because the results were used to confirm that the soil vapor extraction had reduced the concentrations of the compounds of concern to below the target levels.

6.2.2.1. Description of Data Validation Methods

Analytical data from soil sampling activities were presented in one data package consisting of the soil samples and 2 aqueous samples. The aqueous sample were QC samples (equipment blanks). The samples were analyzed for VOCs following EPA SW-846 Method 8240, modified to include Freon 11 and 113. The data validation was performed in accordance with the "Interim Remedial Action , Quality Assurance Project Plan, Operable Unit 2, B Building Solvent Storage Shed Area", 1995 and Appendix H of the OU-9 Quality Assurance Project Plan.

6.2.2.2. Summary of Validated Results

The soil sample analytical results were received from the analytical laboratory along with the supporting documentation needed to perform data validation. The data was validated and validation qualifiers were added if necessary. The validated soil VOC data are summarized in Table IV.2. All of the data are considered usable. Data validation comments were limited to "U" - nondetect, and "J" - estimated value. The validation did not identify any major analytical problems. Therefore, no synopsis of the validation results are presented in this section. Data qualified with a "J" were due to being detected below the quantitation limit and the value is considered an estimated value.

7. DATA ANALYSIS AND DISCUSSION

7.1 Data Analysis

The purpose of the statistical analysis is to compare the residual soil concentrations with soil concentrations which would result in acceptable risk. This latter value is referred to as the cleanup goal in this report. Trichloroethene (TCE) is the only contaminant found that is a carcinogen and was also found in the highest concentrations. EPA's RAGS methodology was used to calculate the soil concentration which would result in a risk of 1×10^{-6}. The on-site office worker scenario resulted in the most restrictive value for TCE. Included in the calculation are the direct soil pathways of ingestion and inhalation. The guideline value for TCE is 41 mg/Kg.

The geometric mean and the upper 95 percent confidence level (95% UCL) of the geometric mean of the soil concentrations were calculated and compared to the cleanup goal. Non-detect concentrations were assigned a value of one half the method quantitation limit in order to calculate the mean and upper 95 percent confidence level. The statistical analysis is based on the EPA Guidance Document "Methods for Evaluating the Attainment of Cleanup Standards, Volume 1: Soils and Solid Media", February 1989.

The equation used for an upper one-sided 100 (1-*a*) percent confidence limit around the log-normal population mean is presented below:

$$\mu Ua = (\bar{x}) + ti\text{-}a,df \quad \frac{s}{\sqrt{n}}$$

where

μUa = is the upper one sided confidence limit

$\bar{x}$ = geometric mean of the sample population

s = standard deviation

n = population

7.2 Discussion

The statistical analysis is summarized in Table VI.1. As shown in Table VI.1, the geometric mean and the 95% UCL concentrations are below the remediation goal for TCE. In addition, every soil sample reported

below the remediation goal with the exception of trichloroethene (TCE) in sample CO-9. The soil sample from CO-9 reported a TCE concentration of 58 mg/Kg.

Table VII.1 Statistical Analysis of Soil Data

Sample I.D.	Freon 113	Total 1,2-DCE	TCE	Toluene
CO-1	0.003	0.830	13.000	0.355
CO-2 2'	0.003	0.064	0.015	0.004
CO-2 4'	0.003	0.074	0.004	0.003
CO-3 2'	0.003	0.003	0.003	0.003
CO-3 2.5'	0.003	0.003	0.003	0.003
CO-4	0.003	0.003	0.014	0.003
CO-5	0.003	0.001	0.012	0.003
CO-6	0.003	0.003	0.002	0.003
CO-7	0.003	0.003	0.004	0.003
CO-8 1.5'	0.003	0.001	0.001	0.001
CO-8 2.5'	0.003	0.003	0.001	0.001
CO-9	0.740	7.100	58.000	5.300
CO-10	0.003	0.025	0.006	0.001
CO-11 1.25'	0.003	0.003	0.002	0.003
CO-11 1.8'	0.003	0.003	0.006	0.003
CO-13	0.003	0.003	0.004	0.003

	Freon 113	Total 1.2-DCE	TCE	Toluene
N	16	16	16	16
Geometric Mean	0.004	0.010	0.012	0.005
s of Log Value	0.579	1.056	1.321	0.953
SQRT N	4.000	4.000	4.000	4.000
ti-alpha,df	1.746	1.746	1.746	1.746
95% UCL	0.008	0.030	0.045	0.014
Cleanup Goal	-------	4100[1]	41[2]	250[1]

All concentrations in mg/Kg
Values shown are the actual analytical reported value or $^1/_2$ the quantitation limit for non-detect values.
DCE = Dichloroethene
TCE = Trichloroethene
TCA = Trichloroethane
N = sample population
Geometric Mean = mean of sample population
s of Log Values = standard deviation
SQRT N = square foot of N
t1-alpha,df = 100 (1-alpha) value, degrees of freedon = 1.694 for alpha = 0.05
95% UCL = upper one sided 95% confidence interval value

[1] Based on hazard index of one for onsite office worker
[2] Based 10^{-6} risk for onsite office worker

8. CONCLUSIONS

The soil vapor and soil samples collected to assess current subsurface soil conditions in the area of the B Building Solvent Storage Shed yielded results ranging from non-detect to 2.442 ppm in the soil vapor samples and non-detect to 58 mg/Kg for the soil samples. Freon was reported in several soil vapor samples between March 2 and April 13, 1995, the highest concentrations (Freon 113) was reported in Probe 8 on March 30, 1995.

The geometric mean soil concentrations and the 95% UCL of the mean were calculated for Freon 113, total 1,2-Dichloroethene (1,2-DCE), TCE, and Toluene and compared to remediation cleanup goals listed in Section 6. Both the mean and the 95% UCL of the soil concentrations for each of these contaminants described were below the cleanup goals. The soil data indicate that the risk from the residual concentrations are less than 10^{-6}.

Based on the results of the soil vapor and soil sample analytical results and comparing the mean soil concentrations with the remedial cleanup goals, the B Building Storage Shed Area removal is considered complete.

9. REFERENCES

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APPENDIX A

ANALYTICAL DATA

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000056 Lab No. 01
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/30/95 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		12	78-87-5	1,2-Dichloropropane	<EQL		6.0
74-83-9	Bromomethane	<EQL		12	10061-02-6	trans-1,3-Dichloropropene	<EQL		6.0
75-01-4	Vinyl chloride	<EQL		12	79-01-6	Trichloroethene	3.7	J	6.0
75-00-3	Chloroethane	<EQL		12	124-48-1	Dibromochloromethane	<EQL		6.0
75-09-2	Methylene chloride	2.8	J	6.0	79-00-5	1,1,2-Trichloroethane	<EQL		6.0
67-64-1	Acetone	10	JB	12	71-43-2	Benzene	<EQL		6.0
75-15-0	Carbon disulfide	<EQL		6.0	10061-01-5	cis-1,3-Dichloropropene	<EQL		6.0
75-35-4	1,1-Dichloroethene	<EQL		6.0	110-75-8	2-Chloroethyl vinyl ether	<EQL		240
75-34-3	1,1-Dichloroethane	<EQL		6.0	75-25-2	Bromoform	<EQL		6.0
156-60-5	1,2-Dichloroethene (total)	<EQL		6.0	591-78-6	2-Hexanone	<EQL		12
67-66-3	Chloroform	<EQL		6.0	108-10-1	4-Methyl-2-pentanone	<EQL		12
107-06-2	1,2-Dichloroethane	<EQL		6.0	127-18-4	Tetrachloroethene	<EQL		6.0
78-93-3	2-Butanone	<EQL		12	108-88-3	Toluene	<EQL		6.0
71-55-6	1,1,1-Trichloroethane	<EQL		6.0	108-90-7	Chlorobenzene	<EQL		6.0
56-23-5	Carbon tetrachloride	<EQL		6.0	100-41-4	Ethyl benzene	<EQL		6.0
108-05-4	Vinyl acetate	<EQL		12	100-42-5	Styrene	<EQL		6.0
75-27-4	Bromodichloromethane	<EQL		6.0		Xylenes	0.7	J	6.0
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		6.0					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	101	70 - 121
Toluene-d8	102	84 - 138
4-Bromofluorobenzene	95	59 - 113

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000057 Lab No. 02
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/30/95 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		12	78-87-5	1,2-Dichloropropane	<EQL		6.0
74-83-9	Bromomethane	<EQL		12	10061-02-6	trans-1,3-Dichloropropene	<EQL		6.0
75-01-4	Vinyl chloride	<EQL		12	79-01-6	Trichloroethene	5.6	J	6.0
75-00-3	Chloroethane	<EQL		12	124-48-1	Dibromochloromethane	<EQL		6.0
75-09-2	Methylene chloride	3.5	J	6.0	79-00-5	1,1,2-Trichloroethane	<EQL		6.0
67-64-1	Acetone	36	B	12	71-43-2	Benzene	<EQL		6.0
75-15-0	Carbon disulfide	<EQL		6.0	10061-01-5	cis-1,3-Dichloropropene	<EQL		6.0
75-35-4	1,1-Dichloroethene	<EQL		6.0	110-75-8	2-Chloroethyl vinyl ether	<EQL		240
75-34-3	1,1-Dichloroethane	<EQL		6.0	75-25-2	Bromoform	<EQL		6.0
156-60-5	1,2-Dichloroethene (total)	25		6.0	591-78-6	2-Hexanone	<EQL		12
67-66-3	Chloroform	<EQL		6.0	108-10-1	4-Methyl-2-pentanone	<EQL		12
107-06-2	1,2-Dichloroethane	<EQL		6.0	127-18-4	Tetrachloroethene	<EQL		6.0
78-93-3	2-Butanone	3.6	J	12	108-88-3	Toluene	1.4	J	6.0
71-55-6	1,1,1-Trichloroethane	<EQL		6.0	108-90-7	Chlorobenzene	<EQL		6.0
56-23-5	Carbon tetrachloride	<EQL		6.0	100-41-4	Ethyl benzene	<EQL		6.0
108-05-4	Vinyl acetate	<EQL		12	100-42-5	Styrene	<EQL		6.0
75-27-4	Bromodichloromethane	<EQL		6.0		Xylenes	<EQL		6.0
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		6.0					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	103	70 - 121
Toluene-d8	98	84 - 138
4-Bromofluorobenzene	91	59 - 113

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000058 Lab No. 03
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/30/95 DILUTION FACTOR 1 (med) UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		1500	78-87-5	1,2-Dichloropropane	<EQL		750
74-83-9	Bromomethane	<EQL		1500	10061-02-6	trans-1,3-Dichloropropene	<EQL		750
75-01-4	Vinyl chloride	<EQL		1500	79-01-6	Trichloroethene	58000	D	750
75-00-3	Chloroethane	<EQL		1500	124-48-1	Dibromochloromethane	<EQL		750
75-09-2	Methylene chloride	180	J	750	79-00-5	1,1,2-Trichloroethane	<EQL		750
67-64-1	Acetone	1700	B	1500	71-43-2	Benzene	<EQL		750
75-15-0	Carbon disulfide	<EQL		750	10061-01-5	cis-1,3-Dichloropropene	<EQL		750
75-35-4	1,1-Dichloroethene	<EQL		750	110-75-8	2-Chloroethyl vinyl ether	<EQL		30000
75-34-3	1,1-Dichloroethane	<EQL		750	75-25-2	Bromoform	<EQL		750
156-60-5	1,2-Dichloroethene (total)	7300		750	591-78-6	2-Hexanone	<EQL		1500
67-66-3	Chloroform	220	J	750	108-10-1	4-Methyl-2-pentanone	<EQL		1500
107-06-2	1,2-Dichloroethane	<EQL		750	127-18-4	Tetrachloroethene	<EQL		750
78-93-3	2-Butanone	<EQL		1500	108-88-3	Toluene	4900		750
71-55-6	1,1,1-Trichloroethane	150	J	750	108-90-7	Chlorobenzene	<EQL		750
56-23-5	Carbon tetrachloride	<EQL		750	100-41-4	Ethyl benzene	<EQL		750
108-05-4	Vinyl acetate	<EQL		1500	100-42-5	Styrene	<EQL		750
75-27-4	Bromodichloromethane	<EQL		750		Xylenes	<EQL		750
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		750					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	107	70 - 121
Toluene-d8	99	84 - 138
4-Bromofluorobenzene	100	59 - 113

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000059 Lab No. 04
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/29/95 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		11	78-87-5	1,2-Dichloropropane	<EQL		5.4
74-83-9	Bromomethane	<EQL		11	10061-02-6	trans-1,3-Dichloropropene	<EQL		5.4
75-01-4	Vinyl chloride	<EQL		11	79-01-6	Trichloroethene	4.8	J	5.4
75-00-3	Chloroethane	<EQL		11	124-48-1	Dibromochloromethane	<EQL		5.4
75-09-2	Methylene chloride	8.3	B	5.4	79-00-5	1,1,2-Trichloroethane	<EQL		5.4
67-64-1	Acetone	9.9	J	11	71-43-2	Benzene	1.0	J	5.4
75-15-0	Carbon disulfide	<EQL		5.4	10061-01-5	cis-1,3-Dichloropropene	<EQL		5.4
75-35-4	1,1-Dichloroethene	<EQL		5.4	110-75-8	2-Chloroethyl vinyl ether	<EQL		220
75-34-3	1,1-Dichloroethane	<EQL		5.4	75-25-2	Bromoform	<EQL		5.4
156-60-5	1,2-Dichloroethene (total)	1.2	J	5.4	591-78-6	2-Hexanone	<EQL		11
67-66-3	Chloroform	<EQL		5.4	108-10-1	4-Methyl-2-pentanone	<EQL		11
107-06-2	1,2-Dichloroethane	<EQL		5.4	127-18-4	Tetrachloroethene	<EQL		5.4
78-93-3	2-Butanone	<EQL		11	108-88-3	Toluene	1.2	J	5.4
71-55-6	1,1,1-Trichloroethane	<EQL		5.4	108-90-7	Chlorobenzene	<EQL		5.4
56-23-5	Carbon tetrachloride	<EQL		5.4	100-41-4	Ethyl benzene	<EQL		5.4
108-05-4	Vinyl acetate	<EQL		11	100-42-5	Styrene	<EQL		5.4
75-27-4	Bromodichloromethane	<EQL		5.4		Xylenes	<EQL		5.4
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		5.4					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	115	70 - 121
Toluene-d8	108	84 - 138
4-Bromofluorobenzene	105	59 - 113

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000060 Lab No. 05
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/30/95 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		11	78-87-5	1,2-Dichloropropane	<EQL		5.7
74-83-9	Bromomethane	<EQL		11	10061-02-6	trans-1,3-Dichloropropene	<EQL		5.7
75-01-4	Vinyl chloride	<EQL		11	79-01-6	Trichloroethene	1.2	J	5.7
75-00-3	Chloroethane	<EQL		11	124-48-1	Dibromochloromethane	<EQL		5.7
75-09-2	Methylene chloride	2.5	J	5.7	79-00-5	1,1,2-Trichloroethane	<EQL		5.7
67-64-1	Acetone	49		11	71-43-2	Benzene	<EQL		5.7
75-15-0	Carbon disulfide	<EQL		5.7	10061-01-5	cis-1,3-Dichloropropene	<EQL		5.7
75-35-4	1,1-Dichloroethene	<EQL		5.7	110-75-8	2-Chloroethyl vinyl ether	<EQL		230
75-34-3	1,1-Dichloroethane	<EQL		5.7	75-25-2	Bromoform	<EQL		5.7
156-60-5	1,2-Dichloroethene (total)	<EQL		5.7	591-78-6	2-Hexanone	<EQL		11
67-66-3	Chloroform	<EQL		5.7	108-10-1	4-Methyl-2-pentanone	<EQL		11
107-06-2	1,2-Dichloroethane	<EQL		5.7	127-18-4	Tetrachloroethene	<EQL		5.7
78-93-3	2-Butanone	<EQL		11	108-88-3	Toluene	0.8	J	5.7
71-55-6	1,1,1-Trichloroethane	<EQL		5.7	108-90-7	Chlorobenzene	<EQL		5.7
56-23-5	Carbon tetrachloride	<EQL		5.7	100-41-4	Ethyl benzene	0.5	J	5.7
108-05-4	Vinyl acetate	<EQL		11	100-42-5	Styrene	<EQL		5.7
75-27-4	Bromodichloromethane	<EQL		5.7		Xylenes	1.7	J	5.7
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		5.7					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	103	70 - 121
Toluene-d8	98	84 - 138
4-Bromofluorobenzene	95	59 - 113

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000061 Lab No. 06
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/29/95 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		11	78-87-5	1,2-Dichloropropane	<EQL		5.6
74-83-9	Bromomethane	<EQL		11	10061-02-6	trans-1,3-Dichloropropene	<EQL		5.6
75-01-4	Vinyl chloride	<EQL		11	79-01-6	Trichloroethene	10000	D	5.6
75-00-3	Chloroethane	<EQL		11	124-48-1	Dibromochloromethane	<EQL		5.6
75-09-2	Methylene chloride	7.4	B	5.6	79-00-5	1,1,2-Trichloroethane	<EQL		5.6
67-64-1	Acetone	6.1	J	11	71-43-2	Benzene	<EQL		5.6
75-15-0	Carbon disulfide	<EQL		5.6	10061-01-5	cis-1,3-Dichloropropene	<EQL		5.6
75-35-4	1,1-Dichloroethene	1.8	J	5.6	110-75-8	2-Chloroethyl vinyl ether	<EQL		220
75-34-3	1,1-Dichloroethane	<EQL		5.6	75-25-2	Bromoform	<EQL		5.6
156-60-5	1,2-Dichloroethene (total)	160		5.6	591-78-6	2-Hexanone	<EQL		11
67-66-3	Chloroform	<EQL		5.6	108-10-1	4-Methyl-2-pentanone	<EQL		11
107-06-2	1,2-Dichloroethane	<EQL		5.6	127-18-4	Tetrachloroethene	<EQL		5.6
78-93-3	2-Butanone	<EQL		11	108-88-3	Toluene	<EQL		5.6
71-55-6	1,1,1-Trichloroethane	<EQL		5.6	108-90-7	Chlorobenzene	<EQL		5.6
56-23-5	Carbon tetrachloride	<EQL		5.6	100-41-4	Ethyl benzene	<EQL		5.6
108-05-4	Vinyl acetate	<EQL		11	100-42-5	Styrene	<EQL		5.6
75-27-4	Bromodichloromethane	<EQL		5.6		Xylenes	<EQL		5.6
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		5.6					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	114	70 - 121
Toluene-d8	113	84 - 138
4-Bromofluorobenzene	91	59 - 113

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000062 Lab No. 07
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/30/95 DILUTION FACTOR 1 (med) UNITS ug/Kg

CAS NO.	COMPOUND	RESULT	EQL	CAS NO.	PARAMETER	RESULT	EQL
74-87-3	Chloromethane	<EQL	1400	78-87-5	1,2-Dichloropropane	<EQL	710
74-83-9	Bromomethane	<EQL	1400	10061-02-6	trans-1,3-Dichloropropene	<EQL	710
75-01-4	Vinyl chloride	<EQL	1400	79-01-6	Trichloroethene	13000	710
75-00-3	Chloroethane	<EQL	1400	124-48-1	Dibromochloromethane	<EQL	710
75-09-2	Methylene chloride	<EQL	710	79-00-5	1,1,2-Trichloroethane	<EQL	710
67-64-1	Acetone	<EQL	1400	71-43-2	Benzene	<EQL	710
75-15-0	Carbon disulfide	<EQL	710	10061-01-5	cis-1,3-Dichloropropene	<EQL	710
75-35-4	1,1-Dichloroethene	<EQL	710	110-75-8	2-Chloroethyl vinyl ether	<EQL	29000
75-34-3	1,1-Dichloroethane	<EQL	710	75-25-2	Bromoform	<EQL	710
156-60-5	1,2-Dichloroethene (total)	820	710	591-78-6	2-Hexanone	<EQL	1400
67-66-3	Chloroform	<EQL	710	108-10-1	4-Methyl-2-pentanone	<EQL	1400
107-06-2	1,2-Dichloroethane	<EQL	710	127-18-4	Tetrachloroethene	<EQL	710
78-93-3	2-Butanone	<EQL	1400	108-88-3	Toluene	<EQL	710
71-55-6	1,1,1-Trichloroethane	<EQL	710	108-90-7	Chlorobenzene	<EQL	710
56-23-5	Carbon tetrachloride	<EQL	710	100-41-4	Ethyl benzene	<EQL	710
108-05-4	Vinyl acetate	<EQL	1400	100-42-5	Styrene	<EQL	710
75-27-4	Bromodichloromethane	<EQL	710		Xylenes	<EQL	710
79-34-5	1,1,2,2-Tetrachloroethane	<EQL	710				

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	106	70 - 121
Toluene-d8	98	84 - 138
4-Bromofluorobenzene	102	59 - 113

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000063 Lab No. 08
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/30/95 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		12	78-87-5	1,2-Dichloropropane	<EQL		5.8
74-83-9	Bromomethane	<EQL		12	10061-02-6	trans-1,3-Dichloropropene	<EQL		5.8
75-01-4	Vinyl chloride	<EQL		12	79-01-6	Trichloroethene	3.2	J	5.8
75-00-3	Chloroethane	<EQL		12	124-48-1	Dibromochloromethane	<EQL		5.8
75-09-2	Methylene chloride	2.7	J	5.8	79-00-5	1,1,2-Trichloroethane	<EQL		5.8
67-64-1	Acetone	62	B	12	71-43-2	Benzene	<EQL		5.8
75-15-0	Carbon disulfide	<EQL		5.8	10061-01-5	cis-1,3-Dichloropropene	<EQL		5.8
75-35-4	1,1-Dichloroethene	<EQL		5.8	110-75-8	2-Chloroethyl vinyl ether	<EQL		230
75-34-3	1,1-Dichloroethane	<EQL		5.8	75-25-2	Bromoform	<EQL		5.8
156-60-5	1,2-Dichloroethene (total)	<EQL		5.8	591-78-6	2-Hexanone	<EQL		12
67-66-3	Chloroform	<EQL		5.8	108-10-1	4-Methyl-2-pentanone	<EQL		12
107-06-2	1,2-Dichloroethane	<EQL		5.8	127-18-4	Tetrachloroethene	<EQL		5.8
78-93-3	2-Butanone	<EQL		12	108-88-3	Toluene	<EQL		5.8
71-55-6	1,1,1-Trichloroethane	<EQL		5.8	108-90-7	Chlorobenzene	<EQL		5.8
56-23-5	Carbon tetrachloride	<EQL		5.8	100-41-4	Ethyl benzene	<EQL		5.8
108-05-4	Vinyl acetate	<EQL		12	100-42-5	Styrene	<EQL		5.8
75-27-4	Bromodichloromethane	<EQL		5.8		Xylenes	<EQL		5.8
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		5.8					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	102	70 - 121
Toluene-d8	106	84 - 138
4-Bromofluorobenzene	81	59 - 113

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000064 Lab No. 09

Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/30/95 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		11	78-87-5	1,2-Dichloropropane	<EQL		5.3
74-83-9	Bromomethane	<EQL		11	10061-02-6	trans-1,3-Dichloropropene	<EQL		5.3
75-01-4	Vinyl chloride	<EQL		11	79-01-6	Trichloroethene	14		5.3
75-00-3	Chloroethane	<EQL		11	124-48-1	Dibromochloromethane	<EQL		5.3
75-09-2	Methylene chloride	1.6	J	5.3	79-00-5	1,1,2-Trichloroethane	<EQL		5.3
67-64-1	Acetone	9.9	JB	11	71-43-2	Benzene	<EQL		5.3
75-15-0	Carbon disulfide	<EQL		5.3	10061-01-5	cis-1,3-Dichloropropene	<EQL		5.3
75-35-4	1,1-Dichloroethene	<EQL		5.3	110-75-8	2-Chloroethyl vinyl ether	<EQL		210
75-34-3	1,1-Dichloroethane	<EQL		5.3	75-25-2	Bromoform	<EQL		5.3
156-60-5	1,2-Dichloroethene (total)	3.3	J	5.3	591-78-6	2-Hexanone	<EQL		11
67-66-3	Chloroform	<EQL		5.3	108-10-1	4-Methyl-2-pentanone	<EQL		11
107-06-2	1,2-Dichloroethane	<EQL		5.3	127-18-4	Tetrachloroethene	<EQL		5.3
78-93-3	2-Butanone	<EQL		11	108-88-3	Toluene	<EQL		5.3
71-55-6	1,1,1-Trichloroethane	<EQL		5.3	108-90-7	Chlorobenzene	<EQL		5.3
56-23-5	Carbon tetrachloride	<EQL		5.3	100-41-4	Ethyl benzene	<EQL		5.3
108-05-4	Vinyl acetate	<EQL		11	100-42-5	Styrene	<EQL		5.3
75-27-4	Bromodichloromethane	<EQL		5.3		Xylenes	<EQL		5.3
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		5.3					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	104	70 - 121
Toluene-d8	102	84 - 138
4-Bromofluorobenzene	93	59 - 113

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Water 203-000065 Lab No. 10
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/31/95 DILUTION FACTOR 1 UNITS ug/L

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		10	78-87-5	1,2-Dichloropropane	<EQL		5.0
74-83-9	Bromomethane	<EQL		10	10061-02-6	trans-1,3-Dichloropropene	<EQL		5.0
75-01-4	Vinyl chloride	<EQL		10	79-01-6	Trichloroethene	<EQL		5.0
75-00-3	Chloroethane	<EQL		10	124-48-1	Dibromochloromethane	<EQL		5.0
75-09-2	Methylene chloride	<EQL		5.0	79-00-5	1,1,2-Trichloroethane	<EQL		5.0
67-64-1	Acetone	55		10	71-43-2	Benzene	<EQL		5.0
75-15-0	Carbon disulfide	9.6		5.0	10061-01-5	cis-1,3-Dichloropropene	<EQL		5.0
75-35-4	1,1-Dichloroethene	<EQL		5.0	110-75-8	2-Chloroethyl vinyl ether	<EQL		200
75-34-3	1,1-Dichloroethane	<EQL		5.0	75-25-2	Bromoform	<EQL		5.0
156-60-5	1,2-Dichloroethene (total)	<EQL		5.0	591-78-6	2-Hexanone	<EQL		10
67-66-3	Chloroform	<EQL		5.0	108-10-1	4-Methyl-2-pentanone	<EQL		10
107-06-2	1,2-Dichloroethane	<EQL		5.0	127-18-4	Tetrachloroethene	3.2	J	5.0
78-93-3	2-Butanone	<EQL		10	108-88-3	Toluene	<EQL		5.0
71-55-6	1,1,1-Trichloroethane	<EQL		5.0	108-90-7	Chlorobenzene	<EQL		5.0
56-23-5	Carbon tetrachloride	<EQL		5.0	100-41-4	Ethyl benzene	<EQL		5.0
108-05-4	Vinyl acetate	<EQL		10	100-42-5	Styrene	<EQL		5.0
75-27-4	Bromodichloromethane	<EQL		5.0		Xylenes	<EQL		5.0
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		5.0					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	106	76 - 114
Toluene-d8	103	88 - 110
4-Bromofluorobenzene	96	86 - 115

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Water 203-000066 Lab No. 11
st Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/31/95 DILUTION FACTOR 1 UNITS ug/L

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		10	78-87-5	1,2-Dichloropropane	<EQL		5.0
74-83-9	Bromomethane	<EQL		10	10061-02-6	trans-1,3-Dichloropropene	<EQL		5.0
75-01-4	Vinyl chloride	<EQL		10	79-01-6	Trichloroethene	<EQL		5.0
75-00-3	Chloroethane	<EQL		10	124-48-1	Dibromochloromethane	<EQL		5.0
75-09-2	Methylene chloride	3.2	J	5.0	79-00-5	1,1,2-Trichloroethane	<EQL		5.0
67-64-1	Acetone	22		10	71-43-2	Benzene	<EQL		5.0
75-15-0	Carbon disulfide	<EQL		5.0	10061-01-5	cis-1,3-Dichloropropene	<EQL		5.0
75-35-4	1,1-Dichloroethene	<EQL		5.0	110-75-8	2-Chloroethyl vinyl ether	<EQL		200
75-34-3	1,1-Dichloroethane	<EQL		5.0	75-25-2	Bromoform	<EQL		5.0
156-60-5	1,2-Dichloroethene (total)	<EQL		5.0	591-78-6	2-Hexanone	<EQL		10
67-66-3	Chloroform	<EQL		5.0	108-10-1	4-Methyl-2-pentanone	<EQL		10
107-06-2	1,2-Dichloroethane	<EQL		5.0	127-18-4	Tetrachloroethene	<EQL		5.0
78-93-3	2-Butanone	<EQL		10	108-88-3	Toluene	<EQL		5.0
71-55-6	1,1,1-Trichloroethane	<EQL		5.0	108-90-7	Chlorobenzene	<EQL		5.0
56-23-5	Carbon tetrachloride	<EQL		5.0	100-41-4	Ethyl benzene	<EQL		5.0
108-05-4	Vinyl acetate	<EQL		10	100-42-5	Styrene	<EQL		5.0
75-27-4	Bromodichloromethane	<EQL		5.0		Xylenes	<EQL		5.0
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		5.0					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	92	76 - 114
Toluene-d8	109	88 - 110
4-Bromofluorobenzene	94	86 - 115

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000067 Lab No. 12
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/30/95 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		11	78-87-5	1,2-Dichloropropane	<EQL		5.5
74-83-9	Bromomethane	<EQL		11	10061-02-6	trans-1,3-Dichloropropene	<EQL		5.5
75-01-4	Vinyl chloride	<EQL		11	79-01-6	Trichloroethene	1.6	J	5.5
75-00-3	Chloroethane	<EQL		11	124-48-1	Dibromochloromethane	<EQL		5.5
75-09-2	Methylene chloride	2.9	J	5.5	79-00-5	1,1,2-Trichloroethane	<EQL		5.5
67-64-1	Acetone	9.7	JB	11	71-43-2	Benzene	<EQL		5.5
75-15-0	Carbon disulfide	<EQL		5.5	10061-01-5	cis-1,3-Dichloropropene	<EQL		5.5
75-35-4	1,1-Dichloroethene	<EQL		5.5	110-75-8	2-Chloroethyl vinyl ether	<EQL		220
75-34-3	1,1-Dichloroethane	<EQL		5.5	75-25-2	Bromoform	<EQL		5.5
156-60-5	1,2-Dichloroethene (total)	<EQL		5.5	591-78-6	2-Hexanone	<EQL		11
67-66-3	Chloroform	<EQL		5.5	108-10-1	4-Methyl-2-pentanone	<EQL		11
107-06-2	1,2-Dichloroethane	<EQL		5.5	127-18-4	Tetrachloroethene	<EQL		5.5
78-93-3	2-Butanone	<EQL		11	108-88-3	Toluene	<EQL		5.5
71-55-6	1,1,1-Trichloroethane	<EQL		5.5	108-90-7	Chlorobenzene	<EQL		5.5
56-23-5	Carbon tetrachloride	<EQL		5.5	100-41-4	Ethyl benzene	<EQL		5.5
108-05-4	Vinyl acetate	<EQL		11	100-42-5	Styrene	<EQL		5.5
75-27-4	Bromodichloromethane	<EQL		5.5		Xylenes	<EQL		5.5
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		5.5					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	101	70 - 121
Toluene-d8	100	84 - 138
4-Bromofluorobenzene	87	59 - 113

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000068 Lab No. 13
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/30/95 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		11	78-87-5	1,2-Dichloropropane	<EQL		5.3
74-83-9	Bromomethane	<EQL		11	10061-02-6	trans-1,3-Dichloropropene	<EQL		5.3
75-01-4	Vinyl chloride	<EQL		11	79-01-6	Trichloroethene	8.7		5.3
75-00-3	Chloroethane	<EQL		11	124-48-1	Dibromochloromethane	<EQL		5.3
75-09-2	Methylene chloride	3.1	J	5.3	79-00-5	1,1,2-Trichloroethane	<EQL		5.3
67-64-1	Acetone	15	B	11	71-43-2	Benzene	<EQL		5.3
75-15-0	Carbon disulfide	<EQL		5.3	10061-01-5	cis-1,3-Dichloropropene	<EQL		5.3
75-35-4	1,1-Dichloroethene	<EQL		5.3	110-75-8	2-Chloroethyl vinyl ether	<EQL		210
75-34-3	1,1-Dichloroethane	<EQL		5.3	75-25-2	Bromoform	<EQL		5.3
156-60-5	1,2-Dichloroethene (total)	<EQL		5.3	591-78-6	2-Hexanone	<EQL		11
67-66-3	Chloroform	<EQL		5.3	108-10-1	4-Methyl-2-pentanone	<EQL		11
107-06-2	1,2-Dichloroethane	<EQL		5.3	127-18-4	Tetrachloroethene	<EQL		5.3
78-93-3	2-Butanone	<EQL		11	108-88-3	Toluene	<EQL		5.3
71-55-6	1,1,1-Trichloroethane	<EQL		5.3	108-90-7	Chlorobenzene	<EQL		5.3
56-23-5	Carbon tetrachloride	<EQL		5.3	100-41-4	Ethyl benzene	<EQL		5.3
108-05-4	Vinyl acetate	<EQL		11	100-42-5	Styrene	<EQL		5.3
75-27-4	Bromodichloromethane	<EQL		5.3		Xylenes	<EQL		5.3
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		5.3					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	102	70 - 121
Toluene-d8	100	84 - 138
4-Bromofluorobenzene	91	59 - 113

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000069 Lab No. 14
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/31/95 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		10	78-87-5	1,2-Dichloropropane	<EQL		5.2
74-83-9	Bromomethane	<EQL		10	10061-02-6	trans-1,3-Dichloropropene	<EQL		5.2
75-01-4	Vinyl chloride	<EQL		10	79-01-6	Trichloroethene	15		5.2
75-00-3	Chloroethane	<EQL		10	124-48-1	Dibromochloromethane	<EQL		5.2
75-09-2	Methylene chloride	3.9	J	5.2	79-00-5	1,1,2-Trichloroethane	<EQL		5.2
67-64-1	Acetone	110		10	71-43-2	Benzene	<EQL		5.2
75-15-0	Carbon disulfide	<EQL		5.2	10061-01-5	cis-1,3-Dichloropropene	<EQL		5.2
75-35-4	1,1-Dichloroethene	<EQL		5.2	110-75-8	2-Chloroethyl vinyl ether	<EQL		210
75-34-3	1,1-Dichloroethane	<EQL		5.2	75-25-2	Bromoform	<EQL		5.2
156-60-5	1,2-Dichloroethene (total)	64		5.2	591-78-6	2-Hexanone	<EQL		10
67-66-3	Chloroform	<EQL		5.2	108-10-1	4-Methyl-2-pentanone	<EQL		10
107-06-2	1,2-Dichloroethane	<EQL		5.2	127-18-4	Tetrachloroethene	<EQL		5.2
78-93-3	2-Butanone	15		10	108-88-3	Toluene	4.2	J	5.2
71-55-6	1,1,1-Trichloroethane	<EQL		5.2	108-90-7	Chlorobenzene	<EQL		5.2
56-23-5	Carbon tetrachloride	<EQL		5.2	100-41-4	Ethyl benzene	<EQL		5.2
108-05-4	Vinyl acetate	<EQL		10	100-42-5	Styrene	<EQL		5.2
75-27-4	Bromodichloromethane	<EQL		5.2		Xylenes	<EQL		5.2
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		5.2					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	91	70 - 121
Toluene-d8	113	84 - 138
4-Bromofluorobenzene	90	59 - 113

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000070 Lab No. 15
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 04/04/95 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		11	78-87-5	1,2-Dichloropropane	<EQL		5.6
74-83-9	Bromomethane	<EQL		11	10061-02-6	trans-1,3-Dichloropropene	<EQL		5.6
75-01-4	Vinyl chloride	<EQL		11	79-01-6	Trichloroethene	4.5	J	5.6
75-00-3	Chloroethane	<EQL		11	124-48-1	Dibromochloromethane	<EQL		5.6
75-09-2	Methylene chloride	8.4		5.6	79-00-5	1,1,2-Trichloroethane	<EQL		5.6
67-64-1	Acetone	45		11	71-43-2	Benzene	<EQL		5.6
75-15-0	Carbon disulfide	2.8	J	5.6	10061-01-5	cis-1,3-Dichloropropene	<EQL		5.6
75-35-4	1,1-Dichloroethene	<EQL		5.6	110-75-8	2-Chloroethyl vinyl ether	<EQL		220
75-34-3	1,1-Dichloroethane	<EQL		5.6	75-25-2	Bromoform	<EQL		5.6
156-60-5	1,2-Dichloroethene (total)	73		5.6	591-78-6	2-Hexanone	<EQL		11
67-66-3	Chloroform	<EQL		5.6	108-10-1	4-Methyl-2-pentanone	3.1	J	11
107-06-2	1,2-Dichloroethane	<EQL		5.6	127-18-4	Tetrachloroethene	<EQL		5.6
78-93-3	2-Butanone	<EQL		11	108-88-3	Toluene	3.4	J	5.6
71-55-6	1,1,1-Trichloroethane	<EQL		5.6	108-90-7	Chlorobenzene	<EQL		5.6
56-23-5	Carbon tetrachloride	<EQL		5.6	100-41-4	Ethyl benzene	<EQL		5.6
108-05-4	Vinyl acetate	<EQL		11	100-42-5	Styrene	<EQL		5.6
75-27-4	Bromodichloromethane	<EQL		5.6		Xylenes	<EQL		5.6
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		5.6					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	108	70 - 121
Toluene-d8	110	84 - 138
4-Bromofluorobenzene	97	59 - 113

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000071 Lab No. 16
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 04/03/95 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		12	78-87-5	1,2-Dichloropropane	<EQL		5.8
74-83-9	Bromomethane	<EQL		12	10061-02-6	trans-1,3-Dichloropropene	<EQL		5.8
75-01-4	Vinyl chloride	<EQL		12	79-01-6	Trichloroethene	3.6	J	5.8
75-00-3	Chloroethane	<EQL		12	124-48-1	Dibromochloromethane	<EQL		5.8
75-09-2	Methylene chloride	8.7		5.8	79-00-5	1,1,2-Trichloroethane	<EQL		5.8
67-64-1	Acetone	20	B	12	71-43-2	Benzene	<EQL		5.8
75-15-0	Carbon disulfide	<EQL		5.8	10061-01-5	cis-1,3-Dichloropropene	<EQL		5.8
75-35-4	1,1-Dichloroethene	<EQL		5.8	110-75-8	2-Chloroethyl vinyl ether	<EQL		230
75-34-3	1,1-Dichloroethane	<EQL		5.8	75-25-2	Bromoform	<EQL		5.8
156-60-5	1,2-Dichloroethene (total)	<EQL		5.8	591-78-6	2-Hexanone	<EQL		12
67-66-3	Chloroform	<EQL		5.8	108-10-1	4-Methyl-2-pentanone	<EQL		12
107-06-2	1,2-Dichloroethane	<EQL		5.8	127-18-4	Tetrachloroethene	<EQL		5.8
78-93-3	2-Butanone	<EQL		12	108-88-3	Toluene	<EQL		5.8
71-55-6	1,1,1-Trichloroethane	<EQL		5.8	108-90-7	Chlorobenzene	<EQL		5.8
56-23-5	Carbon tetrachloride	<EQL		5.8	100-41-4	Ethyl benzene	<EQL		5.8
108-05-4	Vinyl acetate	<EQL		12	100-42-5	Styrene	<EQL		5.8
75-27-4	Bromodichloromethane	<EQL		5.8		Xylenes	<EQL		5.8
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		5.8					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	98	70 - 121
Toluene-d8	97	84 - 138
4-Bromofluorobenzene	90	59 - 113

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000072 Lab No. 17
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/31/95 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		12	78-87-5	1,2-Dichloropropane	<EQL		6.0
74-83-9	Bromomethane	<EQL		12	10061-02-6	trans-1,3-Dichloropropene	<EQL		6.0
75-01-4	Vinyl chloride	<EQL		12	79-01-6	Trichloroethene	12		6.0
75-00-3	Chloroethane	<EQL		12	124-48-1	Dibromochloromethane	<EQL		6.0
75-09-2	Methylene chloride	4.1	J	6.0	79-00-5	1,1,2-Trichloroethane	<EQL		6.0
67-64-1	Acetone	17		12	71-43-2	Benzene	<EQL		6.0
75-15-0	Carbon disulfide	<EQL		6.0	10061-01-5	cis-1,3-Dichloropropene	<EQL		6.0
75-35-4	1,1-Dichloroethene	<EQL		6.0	110-75-8	2-Chloroethyl vinyl ether	<EQL		240
75-34-3	1,1-Dichloroethane	<EQL		6.0	75-25-2	Bromoform	<EQL		6.0
156-60-5	1,2-Dichloroethene (total)	1.3	J	6.0	591-78-6	2-Hexanone	<EQL		12
67-66-3	Chloroform	<EQL		6.0	108-10-1	4-Methyl-2-pentanone	<EQL		12
107-06-2	1,2-Dichloroethane	<EQL		6.0	127-18-4	Tetrachloroethene	<EQL		6.0
78-93-3	2-Butanone	<EQL		12	108-88-3	Toluene	<EQL		6.0
71-55-6	1,1,1-Trichloroethane	<EQL		6.0	108-90-7	Chlorobenzene	<EQL		6.0
56-23-5	Carbon tetrachloride	<EQL		6.0	100-41-4	Ethyl benzene	<EQL		6.0
108-05-4	Vinyl acetate	<EQL		12	100-42-5	Styrene	<EQL		6.0
75-27-4	Bromodichloromethane	<EQL		6.0		Xylenes	<EQL		6.0
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		6.0					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	95	70 - 121
Toluene-d8	106	84 - 138
4-Bromofluorobenzene	97	59 - 113

Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000073 Lab No. 18

Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 03/31/95 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		12	78-87-5	1,2-Dichloropropane	<EQL		5.9
74-83-9	Bromomethane	<EQL		12	10061-02-6	trans-1,3-Dichloropropene	<EQL		5.9
75-01-4	Vinyl chloride	<EQL		12	79-01-6	Trichloroethene	1.9	J	5.9
75-00-3	Chloroethane	<EQL		12	124-48-1	Dibromochloromethane	<EQL		5.9
75-09-2	Methylene chloride	4.1	J	5.9	79-00-5	1,1,2-Trichloroethane	<EQL		5.9
67-64-1	Acetone	19		12	71-43-2	Benzene	<EQL		5.9
75-15-0	Carbon disulfide	<EQL		5.9	10061-01-5	cis-1,3-Dichloropropene	<EQL		5.9
75-35-4	1,1-Dichloroethene	<EQL		5.9	110-75-8	2-Chloroethyl vinyl ether	<EQL		240
75-34-3	1,1-Dichloroethane	<EQL		5.9	75-25-2	Bromoform	<EQL		5.9
156-60-5	1,2-Dichloroethene (total)	<EQL		5.9	591-78-6	2-Hexanone	<EQL		12
67-66-3	Chloroform	<EQL		5.9	108-10-1	4-Methyl-2-pentanone	<EQL		12
107-06-2	1,2-Dichloroethane	<EQL		5.9	127-18-4	Tetrachloroethene	<EQL		5.9
78-93-3	2-Butanone	<EQL		12	108-88-3	Toluene	<EQL		5.9
71-55-6	1,1,1-Trichloroethane	<EQL		5.9	108-90-7	Chlorobenzene	<EQL		5.9
56-23-5	Carbon tetrachloride	<EQL		5.9	100-41-4	Ethyl benzene	<EQL		5.9
108-05-4	Vinyl acetate	<EQL		12	100-42-5	Styrene	<EQL		5.9
75-27-4	Bromodichloromethane	<EQL		5.9		Xylenes	<EQL		5.9
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		5.9					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	95	70 - 121
Toluene-d8	105	84 - 138
4-Bromofluorobenzene	97	59 - 113

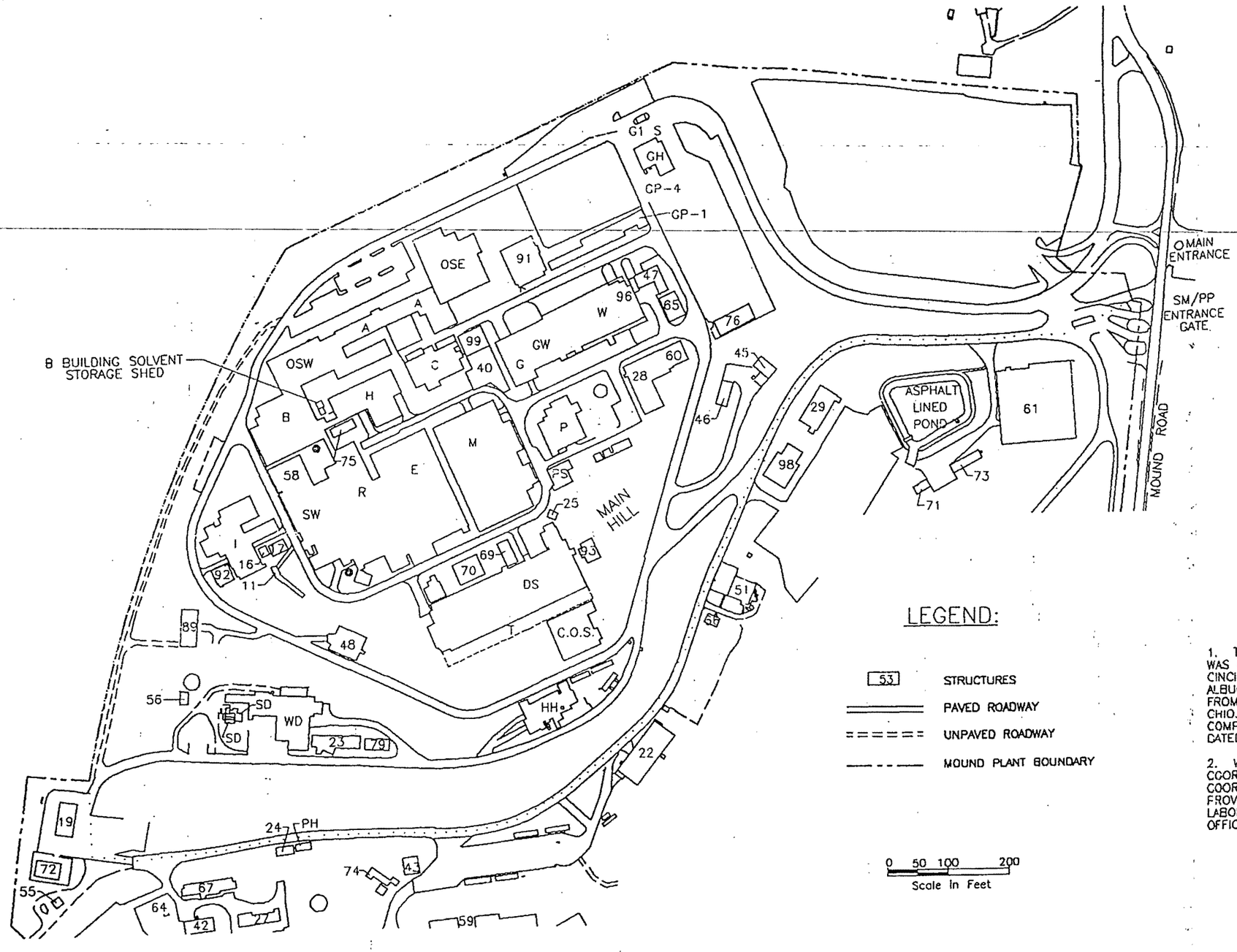
Work Order # 95-03-232 Ross Analytical Services, Inc Reported: 04/18/95

Sample Description Soil 203-000074 Lab No. 19
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 04/03/95 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT		EQL	CAS NO.	PARAMETER	RESULT		EQL
74-87-3	Chloromethane	<EQL		11	78-87-5	1,2-Dichloropropane	<EQL		5.7
74-83-9	Bromomethane	<EQL		11	10061-02-6	trans-1,3-Dichloropropene	<EQL		5.7
75-01-4	Vinyl chloride	<EQL		11	79-01-6	Trichloroethene	6.0		5.7
75-00-3	Chloroethane	<EQL		11	124-48-1	Dibromochloromethane	<EQL		5.7
75-09-2	Methylene chloride	9.6		5.7	79-00-5	1,1,2-Trichloroethane	<EQL		5.7
67-64-1	Acetone	17		11	71-43-2	Benzene	<EQL		5.7
75-15-0	Carbon disulfide	2.1	J	5.7	10061-01-5	cis-1,3-Dichloropropene	<EQL		5.7
75-35-4	1,1-Dichloroethene	<EQL		5.7	110-75-8	2-Chloroethyl vinyl ether	<EQL		230
75-34-3	1,1-Dichloroethane	<EQL		5.7	75-25-2	Bromoform	<EQL		5.7
156-60-5	1,2-Dichloroethene (total)	<EQL		5.7	591-78-6	2-Hexanone	<EQL		11
67-66-3	Chloroform	<EQL		5.7	108-10-1	4-Methyl-2-pentanone	<EQL		11
107-06-2	1,2-Dichloroethane	<EQL		5.7	127-18-4	Tetrachloroethene	<EQL		5.7
78-93-3	2-Butanone	<EQL		11	108-88-3	Toluene	<EQL		5.7
71-55-6	1,1,1-Trichloroethane	<EQL		5.7	108-90-7	Chlorobenzene	<EQL		5.7
56-23-5	Carbon tetrachloride	<EQL		5.7	100-41-4	Ethyl benzene	<EQL		5.7
108-05-4	Vinyl acetate	<EQL		11	100-42-5	Styrene	<EQL		5.7
75-27-4	Bromodichloromethane	<EQL		5.7		Xylenes	<EQL		5.7
79-34-5	1,1,2,2-Tetrachloroethane	<EQL		5.7					

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	95	70 - 121
Toluene-d8	100	84 - 138
4-Bromofluorobenzene	89	59 - 113



NOTES:

1. THE ELECTRONIC BASE MAP DATA FILE WAS OBTAINED BY ICF KAISER ENGINEERS, CINCINNATI, OHIO, FROM ROY F. WESTON, INC., ALBUQUERQUE, NEW MEXICO, WHO OBTAINED IT FROM WOOLPERT CONSULTANTS, INC., DAYTON, OHIO. THE DATA WERE PHOTOGRAMMETRICALLY COMPILED FROM AERIAL PHOTOGRAPHY DATED 12/08/85.

2. WESTON CONVERTED MOUND PLANT COORDINATES TO OHIO STATE PLANE COORDINATES USING AN ALGORITHM PROVIDED BY OAK RIDGE NATIONAL LABORATORY, GRAND JUNCTION PROJECT OFFICE.

Figure 1.3.2 Location of B Building Solvent Storage Shed Area

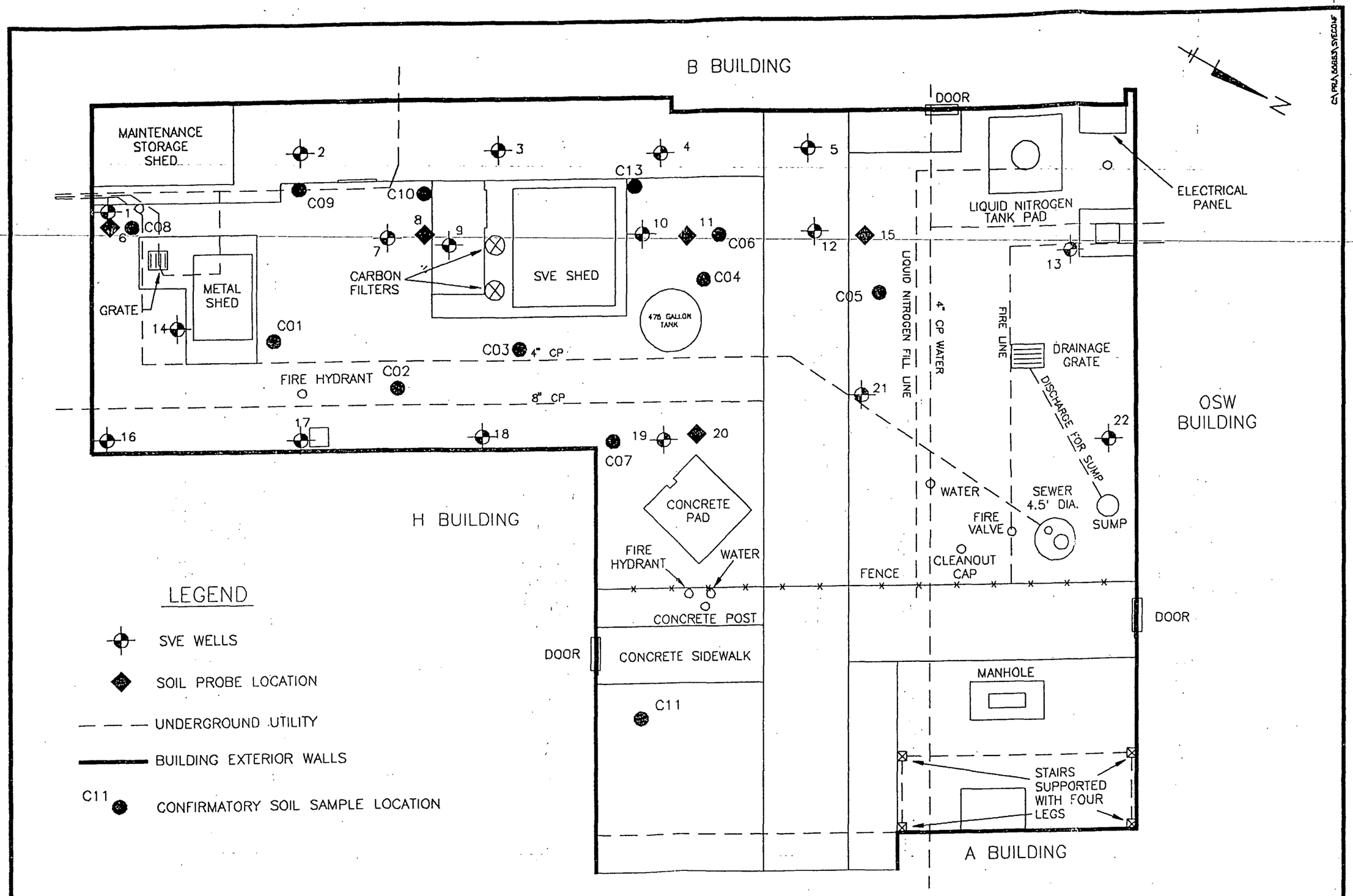


Figure 3.4.1 Soil Probe and Soil Boring Locations

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