NORTH POND RCRA FACILITY INVESTIGATION REPORT

VOLUME 1 OF 2

VICKSBURG CHEMICAL COMPANY
VICKSBURG, MISSISSIPPI

Prepared for
Vicksburg Chemical Company
Vicksburg, Mississippi

Cedar Chemical Corporation
Memphis, Tennessee

February 1994

WCC File 92B007C

Woodward-Clyde

Woodward-Clyde Consultants
2822 O'Neal Lane (70816)
P.O. Box 66317 (70896)
Baton Rouge, Louisiana

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1.0
INTRODUCTION

Vicksburg Chemical Company (VCC) has retained Woodward-Clyde Consultants (WCC) to perform activities associated with a RCRA corrective action program. The corrective action program is in response to a Consent Decree. The Consent Decree requires that a RCRA Facility Investigation (RFI) be conducted at the Vicksburg, Mississippi manufacturing facility.

The purpose of the RFI is to determine the nature and extent of releases of hazardous wastes and/or constituents from regulated units, solid waste management units (SWMUs), and other areas of concern (AOCs) at the facility and to gather all necessary data to support a Corrective Measures Study.

The RFI constitutes the second phase of the RCRA corrective action program. The program's initial phase consists of the RCRA Facility Assessment (RFA) which is conducted by EPA and precedes the RFI. The RFI itself is divided into five separate tasks which includes the Preliminary Report (previously submitted as a separate document and resubmitted in February 1994 on the Amended and Supplemental Preliminary Report), the RFI Work Plan, the Facility Investigation, and the Investigative Analysis and Reports. In addition to these phases, a Groundwater Assessment Work Plan and Annual Groundwater Assessment Reports are required by the Consent Decree.

This document is the North Pond RCRA Facility Investigation Report. The procedures followed at the VCC site during the field investigation are based on the following, issued in October, 1993.

- North Pond Field Investigation Work Plan
- Data Collection Quality Assurance Plan
- Data Management Plan
- Health and Safety Plan

The RFI Work Plan for the North Pond is guided by the information contained in the Preliminary Report (Report of Current Conditions) and was expedited because of VCC's plans to construct a new manufacturing facility. One of the sites considered is in the vicinity of the North Pond. Data is summarized and presented to VCC in this report, the North Pond RFI Report. The report discusses the sampling and analytical results and presents the data in a concise manner.

In conjunction with the development of the RFI Work Plan, a draft Preinvestigation Evaluation of Corrective Measure Technologies (PECMT) Report has been developed. The PECMT report identifies the potential corrective measure technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination. This report also identifies the field, laboratory, bench or pilot scale data to be collected during the field investigation to facilitate the evaluation and selection of the final corrective measure or measures. The PECMT Report will be submitted as a separate document on a schedule to be determined by activity of the U.S. EPA.

The RCRA Facility Investigation is intended to obtain information to characterize the nature and extent of releases of hazardous waste or constituents, if any. This information will be used to determine whether a Corrective Measures Study (CMS) will be necessary. The purpose of a CMS is to develop and evaluate the corrective action alternatives and to recommend the corrective measure or measures to be taken at the facility. The CMS will combine information obtained during RFI sampling and technology evaluated in the PECMT. Corrective Action Design and Corrective Measures Implementation would be the additional steps in the RCRA corrective action program for the VCC facility.

Prior to determination of a long term solution for the facility, Interim Measures may be taken. The purpose of Interim Measures is to mitigate the potential threat to human health and the environment. An Interim Measures Work Plan has been developed as a separate document by WCC for VCC and was submitted to the U.S. EPA in May 1992. The information developed in the North Pond RFI has obviated the need for and made obsolete the Interim Measures Work Plan. VCC proposed to continue with those Interim Measure activities already begun and to incorporate the three monitoring wells

noted in the Interim Measures Work Plan into the RFI Work Plan and/or the Groundwater Assessment Work Plan. No interim measures are recommended for the North Pond.

2.0
SITE CHARACTERIZATION

The following information describes the environmental setting on a regional and local basis.

2.1 REGIONAL GEOLOGY

The Vicksburg area lies on the eastern flank, near the axis, of the Mississippi Embayment. Containing unconsolidated sediments of Cretaceous to Quaternary Age, the sediments thicken in the structural trough toward the axis of the Embayment and the Gulf of Mexico.

Wind-borne deposited silty sediments form loess. The Pleistocene loess in the Vicksburg area is a homogeneous, massive silt with variable clay content. The loess underlies the ground surface throughout the local region. Loess generally is characterized by a higher vertical permeability in comparison to its horizontal permeability.

Underlying the Pleistocene loess is the Oligocene Vicksburg formation. This formation consists of alternating beds of sandy marl, clay marl, montmorillonitic clay and thin beds of limestone.

2.2 SITE GEOLOGIC FEATURES

In 1981, VCC commissioned the first hydrogeologic investigation. The report of that investigation provides descriptions of the geology of the site, in the vicinity of the South Plant and particularly the storm water surface impoundment, railroad area and area surrounding the inactive disposal area. A silty clay (fill) extends from the surface to a depth of less than 10 feet. Pleistocene loess (silty clay - clayey silt) extends from about 6 to 48 feet below the surface across the site. Immediately below the loess, a thin layer (1 to 2 feet) of greenish-gray sandy clay is usually present. Underlying the sandy clay is the marl from the Vicksburg formation. The top of the marl varies across the site

from 60 to 65 feet mean sea level (msl). This marl serves as the bottom of a shallow confined aquifer.

The sandy-clay deposit grades across the zone to a clayey-sand above the marl. This deposit could be the Citronelle Formation or weathered marl. The Citronelle has been interpreted as Pleistocene terrace deposits. These deposits are absent in some areas underlying the site, but where present are characterized by relatively fine-grained sediments. They do not represent a continuous permeable unit across the site.

The Byram marl has been described as representing mixed clastic and carbonate sedimentation in an open shelf or platform environment. The argillaceous, massive and medium dense character of the marl would inhibit any significant movement of water through this unit, and there is no indication of secondary permeability.

The bedrock underlying the facility is a layer of Glendon limestone of the Vicksburg Formation and, beneath the limestone, is the Jackson Formation. The top of the Glendon limestone is estimated to be 80 to 100 feet beneath the plant site and ranges from 25 to 65 feet thick. The Glendon is a dark gray to brown, dense, fine-grained limestone. The underlying non-permeable Jackson Formation is 40 to 150 feet thick.

The North Pond RFI field program confirmed the geologic observations of previous investigations. The North Pond was constructed in an elevated area with a surface elevation at 133 feet msl, whereas the railroad track area, surface pond and area surrounding the inactive disposal area are located at surface elevations of approximately 110 feet msl. The South Plant is constructed at surface elevation approximately 120 feet msl, the North Plant is constructed at surface elevation approximately 115 feet msl and the inactive disposal area at surface elevation approximately 135 feet msl. A topography of the entire site is presented as Figure 1.

The North Pond Area is generally bounded by plant coordinates N99750 E100500, N99750 E100250, N10000 E100000, N100250 E100000, and N100250 E100500. At the time of this investigation, the site was covered with tall grass and weeds. Two empty and abandoned fuel tanks and associated distribution lines were located on the northeastern portion of the site.

Fifteen soil borings were advanced by Soil Testing Engineers, Inc. in the area to determine adequacy of soil conditions for a new manufacturing facility. The locations are depicted on Figure 2 as B-1 through B-15. Evidence of potential environmental contamination resulted in additional borings at locations B-19 through B-25 by WCC and Soil Testing Engineers, Inc. in order to obtain soil samples and groundwater samples for analysis.

Generalized soil profiles illustrating the stratigraphy near the North Pond are presented as Figures 3, 4, and 5. The generalized soil profiles depict interpretation of soil stratigraphy at the site based on conditions observed at the specific boring locations. Actual soil conditions between borings possibly differ from those portrayed on the generalized soil profiles contained in this report.

2.3 SHALLOW GROUNDWATER HYDROLOGY

The marl in the Vicksburg Formation constitutes the bottom of the uppermost waterbearing zone underlying the facility. This aquifer consists almost exclusively of Pleistocene loess (silt). The clayey fill material placed atop the loess is acting as a "cap" inhibiting the vertical migration of the groundwater. The marl on the bottom of the aquifer which is not hydraulically connected to any potential water-bearing zones at greater depths. The artesian property is characteristic of an aquifer which is under pressure from above and below. The background water quality of this aquifer is marginally acceptable for drinking water, however due to its low lateral flow and yield characteristics its usefulness as a domestic water supply is severely limited. At an elevation of 70 feet msl, the hydraulic conductivity ranged from 7.5×10^{-4} to 4.3×10^{-7} centimeters per second on boring samples. The hydraulic conductivity of the aquifer decreases significantly with depth.

In the assessment work and groundwater monitoring to date there is indication that the uppermost aquifer may contain two zones in which water is encountered. The two zones are generally separated by a non-continuous stiff clay. Although the stiff clay may be non-continuous in the storm water surface impoundment area, railroad track area and area surrounding the inactive disposal area, examination of figures 3, 4, and 5 indicate it to be continuous in the North Pond area. Non-documented evidence (based

on observations and comments of construction and operations personnel during past years of construction), indicates that the stiff clay may form a continuous lens underneath the South Plant from the engineering and maintenance buildings to the railroad track area. It is because of the two distinct zones that piezometers have been nested at seven locations in the investigation of the North Pond area. A shallow piezometer intercepts the zone atop the stiff clay at each location and a deeper piezometer intercepts the zone atop the marl at each location.

Several groundwater monitoring wells have been bored across the plant site. The locations are depicted in Figure 6. The groundwater monitoring program is discussed below. A cross-section of the aquifer beneath the Railroad Track area is shown in Figure 7.

2.4 HISTORIC GROUNDWATER QUALITY

VCC has endeavored to maintain a groundwater monitoring program equivalent to the RCRA program. In 1981, a groundwater monitoring system of four wells was first installed around the Surface Impoundment. Since its original installation, numerous assessments and revisions have occurred. The existing groundwater monitoring system (Figure 6) monitors groundwater around the Surface Impoundment, the Inactive Landfill, and the Railroad Track Area.

The chronology of well installation is as follows (complete details are found in Appendix C and Appendix D of the RFI Preliminary Report or Report of Current Conditions submitted by VCC to the U.S. EPA in May, 1992):

- 1981 Wells 1, 2, 3 and 4
- 1983 Wells 5, 6, 7 and 8
- 1985 Wells 9, 10, 11 and 12
- 1986 Wells 1A, 13, 14 and 15
- 1988 Well 16

The groundwater results in Appendix C of the Preliminary Report are tabulated by compound, by monitor well, and date to show a time series history of the available data.

Originally, four compounds were tested quarterly at the facility. These compounds were arsenic, dinitrobutyl phenol, toxaphene, and methylene chloride. More recent quarterly sampling has also tested for volatile compounds using the SW 846 Method 8240 (GC/MS). This expanded sampling and analysis has been reported to the MSDNR as part of the quarterly groundwater monitoring reports. A tabulation of the data from Appendix C of the Preliminary Report is attached to this report as Appendix A.

The groundwater data in Appendix A shows that certain compounds are present in trace concentrations at the VCC site, due to man made sources on site. Approximate concentrations detected are listed below, with comment to give perspective to the concentration:

Well Number	Approximate Concentration in ppb	Comment
1A	200 ppb dinitrobutylphenol	Drinking Water Standard = 7 ppb
6	10 ppb toxaphene	May 1993 Drinking Water Standard and Health Advisory = 3 ppb
2	10 ppb dichloroethylene	May 1993 Drinking Water Standard and Health Advisory = 7 ppb
1A	10 ppb trichloroethene	May 1993 Drinking Water Standard and Health Advisory = 5 ppb
11	20 ppb trichloroethene	May 1993 Drinking Water Standard and Health Advisory = 5 ppb

3.0 SAMPLING AND PIEZOMETER INSTALLATION

The North Pond RFI sampling activities were conducted at the Vicksburg Mississippi site over a one month period beginning October 25, 1993. The sampling activities are described in the subsequent paragraphs. The sampling activities and piezometer installations are summarized in Tables 1 and 2.

3.1 SAMPLING

The general strategy was to perform environmental borings from the surface (110 to 130 feet msl) to auger refusal (approximately 60 feet msl) and continuously sample. A field screening instrument (Microtip® - PID) was utilized to help determine which soil samples are sent for chemical analysis. Boring locations (B-19 through B-25) are shown on Figure 2. For each boring location two samples were sent for chemical analysis:

- The 2-foot interval just above the clay lens at approximately 30 feet msl separating the two groundwater zones. The one exception was location B-21, where the clay lens was near the ground surface.

- The 5-foot interval just above auger refusal, that is, the marl interface at approximately 65 feet msl.

A sample was to be sent for chemical analysis if during field screening it was apparent there is greater contamination present at some sample interval from the surface to the clay lens than the sample interval just above the clay lens. There was no such indication. An additional sample was to be sent for chemical analysis if during field screening it was apparent there was greater contamination present at some sample interval from the clay lens to the marl than the sample interval just above the marl. There was no such indication. There are seven environmental boring locations; they are shown on Figures 2, 3, and 4.

Additionally the waste sludges on the bottom of the North Pond was sampled for TCLP analysis. The purpose was to determine if the sludges were hazardous by characteristic in the event it was necessary to remove the sludge prior to using the site for construction.

3.2 PIEZOMETER INSTALLATION

After completion of the borings, two nested piezometers were installed at each location (*except location B-24 where there is one piezometer existing and at location B-21 where* the shallow zone was near the ground surface). One piezometer was screened in the 10-foot interval just above the clay lens. The other piezometer was screened in the 10-foot interval just above the marl. After taking the initial water elevation levels, the piezometers were baled to remove 3 well volumes and groundwater samples were taken from each for chemical analysis.

3.3 DECONTAMINATION AND CROSS-CONTAMINATION CONTROL

In all phases of sampling, care was taken to prevent sample cross-contamination and to work with only decontaminated sampling equipment. Sample containers were stored in limited access or locked storage areas prior to use. Latex gloves were worn during all sampling activities and changed between sampling locations. Decontaminated sampling equipment was wrapped in aluminum foil prior to use and placed on clean sheets of plastic or waxed paper which were spread in the sampling areas and discarded after each use. All soil cuttings, discarded gloves, and similar items were collected on-site in 55-gallon drums and subsequently dealt with by VCC in accordance with Mississippi Regulations.

All equipment that contacted the samples was decontaminated between sample locations. Drilling equipment such as augers, shelby tubes, split-spoons, and stems was also decontaminated.

3.4 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) SAMPLES

To attain the project QA/QC objectives of accuracy, precision, completeness, comparability, and representativeness, QA/QC samples were also collected and submitted to the laboratory for analysis. A more detailed description of the QA\QC objectives was presented in the Data Collection Quality Assurance Plan (DCQAP) submitted as a part of the RFI Work Plan.

QA/QC samples collected in the field consisted of field duplicates, rinsate samples, and matrix spike/matrix duplicates. In addition, trip blanks containing samples for volatile organic analysis accompanied each sample set. The various types of field QC samples and their frequency are summarized below:

3.4.1 Field Duplicates

A second sample container was filled at a frequency of one duplicate for every 20 samples.

3.4.2 Rinsate Blanks

These samples were used to monitor potential contamination resulting from improper decontamination procedures. Rinsate blanks were collected by pouring reagent-grade, organic free water over the portion of decontaminated sampling equipment that had contacted the samples. These samples were collected at a frequency of one for every 20 samples.

3.4.3 Matrix Spike/Matrix Spike Duplicates (MS/MSD)

The purpose of these samples was to determine the accuracy and precision of the laboratory's analytical method for various matrices (soil, water, etc.). Field samples were split into three parts, two of which were spiked or dosed with a known concentration of specified compounds or constituents. Results from the spiked samples (MS/MSD) were compared with each other and the original sample to give a measure

of laboratory accuracy and precision and to determine the effect of the matrix on accuracy and precision. One MS/MSD sample was collected for every 20 samples.

3.4.4 Trip Blanks

Trip blanks were used to determine whether field samples could have been contaminated with volatile organic materials, either in the field, during shipment, or by the sample container itself. Trip blanks consisted of reagent-grade, organic-free water which was placed in vials by the laboratory, sealed, and shipped to the field in coolers with empty sample vials (one trip blank per cooler). The trip blanks were held in the field without being opened and returned to the laboratory with samples collected for volatile organic analysis.

3.5 SAMPLE LABELING AND HANDLING

All samples were labeled and sealed in accordance with the procedures established in the DCQAP. Samples were also recorded in the field log book as well as on a chain-of-custody form. Samples were stored on ice and shipped under proper chain-of-custody procedures, as described in the RFI Work Plan.

3.6 ANALYTICAL PROCEDURES

The soil samples were submitted to Analytical Technologies, Inc. Pensacola, Florida, for analyses in accordance with the DCQAP. Samples were analyzed for constituents on the EPA's Target Compound List (TCL) and Target Analyte List (TAL) and were tested using EPA Contract Laboratory Program (CLP) standard operating procedures.

3.7 ANALYTICAL QUALITY ASSURANCE REPORTS

The DCQAP in the RFI Work Plan detailed the methods of validation for both organic and inorganic analysis. All analytical results were reviewed by WCC. Validation of analytical results ensures that data are scientifically valid, defensible, and of known precision and accuracy.

3.8 DOCUMENTATION OF SAMPLING ACTIVITIES

Subsurface soil sampling was documented in the field log book as well as on a boring log form for each boring drilled. The boring logs are attached in Appendix B. Each boring log included the boring number, date, logger, lithologic description, core recovery, PID readings, depth of water table, and boring completion depth. Lithology was logged by visual classification using the Unified Soil Classification System (American Standard Testing Methods, designation D2488-84).

4.0
RESULTS OF SAMPLING AND ANALYSIS

The results of the analyses are discussed below for the waste sludge, soil and the groundwater. Results are also summarized in Table 1.

4.1 WASTE SLUDGE

It is known from the history of the manufacturing facility that the sludge in the bottom of the North Pond does not contain listed hazardous wastes. The sludge was additionally analyzed by the Toxicity Characteristic Leaching Procedure to determine if it was hazardous by characteristic. Analysis detected 29 parts per billion carbon tetrachloride and 440 parts per billion chloroform. The sludges would be hazardous by characteristic if the carbon tetrachloride concentration exceeded 500 parts per billion or the chloroform exceeded 6,000 parts per billion; therefore, the sludge is not hazardous by characteristic.

4.2 SOIL

Results of soil analyses are tabulated in Table 1 adjacent to information on the location and depth of the sample. Samples are clean with the exception of the following:

Location	Contaminant (Concentration in ppb)	Comment
B-20B Shallow Zone	Chloroform = 45	Action Level in Soil[1] = 100,000 Media Protection Standard[2], Maximum in Industrial Soil = 1,000,000 Preliminary Remediation Goal[3] in Industrial Soil = 1,600
B-20A Deep Zone	Chloroform = 13	See above
B-22B Shallow Zone	Chloroform = 830	See above
B-23A Deep Zone	Chloroform = 26	See above

NOTES: [1] EPA Proposed Corrective Action Rule for Solid Waste Management Units-Appendix A-Federal Register July 27, 1990.
[2] EPA Proposed Corrective Action Rule for Solid Waste Management Units-Appendix C-Federal Register July 27, 1990.
[3] U.S. EPA Region IX Preliminary Remediation Goals-August 6, 1993.

4.3 GROUNDWATER

Results of groundwater analyses are also tabulated in Table 1 adjacent to information on piezometer location and screened interval.

4.3.1 Inorganics

From the data it is evident that an extensive plume of calcium, magnesium, potassium and sodium developed during the active use of the North Pond. The potassium is characteristically present in waste water from the North Plant. Potassium nitrate is manufactured in the North Plant. The source of sodium is the sodium hydroxide used to scrub streams containing chlorine and nitrogen oxides or for adjusting the pH of the wastewater stream. The source of the calcium and magnesium was the dolomite placed into the North Pond to adjust the pH of the pond.

4.3.2 Organics

The extent of migration of organics from the North Pond is not extensive. The significant concentration of organics in groundwater is limited to the shallow zone (perched water table) and the area directly east and adjacent to the North Pond (20B, 22B, 23B). The following is a summary of results:

Location	Contaminant (Concentration in ppb)	Comment
B-20B Shallow Zone	Chloroform = 1,700	Media Protection Standard[2], Maximum in Water (Industrial Site) = 600 Action Level[1] in Water = 6 Preliminary Remediation Goal[3] in Tap Water = 0.28 MCL Trihalomethanes[4] = 100
	Bromodichloromethane = 36	Maximum Action Level[1] in water = 3.0 Preliminary Remediation Goal[3] in Tap Water = 0.14
	Dibromochloromethane = 14	Preliminary Remediation Goal[3] in Tap Water = 1.0
	Bromoform = 18	Preliminary Remediation Goal[3] in Tap Water = 11.0

Location	Contaminant (Concentration in ppb)	Comment
B-20B Shallow Zone (Continued)	Carbon Tetrachloride = 4.0	Media Protection Standard[2], Maximum in Water (Industrial Site) = 30.0 Action Level[1] in Water = 0.3 Preliminary Remediation Goal[3] in Tap Water = 0.026 MCL = 5.0
	Trichloroethene = 1.0	MCL = 5.0
B-22B Shallow Zone	Chloroform = 6,200	see above
	Bromodichloromethane = 66	see above
	Dibromochloromethane = 78	see above
	Bromoform = 160	see above MCL Trihalomethanes[4] = 100
B-23B Shallow Zone	Chloroform = 79	see above
	Bromoform = 8	see above
	2 - Butanone	Laboratory Artifact

NOTES:

1. EPA Proposed Corrective Action Rule for Solid Waste Management Units-Appendix A-Federal Register July 27, 1990.
2. EPA Proposed Corrective Action Rule for Solid Waste Management Units-Appendix C-Federal Register July 27, 1990.
3. U.S. EPA Region IX Preliminary Remediation Goals-August 6, 1993.
4. Trihalomethanes (total) including chloroform, bromoform, bromodichloromethane and dibromochloromethane.

5.0 GROUNDWATER ELEVATIONS AT THE NORTH POND AREA AND THE ENTIRE VCC SITE AND AQUIFER CHARACTERISTICS

The results of groundwater level measurements at the North Pond area and the entire vcc site are noted herein and aquifer characteristics are included from previous studies. Groundwater elevations were measured by WCC in the newly installed piezometers. Additionally VCC personnel obtained groundwater elevations in existing monitor wells. The data is tabulated in Table 3. Potentiometric contours of the VCC manufacturing site have been prepared and are presented as Figure 8 and Figure 9.

Figure 8 is a comprehensive potentiometric contour of the uppermost aquifer. Figure 9 is the same potentiometric contour as Figure 8, however, the potentiometric contour of the perched water table in the vicinity of the North Pond is superimposed on it. The evidence of the perched water table atop the clay lens in the North Pond area was established by the installation of shallow piezometers. The perched water table merges with or stops in the vicinity of the roadway that connects the North Plant with the South Plant. Even though there is a mixed stratigraphy in the area to the east of the road connecting the North Plant with the South Plant, including the Railroad Area, Surface Impoundment Area and Inactive Disposal Area there is no evidence of more than one zone in the uppermost aquifer in those areas, that is, the mixed stratigraphic areas are well connected.

Aquifer properties were not obtained during the present investigation. Properties previously obtained are summarized below:

Monitor Well No.	Porosity (%)	Standard Thickness (ft)	Hydraulic Gradient (ft/ft)	Hydraulic Conductivity (gal/day)(ft^2)	Velocity (ft/day)	Transmissivity (gal/day)(ft)
1	46	30	0.04	1.93	0.022	58
6	45	20.5	0.025	1.97	0.015	40
11	44	42	0.11	5.52	0.184	232
12	42	41	0.011	2.83	0.01	116

6.0
CONCLUSIONS AND RECOMMENDATIONS

Conclusions:

- The site description and history of the facility, including the North Pond, has been identified and is found in the Preliminary Report (Report of Current Conditions).
- Pertinent regional and site-specific geology has been identified.
- Pertinent regional and site-specific hydrology has been identified.
- Water level data taken at the site indicates a perched water table in the vicinity of the North Pond.
- The groundwater flow pattern of the uppermost aquifer for the site has been identified.
- Groundwater sampling and analysis performed in November and December, 1993 indicates the potential groundwater contamination issues are restricted to the shallow zone (perched water table) around the North Pond and located in the vicinity of B-20B, B-22B and B-23B.
- The sludge in the bottom of the North Pond is not hazardous. The sludge would have to be removed prior to construction atop it for reasons of soil stability and strength.
- There is no environmentally related reason to restrict construction in the vicinity of the North Pond.

Recommendations:

- The installation of a shallow recovery well in the vicinity of B-22B should be considered.
- Prior to installation of the well, a treatment scheme should be worked out. The treatment scheme would be conceptually designed in the Corrective Measures Studies.

TABLES

TABLE 1 SAMPLING, PIEZOMETER INSTALLATION AND RESULTS OF ANALYSES
TABLE 2 ANALYTICAL METHODOLOGY AND SAMPLING CONTAINERS
TABLE 3 GROUNDWATER DATA - NOVEMBER 1993

TABLE 1

SAMPLING, PIEZOMETER INSTALLATION AND RESULTS OF ANALYSES

Location (See Figures 2, 3, 4 and 5) Approximate Surface Elevation (msl)	Environmental Soil Sampling for Lab Analysis (Discussion)	Significant[1, 4] Results of Analysis of Soil Samples (ppb)	Piezometer Installation	Significant[2] Results of Analysis of Groundwater (ppb)
x 130 feet	Composited sample within pond through 5 feet of sludge. Four sample points-one composite sample for TCLP analysis.	Carbon Tetrachloride = 29 ppb Chloroform = 440 ppb (Waste is not hazardous by characteristic)	None	Not applicable
B-19 140 feet	Drilled to refusal (marl at approximately 55 feet msl)		Nested Piezometers	
19-B	Soil sampled for analysis at approximately 120 to 122 feet msl. (If during field screening there was greater contamination evident from 130 to 109 feet msl, then the 5-foot interval with the highest reading would have been submitted for analysis.)	Clean[3] Ca = 86,100,000 Mg = 39,000,000 Ma = 112,000 K = 537,000	140 to 109 msl screen bottom 10 feet	Ca = 232,000 Mg = 88,400 Na = 33,000 K = 5,140
19-A	Soil Sample for analysis at approximately 60 to 65 feet msl. (If during field screening there was greater contamination evident from 100 to 55 feet msl, then the 5-foot interval with the highest reading would have been submitted for analysis.)	Clean[3]	140 to 55 feet msl screen bottom 10 feet	Ca = 175,000 Mg = 95,800 Na = 70,300 K = 3,650

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TABLE 1 (Continued)

SAMPLING, PIEZOMETER INSTALLATION AND RESULTS OF ANALYSES

Location (See Figures 2, 3, 4 and 5) Approximate Surface Elevation (msl)	Environmental Soil Sampling for Lab Analysis (Discussion)	Significant[1, 4] Results of Analysis of Soil Samples (ppb)	Piezometer Installation	Significant[2] Results of Analysis of Groundwater (ppb)
B-12 R 137 feet			Nested Piezometers	
12(R)-B	Soil sampled for analysis at approximately 105 to 110 msl.	Clean[3] Ca = 79,600,000 Mg = 39,500,000 Na = 104,000 K = 628,000	137 to 960 msl screen bottom 10 feet	Ca = 149,000 Mg = 75,200 Na = 23,000 K = 3,480
12(R)-A	Soil sampled for analysis at approximately 65 to 70 feet msl.	Clean[3]	134 to 60 msl screen bottom 10 feet	Ca = 319,000 Mg = 123,200 Na = 34,000 K = 5,830

TABLE 1 (Continued)

SAMPLING, PIEZOMETER INSTALLATION AND RESULTS OF ANALYSES

Location (See Figures 2, 3, 4 and 5) Approximate Surface Elevation (msl)	Environmental Soil Sampling for Lab Analysis (Discussion)	Significant[1, 4] Results of Analysis of Soil Samples (ppb)	Piezometer Installation	Significant[2] Results of Analysis of Groundwater (ppb)
B-20 136 feet	Drilled to refusal (marl at approximately 60 feet msl).		Nested Piezometers	
20-B	Soil sample for analysis at approximately 93 to 95 feet msl. (If during field screening there was greater contamination evident from 130 to 93 feet msl, then the 5-foot interval with the highest reading would have been submitted for analysis.)	Chloroform = 45 ppb Ca = 80,900,000 Mg = 38,700,000 Na = 704,000 K = 537,000	136 to 100 msl screen bottom 10 feet	Chloroform = 1700 Carbontetrachloride = 4 Bromodichloromethane = 36 Trichloroethene = 1 Dibromochloromethane = 14 Bromoform = 18 Ca = 216,000 Mg = 226,000 Na = 3,700,000 K = 152,000
20-A	Soil Sample for analysis at approximately 50 to 55 feet msl. (If during field screening there was greater contamination evident from 93 to 65 feet msl, then the 5-foot interval with the highest reading would have been submitted for analysis.)	Chloroform = 13 ppb	136 to 65 msl screen bottom 10 feet	Ca = 216,000 Mg = 85,600 Na = 50,200 K = 6,630

TABLE 1 (Continued)

SAMPLING, PIEZOMETER INSTALLATION AND RESULTS OF ANALYSES

Location (See Figures 2, 3, 4 and 5) Approximate Surface Elevation (msl)	Environmental Soil Sampling for Lab Analysis (Discussion)	Significant[1, 4] Results of Analysis of Soil Samples (ppb)	Piezometer Installation	Significant[2] Results of Analysis of Groundwater (ppb)
B-21 113 feet	Drilled to refusal (marl at approximately 60 feet msl).		Piezometer	
	Clay lens near ground surface. Shallow sample was obtained at 105 to 107 feet msl.	Clean[3]	No shallow piezometer installed	No sample
21-A	Soil Sample for analysis at approximately 60 to 65 feet msl. (If during field screening there was greater contamination evident from 95 to 65 feet msl, then the 5-foot interval with the highest reading would have been submitted for analysis.)	Clean[3]	113 to 60 msl screen bottom 10 feet	Ca = 101,000 Mg = 34,700 Na = 29,600 K = 5,570

TABLE 1 (Continued)

SAMPLING, PIEZOMETER INSTALLATION AND RESULTS OF ANALYSES

Location (See Figures 2, 3, 4 and 5) Approximate Surface Elevation (msl)	Environmental Soil Sampling for Lab Analysis (Discussion)	Significant[1, 4] Results of Analysis of Soil Samples (ppb)	Piezometer Installation	Significant[2] Results of Analysis of Groundwater (ppb)
B-22 113 feet	Drilled to refusal (marl at approximately 60 feet msl).		Permanent Nested Piezometers	
22-B	Soil sample for analysis at approximately 86 to 88 feet msl. (If during field screening there was greater contamination evident from 110 to 90 feet msl, then the 5-foot interval with the highest reading would have been submitted for analysis.)	Chloroform = 830 ppb Ca = 70,600,000 Mg = 35,100,000 Na = 7,010,000 K = 700,000	113 to 85 feet msl screen bottom 10 feet	Chloroform = 1600 Bromodichloromethane = 66 Dibromochloromethane = 78 Bromoform = 160 Ca = 624,000 Mg = 124,000 Na = 16,500,000 K = 273,000
22-A		No Sample	113 to 60 feet msl screen bottom 10 feet	Chloroform = 44 Ca = 131,000 Mg = 39,100 Na = 73,500 K = 5,000

Woodward-Clyde

TABLE 1 (Continued)

SAMPLING, PIEZOMETER INSTALLATION AND RESULTS OF ANALYSES

Location (See Figures 2, 3, 4 and 5) Approximate Surface Elevation (msl)	Environmental Soil Sampling for Lab Analysis (Discussion)	Significant[1, 4] Results of Analysis of Soil Samples (ppb)	Piezometer Installation	Significant[2] Results of Analysis of Groundwater (ppb)
B-23 113 feet	Drilled to refusal (marl at approximately 60 feet msl).		Permanent Piezometers	
23-B	Soil sample for analysis at approximately 90 to 92 feet msl. (If during field screening there was greater contamination evident from 110 to 90 feet msl, then the 5-foot interval with the highest reading would have been submitted for analysis.)	Clean[3] Ca = 607,000 Mg = 366,000 Na = 29,500 K = 69,000	113 to 90 feet msl screen bottom 10 feet	Chloroform = 79 2-Butanone = 440 Bromoform = 8 Ca = 408,000 Mg = 228,000 Na = 376,000 K = 10,100
23-A	Soil Sample for analysis at approximately 65 to 70 feet msl. (If during field screening there was greater contamination evident from 85 to 65 feet msl, then the 5-foot interval with the highest reading would have been submitted for analysis.)	Chloroform = 26 ppb Ca = 6,420,000 Mg = 2,200,000 Na = 119,000 K = 487,000	113 to 65 feet msl screen bottom 10 feet	Ca = 139,000 Mg = 45,200 Na = 116,000 K = 11,100

TABLE 1 (Continued)

SAMPLING, PIEZOMETER INSTALLATION AND RESULTS OF ANALYSES

Location (See Figures 2, 3, 4 and 5) Approximate Surface Elevation (msl)	Environmental Soil Sampling for Lab Analysis (Discussion)	Significant[1, 4] Results of Analysis of Soil Samples (ppb)	Piezometer Installation	Significant[2] Results of Analysis of Groundwater (ppb)
B-24 113 feet			Permanent Piezometers	
24-B	Soil sample for analysis at approximately 85 to 88 feet msl. (If during field screening there was greater contamination evident from 110 to 90 feet msl, then the 5-foot interval with the highest reading would have been submitted for analysis.)	Clean[3] Ca = 29,400,000 Mg = 10,100,000 Na = 80,000 K = 680,000	110 to 85 feet msl screen bottom 10 feet	Ca = 198,000 Mg = 82,700 Na = 27,000 K = 19,800
24-A	Soil Sample for analysis at approximately 55 to 65 feet msl. (If during field screening there was greater contamination evident from 85 to 65 feet msl, then the 5-foot interval with the highest reading would have been submitted for analysis.)	Clean[3] Ca = 15,400,000 Mg = 1,360,000 Na = 53,000 K = 414,000	An existing piezometer (PZ-4) which exists at B-24 location from 110 to 60 feet msl is screened in the bottom 10 feet	No sample
B-25 114 feet			Permanent Piezometers	
25-B	Soil Sample for analysis at approximately 78 to 80 feet msl. (If during field screening there was greater contamination evident from 85 to 65 feet msl, then the 5-foot interval with the highest reading would have been submitted for analysis.)	Clean[3] Ca = 52,100,000 Mg = 25,500,000 Na = 94,000 K = 698,000	110 to 60 feet msl is screened in the bottom 10 feet	Ca = 518,000 Mg = 332,000 Na = 27,200 K = 4,250

TABLE 1 (Continued)

SAMPLING, PIEZOMETER INSTALLATION AND RESULTS OF ANALYSES

NOTES:

1. Data summary sheets for soil are attached as Appendix D.
2. Data summary sheets for groundwater are attached as Appendix C.
3. Essentially free of man made organics.
4. TCLP data summary sheets for soil (sludge) in pond are attached as Appendix F.

TABLE 2

ANALYTICAL METHODOLOGY AND SAMPLING CONTAINERS

SOILS SAMPLE SUMMARY:				
Number	**Analysis**	**Container Size/Type**	**Preservation**	**Holding Time**
1	TCLP 1311	32 ounce glass	Cool 4° C	7 days
10 (but as high as 20)	VOA CLP	4 ounce glass teflon lined cap	Cool 4° C	10 days
	Semi-VOA CLP	8 ounce glass teflon lined cap	Cool 4° C	10 days
	Metals CLP	4 ounce glass teflon lined cap	Cool 4° C	6 months
GROUNDWATER SAMPLE SUMMARY:				
10	VOA CLP	2 to 5 ml glass teflon lined septum	Cool 4° C	10 days
	Semi-VOA CLP	1 liter glass teflon lined cap	Cool 4° C	10 days
	Metals CLP	4 ounce glass teflon lined cap	Cool 4° C	6 months
QA/QC:				
Soil: 1 matrix spike 1 matrix spike duplicate 1 rinsate 1 trip Groundwater: 1 matrix spike 1 matrix spike duplicate 1 field blank 1 trip				

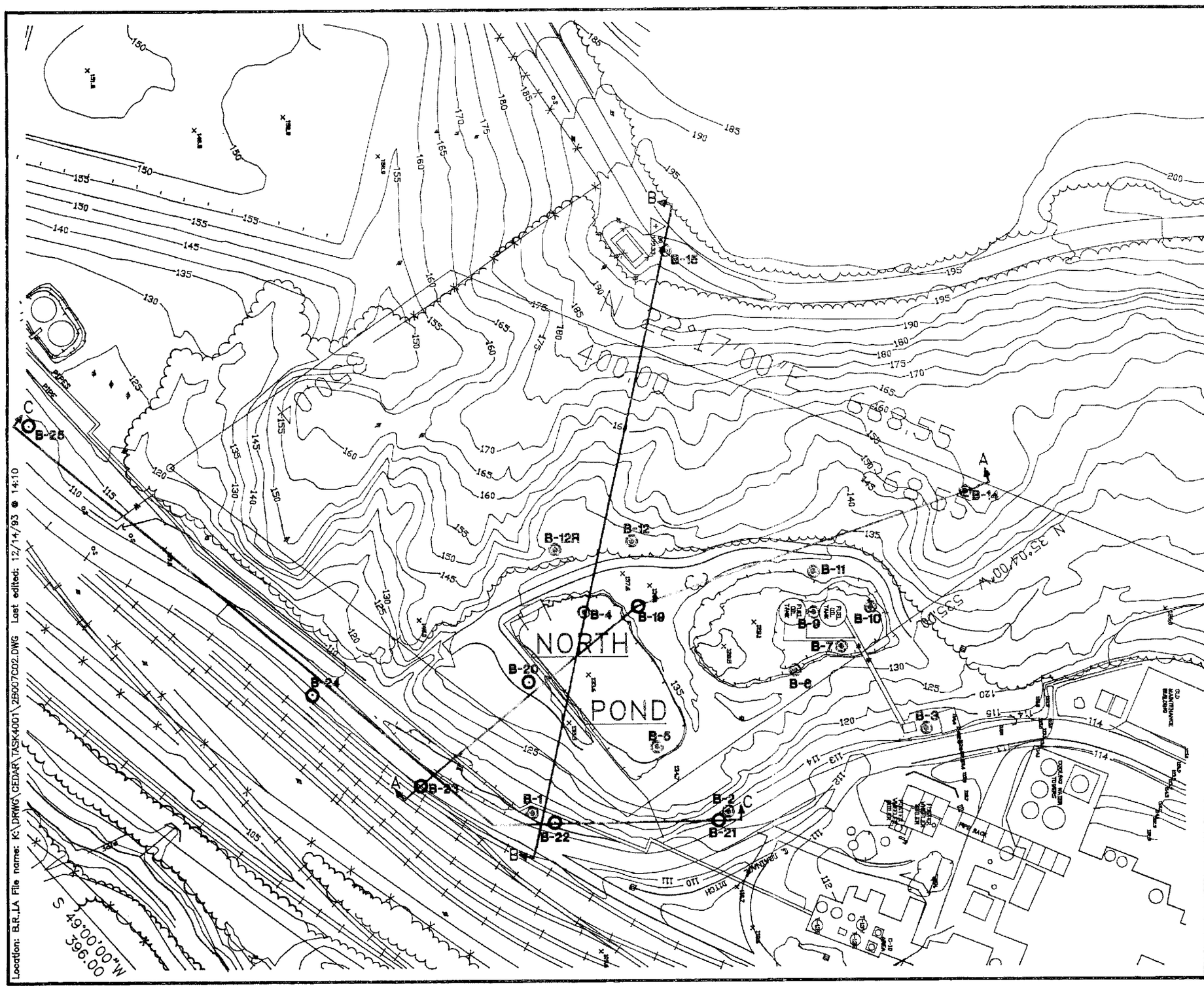
TABLE 3

GROUNDWATER DATA - NOVEMBER 1993

Piezometer or Well Number	Casing Elevation (ft msl)	Bottom Elevation (ft msl)	Top of Screen (ft msl)	November 1993 Groundwater Elevation (ft msl)
MW 1 A	113.01	83.01	93.51	108.39
MW 2	108.21	68.21	78.71	98.87
MW 3	99.33	69.33	79.83	
MW 4	114.70	94.70	105.20	106.89
MW 5	100.30	80.30	85.80	84.01
MW 6	100.76	73.78	79.28	86.48
MW 7	99.66	69.33	74.83	92.39
MW 8	110.83	80.83	86.33	103.14
MW 9	116.02	58.02	73.02	110.89
MW 10	114.73	61.73	74.73	107.40
MW 11	105.62	57.62	70.62	98.16
MW 12	112.06	64.56	80.06	109.32
MW 13	113.52	63.52	73.52	109.51
MW 14	113.9	57.9	67.9	107.64
MW 15	Plugged and abandoned during surface impoundment retrofit			
MW 16	111.84	58.84	68.84	108.84
PZ 12A (R)	137.87	66.97	72.97	107.64
PZ 12B (R)	137.27	105.27	111.27	123.48
PZ 19A	140.34	64.34	70.34	107.59
PZ 19B	140.22	120.22	126.22	124.46
PZ 20A	136.25	65.25	71.25	107.68
PZ 20B	136.43	103.43	109.43	114.50
PZ 21A	115.22	61.22	67.22	107.75
PZ 22A	112.71	61.71	67.71	107.11
PZ 22B	113.51	88.17	94.17	108.17
PZ 23A	112.49	66.49	72.49	107.27
PZ 23B	113.10	91.10	97.10	109.79
PZ 24B	113.16	85.16	91.16	107.21
PZ 25B	113.96	77.96	83.96	110.44

FIGURES

FIGURE 1 TOPOGRAPHY
FIGURE 2 BORING LOCATIONS
FIGURE 3 GENERALIZED SOIL PROFILE - SECTION A-A
FIGURE 4 GENERALIZED SOIL PROFILE - SECTION B-B
FIGURE 5 GENERALIZED SOIL PROFILE - SECTION C-C
FIGURE 6 LOCATION PLAN - MONITOR WELLS 1 - 16
FIGURE 7 GEOLOGIC CROSS SECTION
FIGURE 8 POTENTIOMETRIC CONTOURS - UPPERMOST AQUIFER
FIGURE 9 POTENTIOMETRIC CONTOURS - PERCHED WATER TABLE - NORTH POND AREA



LEGEND:

- GEOTECHNICAL BORINGS
- ENVIRONMENTAL BORINGS & PIEZOMETER LOCATION

SCALE: 1 INCH=100 FEET

100' 0 100'

DATE	REVISION	DRWN/CHKD

RCRA FACILITY INVESTIGATION
NORTH POND RFI REPORT

Woodward-Clyde Consultants
Consulting Engineers, Geologists and Environmental Scientists
Baton Rouge, Louisiana

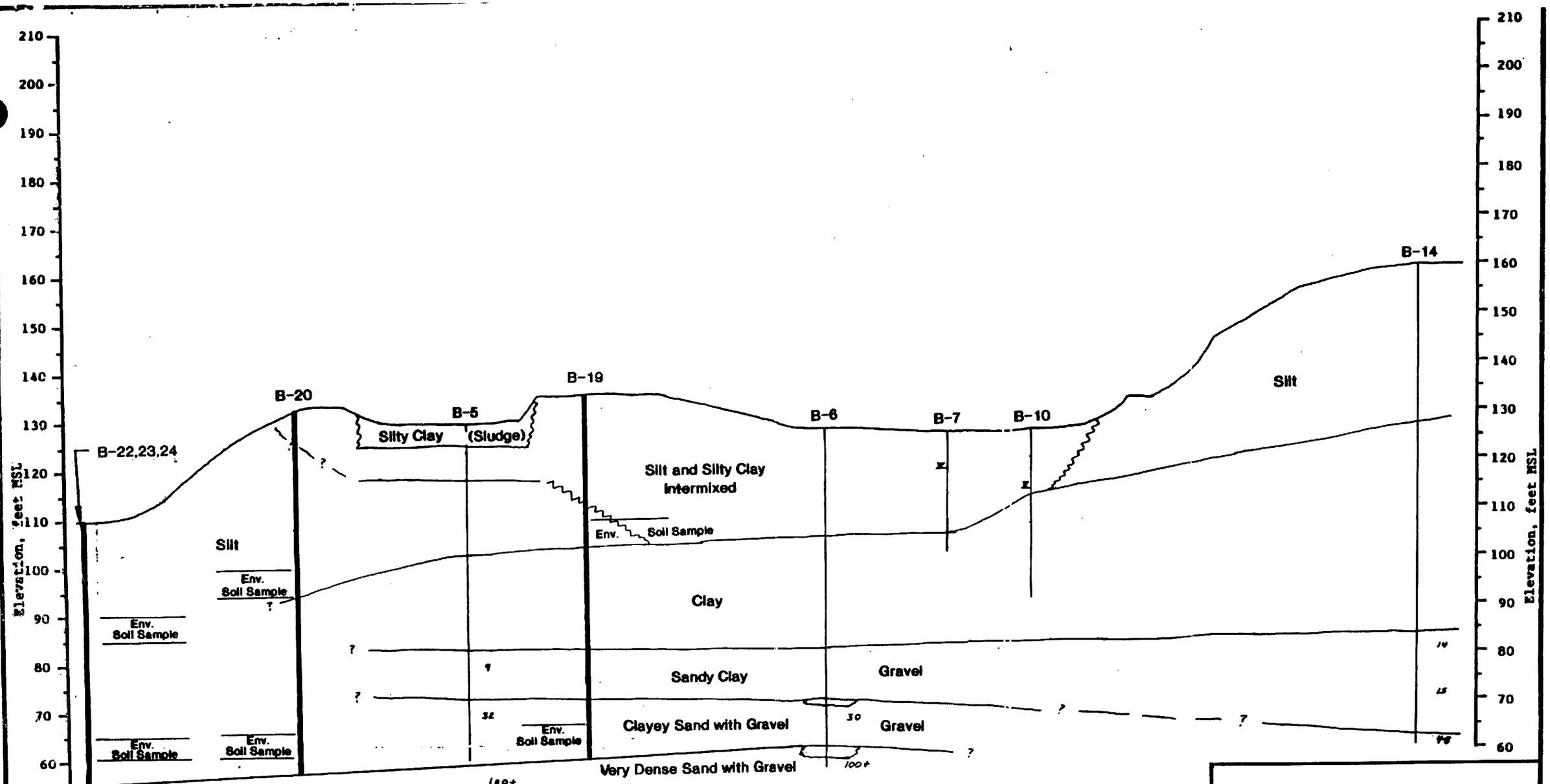
VICKSBURG CHEMICAL
VICKSBURG, MISSISSIPPI

SCALE:	MADE BY:	DATE:	FILE NO.
NOTED	CHECKED BY: MOK	DATE: 12/17/93	92B007C

BORING LOCATIONS

FIGURE 2

Location: B.R.,LA File name: K:\DRWG\CEDAR\TASK4001\2B007C02.DWG Last edited: 12/14/93 @ 14:10



ENVIRONMENTAL BORINGS & PIEZOMETER LOCATIONS

GEOTECHNICAL BORINGS

GENERALIZED SOILS PROFILE

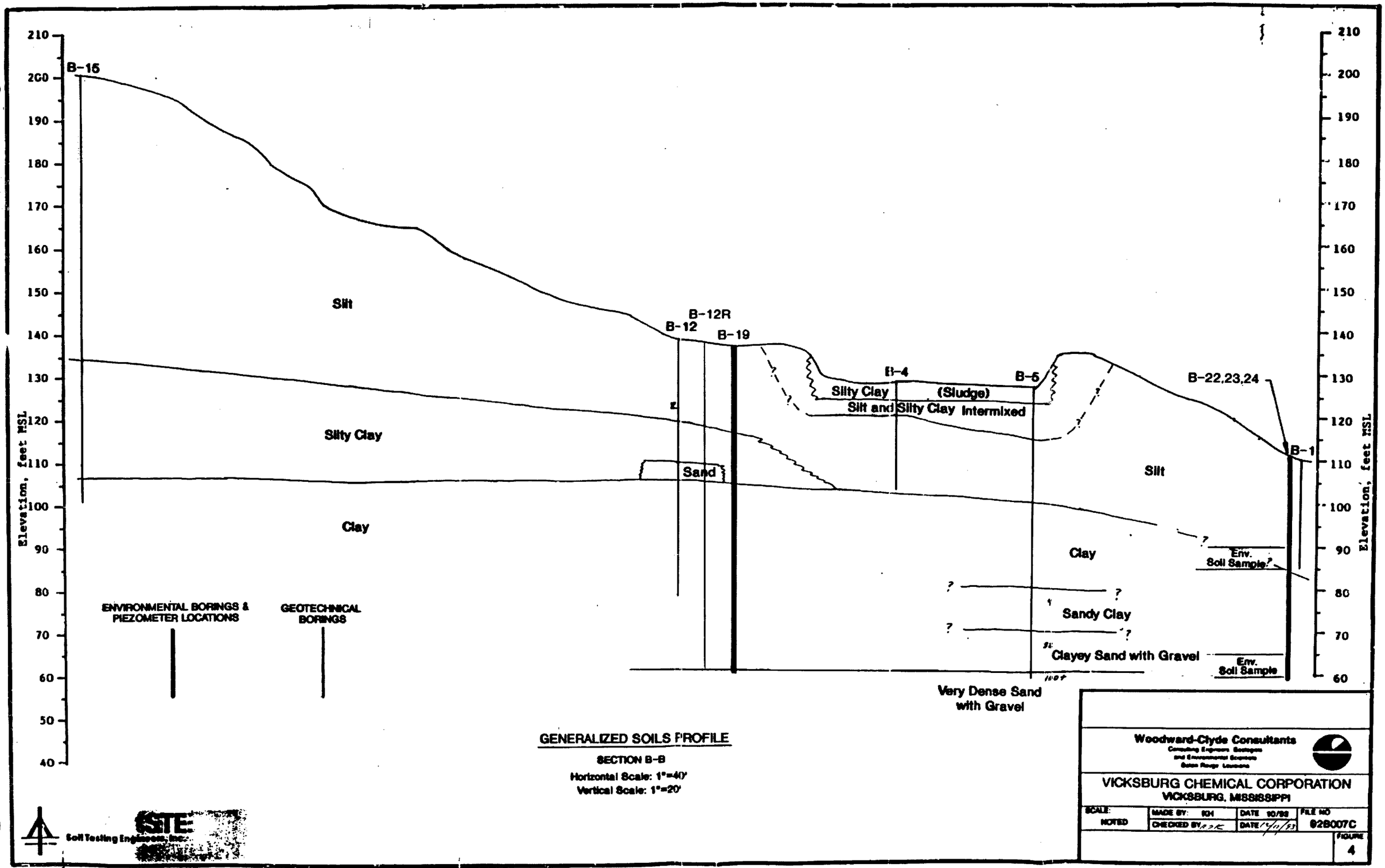
SECTION A-A
Horizontal Scale: 1"=40'
Vertical Scale: 1"=20'

Soil Testing Engineers, Inc.

Woodward-Clyde Consultants
Consulting Engineers, Geologists and Environmental Scientists
Baton Rouge, Louisiana

VICKSBURG CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

SCALE: NOTED	MADE BY: WH	DATE 10/88	FILE NO. B2B007C
	CHECKED BY	DATE	FIGURE 3



GENERALIZED SOILS PROFILE

SECTION B-B

Horizontal Scale: 1"=40'

Vertical Scale: 1"=20'

Soil Testing Engineers, Inc.

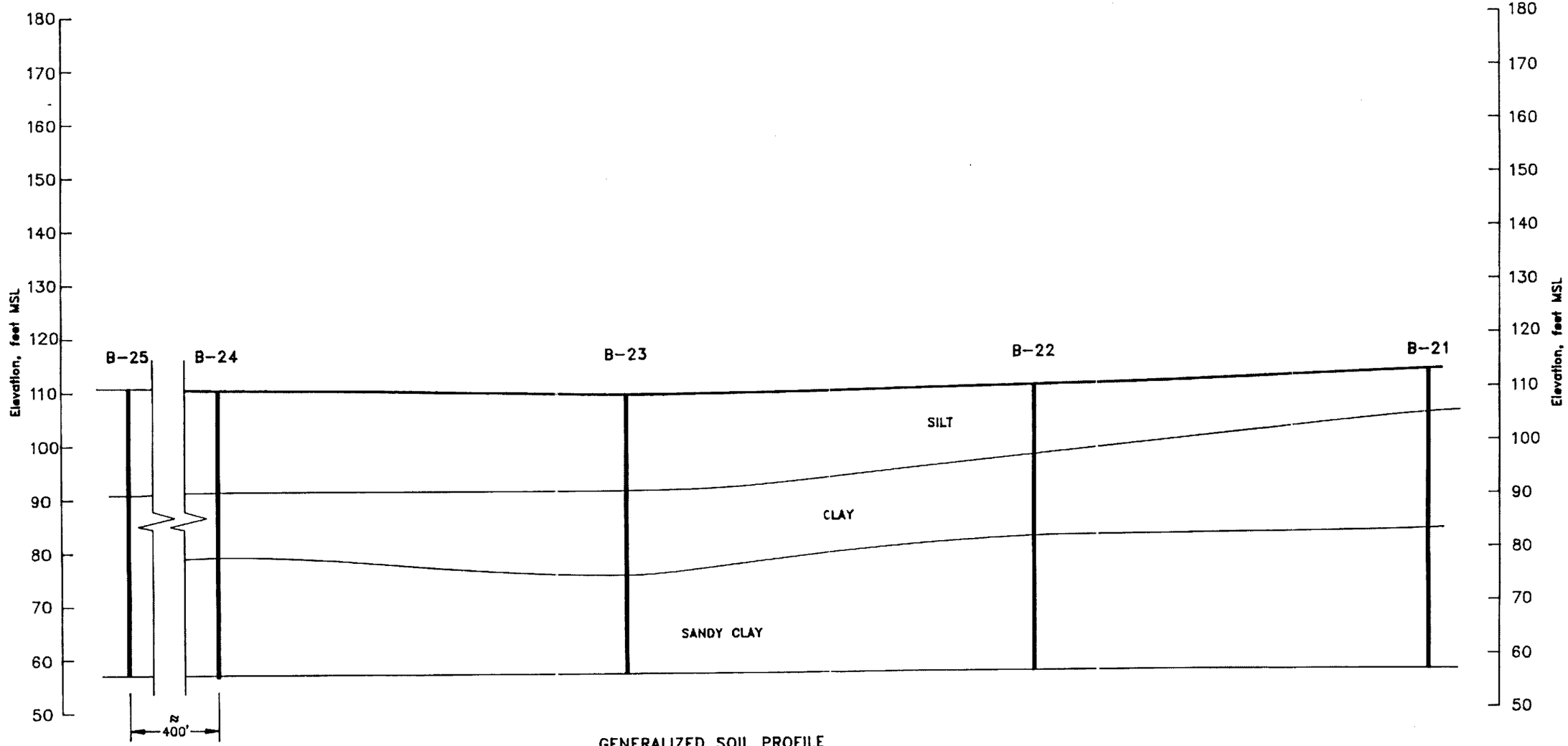
Woodward-Clyde Consultants

Consulting Engineers, Geologists and Environmental Scientists
Baton Rouge, Louisiana

VICKSBURG CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

SCALE:	MADE BY: KH	DATE 10/88	FILE NO
NOTED	CHECKED BY:	DATE:	028007C

FIGURE 4



GENERALIZED SOIL PROFILE

SECTION C – C

HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=20'

ENVIRONMENTAL BORINGS & PIEZOMETER LOCATIONS

GEOTECHNICAL BORINGS

DATE	REVISION	DRWN/CHKD

Woodward-Clyde Consultants
Consulting Engineers, Geologists and Environmental Scientists
Baton Rouge, Louisiana

VICKSBURG CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

SCALE:	MADE BY: G.T.	DATED: 12/93	FILE NO.
	CHECKED BY: epk	DATED: 12/16/93	92B007C

FIGURE 5

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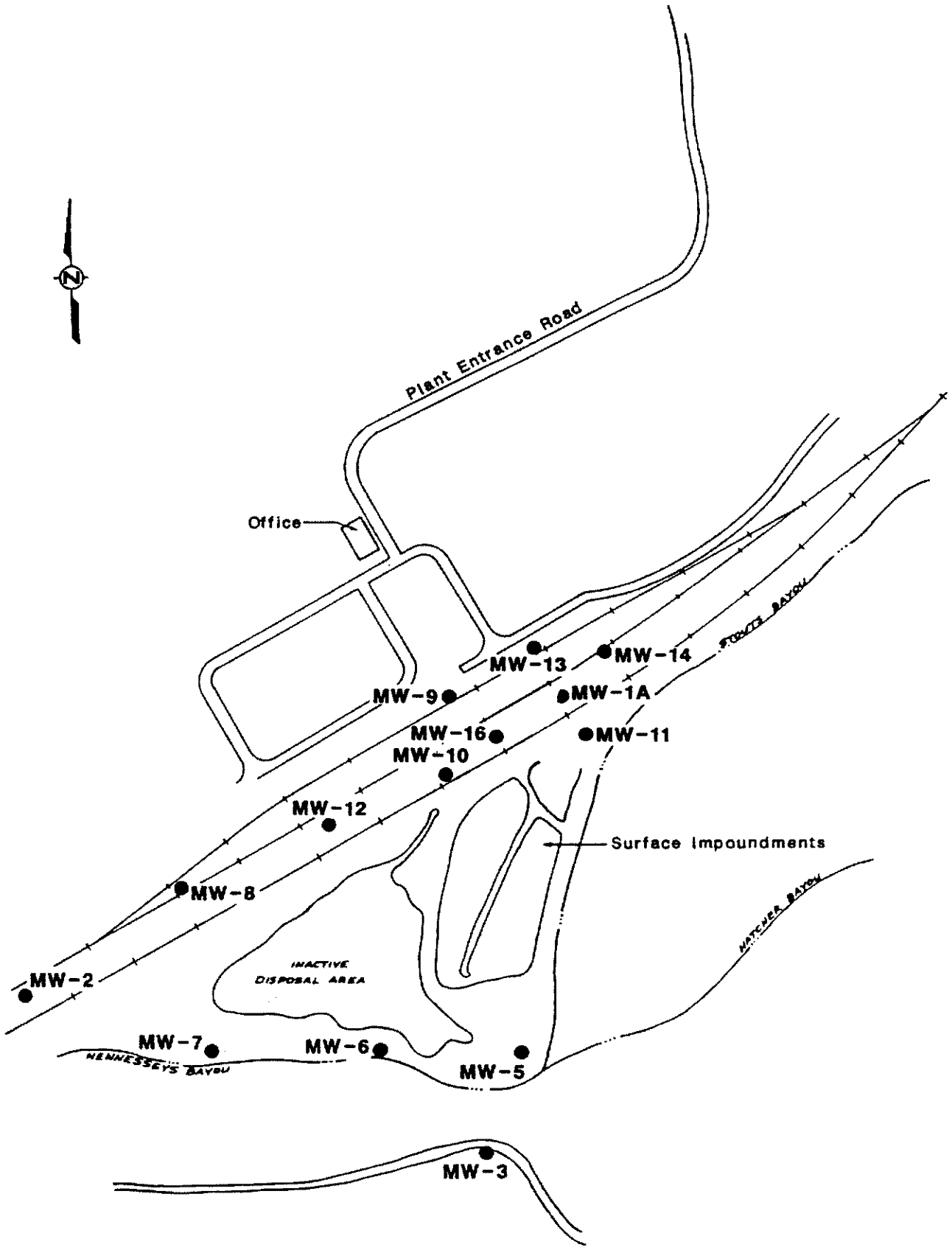
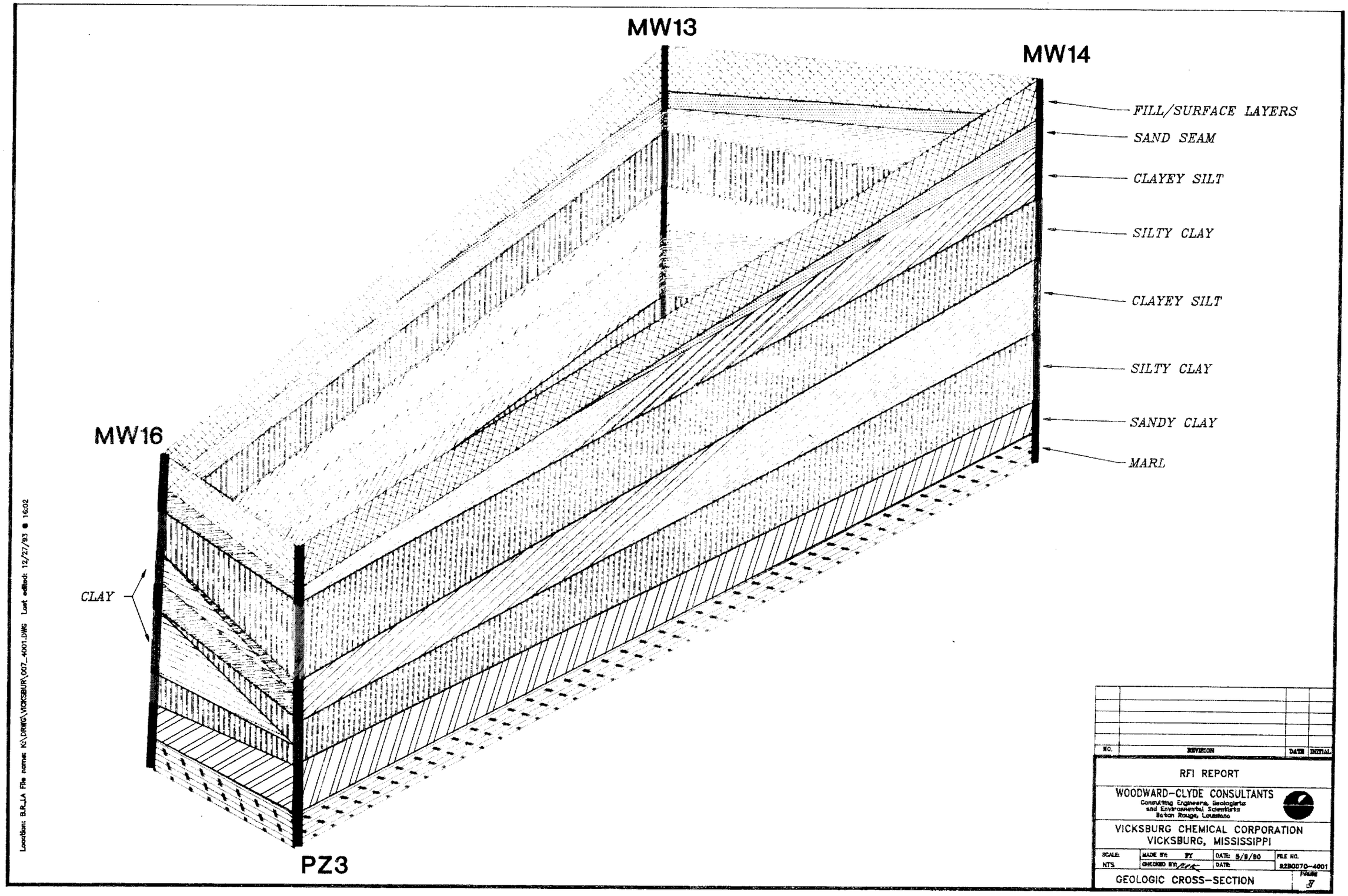


CEDAR CHEMICAL CORPORATION VICKSBURG CHEMICAL DIVISION VICKSBURG, MISSISSIPPI	**Woodward-Clyde Consultants** Consulting Engineers, Geologists and Environmental Scientists Baton Rouge, Louisiana	ACTIVE GROUNDWATER MONITORING WELLS	FILE NO. 92B007C
	SCALE: 1"=400' | DRAWN BY: SB | DATE: 5/91 CHKD. BY: | DATE:		FIG. NO. 6



Location: BLR_LA File name: K:\DRWG\VICKSBUR\007_4001.DWG Last edited: 12/27/93 @ 16:02

NO.	REVISION	DATE	INITIAL

RFI REPORT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists
Baton Rouge, Louisiana

VICKSBURG CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

SCALE:	MADE BY: FY	DATE: 5/9/90	FILE NO.
NTS	CHECKED BY:	DATE:	92B0070-4001

GEOLOGIC CROSS-SECTION

FIGURE 3

APPENDIX A

HISTORIC GROUNDWATER ANALYTICAL DATA WELLS 1 - 16

Vicksburg Chemical Corporation
Groundwater Monitor Results for **Toxaphene** (µg/l)

Sampling Date	MW 8	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 15	MW 16
Dec 1981	NT	NT	NT	NT	NT	NT	NT	NT	NT
Oct 1983	BDL	NT	NT	NT	NT	NT	NT	NT	NT
Nov 1983	BDL	NT	NT	NT	NT	NT	NT	NT	NT
Jan 1985	NT	NT	NT	NT	NT	NT	NT	NT	NT
June 1987	BDL	NT	NT	NT	NT	NT	NT	NT	NT
Sept 1987	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT
Nov 1987	NT	NT	NT	NT	NT	NT	NT	NT	NT
Dec 1987	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT
Mar 1988	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT
June 1988	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT
Aug 1988	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Dec 1988	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Mar 1989	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
June 1989	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Sept 1989	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Nov 1989	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Mar 1990	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
June 1990	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Sept 1990	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Dec 1990	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Mar 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
June 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL

Woodward-Clyde

Vicksburg Chemical Corporation
Groundwater Monitoring for **trans-1,3-Dichloropropene** (µg/l)

Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation
Groundwater Monitoring for **trans-1,3-Dichloropropene** (µg/l)

Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation
Groundwater Monitoring for **Trichlorofluoromethane** (µg/l)

Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NTQ
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation
Groundwater Monitoring for **Trichlorofluoromethane** (µg/l)

Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	1
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation
Groundwater Monitoring for **Trichloroethene** (µg/l)

Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
June 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Sept 1991	11	2	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	9	2	NT	NT	BDL	BDL	NT	NT
Nov 1991	10	2J	NT	NT	BDL	BDL	NT	NT
Dec 1991	9	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	13	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	9	2	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	8	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	12	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	9	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation
Groundwater Monitoring for **Trichlorofluoromethane** (µg/l)

Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
June 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Sept 1991	BDL	BDL	20	BDL	BDL	BDL	BDL	1
Nov 1991	NT	NT	14	NT	BDL	NT	NT	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	16	BDL	BDL	BDL	BDL	
Mar 1992	BDL	BDL	18	BDL	BDL	BDL	BDL	1
Sept 1992	BDL	BDL	13	BDL	BDL	BDL	BDL	1
Dec 1992	BDL	BDL	20	BDL	BDL	BDL	BDL	1
April 1993	BDL	BDL	25	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	27	BDL	BDL	BDL	BDL	1

NOTES:

BDL Below Detection Limit
NT Not Tested
J Result is less than quantitation limit but greater than zero

Woodward-Clyde

Vicksburg Chemical Corporation Groundwater Monitoring for Vinyl Acetate (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for Vinyl Acetate (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	50
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2

NOTES:

BDL Below Detection Limit
NT Not Tested

Woodward-Clyde

Vicksburg Chemical Corporation Groundwater Monitoring for **Vinyl Chloride** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	3	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	4	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	3J	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	4
Dec 1992	BDL	BDL	NT	BDL	BDL	2	BDL	2
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Vinyl Chloride** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	10
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1

NOTES:

BDL Below Detection Limit
NT Not Tested
J Result is less than quantitation limit but greater than zero

Vicksburg Chemical Corporation Groundwater Monitoring for **Total Xylenes** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	10	7	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	5	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Total Xylenes** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	4
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	4
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	4
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	4
Sept 1992	BDL	BDL	BDL	5	BDL	BDL	BDL	4
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	4
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	4
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	4

NOTES:

BDL *Below Detection Limit*
NT Not Tested

Vicksburg Chemical Corporation
Groundwater Monitoring for **1,1,1-Trichloroethane** (μg/l)

Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation
Groundwater Monitoring for **1,1,1-Trichloroethane** (μg/l)

Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation Groundwater Monitoring for **1,1,2,2-Tetrachloroethane** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **1,1,2,2-Tetrachloroethane** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2

NOTES:

BDL Below Detection Limit
NT Not Tested

Woodward-Clyde

Vicksburg Chemical Corporation Groundwater Monitoring for **1,1,2-Trichloroethane** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **1,1,2-Trichloroethane** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2

NOTES:

BDL Below Detection Limit
NT Not Tested

Woodward-Clyde

Vicksburg Chemical Corporation
Groundwater Monitoring for **1,1-Dichloroethene** (µg/l)

Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation
Groundwater Monitoring for **1,1-Dichloroethene** (µg/l)

Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation Groundwater Monitoring for 1,1-Dichloroethane (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for 1,1-Dichloroethane (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation Groundwater Monitoring for **1,2,3-Trichloropropane** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **1,2,3-Trichloropropane** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5

NOTES:

BDL Below Detection Limit
NT Not Tested

Woodward-Clyde

Vicksburg Chemical Corporation Groundwater Monitoring for 1,2-Dichloroethane (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for 1,2-Dichloroethane (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation
Groundwater Monitoring for **1,2-Dichloropropane** (µg/l)

Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation
Groundwater Monitoring for **1,2-Dichloropropane** (µg/l)

Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation Groundwater Monitoring for **1,4-Dichloro-2-butene** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **1,4-Dichloro-2-butene** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5

NOTES:

BDL Below Detection Limit
NT *Not Tested*

Woodward-Clyde

Vicksburg Chemical Corporation Groundwater Monitoring for **2-Butanone** (MEK) (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **2-Butanone** (MEK) (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	3
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	100
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation
Groundwater Monitoring for **2-Chloroethyl Vinyl Ether (µg/l)**

Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	4	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation
Groundwater Monitoring for **2-Chloroethyl Vinyl Ether (µg/l)**

Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	10
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation Groundwater Monitoring for **2-Hexanone** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **2-Hexanone** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	3
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	50
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation Groundwater Monitoring for **4-Methyl-2-Pentanone** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **4-Methyl-2-Pentanone** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	3
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	50
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation Groundwater Monitoring for **Acetone** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	100	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BLD	BLD	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BLD	BLD	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Acetone** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	116	BDL	BDL	10
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	10
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	50
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	10
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	10
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	10
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	10
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	10
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	10

NOTES:

BDL Below listed detection limit
NT Not tested

Vicksburg Chemical Corporation Groundwater Monitoring for **Acrolein** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Acrolein** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	100
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	100
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	100
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	100
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	100
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	100
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	100
Dec 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	100

NOTES:

BDL Below listed detection limit
NT Not tested

Vicksburg Chemical Corporation Groundwater Monitoring for **Acrylonitrile** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Acrylonitrile** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	100
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	100
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	100
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	100
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	100
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	100
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	100

NOTES:

BDL Below listed detection limit
NT Not tested

Woodward-Clyde

Vicksburg Chemical Corporation
Groundwater Monitor Results for Arsenic, Total (mg/l)

Sampling Date	MW 1	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7
Dec 1981	0.015	NT	NT	0.003	NT	NT	NT	NT
April 1982	0.003	NT	0.003	0.0048	0.0039	NT	NT	NT
Jan 1983	NT	NT	0.002	0.018	0.0089	NT	NT	NT
Jan 1985	NT	NT	NT	NT	NT	NT	NT	NT
July 1985	BDL	NT	BDL	BDL	BDL	0.019	0.015	0.030
June 1987	NT	NT	NT	NT	NT	NT	NT	NT
Sept 1987	NT	0.054	BDL	NT	BDL	BDL	0.003	0.010
Nov 1987	NT	NT	NT	0.022	NT	NT	NT	NT
Dec 1987	NT	0.003	0.003	NT	BDL	0.007	0.005	0.013
Mar 1988	NT	BDL	BDL	NT	BDL	BDL	BDL	0.005
June 1988	NT	BDL	BDL	NT	BDL	0.006	BDL	0.009
Aug 1988	NT	0.003	0.003	NT	0.006	NT	0.007	0.012
Dec 1988	NT	BDL	BDL	NT	BDL	0.010	0.003	0.014
Mar 1989	NT	0.009	0.005	NT	0.007	0.009	0.012	0.020
June 1989	NT	BDL	BDL	NT	0.003	BDL	BDL	BDL
Sept 1989	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Nov 1989	NT	BDL	BDL	NT	BDL	BDL	BDL	0.008
Mar 1990	NT	BDL	BDL	NT	BDL	BDL	0.005	0.011
June 1990	NT	0.003	BDL	NT	BDL	BDL	BDL	0.006
Sept 1990	NT	BDL	BDL	NT	BDL	NT	BDL	BDL
Dec 1990	NT	0.003	0.003	NT	BDL	BDL	BDL	BDL
Mar 1991	NT	BDL	BDL	NT	BDL	BDL	BDL	0.009
June 1991	NT	BDL	BDL	NT	BDL	BDL	BDL	0.010
Sept 1991	NT	BDL	BDL	NT	BDL	0.012	BDL	0.011
Dec 1991	NT	BDL	BDL	BDL	BDL	0.008	BDL	0.009
Mar 1992	NT	BDL	BDL	BDL	BDL	0.006	BDL	0.011
Sept 1992	NT	BDL	BDL	NT	BDL	0.005	BDL	0.014
Dec 1992	NT	BDL	BDL	NT	BDL	0.008	BDL	0.020
April 1993	NT	BDL	BDL	NT	BDL	BDL	BDL	0.012
July 1993	NT	BDL	BDL	NT	BDL	0.008	BDL	0.014

Vicksburg Chemical Corporation
Groundwater Monitor Results for **Arsenic**, Total (mg/l)

Sampling Date	MW 8	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 15	MW 16
Dec 1981	NT	NT	NT	NT	NT	NT	NT	NT	NT
April 1982	NT	NT	NT	NT	NT	NT	NT	NT	NT
Jan 1983	NT	NT	NT	NT	NT	NT	NT	NT	NT
Jan 1985	NT	NT	NT	NT	NT	NT	NT	NT	NT
July 1985	.080	NT	NT	NT	NT	NT	NT	NT	NT
June 1987	NT	NT	NT	NT	NT	NT	NT	NT	NT
Sept 1987	0.017	0.004	BDL	0.010	0.006	0.018	BDL	BDL	NT
Nov 1987	NT	NT	NT	NT	NT	NT	NT	NT	NT
Dec 1987	0.039	0.004	0.005	BDL	0.005	0.023	BDL	0.005	NT
Mar 1988	BDL	BDL	BDL	0.005	BDL	BDL	BDL	0.016	NT
June 1988	0.015	0.003	BDL	0.003	BDL	0.006	BDL	0.007	NT
Aug 1988	BDL	0.006	0.003	0.007	BDL	0.011	0.003	NT	0.010
Dec 1988	0.027	BDL	0.006	0.012	0.005	0.009	0.003	NT	0.006
Mar 1989	0.040	0.009	0.014	0.011	0.020	0.032	0.007	NT	0.021
June 1989	0.007	0.003	0.008	0.008	0.010	0.007	BDL	NT	0.005
Sept 1989	BDL	BDL	BDL	0.003	BDL	BDL	BDL	NT	BDL
Nov 1989	0.033	BDL	0.005	BDL	0.009	BDL	BDL	NT	0.005
Mar 1990	0.040	0.003	0.004	BDL	0.006	0.005	0.003	NT	0.008
June 1990	0.042	0.004	0.005	0.004	0.008	0.008	BDL	NT	BDL
Sept 1990	0.003	BDL	BDL	BDL	BDL	0.004	BDL	NT	0.005
Dec 1990	BDL	BDL	BDL	BDL	0.004	0.014	0.004	NT	0.003
Mar 1991	0.048	BDL	0.015	BDL	0.008	BDL	0.004	NT	0.005
June 1991	0.049	BDL	0.009	BDL	BDL	0.007	0.003	NT	BDL
Sept 1991	0.043	BDL	0.005	BDL	0.008	BDL	BDL	NT	0.005
Dec 1991	0.049	BDL	0.006	BDL	0.011	0.003	BDL	NT	0.005
Mar 1992	0.039	BDL	0.006	BDL	0.009	BDL	BDL	NT	BDL
Sept 1992	0.051	BDL	0.006	BDL	0.017	BDL	BDL	NT	0.005
Dec 1992	0.062	BDL	0.007	BDL	0.013	0.006	BDL	NT	0.008
April 1993	0.040	BDL	0.006	BDL	0.009	0.006	BDL	NT	0.006
July 1993	0.050	BDL	0.006	BDL	0.008	0.005	BDL	NT	0.006

Woodward-Clyde

Vicksburg Chemical Corporation Groundwater Monitoring for **Benzene** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Benzene** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1

NOTES:

BDL Below detection limit
NT Not tested

Vicksburg Chemical Corporation Groundwater Monitoring for **Bromodichloromethane** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Bromodichloromethane** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation Groundwater Monitoring for **Bromoform** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Bromoform** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation Groundwater Monitoring for **Bromomethane** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Bromomethane** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	10
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1

NOTES:

BDL Below Detection Limit
NT Not Tested

Woodward-Clyde

Vicksburg Chemical Corporation
Groundwater Monitoring for **Carbon Disulfide (µg/l)**

Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation
Groundwater Monitoring for **Carbon Disulfide (µg/l)**

Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation Groundwater Monitoring for **Carbon Tetrachloride** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
June 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Carbon Tetrachloride** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
June 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation
Groundwater Monitoring for **Chlorobenzene** (µg/l)

Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation
Groundwater Monitoring for **Chlorobenzene** (µg/l)

Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation
Groundwater Monitoring for **Chlorodibromomethane** (µg/l)

Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation
Groundwater Monitoring for **Chlorodibromomethane** (µg/l)

Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5

NOTES:

BDL Below Detection Limit
NT Not Tested

Woodward-Clyde

Vicksburg Chemical Corporation Groundwater Monitoring for **Chloroethane** (μg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Chloroethane** (μg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	10
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation Groundwater Monitoring for **Chloroform** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
June 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Sept 1991	4	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	4	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	4	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	4	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Chloroform** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
June 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	4
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2

NOTES:

BDL Below Detection Limit
NT Not Tested

Woodward-Clyde

Vicksburg Chemical Corporation Groundwater Monitoring for **Chloromethane** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	3	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	5	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Chloromethane** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Nov 1991	NT	NT	BDL	NT	BDL	NTL	NT	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	10
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2

NOTES:

BDL Below Detection Limit
NT Not Tested

Woodward-Clyde

Vicksburg Chemical Corporation Groundwater Monitoring for **cis-1,3-Dichloropropene** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **cis-1,3-Dichloropropene** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation Groundwater Monitoring for **Dibromomethane** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Dibromomethane** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation
Groundwater Monitoring for **Dichlorodifluoromethane** (µg/l)

Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation
Groundwater Monitoring for **Dichlorodifluoromethane** (µg/l)

Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5

NOTES:

BDL Below Detection Limit
NT Not Tested

Woodward-Clyde

Vicksburg Chemical Corporation
Groundwater Monitor Results for **Dinitrobutyl Phenol** (µg/l)

Sampling Date	MW 1	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7
Oct 1983	117	NT	BDL	NT	NT	NT	75.0	4.5
Nov 1983	1200	NT	NT	NT	NT	NT	NT	NT
Nov 1983	BDL	BDL	NT	NT	NT	BDL	BDL	BDL
Dec 1984	1000	NT	NT	NT	NT	NT	NT	NT
July 1985	1130	NT	BDL	BDL	BDL	BDL	BDL	BDL
June 1987	NT	NT	BDL	NT	BDL	BDL	BDL	BDL
Sept 1987	NT	340	BDL	NT	BDL	BDL	BDL	BDL
Nov 1987	NT	NT	32	BDL	BDL	12	NT	BDL
Dec 1987	NT	5500	BDL	NT	BDL	BDL	BDL	BDL
Mar 1988	NT	4000	BDL	NT	BDL	BDL	BDL	BDL
June 1988	NT	3500	BDL	NT	BDL	BDL	BDL	BDL
Aug 1988	NT	ND	BDL	NT	BDL	NT	BDL	BDL
Dec 1988	NT	61	BDL	NT	BDL	BDL	BDL	BDL
Mar 1989	NT	390	BDL	NT	BDL	BDL	BDL	BDL
June 1989	NT	103	BDL	NT	BDL	BDL	BDL	BDL
Sept 1989	NT	283	BDL	NT	BDL	BDL	BDL	BDL
Nov 1989	NT	504	BDL	NT	BDL	BDL	BDL	BDL
Mar 1990	NT	371	BDL	NT	BDL	BDL	BDL	BDL
June 1990	NT	362	BDL	NT	BDL	BDL	BDL	BDL
Sept 1990	NT	441	BDL	NT	BDL	NT	BDL	BDL
Dec 1990	NT	164	BDL	NT	BDL	BDL	BDL	BDL
Mar 1991	NT	177	BDL	NT	BDL	BDL	BDL	BDL
June 1991	NT	297	BDL	NT	BDL	BDL	BDL	BDL
Sept 1991	NT	163	BDL	NT	BDL	BDL	BDL	BDL
Dec 1991	NT	67	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	NT	237	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	NT	164J	BDL	NT	NT	NT	NT	NT
Dec 1992	NT	84	BDL	NT	BDL	BDL	BDL	BDL
April 1993	NT	260	BDL	NT	BDL	BDL	BDL	BDL
July 1993	NT	540	BDL	NT	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation
Groundwater Monitor Results for **Dinitrobutyl Phenol** (µg/l)

Sampling Date	MW 8	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 15	MW 16
Oct 1983	BDL	NT	NT	NT	NT	NT	NT	NT	NT
Nov 1983	NT	NT	NT	NT	NT	NT	NT	NT	NT
Nov 1983	BDL	NT	NT	NT	NT	NT	NT	NT	NT
Dec 1984	NT	NT	NT	NT	NT	NT	NT	NT	NT
July 1985	BDL	NT	NT	NT	NT	NT	NT	NT	NT
June 1987	BDL	NT	NT	NT	NT	NT	NT	NT	NT
Sept 1987	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT
Nov 1987	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT
Dec 1987	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT
Mar 1988	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT
June 1988	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT
Aug 1988	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Dec 1988	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Mar 1989	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
June 1989	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Sept 1989	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Nov 1989	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Mar 1990	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
June 1990	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Sept 1990	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Dec 1990	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Mar 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
June 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
July 1993	BDL	BDL	BDL	0.90	BDL	BDL	BDL	NT	BDL

Woodward-Clyde

Vicksburg Chemical Corporation Groundwater Monitoring for Ethanol (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for Ethanol (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	50
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	50
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	50
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	50
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	50
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	50
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	50
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	50

NOTES:

BDL Below Detection Limit
NT Not Tested

Woodward-Clyde

Vicksburg Chemical Corporation Groundwater Monitoring for **Ethylbenzene** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	2	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Ethylbenzene** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation Groundwater Monitoring for **Ethyl Methacrylate** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Ethyl Methacrylate** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation Groundwater Monitoring for **Iodomethane** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Iodomethane** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5

NOTES:

BDL Below Detection Limit
NT Not Tested

Woodward-Clyde

Vicksburg Chemical Corporation Groundwater Monitoring for **Methyl Ethyl Ketone*** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
June 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Methyl Ethyl Ketone** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
June 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	10
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	10
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	10
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	10
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	10

NOTES:

BDL *Below Detection Limit*
NT Not Tested
* 2-Butanone

Woodward-Clyde

Cedar Chemical Corporation, Vicksburg Chemical Division Groundwater Monitoring for Methyl Chloride (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
June 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Cedar Chemical Corporation, Vicksburg Chemical Division Groundwater Monitoring for Methyl Chloride (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	DETECTION LIMIT
June 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation
Groundwater Monitor Results for **Methylene Chloride** (µg/l)

Sampling Date	MW 1	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7
Dec 1981	NT	NT	NT	NT	NT	NT	NT	NT
Jan 1983	NT	NT	NT	NT	NT	NT	NT	NT
April 1983	NT	NT	NT	NT	NT	NT	NT	NT
Jan 1985	NT	NT	NT	NT	NT	NT	NT	NT
July 1985	BDL	NT	BDL	8.0	BDL	15	11.4	14.6
June 1987	NT	NT	NT	NT	NT	NT	NT	NT
Sept 1987	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Nov 1987	NT	NT	NT	NT	NT	NT	NT	NT
Dec 1987	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Mar 1988	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
June 1988	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Aug 1988	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Dec 1988	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Mar 1989	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
June 1989	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Sept 1989	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Nov 1989	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Mar 1990	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
June 1990	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Sept 1990	NT	BDL	BDL	NT	BDL	NT	BDL	BDL
Dec 1990	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Mar 1991	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
June 1991	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Sept 1991	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Nov 1991	NT	BDL	BDL	NT	NT	BDL	BDL	NT
Nov 1991	NT	BDL	BDL	NT	NT	BDL	BDL	NT
Dec 1991	NT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	NT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Dec 1992	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
April 1993	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
July 1993	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation
Groundwater Monitor Results for **Methylene Chloride** (µg/l)

Sampling Date	MW 8	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 15	MW 16
Dec 1981	NT	NT	NT	NT	NT	NT	NT	NT	NT
Jan 1983	NT	NT	NT	NT	NT	NT	NT	NT	NT
April 1983	NT	NT	NT	NT	NT	NT	NT	NT	NT
Jan 1985	NT	NT	NT	NT	NT	NT	NT	NT	NT
July 1985	BDL	NT	NT	NT	NT	NT	NT	NT	NT
June 1987	NT	NT	NT	NT	NT	NT	NT	NT	NT
Sept 1987	BDL	BDL	BDL	BDL	BDL	400	BDL	BDL	NT
Nov 1987	NT	NT	NT	NT	NT	7269	NT	NT	NT
Dec 1987	BDL	BDL	BDL	BDL	BDL	175	BDL	BDL	NT
Mar 1988	BDL	BDL	BDL	BDL	BDL	BDL	BDL	13,000	NT
June 1988	BDL	BDL	BDL	BDL	BDL	BDL	BDL	19,000	NT
Aug 1988	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Dec 1988	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Mar 1989	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
June 1989	BDL	BDL	BDL	BDL	BDL	0.1	BDL	NT	BDL
Sept 1989	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Nov 1989	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Mar 1990	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
June 1990	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Sept 1990	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Dec 1990	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Mar 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
June 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Nov 1991	NT	NT	NT	BDL	NT	BDL	NT	NT	NT
Nov 1991	NT	NT	NT	BDL	NT	BDL	NT	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NT	BDL
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation
Groundwater Monitoring for Styrene (µg/l)

Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation
Groundwater Monitoring for Styrene (µg/l)

Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	2
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2

NOTES:

BDL Below Detection Limit
NT Not Tested

Vicksburg Chemical Corporation Groundwater Monitoring for **Tetrachloroethene** (µg/l)								
Sampling Date	*MW 1A*	*MW 2*	*MW 3*	*MW 4*	*MW 5*	*MW 6*	*MW 7*	*MW 8*
Sept 1991	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Tetrachloroethene** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	1
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1

NOTES:

BDL Below Detection Limit
NT Not Tested

Woodward-Clyde

Vicksburg Chemical Corporation Groundwater Monitoring for **Toluene** (µg/l)								
Sampling Date	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7	MW 8
Sept 1991	BDL	BDL	NT	BDL	6	BDL	BDL	BDL
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Nov 1991	BDL	BDL	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	BDL	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Toluene** (µg/l)								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5

NOTES:

BDL Below Detection Limit
NT Not Tested

Woodward-Clyde

Vicksburg Chemical Corporation Groundwater Monitoring for **Total 1,2-Dichloroethylene (µg/l)**								
Sampling Date	*MW 1A*	*MW 2*	*MW 3*	*MW 4*	*MW 5*	*MW 6*	*MW 7*	*MW 8*
Sept 1991	BDL	12	NT	BDL	BDL	BDL	BDL	BDL
Nov 1991	BDL	10	NT	NT	BDL	BDL	NT	NT
Dec 1991	BDL	11	BDL	BDL	BDL	BDL	BDL	BDL
Mar 1992	BDL	8	BDL	BDL	BDL	BDL	BDL	BDL
Sept 1992	BDL	9	NT	BDL	BDL	BDL	BDL	BDL
Dec 1992	BDL	10	NT	BDL	BDL	BDL	BDL	BDL
April 1993	BDL	10	NT	BDL	BDL	BDL	BDL	BDL
July 1993	BDL	8	NT	BDL	BDL	BDL	BDL	BDL

Vicksburg Chemical Corporation Groundwater Monitoring for **Total 1,2-Dichloroethylene (µg/l)**								
Sampling Date	MW 9	MW 10	MW 11	MW 12	MW 13	MW 14	MW 16	Detection Limit
Sept 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Nov 1991	NT	NT	BDL	NT	BDL	NT	NT	5
Dec 1991	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Mar 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Sept 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
Dec 1992	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
April 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5
July 1993	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5

NOTES:

BDL *Below Detection Limit*
NT Not Tested

Woodward-Clyde

Vicksburg Chemical Corporation
Groundwater Monitor Results for Toxaphene (µg/l)

Sampling Date	MW 1	MW 1A	MW 2	MW 3	MW 4	MW 5	MW 6	MW 7
Dec 1981	NT	NT	NT	NT	NT	NT	NT	NT
Oct 1983	BDL	NT	BDL	NT	NT	NT	BDL	BDL
Nov 1983	BDL	NT	BDL	NT	NT	NT	BDL	BDL
Jan 1985	NT	NT	NT	NT	NT	NT	NT	NT
June 1987	NT	NT	BDL	NT	BDL	BDL	BDL	BDL
Sept 1987	NT	BDL	BDL	NT	NT	BDL	BDL	BDL
Nov 1987	NT	BDL	NT	BDL	BDL	NT	NT	NT
Dec 1987	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Mar 1988	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
June 1988	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Aug 1988	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Dec 1988	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Mar 1989	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
June 1989	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Sept 1989	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Nov 1989	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Mar 1990	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
June 1990	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Sept 1990	NT	BDL	BDL	NT	BDL	NT	BDL	BDL
Dec 1990	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Mar 1991	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
June 1991	NT	BDL	BDL	NT	BDL	BDL	BDL	BDL
Sept 1991	NT	BDL	BDL	NT	BDL	BDL	25	BDL
Dec 1991	NT	BDL	BDL	NT	BDL	BDL	18.8	BDL
Mar 1992	NT	BDL	BDL	BDL	BDL	BDL	12.3	BDL
Sept 1992	NT	BDL	BDL	NT	BDL	BDL	2.5	BDL
Dec 1992	NT	BDL	BDL	NT	BDL	BDL	4.7	BDL
April 1993	NT	BDL	BDL	NT	BDL	BDL	2.1	BDL
July 1993	NT	BDL	BDL	NT	BDL	BDL	14.0	BDL

Woodward-Clyde

APPENDIX B

BORING LOGS

LOG OF BORING

PROJECT: North Pond RFI
LOCATION: Vicksburg, Mississippi
CLIENT: Vicksburg Chemical Corporation

BORING: B-12B(R)
FILE: 92B007C-4001
DATE: 11/10/93
TECHNICIAN: M. Olson
APPROVED:
PAGE: 1 of 1

Hollow-stem Augered: Full Depth

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)				Description of Stratum
0								Augered down to 12' B.L.S.
5								
10								
		NR						Firm tan Clayey SILTS, wet (ML)
15		1.00		14				—with a trace of organics and white specks, 14'- 16'
		0.75		24				—tan and light gray below 16'
		0.50		24				—with a trace of rootlets, 18'- 20'
20		0.50		24				—with a trace of organics below 20'
		1.25		16				—firm to dense, with a trace of ferrous nodules, 22'- 26'
25		1.50		20				—damp, 24'- 28' —light gray below 25'
		2.00		24				—dense, 26'- 28'
		<0.25		14				—loose to firm, 28'- 30' —wet below 28'
30		0.25		24				—firm, 30'- 32'
		2.25		20				—dense below 32' —with a trace of organics and shell fragments, 32'- 34'
35		3.50		14				Dense to stiff light gray Clayey SILTS / Silty CLAYS (ML/CL)
								Bottom of boring at 36'. Borehole grouted full depth. Set piezometer with screen interval at 26'- 36' BLS.

NR = No Recovery

Unified Soil Classifications based on visual observations.

DEC 13 93 ENVIRS4 2B007

Woodward-Clyde Consultants

LOG OF BORING

PROJECT: **North Pond RFI**
LOCATION: **Vicksburg, Mississippi**
CLIENT: **Vicksburg Chemical Corporation**

BORING: **B-25B**
FILE: **92B007C-4001**
DATE: **11/12/93**
TECHNICIAN: **M. Olson**
APPROVED:
PAGE: **1 of 1**

Hollow-stem Augered: **Full Depth**

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)				Description of Stratum
0								Fill Material (FILL)
		<0.25		20				Loose tan Clayey SILTS, wet (ML)
5		<0.25		20				—with a trace of ferrous nodules, 2'- 4' —with a trace of organics, 4'- 14'
		<0.25		24				
		<0.25		24				—with ferrous seams, 8'- 10'
10		<0.25		24				—tan and light gray, 10'- 23'
		<0.25		24				—with a trace of ferrous nodules, 12'- 23'
15		1.25		24				—firm, 14'- 16'
		0.25		24				—loose below 16'
		<0.25		24				
20		<0.25		24				
		<0.25		24				
		0.25						—light gray below 23'
25		0.25		24				—with a trace of shells, 23'- 26'
		0.25		24				
		<0.25		24				—with a trace of organics, 28'- 30'
30		0.25		24				
		0.75		24				—firm below 40'
35		0.75		24				—with a trace of shells, 34'- 38'
		0.75		24				
		0.75		24				Firm to medium, light gray and tan Clayey fine SANDS / Sandy CLAYS with ferrous stains and a trace of organics (SC/CL)
40								

Bottom of boring at 40'.
Borehole grouted full depth.
Piezometer installed in borehole.

Unified Soil Classifications based on visual observations.

Woodward-Clyde Consultants

LOG OF BORING

PROJECT: **North Pond RFI**
LOCATION: **Vicksburg, Mississippi**
CLIENT: **Vicksburg Chemical Corporation**

BORING: **B-19A**
FILE: **92B007C-4001**
DATE: **11/1/93**
TECHNICIAN: **M. Olson**
APPROVED:
PAGE: **1 of 2**

Hollow-stem Augered: **Full Depth**

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)				Description of Stratum
0		3.0		12				Stiff tan Silty CLAYS (CL)
		1.5		18				—medium, 2'- 4'
5		>4.0 0.75		18				Very stiff tan Clayey SILTS / Silty CLAYS (ML/CL)
		0.75		24				—soft below 5'
		2.25 <0.25		24				Soft tan and light gray Clayey SILTS, damp to wet (ML) —stiff, 8'- 9' —very soft, 9'- 10'
10		1.00		24				—tan below 9' —wet, 9'- 16' —firm to dense below 10'
		1.25		24				—*with ferrous streaks*, 10'- 14' —with white specks, 12'- 16'
15		1.75		24				—with a trace of organics, 14'- 16'
		1.25		24				—damp, 16'- 24'
		1.25		18				
20		1.25		24				—with a trace of shell fragments, 20'- 24'
		1.25		24				
25		1.50		18				—less clayey below 24'
		1.50 2.25		24				Stiff gray Clayey SILTS / Silty CLAYS (ML/CL)
30		2.50		16				Stiff light gray Silty CLAYS with silt pockets and ferrous streaks (CL)
35		1.75		24				Stiff light gray CLAYS (CH) —with silt seams and calcareous nodules, slickensides, 33'- 35'
40		1.75		24				—with silt and ferrous stains, organics, 38'- 40'

Continued Next Page

Unified Soil Classifications based on visual observations.

LOG OF BORING

PROJECT: North Pond RFI
LOCATION: Vicksburg, Mississippi
CLIENT: Vicksburg Chemical Corporation

BORING: B-19A
FILE: 92B007C-4001
DATE: 11/1/93
TECHNICIAN: M. Olson
APPROVED:
PAGE: 2 of 2

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)				Description of Stratum
40								Stiff light gray CLAYS with silt seams and ferrous stains, organics (CH)
		1.75		24				—tan and light gray, slickensides, 43'- 45' —with ferrous stains, 43'- 50'
45								
		2.75		24				—with white vertical streaks, 48'- 50'
50								
		2.5		24				—gray, slickensides, 53'- 55'
55								
		2.25		24				Dense light gray SANDS (SP) —with traces of silt and clay below 59.5' —with wood and alternating layers of clay and sandy clay below 60'
60								
65								
70								
75								

Bottom of boring at 79'.
Borehole grouted full depth.

Unified Soil Classifications based on visual observations.

LOG OF BORING

PROJECT: **North Pond RFI**
LOCATION: **Vicksburg, Mississippi**
CLIENT: **Vicksburg Chemical Corporation**

BORING: **B-20A**
FILE: **92B007C-4001**
DATE: **10/26/93**
TECHNICIAN: **M. Olson**
APPROVED:
PAGE: **1 of 2**

Hollow-stem Augered: **Full Depth**

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)				Description of Stratum
0		4.5		6				Stiff tan and light gray Silty CLAYS (CL)
		–		2				
		0.75		12				---soft, 4'- 8'
5								
		1.75 >4.5		12 14				---medium, tan, 8'- 10'
10		>4.5		0				Soft, brown and tan Silty CLAYS / Clayey SILTS (CL/ML)
		1.50PT 0.25PB		24				
		>0.25		24				
15								---firm, with ferrous nodules below 16'
		1.25PT 0.75PB		24				
20								---becomes medium to stiff at 20' ---brown, 20'- 21' ---soft, 21'- 22' ---tan below 21' ---firm to dense, 22'- 33'
				24				
25				24				
				24				---with shell fragments and traces of ferrous nodules below 26'
				6				
30								
				12				Medium to dense, light gray and tan Clayey SILTS (ML)
35								
		2.5		24				Stiff light gray Silty CLAYS with silt pockets (CL)
40								

Continued Next Page

Unified Soil Classifications based on visual observations.

Woodward-Clyde Consultants

LOG OF BORING

PROJECT: **North Pond RFI**
LOCATION: **Vicksburg, Mississippi**
CLIENT: **Vicksburg Chemical Corporation**

BORING: **B-20A**
FILE: **92B007C-4001**
DATE: **10/26/93**
TECHNICIAN: **M. Olson**
APPROVED:
PAGE: **2 of 2**

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)				Description of Stratum
40								Stiff light gray Silty CLAYS with silt pockets (CL)
		3.75		24				
45								—with shells and sandy clay at 45'
		2.25		24				—slickensided, with ferrous stains and silt pockets, 48'- 50'
50								
		1.75		24				—with more silt below 53'
55								
		–		24				—with a layer of medium light gray silty sand at 58'
60								
		–		18				—medium, with organics, becoming more clayey, 63'- 65'
65								
		NR						Firm to dense gray medium to coarse SANDS with a trace of gravel and clay (SP)
70								
				24				Alternating layers of CLAYS and Clayey SILTS with shells (CH/ML)
75								Bottom of boring at 75'. Borehole grouted full depth.

Unified Soil Classifications based on visual observations.

Woodward-Clyde Consultants

LOG OF BORING

PROJECT: North Pond RFI
LOCATION: Vicksburg, Mississippi
CLIENT: Vicksburg Chemical Corporation

BORING: B-20B
FILE: 92B007C-4001
DATE: 10/28/93
TECHNICIAN: M. Olson
APPROVED:
PAGE: 1 of 1

Hollow-stem Augered: Full Depth

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)				Description of Stratum
0								Medium tan SILTS with white streaks (ML)
5								
10								
15				9				
20								
25								
30								
35		1.25		24				Medium CLAYEY SILTS with little moisture (ML)
		1.25		24				Medium light gray fine SILTS (ML)

Bottom of boring at 39'.
Borehole grouted full depth.

Unified Soil Classifications based on visual observations.

Woodward-Clyde Consultants

LOG OF BORING

PROJECT: North Pond RFI
LOCATION: Vicksburg, Mississippi
CLIENT: Vicksburg Chemical Corporation

BORING: B-21A
FILE: 92B007C-4001
DATE: 11/3/93
TECHNICIAN: M. Olson
APPROVED:
PAGE: 1 of 2

Hollow-stem Augered: **Full Depth**

Free water was encountered at a depth of 33' during hollow stem augering. The water level rose to depths of 33.1' and 32.9' after observation periods of 10 and 15 minutes, respectively.

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)				Description of Stratum
0								CLAYS, shell and gravel (FILL)
5		>4.0		24				Very dense tan Clayey SILTS (ML)
		2.5						
		2.0		24				—becoming firm to dense at 5.75'
		2.5						—with a trace of ferrous stains below 6'
		2.25		24				Stiff light gray and tan Silty CLAYS (CL)
10		1.5		24				—with a trace of organics and ferrous stains, 8'- 15.5' —medium below 10'
		1.75		24				
15		1.75		24				
		2.5		24				—stiff, gray below 15.5' —with rootlets, 15.5'- 18' —with silt pockets below 16'
		2.5		24				—with ferrous stains, 16'- 26'
20		2.25		24				
		2.25		24				
25		1.75		24				—with white vertical seams and streaks, 25'- 26'
		–		24				
30		3.0		24				—light gray and tan, 28'- 30'
35		2.25		24				Alternating layers of stiff gray Silty CLAYS and firm to dense light gray Clayey SANDS (CL/SC)
40		–		24				—with a layer of wood at 39.5'

Continued Next Page

Unified Soil Classifications based on visual observations.

LOG OF BORING

PROJECT: North Pond RFI
LOCATION: Vicksburg, Mississippi
CLIENT: Vicksburg Chemical Corporation

BORING: B-21A
FILE: 92B007C-4001
DATE: 11/3/93
TECHNICIAN: M. Olson
APPROVED:
PAGE: 2 of 2

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)				Description of Stratum
40								Alternating layers of stiff gray Silty CLAYS and firm to dense light gray Clayey SANDS (CL/SC)
		—		22				Firm to dense light gray medium to coarse SANDS becoming stiff light gray Silty Sandy CLAYS (SP/CL)
45								
		0.50		24				—soft, gray below 48'
50								
		NR						
55								
		NR						
								Bottom of boring at 58.5'. Borehole grouted full depth. Piezometer installed in borehole.

Unified Soil Classifications based on visual observations.

Woodward-Clyde Consultants

LOG OF BORING

PROJECT: **North Pond RFI**
LOCATION: **Vicksburg, Mississippi**
CLIENT: **Vicksburg Chemical Corporation**

BORING: **B-22A**
FILE: **92B007C-4001**
DATE: **11/6/93**
TECHNICIAN: **M. Olson**
APPROVED:
PAGE: **1 of 2**

Hollow-stem Augered: **Full Depth**

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)				Description of Stratum
0								Toe of slope and Drainage Ditch Fill Material (FILL)
5		2.25		20				Firm to dense tan and light gray Clayey SILTS with ferrous stains (ML)
		2.25		22				—with more silt, 6'- 8'
		2.25		22				—tan, with more ferrous stains, 8'- 10'
10		2.50		24				—tan and light gray with more silt, 10'- 12'
		3.00		24				—light gray below 12' —with shell fragments, 12'- 18' —damp to wet, 12'- 22'
15		2.75		24				
		1.75		22				—gray, with a trace of organics, 16'- 20'
		1.50		24				
20		1.50		24				—gray and tan, with more clay, 20'- 22'
		1.75		24				—light gray, with a trace of shell fragments below 22'
25								
		2.75		24				Dense to stiff light gray Clayey SILTS / Silty CLAYS with silt pockets and a trace of shell fragments (ML/CL)
30								
35								
40								

Continued Next Page

Unified Soil Classifications based on visual observations.

Woodward-Clyde Consultants

LOG OF BORING

PROJECT: North Pond RFI
LOCATION: Vicksburg, Mississippi
CLIENT: Vicksburg Chemical Corporation

BORING: B-22A
FILE: 92B007C-4001
DATE: 11/6/93
TECHNICIAN: M. Olson
APPROVED:
PAGE: 2 of 2

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)				Description of Stratum
40								Dense to stiff light gray Clayey SILTS / Silty CLAYS with silt pockets and *a trace of shell fragments* (ML/CL)
45								
50								
								Bottom of boring at 52'. Borehole grouted full depth. Set piezometer in borehole.

Unified Soil Classifications based on visual observations.

Woodward-Clyde Consultants

LOG OF BORING

PROJECT: North Pond RFI
LOCATION: Vicksburg, Mississippi
CLIENT: Vicksburg Chemical Corporation

BORING: B-23A
FILE: 92B007C-4001
DATE: 11/7/93
TECHNICIAN: M. Olson
APPROVED:
PAGE: 1 of 2

Hollow-stem Augered: **Full Depth**

Free water was encountered at a depth interval of 16'- 18' during hollow stem augering. The water level rose to depths of 15.65' and 15.25' after observation periods of 15 and 20 minutes, respectively.

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)				Description of Stratum
0								Limestone and FILL (FILL)
5		1.25		22				Firm to dense tan and dark gray Clayey SILTS, damp (ML)
		1.00		24				—with organics, 4'- 6' —tan below 6'
		1.00		20				
10		2.25		24				—tan and light gray, with a traces of rootlets, 10'- 12'
		3.00		24				Dense to stiff light gray and tan Clayey SILTS / Silty CLAYS with traces of ferrous stains (ML/CL)
		3.00		24				
15		4.25						—dense, 15'- 16'
		<4.50		24				—dense to stiff, light gray with greenish gray streaks, 16'- 20'
		2.00		16				
20		2.00		18				—stiff, light gray below 20'
		--		16				Dense light gray medium to coarse SANDS, wet (SP)
		2.00						Stiff light gray and gray Silty CLAYS (CL)
25		2.00		14				
		2.50		24				—with silt pockets and traces of ferrous stains, slightly slickensided and blocky fractures, 24' - 31.5' —with a trace of calcareous nodules, 26'- 31.5'
		2.00		24				
30		2.00 0.50		24				—with a trace of organics at 30'
35								Firm to dense light gray and tan Clayey SANDS (SC)
40		2.00		24				Stiff light gray and tan Silty Sandy CLAYS with a trace of ferrous nodules (CL)

Continued Next Page

Unified Soil Classifications based on visual observations.

Woodward-Clyde Consultants

LOG OF BORING

PROJECT: **North Pond RFI**
LOCATION: **Vicksburg, Mississippi**
CLIENT: **Vicksburg Chemical Corporation**

BORING: B-23A
FILE: 92B007C-4001
DATE: 11/7/93
TECHNICIAN: M. Olson
APPROVED:
PAGE: 2 of 2

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)				Description of Stratum
40								Stiff light gray and tan Silty Sandy CLAYS with a trace of ferrous nodules (CL)
	V	2.50		24				
		0.50						Stiff gray Silty CLAYS with fine sand layers (CL)
45								
	V	3.00		18				—greenish gray, slightly blocky fractures and a trace of gravel below 48'
50								Bottom of boring at 50'. Borehole grouted full depth. Piezometer installed in borehole.

Unified Soil Classifications based on visual observations.

LOG OF BORING

PROJECT: **North Pond RFI**
LOCATION: **Vicksburg, Mississippi**
CLIENT: **Vicksburg Chemical Corporation**

BORING: **B-24B**
FILE: **92B007C-4001**
DATE: **11/9/93**
TECHNICIAN: **M. Olson**
APPROVED:
PAGE: **1 of 1**

Hollow-stem Augered: **Full Depth**

DEPTH (FEET)	SAMPLE	S.P.T.(b/ft) or P.Pen.(tsf)	OVA (ppm)	Recovery (inch)				Description of Stratum
0								Limestone / Gravel FILL (FILL)
5		1.50		24				Firm to dense tan Clayey SILTS with a trace of gravel (FILL)
		2.25		12				
		3.25		20				Firm to dense tan Clayey SILTS (ML)
10		2.00		24				—with 6" layer of dark brown layer at 10.7' —moist to damp below 10'
		2.00		24				—with a trace of organics, 12'- 18' —with ferrous stains below 12'
15		0.25 0.50		24				—tan and light gray, 14'- 21'
		2.25		24				
		1.75		24				
20		0.75		20				
		0.50		22				Medium gray and dark gray Silty CLAYS with a trace of ferrous stains (CL)
25		1.00		22				Medium to stiff light gray Sandy CLAYS (CL) —with ferrous stains and a trace of white specks to 26'
		0.75		24				—medium, with a trace of organics, 26'- 28' —damp below 26'
		0.25		24				—soft, gray, 28'- 30'
30		1.75		24				Stiff light gray Silty Sandy CLAYS with a trace of ferrous stains and blocky fractures (CL)
								Bottom of boring at 32.5'. Borehole grouted full depth. Piezometer installed in borehole.

Unified Soil Classifications based on visual observations.

Woodward-Clyde Consultants

APPENDIX C

PIEZOMETER INSTALLATION LOGS

STE
Soil Testing Engineers, Inc.

1350 LIVINGSTON LANE, SUITE A ● P.O. BOX 9144 ● JACKSON, MISSISSIPPI 39286
TELEPHONE (601) 982-0748

GORDON P. BOUTWELL, JR. Ph.D.
EUGENE G. WARDLAW, MS
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CHING N. TSAI, MS
REGISTERED PROFESSIONAL ENGINEERS

VERNON C. ASHWORTH, MS
CERTIFIED PROFESSIONAL GEOLOGIST
DANIEL L. FRANKLIN, JR. MSCE
KENNETH A. FLUKER, MSCE
BOBBY J. BAILEY, B.Geol.

November 30, 1993

Woodward-Clyde Consultants
2822 O'Neal Lane
Baton Rouge, Louisiana 70816

Attention: Mr. Dick Karkkainen

Re: Geotechnical Services
North Pond Field Investigation
Vicksburg Chemical Company
Vicksburg, Mississippi
STE File: 93-3109

Gentlemen:

Submitted herein is the report of our services related to the field investigation of the North Pond for Vicksburg Chemical Company in Vicksburg, Mississippi. This report covers the time period of October 27, 1993 through November 29, 1993. These geotechnical services were provided in general accordance with our proposal letter to you dated October 22, 1993 and as verbally approved by Mr. Dick Karkkainen on October 22, 1993. Additionally, Mr. Mike Olsen verbally authorized a change in the scope of services to add additional wells on November 10, 1993. This project was identified as Woodward-Clyde Project No. 92B007C, Task 4001.

Summary. During the period of this report, STE assisted Woodward-Clyde in the performance of the field investigation of the North Pond by providing soil sampling and installation of fifteen monitoring wells. During the advancement of the soil borings for the environmental investigation, soil samples were obtained continuously from the ground surface to depths of 30 ft, then on 5-ft depth intervals thereafter. Each of the soil borings performed for this investigation were logged by representatives of Woodward-Clyde Consultants. During the advancement of the soil borings for this project, representatives of Woodward-Clyde Consultants also performed field screening of soil samples and collected soil samples for laboratory analysis. Additionally, Woodward-Clyde representatives developed the monitor wells and collected groundwater samples. Upon completion of the monitor well installation, STE constructed well pads to complete this phase of the project. Monitor well logs describing the general construction of each well are attached. These monitor well logs have been filed with the Mississippi Department of Environmental Quality.

STE
Soil Testing Engineers, Inc.

We appreciate the opportunity of providing you with our services. If we can answer any questions or further assist you in any way, please call on us.

Very Truly Yours,

SOIL TESTING ENGINEERS, INC.

David M. Coleman, P. E.

DMC/tls
Copy Furnished:
Vicksburg Chemical Company - Mr. Steve Boswell

STE
Soil Testing Engineers, Inc.

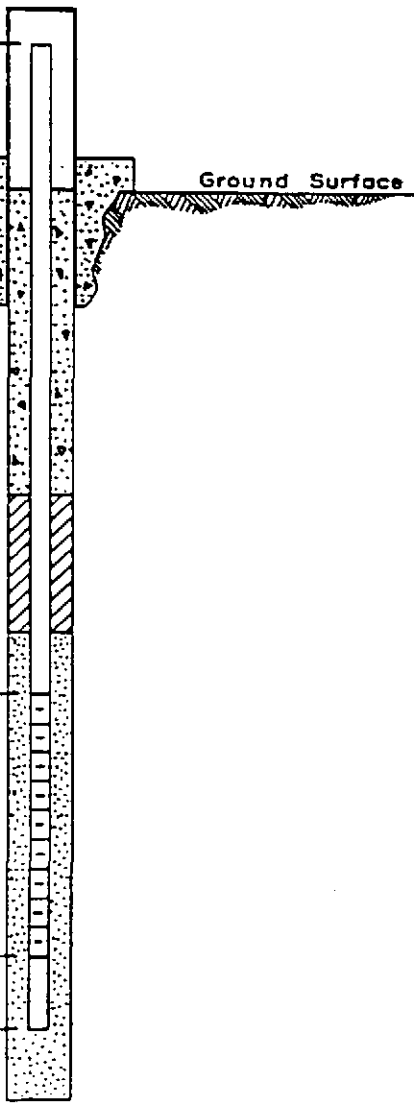
MONITOR WELL LOG

Project & Location Vicksburg Chemical Company North Pond Investigation
Client Woodward-Clyde Consultants Date of Report 11/2/93

Observation Well No. 19A Date Completed 11/2/93 Technician B. Till
Riser Pipe: Material PVC Diameter 2 in. Type of Joints Threaded
Screen: Material PVC Slot Size 0.01 Diameter 2 in. Length 10 ft
Diameter of Borehole 8 in. Type of Filter Pack No. 3 Blasting Sand
Method of Placement of Filter Material Pour from Top of Hollow Stem Auger
Type of Seal Above Screen Bentonite 1/2 Pellets Backfill Above Seal Grout
Drilling Mud 0 used. Fresh Water Flush Before Setting Well Screen 0
Well Developed by Woodward-Clyde Consultants Development Time N/A hrs
Groundwater Level @ 2 hrs N/A @ 24 hrs _____ Other N/A

*N/A = Not Available

ELEV, MSL / DEPTH, FT X	FEATURE	GENERALIZED SOIL STRATIFICATION	DEPTH, FT
	Top of Shroud		
	Top of Riser Pipe		
		Ground Surface	
66	Top of Seal Plug		
68	Top of Filter Sand		
70	Top of Screen		
76	Bottom of Screen		
80	Bottom of Plug / Cap		
80	Bottom of Bore Hole		



STE
Soil Testing Engineers, Inc.

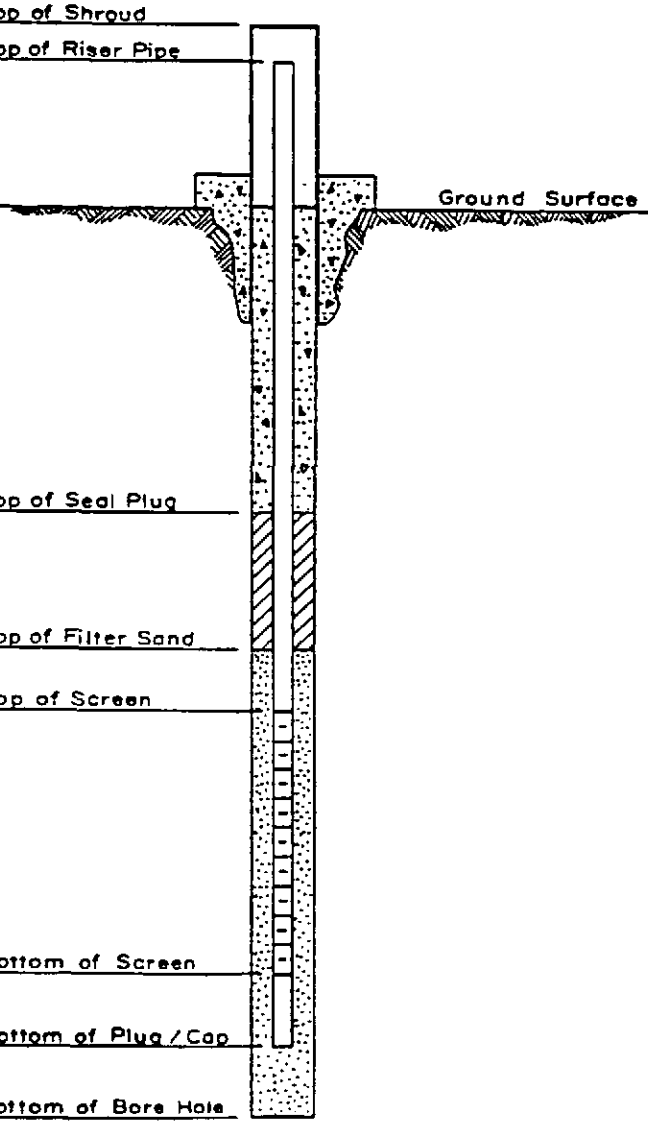
MONITOR WELL LOG

Project & Location Vicksburg Chemical Company North Pond Investigation
Client Woodward-Clyde Consultants Date of Report

Observation Well No. 19B Date Completed 11/2/93 Technician B. Till
Riser Pipe: Material PVC Diameter 2 in. Type of Joints Threaded
Screen: Material PVC Slot Size 0.01 Diameter 2 in. Length 10 ft
Diameter of Borehole 8 in. Type of Filter Pack No. 3 Blasting Sand
Method of Placement of Filter Material Pour from Top of Hollow Stem Auger
Type of Seal Above Screen Bentonite 1/2 Pellets Backfill Above Seal Grout
Drilling Mud 0 used. Fresh Water Flush Before Setting Well Screen 0
Well Developed by Woodward-Clyde Consultants Development Time N/A hrs
Groundwater Level @ 2 hrs N/A @ 24 hrs Other N/A

*N/A = Not Available

ELEV, MSL / DEPTH, FT	FEATURE	GENERALIZED SOIL STRATIFICATION	DEPTH, FT
	Top of Shroud		
	Top of Riser Pipe		
	Ground Surface		
10	Top of Seal Plug		
12	Top of Filter Sand		
14	Top of Screen		
20	Bottom of Screen		
24	Bottom of Plug / Cap		
24	Bottom of Bore Hole		



STE
Soil Testing Engineers, Inc.

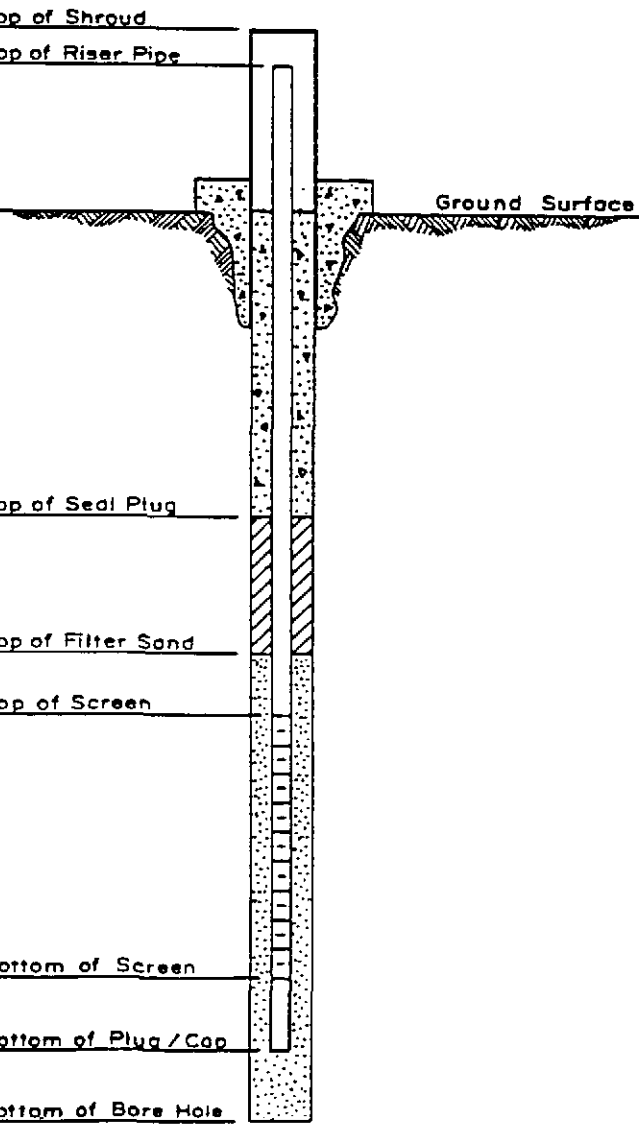
MONITOR WELL LOG

Project & Location Vicksburg Chemical Company North Pond Investigation
Client Woodward-Clyde Consultants Date of Report 10/28/93

Observation Well No. 20A Date Completed 10/28/93 Technician R. Sanders
Riser Pipe: Material PVC Diameter 2 in. Type of Joints Threaded
Screen: Material PVC Slot Size 0.01 Diameter 2 in. Length 10 ft
Diameter of Borehole 8 in. Type of Filter Pack No. 3 Blasting Sand
Method of Placement of Filter Material Pour from Top of Hollow Stem Auger
Type of Seal Above Screen Bentonite 1/2 Pellets Backfill Above Seal Grout
Drilling Mud 0 used. Fresh Water Flush Before Setting Well Screen 0
Well Developed by Woodward-Clyde Consultants Development Time N/A hrs
Groundwater Level @ 2 hrs N/A @ 24 hrs _____ Other N/A

*N/A = Not Available

ELEV, MSL / DEPTH, FT X	FEATURE	GENERALIZED SOIL STRATIFICATION	DEPTH, FT
	Top of Shroud		
	Top of Riser Pipe		
		Ground Surface	
61	Top of Seal Plug		
63	Top of Filter Sand		
65	Top of Screen		
71	Bottom of Screen		
75	Bottom of Plug / Cap		
75	Bottom of Bore Hole		



STE
Soil Testing Engineers, Inc.

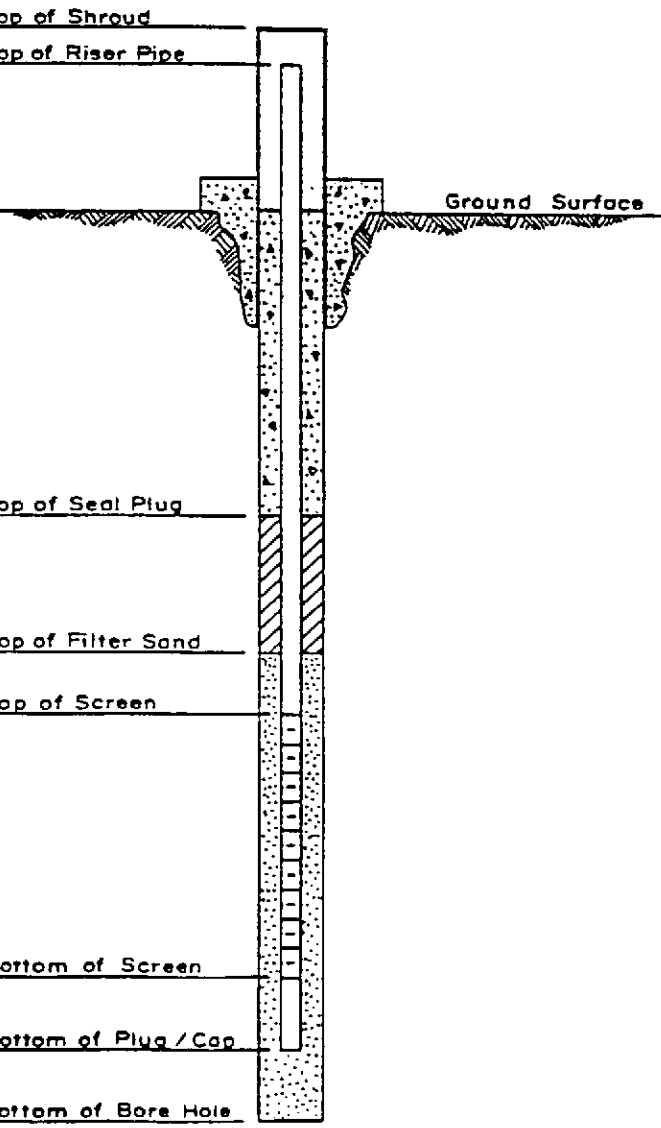
MONITOR WELL LOG

Project & Location Vicksburg Chemical Company North Pond Investigation
Client Woodward-Clyde Consultants Date of Report 10/28/93

Observation Well No. 20B Date Completed 10/28/93 Technician R. Sanders
Riser Pipe: Material PVC Diameter 2 in. Type of Joints Threaded
Screen: Material PVC Slot Size 0.01 Diameter 2 in. Length 10 ft
Diameter of Borehole 8 in. Type of Filter Pack No. 3 Blasting Sand
Method of Placement of Filter Material Pour from Top of Hollow Stem Auger
Type of Seal Above Screen Bentonite 1/2 Pellets Backfill Above Seal Grout
Drilling Mud 0 used. Fresh Water Flush Before Setting Well Screen 0
Well Developed by Woodward-Clyde Consultants Development Time N/A hrs
Groundwater Level @ 2 hrs N/A @ 24 hrs _____ Other N/A

*N/A = Not Available

ELEV, MSL / DEPTH, FT	X	FEATURE	GENERALIZED SOIL STRATIFICATION	DEPTH, FT
		Top of Shroud		
		Top of Riser Pipe		
			Ground Surface	
23		Top of Seal Plug		
25		Top of Filter Sand		
27		Top of Screen		
33		Bottom of Screen		
37		Bottom of Plug / Cap		
37		Bottom of Bore Hole		



STE
Soil Testing Engineers, Inc.

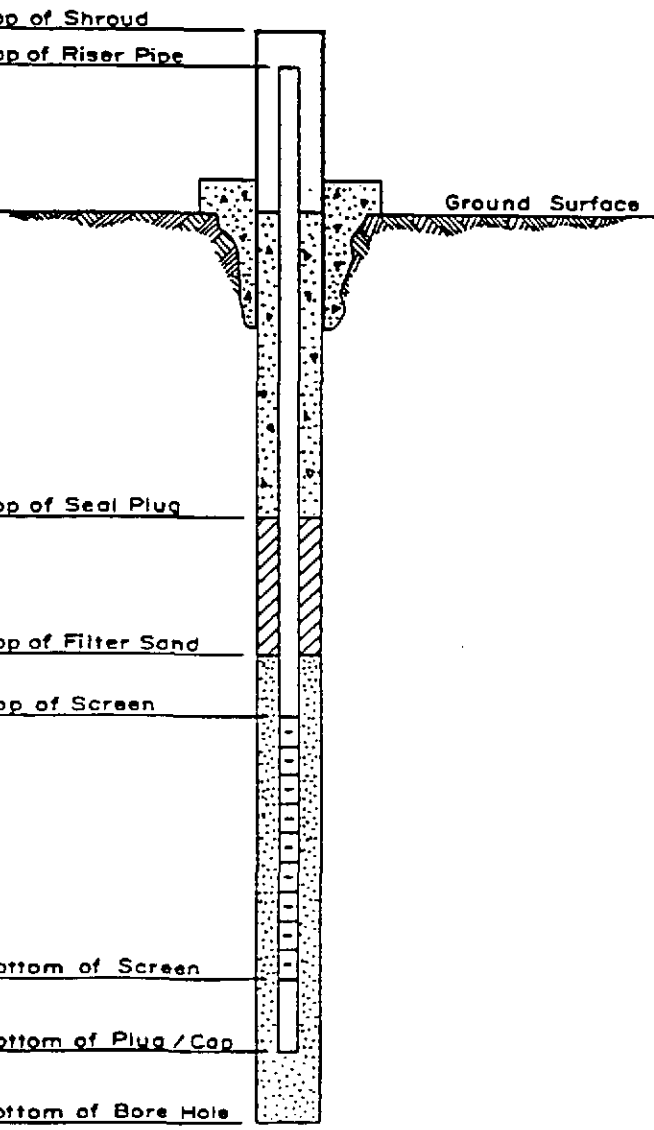
MONITOR WELL LOG

Project & Location Vicksburg Chemical Company North Pond Investigation
Client Woodward-Clyde Consultants Date of Report 11/5/93

Observation Well No. 21A Date Completed 11/5/93 Technician M. Biglane
Riser Pipe: Material PVC Diameter 2 in. Type of Joints Threaded
Screen: Material PVC Slot Size 0.01 Diameter 2 in. Length 10 ft
Diameter of Borehole 8 in. Type of Filter Pack No. 3 Blasting Sand
Method of Placement of Filter Material Pour from Top of Hollow Stem Auger
Type of Seal Above Screen Bentonite 1/2 Pellets Backfill Above Seal Grout
Drilling Mud 0 used. Fresh Water Flush Before Setting Well Screen 0
Well Developed by Woodward-Clyde Consultants Development Time N/A hrs
Groundwater Level @ 2 hrs N/A @ 24 hrs Other N/A

*N/A = Not Available

ELEV, MSL / DEPTH, FT X	FEATURE	GENERALIZED SOIL STRATIFICATION	DEPTH, FT
	Top of Shroud		
	Top of Riser Pipe		
		Ground Surface	
44	Top of Seal Plug		
46	Top of Filter Sand		
48	Top of Screen		
54	Bottom of Screen		
58	Bottom of Plug / Cap		
58	Bottom of Bore Hole		



STE
Soil Testing Engineers, Inc.

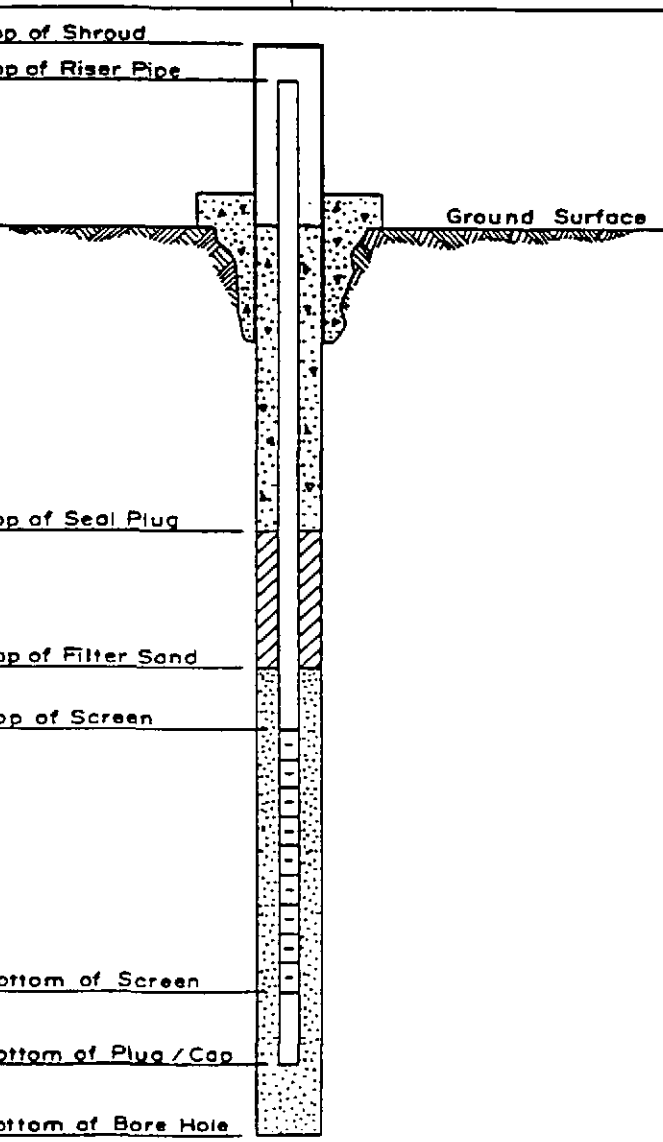
MONITOR WELL LOG

Project & Location Vicksburg Chemical Company North Pond Investigation
Client Woodward-Clyde Consultants Date of Report 11/6/93

Observation Well No. 22A Date Completed 11/6/93 Technician M. Biglane
Riser Pipe: Material PVC Diameter 2 in. Type of Joints Threaded
Screen: Material PVC Slot Size 0.01 Diameter 2 in. Length 10 ft
Diameter of Borehole 8 in. Type of Filter Pack No. 3 Blasting Sand
Method of Placement of Filter Material Pour from Top of Hollow Stem Auger
Type of Seal Above Screen Bentonite 1/2 Pellets Backfill Above Seal Grout
Drilling Mud 0 used. Fresh Water Flush Before Setting Well Screen 0
Well Developed by Woodward-Clyde Consultants Development Time N/A hrs
Groundwater Level @ 2 hrs N/A @ 24 hrs _____ Other N/A

*N/A = Not Available

ELEV, MSL / DEPTH, FT	FEATURE	GENERALIZED SOIL STRATIFICATION
	Top of Shroud	
	Top of Riser Pipe	
	Ground Surface	
41	Top of Seal Plug	
43	Top of Filter Sand	
45	Top of Screen	
51	Bottom of Screen	
55	Bottom of Plug / Cap	
60	Bottom of Bore Hole	



DEPTH, FT

STE
Soil Testing Engineers, Inc.

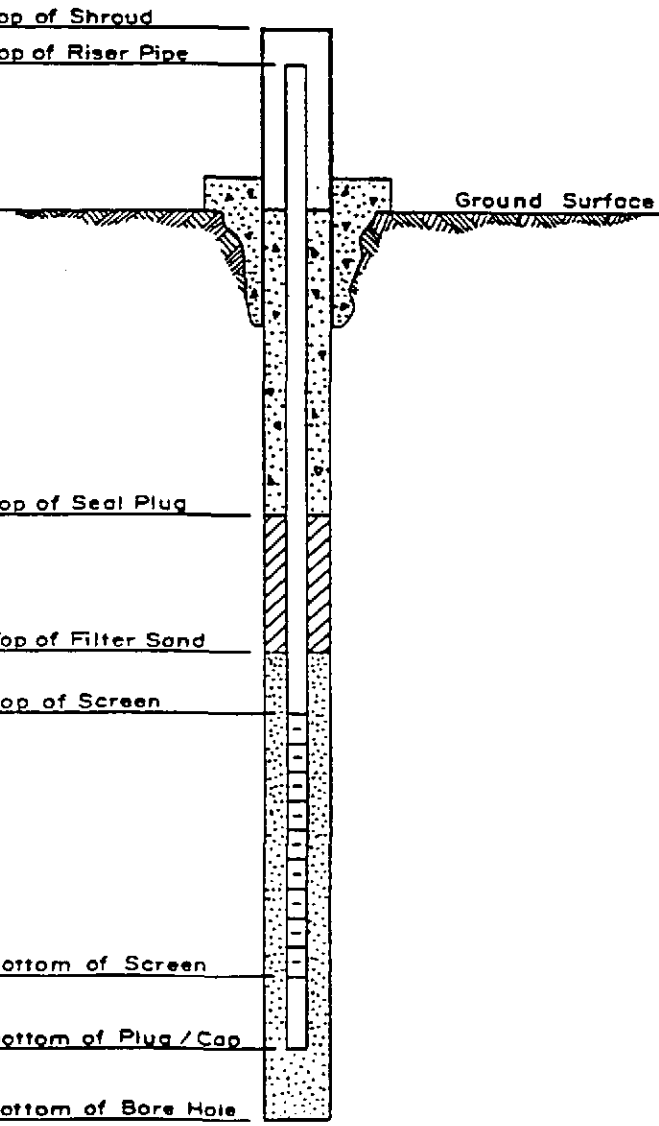
MONITOR WELL LOG

Project & Location Vicksburg Chemical Company North Pond Investigation
Client Woodward-Clyde Consultants Date of Report 11/8/93

Observation Well No. 22B Date Completed 11/8/93 Technician M. Biglane
Riser Pipe: Material PVC Diameter 2 in. Type of Joints Threaded
Screen: Material PVC Slot Size 0.01 Diameter 2 in. Length 10 ft
Diameter of Borehole 8 in. Type of Filter Pack No. 3 Blasting Sand
Method of Placement of Filter Material Pour from Top of Hollow Stem Auger
Type of Seal Above Screen Bentonite 1/2 Pellets Backfill Above Seal Grout
Drilling Mud 0 used. Fresh Water Flush Before Setting Well Screen 0
Well Developed by Woodward-Clyde Consultants Development Time N/A hrs
Groundwater Level @ 2 hrs N/A @ 24 hrs _____ Other N/A

*N/A = Not Available

ELEV, MSL / DEPTH, FT X	FEATURE	GENERALIZED SOIL STRATIFICATION	DEPTH, FT
	Top of Shroud		
	Top of Riser Pipe		
		Ground Surface	
10	Top of Seal Plug		
12	Top of Filter Sand		
14	Top of Screen		
20	Bottom of Screen		
24	Bottom of Plug / Cap		
24	Bottom of Bore Hole		



STE
Soil Testing Engineers, Inc.

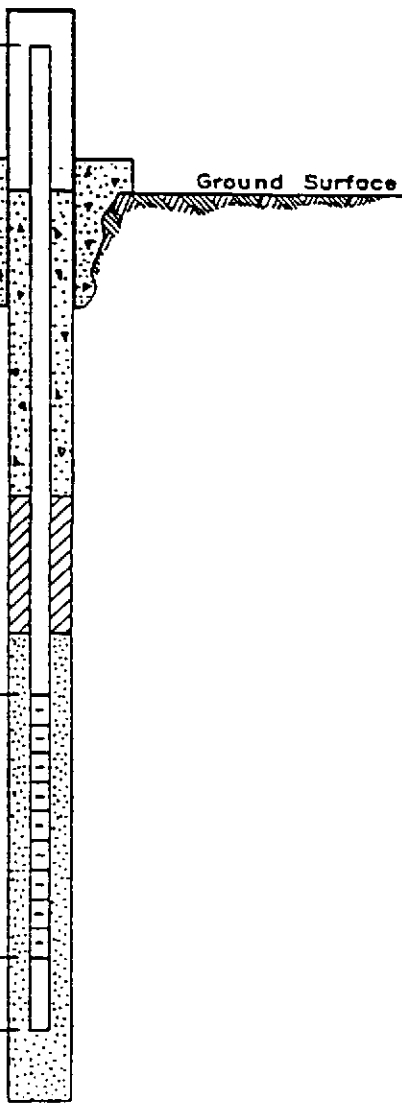
MONITOR WELL LOG

Project & Location Vicksburg Chemical Company North Pond Investigation
Client Woodward-Clyde Consultants Date of Report 11/7/93

Observation Well No. 23A Date Completed 11/7/93 Technician M. Biglane
Riser Pipe: Material PVC Diameter 2 in. Type of Joints Threaded
Screen: Material PVC Slot Size 0.01 Diameter 2 in. Length 10 ft
Diameter of Borehole 8 in. Type of Filter Pack No. 3 Blasting Sand
Method of Placement of Filter Material Pour from Top of Hollow Stem Auger
Type of Seal Above Screen Bentonite 1/2 Pellets Backfill Above Seal Grout
Drilling Mud 0 used. Fresh Water Flush Before Setting Well Screen 0
Well Developed by Woodward-Clyde Consultants Development Time N/A hrs
Groundwater Level @ 2 hrs N/A @ 24 hrs _____ Other N/A

*N/A = Not Available

ELEV, MSL / DEPTH, FT X	FEATURE	GENERALIZED SOIL STRATIFICATION	DEPTH, FT
	Top of Shroud		
	Top of Riser Pipe		
		Ground Surface	
36	Top of Seal Plug		
38	Top of Filter Sand		
40	Top of Screen		
46	Bottom of Screen		
50	Bottom of Plug / Cap		
50	Bottom of Bore Hole		



STE
Soil Testing Engineers, Inc.

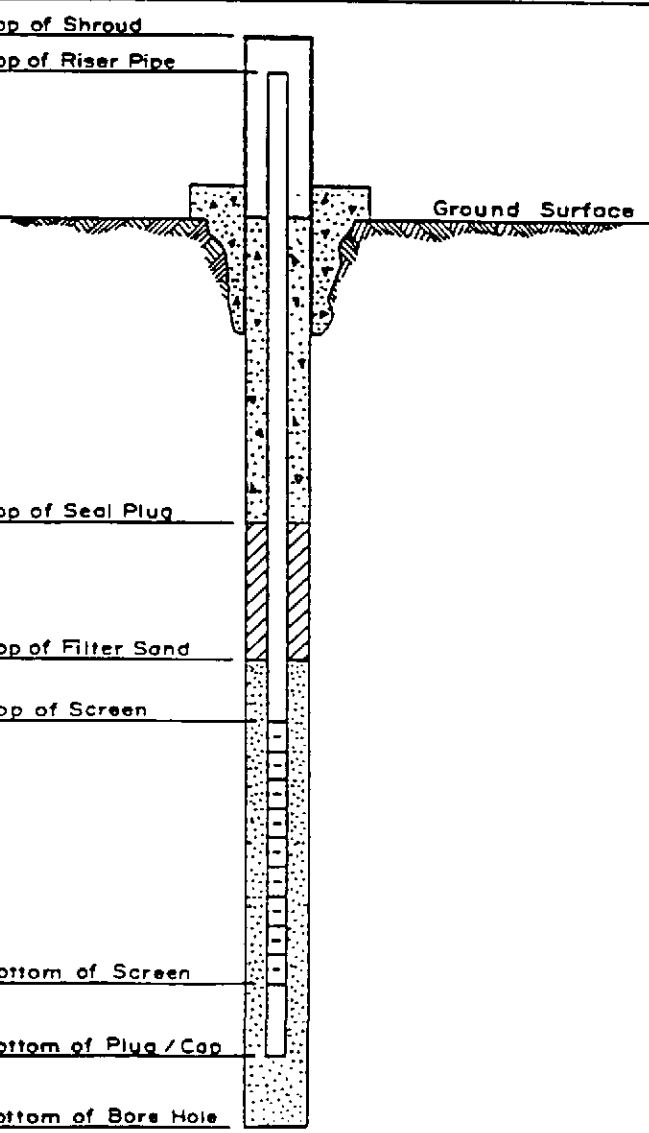
MONITOR WELL LOG

Project & Location Vicksburg Chemical Company North Pond Investigation
Client Woodward-Clyde Consultants Date of Report 11/8/93

Observation Well No. 23B Date Completed 11/8/93 Technician M. Biglane
Riser Pipe: Material PVC Diameter 2 in. Type of Joints Threaded
Screen: Material PVC Slot Size 0.01 Diameter 2 in. Length 10 ft
Diameter of Borehole 8 in. Type of Filter Pack No. 3 Blasting Sand
Method of Placement of Filter Material Pour from Top of Hollow Stem Auger
Type of Seal Above Screen Bentonite 1/2 Pellets Backfill Above Seal Grout
Drilling Mud 0 used. Fresh Water Flush Before Setting Well Screen 0
Well Developed by Woodward-Clyde Consultants Development Time N/A hrs
Groundwater Level @ 2 hrs N/A @ 24 hrs _____ Other N/A

*N/A = Not Available

ELEV, MSL / DEPTH, FT X	FEATURE	GENERALIZED SOIL STRATIFICATION	DEPTH, FT
	Top of Shroud		
	Top of Riser Pipe		
		Ground Surface	
12	Top of Seal Plug		
14	Top of Filter Sand		
16	Top of Screen		
22	Bottom of Screen		
26	Bottom of Plug / Cap		
26	Bottom of Bore Hole		



STE
Soil Testing Engineers, Inc.

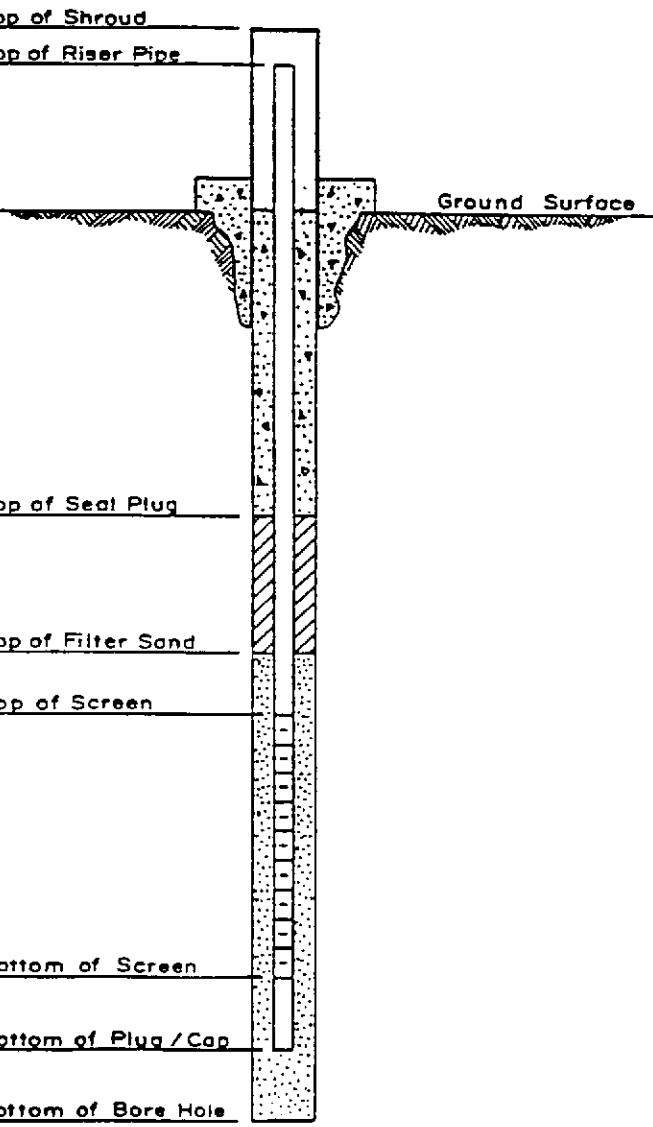
MONITOR WELL LOG

Project & Location Vicksburg Chemical Company North Pond Investigation
Client Woodward-Clyde Consultants Date of Report 11/9/93

Observation Well No. 24B Date Completed 11/9/93 Technician M. Biglane
Riser Pipe: Material PVC Diameter 2 in. Type of Joints Threaded
Screen: Material PVC Slot Size 0.01 Diameter 2 in. Length 10 ft
Diameter of Borehole 8 in. Type of Filter Pack No. 3 Blasting Sand
Method of Placement of Filter Material Pour from Top of Hollow Stem Auger
Type of Seal Above Screen Bentonite 1/2 Pellets Backfill Above Seal Grout
Drilling Mud 0 used. Fresh Water Flush Before Setting Well Screen 0
Well Developed by Woodward-Clyde Consultants Development Time N/A hrs
Groundwater Level @ 2 hrs N/A @ 24 hrs _____ Other N/A

*N/A = Not Available

ELEV, MSL / DEPTH, FT	X	FEATURE	GENERALIZED SOIL STRATIFICATION	DEPTH, FT
		Top of Shroud		
		Top of Riser Pipe		
			Ground Surface	
18		Top of Seal Plug		
20		Top of Filter Sand		
22		Top of Screen		
28		Bottom of Screen		
32		Bottom of Plug / Cap		
32		Bottom of Bore Hole		



STE
Soil Testing Engineers, Inc.

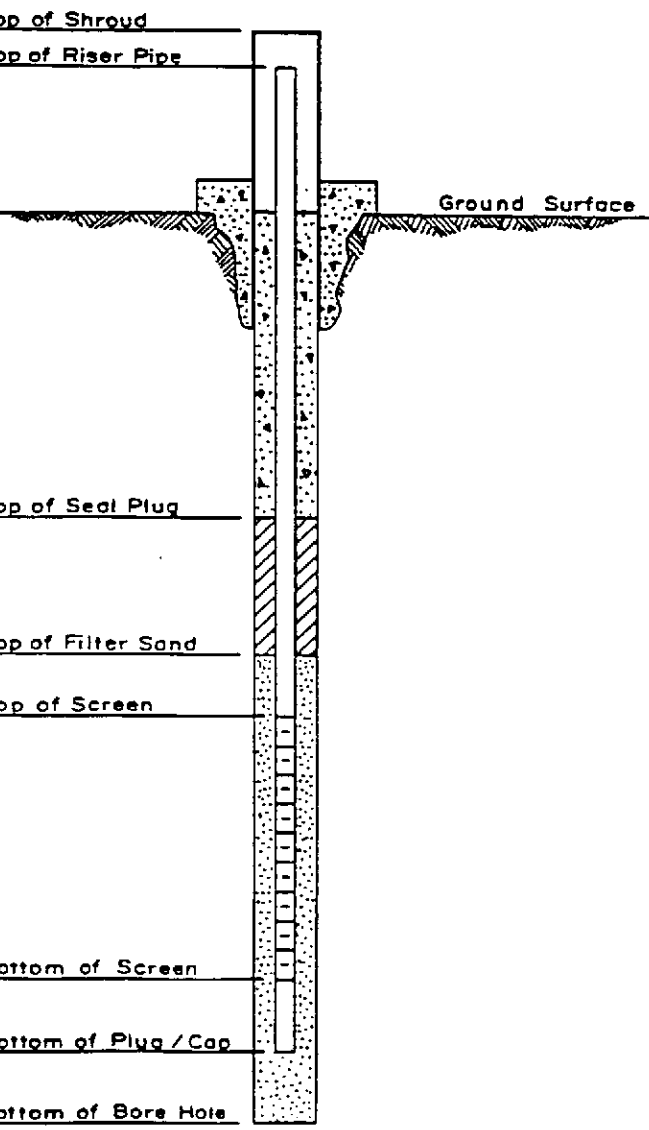
MONITOR WELL LOG

Project & Location Vicksburg Chemical Company North Pond Investigation
Client Woodward-Clyde Consultants Date of Report 11/12/93

Observation Well No. 25B Date Completed 11/12/93 Technician M. Biglane
Riser Pipe: Material PVC Diameter 2 in. Type of Joints Threaded
Screen: Material PVC Slot Size 0.01 Diameter 2 in. Length 10 ft
Diameter of Borehole 8 in. Type of Filter Pack No. 3 Blasting Sand
Method of Placement of Filter Material Pour from Top of Hollow Stem Auger
Type of Seal Above Screen Bentonite 1/2 Pellets Backfill Above Seal Grout
Drilling Mud 0 used. Fresh Water Flush Before Setting Well Screen 0
Well Developed by Woodward-Clyde Consultants Development Time N/A hrs
Groundwater Level @ 2 hrs N/A @ 24 hrs _____ Other N/A

*N/A = Not Available

ELEV, MSL / DEPTH, FT	X	FEATURE	GENERALIZED SOIL STRATIFICATION	DEPTH, FT
		Top of Shroud		
		Top of Riser Pipe		
			Ground Surface	
26		Top of Seal Plug		
28		Top of Filter Sand		
30		Top of Screen		
36		Bottom of Screen		
40		Bottom of Plug / Cap		
40		Bottom of Bore Hole		



STE
Soil Testing Engineers, Inc.

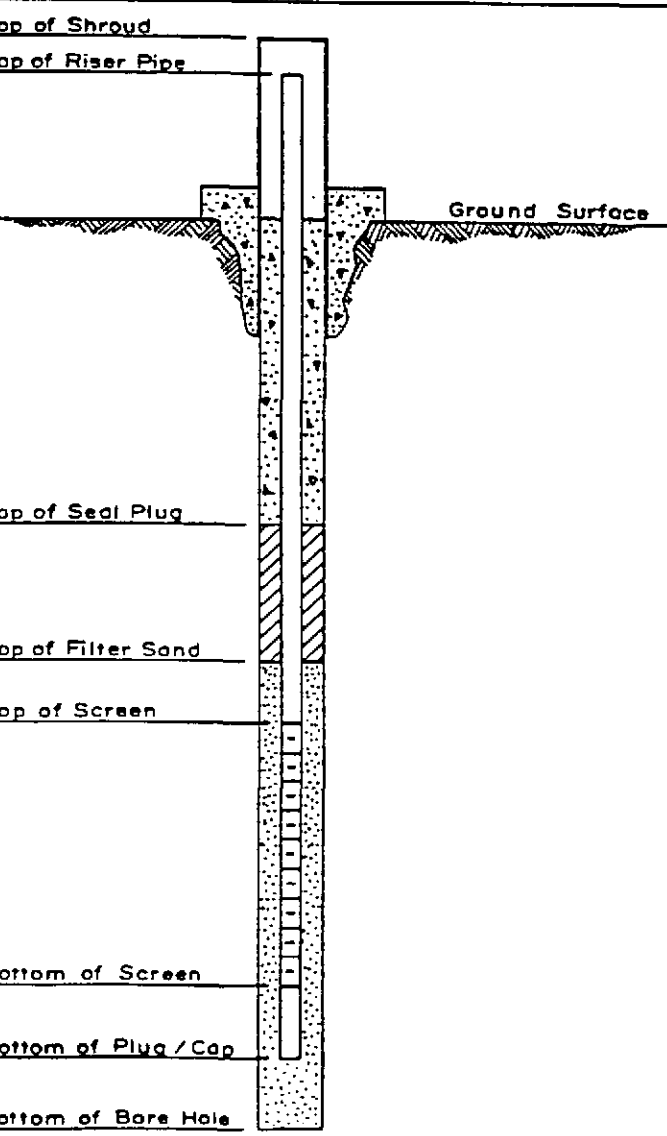
MONITOR WELL LOG

Project & Location Vicksburg Chemical Company North Pond Investigation
Client Woodward-Clyde Consultants Date of Report 11/11/93

Observation Well No. ~~26A~~ 12 Date Completed 11/11/93 Technician M. Biglane
Riser Pipe: Material PVC Diameter 2 in. Type of Joints Threaded
Screen: Material PVC Slot Size 0.01 Diameter 2 in. Length 10 ft
Diameter of Borehole 8 in. Type of Filter Pack No. 3 Blasting Sand
Method of Placement of Filter Material Pour from Top of Hollow Stem Auger
Type of Seal Above Screen Bentonite 1/2 Pellets Backfill Above Seal Grout
Drilling Mud 0 used. Fresh Water Flush Before Setting Well Screen 0
Well Developed by Woodward-Clyde Consultants Development Time N/A hrs
Groundwater Level @ 2 hrs N/A @ 24 hrs _____ Other N/A

*N/A = Not Available

ELEV, MSL / DEPTH, FT	FEATURE	GENERALIZED SOIL STRATIFICATION
	Top of Shroud	
	Top of Riser Pipe	
	Ground Surface	
61	Top of Seal Plug	
63	Top of Filter Sand	
65	Top of Screen	
71	Bottom of Screen	
75	Bottom of Plug / Cap	
75	Bottom of Bore Hole	



DEPTH, FT

STE
Soil Testing Engineers, Inc.

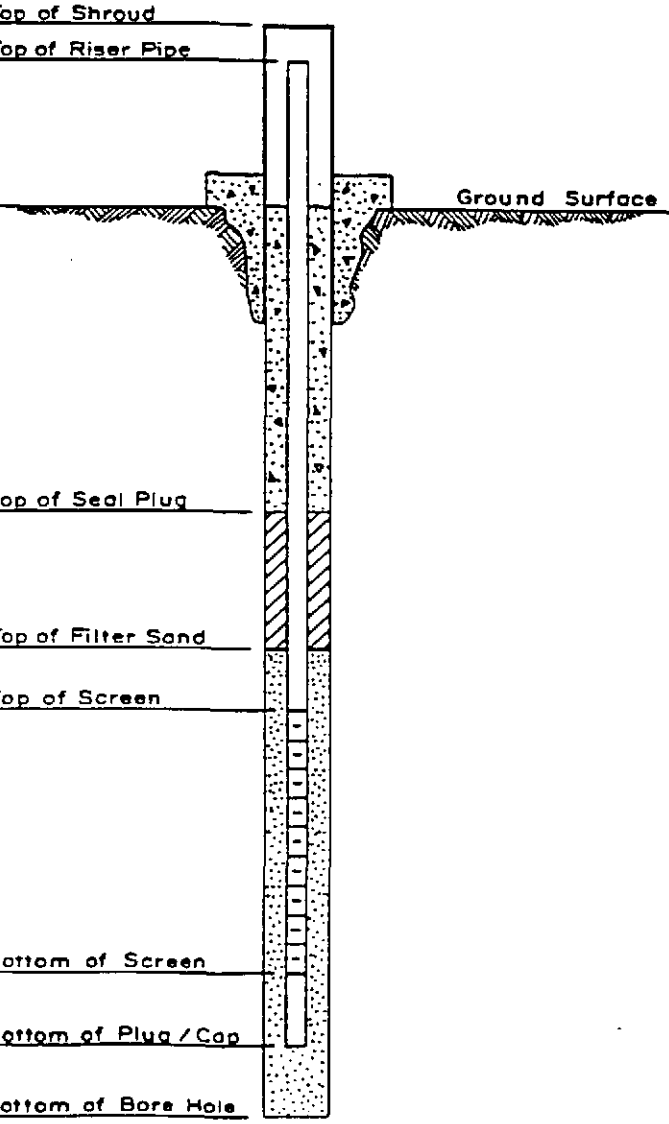
MONITOR WELL LOG

Project & Location Vicksburg Chemical Company North Pond Investigation
Client Woodward-Clyde Consultants Date of Report 11/10/93

Observation Well No. ~~26B~~ 12 Date Completed 11/10/93 Technician M. Biglane
Riser Pipe: Material PVC Diameter 2 in. Type of Joints Threaded
Screen: Material PVC Slot Size 0.01 Diameter 2 in. Length 10 ft
Diameter of Borehole 8 in. Type of Filter Pack No. 3 Blasting Sand
Method of Placement of Filter Material Pour from Top of Hollow Stem Auger
Type of Seal Above Screen Bentonite 1/2 Pellets Backfill Above Seal Grout
Drilling Mud 0 used. Fresh Water Flush Before Setting Well Screen 0
Well Developed by Woodward-Clyde Consultants Development Time N/A hrs
Groundwater Level @ 2 hrs N/A @ 24 hrs _____ Other N/A

*N/A = Not Available

ELEV, MSL / DEPTH, FT	FEATURE	GENERALIZED SOIL STRATIFICATION	DEPTH, FT
	Top of Shroud		
	Top of Riser Pipe		
	Ground Surface		
22	Top of Seal Plug		
24	Top of Filter Sand		
26	Top of Screen		
32	Bottom of Screen		
36	Bottom of Plug / Cap		
36	Bottom of Bore Hole		



NORTH POND RCRA FACILITY INVESTIGATION REPORT

VOLUME 2
ANALYTICAL DATA SUMMARY SHEETS
APPENDIX D, E AND F

VICKSBURG CHEMICAL COMPANY
VICKSBURG, MISSISSIPPI

Prepared for
Vicksburg Chemical Company
Vicksburg, Mississippi

Cedar Chemical Corporation
Memphis, Tennessee

February 1994

WCC File 92B007C

Woodward-Clyde

Woodward-Clyde Consultants
2822 O'Neal Lane (70816)
P.O. Box 66317 (70896)
Baton Rouge, Louisiana

APPENDIX D

DATA SUMMARY SHEETS - SOIL

B-12B Volatiles, Semivolatiles, Inorganics
B-12A Volatiles, Semivolatiles, Inorganics
B-19B Volatiles, Semivolatiles, Inorganics
B-19A Volatiles, Semivolatiles, Inorganics
B-20B Volatiles, Semivolatiles, Inorganics
B-20A Volatiles, Semivolatiles, Inorganics
B-21B Volatiles, Semivolatiles, Inorganics
B-21A Volatiles, Semivolatiles, Inorganics
B-22B Volatiles, Semivolatiles, Inorganics
B-23B Volatiles, Semivolatiles, Inorganics
B-23A Volatiles, Semivolatiles, Inorganics
B-24B Volatiles, Semivolatiles, Inorganics
B-24A Volatiles, Semivolatiles, Inorganics
B-25B Volatiles, Semivolatiles, Inorganics
TB-19 Volatiles
TB-20A, 20B Volatiles
TB-21, 22, 23 Volatiles
TB-No. 4 Volatiles
TB-No. 5 Volatiles
Rinsate RS-PZ Volatiles, Semivolatiles, Inorganics

Lab Certification Statements, Chain-of-Custody

VOLATILE ORGANICS ANALYSIS DATA SHEET

B-12B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11399 SAS No.: _____ SDG No.: 311399

Matrix: (soil/water) SOIL Lab Sample ID: 311399-3

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 113993

Level: (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. 20 Date Analyzed: 11/19/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	U
75-01-4	Vinyl Chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene Chloride	9	B
67-64-1	Acetone	18	B
75-15-0	Carbon Disulfide	6	U
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	6	U
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	12	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	12	U
591-78-6	2-Hexanone	12	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
----------	o,p-XYLENE	6	U
108-38-3	M-XYLENE	6	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-12B(R)(32'-34'

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11399 SAS No.: N/A SDG No.: 311399

Matrix: (soil/water) SOIL Lab Sample ID: 311399-3

Sample wt/vol: 5 (g/mL) G Lab File ID: 113993

Level (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. 20 Date Analyzed: 11/19/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-12B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC4 SAS No.: NA SDG No.: 399

Matrix: (soil/water) SOIL Lab Sample ID: 311399-3

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 3113993

Level: (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. 19 dec. Date Extracted: 11/13/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/17/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	400	U
111-44-4	bis(2-Chloroethyl)Ether	400	U
95-57-8	2-Chlorophenol	400	U
541-73-1	1,3-Dichlorobenzene	400	U
106-46-7	1,4-Dichlorobenzene	400	U
100-51-6	Benzyl Alcohol	400	U
95-50-1	1,2-Dichlorobenzene	400	U
95-48-7	2-Methylphenol	400	U
39638-32-9	bis(2-Chloroisopropyl)Ether	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-Di-n-Propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
65-85-0	Benzoic Acid	2000	U
111-91-1	bis(2-Chloroethoxy)Methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
120-82-1	1,2,4-Trichlorobenzene	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
59-50-7	4-Chloro-3-Methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	2000	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	400	U
131-11-3	Dimethyl Phthalate	400	U
208-96-8	Acenaphthylene	400	U
606-20-2	2,6-Dinitrotoluene	400	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-12B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC4 SAS No.: NA SDG No.: 399

Matrix: (soil/water) SOIL Lab Sample ID: 311399-3

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 3113993

Level: (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. 19 dec. Date Extracted: 11/13/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/17/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	400	U
83-32-9	Acenaphthene	400	U
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	2000	U
132-64-9	Dibenzofuran	400	U
121-14-2	2,4-Dinitrotoluene	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-10-6	4-Nitroaniline	400	U
534-52-1	4,6-Dinitro-2-Methylphenol	2000	U
86-30-6	N-Nitrosodiphenylamine	400	U
122-66-7	1,2-Diphenylhydrazine	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
87-86-5	Pentachlorophenol	2000	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
84-74-2	Di-n-Butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	2000	U
56-55-3	Benzo(a)Anthracene	400	U
218-01-9	Chrysene	400	U
117-81-7	bis(2-Ethylhexyl)Phthalate	400	U
117-84-0	Di-n-OctylPhthalate	400	U
205-99-2	Benzo(b)Fluoranthene	400	U
207-08-9	Benzo(k)Fluoranthene	400	U
50-32-8	Benzo(a)Pyrene	400	U
193-39-5	Indeno(1,2,3-cd)Pyrene	400	U
53-70-3	Dibenz(a,h)Anthracene	400	U
191-24-2	Benzo(g,h,i)Perylene	400	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-12B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC4 SAS No.: NA SDG No.: 399

Matrix: (soil/water) SOIL Lab Sample ID: 311399-3

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 3113993

Level: (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. 19 dec. Date Extracted: 11/13/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/17/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOA TCL	6.73	200	J
2.	UNKNOWN ALKANOIC ACID	21.50	200	J
3.	UNKNOWN HYDROCARBON	25.38	200	J
4.	UNKNOWN ALKANE	29.45	200	J
5.				
6.				
7.				
8.				
9.				
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U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

12B(32-34)

Lab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

Lab Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix (soil/water): SOIL Lab Sample ID: 311399-3

Level (low/med): LOW Date Received: 11/12/93

% Solids: 79.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4350			P
7440-36-0	Antimony	5.3	B	N	P
7440-38-2	Arsenic	1.3	B	N	F
7440-39-3	Barium	36.6			P
7440-41-7	Beryllium	0.20	B		P
7440-43-9	Cadmium	0.33	U		P
7440-70-2	Calcium	79600			P
7440-47-3	Chromium	6.2			P
7440-48-4	Cobalt	3.5	B		P
7440-50-8	Copper	10.2			P
7439-89-6	Iron	9250		E	P
7439-92-1	Lead	5.6			F
7439-95-4	Magnesium	39500			P
7439-96-5	Manganese	412			P
7439-97-6	Mercury	0.05	U		AV
7440-02-0	Nickel	7.4			P
7440-09-7	Potassium	628			P
7782-49-2	Selenium	0.19	U	WN	F
7440-22-4	Silver	1.6	U		P
7440-23-5	Sodium	104	B		P
7440-28-0	Thallium	0.17	U		F
7440-62-2	Vanadium	12.6			P
7440-66-6	Zinc	21.3		E	P
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

12B(32-34)=B-12B(R)(32'-34')

FORM I - IN

ILMO2.1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-12A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11399 SAS No.: _____ SDG No.: 311399

Matrix: (soil/water) SOIL Lab Sample ID: 311460-1

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 114601

Level: (low/med) LOW Date Received: 11/15/93

% Moisture: not dec. 19 Date Analyzed: 11/19/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	U
75-01-4	Vinyl Chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene Chloride	5	BJ
67-64-1	Acetone	20	B
75-15-0	Carbon Disulfide	6	U
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	6	U
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	12	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	12	U
591-78-6	2-Hexanone	12	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
----------	o,p-XYLENE	6	U
108-38-3	M-XYLENE	6	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-12A(R)(63'-65'

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11399 SAS No.: N/A SDG No.: 311399

Matrix: (soil/water) SOIL Lab Sample ID: 311460-1

Sample wt/vol: 5 (g/mL) G Lab File ID: 114601

Level (low/med) LOW Date Received: 11/15/93

% Moisture: not dec. 19 Date Analyzed: 11/19/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-12A(R)

Lab Name: A.T.I. Contract: NA

Code: FINNMAT Case No.: WCC3 SAS No.: NA SDG No.: 460

Matrix: (soil/water) SOIL Lab Sample ID: 311460-1

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 3114601

Level: (low/med) LOW Date Received: 11/15/93

% Moisture: not dec. 18 dec. Date Extracted: 11/19/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/27/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	400	U
111-44-4	bis(2-Chloroethyl)Ether	400	U
95-57-8	2-Chlorophenol	400	U
541-73-1	1,3-Dichlorobenzene	400	U
106-46-7	1,4-Dichlorobenzene	400	U
100-51-6	Benzyl Alcohol	400	U
95-50-1	1,2-Dichlorobenzene	400	U
95-48-7	2-Methylphenol	400	U
39638-32-9	bis(2-Chloroisopropyl)Ether	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-Di-n-Propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
65-85-0	Benzoic Acid	1900	U
111-91-1	bis(2-Chloroethoxy)Methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
120-82-1	1,2,4-Trichlorobenzene	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
59-50-7	4-Chloro-3-Methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	1900	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	400	U
131-11-3	Dimethyl Phthalate	400	U
208-96-8	Acenaphthylene	400	U
606-20-2	2,6-Dinitrotoluene	400	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-12A(R)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC3 SAS No.: NA SDG No.: 460

Matrix: (soil/water) SOIL Lab Sample ID: 311460-1

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 3114601

Level: (low/med) LOW Date Received: 11/15/93

% Moisture: not dec. 18 dec. Date Extracted: 11/19/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/27/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	400	U
83-32-9	Acenaphthene	400	U
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	1900	U
132-64-9	Dibenzofuran	400	U
121-14-2	2,4-Dinitrotoluene	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-10-6	4-Nitroaniline	400	U
534-52-1	4,6-Dinitro-2-Methylphenol	1900	U
86-30-6	N-Nitrosodiphenylamine	400	U
122-66-7	1,2-Diphenylhydrazine	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
87-86-5	Pentachlorophenol	1900	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
84-74-2	Di-n-Butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	1900	U
56-55-3	Benzo(a)Anthracene	400	U
218-01-9	Chrysene	400	U
117-81-7	bis(2-Ethylhexyl)Phthalate	400	U
117-84-0	Di-n-OctylPhthalate	400	U
205-99-2	Benzo(b)Fluoranthene	400	U
207-08-9	Benzo(k)Fluoranthene	400	U
50-32-8	Benzo(a)Pyrene	400	U
193-39-5	Indeno(1,2,3-cd)Pyrene	400	U
53-70-3	Dibenz(a,h)Anthracene	400	U
191-24-2	Benzo(g,h,i)Perylene	400	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-12A(R)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC3 SAS No.: NA SDG No.: 460

Matrix: (soil/water) SOIL Lab Sample ID: 311460-1

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 3114601

Level: (low/med) LOW Date Received: 11/15/93

% Moisture: not dec. 18 dec. Date Extracted: 11/19/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/27/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOA TCL	6.68	300	J
2.	UNKNOWN ALKANOIC ACID	21.43	400	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-25B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC3 SAS No.: NA SDG No.: 460

Matrix: (soil/water) SOIL Lab Sample ID: 311460-2

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 3114602

Level: (low/med) LOW Date Received: 11/15/93

% Moisture: not dec. 20 dec. Date Extracted: 11/19/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/27/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	410	U
111-44-4	bis(2-Chloroethyl)Ether	410	U
95-57-8	2-Chlorophenol	410	U
541-73-1	1,3-Dichlorobenzene	410	U
106-46-7	1,4-Dichlorobenzene	410	U
100-51-6	Benzyl Alcohol	410	U
95-50-1	1,2-Dichlorobenzene	410	U
95-48-7	2-Methylphenol	410	U
39638-32-9	bis(2-Chloroisopropyl)Ether	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-Di-n-Propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
65-85-0	Benzoic Acid	2000	U
111-91-1	bis(2-Chloroethoxy)Methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
120-82-1	1,2,4-Trichlorobenzene	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
59-50-7	4-Chloro-3-Methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	2000	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	410	U
131-11-3	Dimethyl Phthalate	410	U
208-96-8	Acenaphthylene	410	U
606-20-2	2,6-Dinitrotoluene	410	U

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

12A(63-65)

Lab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

Lab Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix (soil/water): SOIL Lab Sample ID: 311460-1

Level (low/med): LOW Date Received: 11/15/93

% Solids: 80.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	195			P
7440-36-0	Antimony	2.6	U	N	P
7440-38-2	Arsenic	0.34	B	N	F
7440-39-3	Barium	4.7	B		P
7440-41-7	Beryllium	0.08	B		P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	208	B		P
7440-47-3	Chromium	1.7			P
7440-48-4	Cobalt	0.43	B		P
7440-50-8	Copper	0.82	B		P
7439-89-6	Iron	293		E	P
7439-92-1	Lead	0.55	B		F
7439-95-4	Magnesium	93.1	B		P
7439-96-5	Manganese	2.2			P
7439-97-6	Mercury	0.05	U		AV
7440-02-0	Nickel	0.66	U		P
7440-09-7	Potassium	68.2	B		P
7782-49-2	Selenium	0.34	B	N	F
7440-22-4	Silver	1.5	U		P
7440-23-5	Sodium	20.5	U		P
7440-28-0	Thallium	0.17	U		F
7440-62-2	Vanadium	2.2	B		P
7440-66-6	Zinc	1.7	B	E	P
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

12A(63-65)=B12A(R)(63'-65')

FORM I - IN

ILMO2.1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-19B

Lab Name: A.T.I. Contract: _____

Code: FINNMAT Case No.: 11024 SAS No.: _____ SDG No.: 311024

Matrix: (soil/water) SOIL Lab Sample ID: 311139-2

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 111392

Level: (low/med) LOW Date Received: 11/04/93

% Moisture: not dec. 19 Date Analyzed: 11/05/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	U
75-01-4	Vinyl Chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene Chloride	7	B
67-64-1	Acetone	20	
75-15-0	Carbon Disulfide	6	U
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	6	U
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	12	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	12	U
591-78-6	2-Hexanone	12	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
	o,p-XYLENE	6	U
108-38-3	M-XYLENE	6	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-19B

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11024 SAS No.: N/A SDG No.: 311024

Matrix: (soil/water) SOIL Lab Sample ID: 311139-2

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 111392

Level (low/med) LOW Date Received: 11/04/93

% Moisture: not dec. 19 Date Analyzed: 11/05/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) _____

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-19B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC2 SAS No.: NA SDG No.: 1139

Matrix: (soil/water) SOIL Lab Sample ID: 311139-2

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 3111392

Level: (low/med) LOW Date Received: 11/04/93

% Moisture: not dec. 20 dec. Date Extracted: 11/09/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/12/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	410	U
111-44-4	bis(2-Chloroethyl)Ether	410	U
95-57-8	2-Chlorophenol	410	U
541-73-1	1,3-Dichlorobenzene	410	U
106-46-7	1,4-Dichlorobenzene	410	U
100-51-6	Benzyl Alcohol	410	U
95-50-1	1,2-Dichlorobenzene	410	U
95-48-7	2-Methylphenol	410	U
39638-32-9	bis(2-Chloroisopropyl)Ether	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-Di-n-Propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
65-85-0	Benzoic Acid	2000	U
111-91-1	bis(2-Chloroethoxy)Methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
120-82-1	1,2,4-Trichlorobenzene	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
59-50-7	4-Chloro-3-Methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	2000	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	410	U
131-11-3	Dimethyl Phthalate	410	U
208-96-8	Acenaphthylene	410	U
606-20-2	2,6-Dinitrotoluene	410	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-19B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC2 SAS No.: NA SDG No.: 1139

Matrix: (soil/water) SOIL Lab Sample ID: 311139-2

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 3111392

Level: (low/med) LOW Date Received: 11/04/93

% Moisture: not dec. 20 dec. Date Extracted: 11/09/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/12/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	410	U
83-32-9	Acenaphthene	410	U
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	2000	U
132-64-9	Dibenzofuran	410	U
121-14-2	2,4-Dinitrotoluene	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-10-6	4-Nitroaniline	410	U
534-52-1	4,6-Dinitro-2-Methylphenol	2000	U
86-30-6	N-Nitrosodiphenylamine	410	U
122-66-7	1,2-Diphenylhydrazine	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
87-86-5	Pentachlorophenol	2000	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
84-74-2	Di-n-Butylphthalate	96	J
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	2000	U
56-55-3	Benzo(a)Anthracene	410	U
218-01-9	Chrysene	410	U
117-81-7	bis(2-Ethylhexyl)Phthalate	410	U
117-84-0	Di-n-OctylPhthalate	410	U
205-99-2	Benzo(b)Fluoranthene	410	U
207-08-9	Benzo(k)Fluoranthene	410	U
50-32-8	Benzo(a)Pyrene	410	U
193-39-5	Indeno(1,2,3-cd)Pyrene	410	U
53-70-3	Dibenz(a,h)Anthracene	410	U
191-24-2	Benzo(g,h,i)Perylene	410	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-19B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC2 SAS No.: NA SDG No.: 1139

Matrix: (soil/water) SOIL Lab Sample ID: 311139-2

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 3111392

Level: (low/med) LOW Date Received: 11/04/93

% Moisture: not dec. 20 dec. Date Extracted: 11/09/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/12/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

Number TICs found: 11

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN KETONE	4.17	10000	A
2.	UNKNOWN SILOXANE	4.60	400	J
3.	UNKNOWN ALCOHOL	5.20	8000	J
4.	UNKNOWN KETONE	7.60	1000	A
5.	UNKNOWN HYDROCARBON	7.90	200	J
6.	UNKNOWN HYDROCARBON	21.40	400	J
7.	UNKNOWN ALKANOIC ACID	25.52	8000	J
8.	UNKNOWN ALKANE	28.57	200	J
9.	UNKNOWN ALKANE	29.30	1000	J
10.	UNKNOWN ALKANE	30.98	500	J
11.	UNKNOWN ALKANE	33.18	300	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-19BRE

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC2 SAS No.: NA SDG No.: 1139

Matrix: (soil/water) SOIL Lab Sample ID: 311139-2RE

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 3111392R

Level: (low/med) LOW Date Received: 11/04/93

% Moisture: not dec. 20 dec. Date Extracted: 11/11/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/18/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	410	U
111-44-4	bis(2-Chloroethyl)Ether	410	U
95-57-8	2-Chlorophenol	410	U
541-73-1	1,3-Dichlorobenzene	410	U
106-46-7	1,4-Dichlorobenzene	410	U
100-51-6	Benzyl Alcohol	410	U
95-50-1	1,2-Dichlorobenzene	410	U
95-48-7	2-Methylphenol	410	U
39638-32-9	bis(2-Chloroisopropyl)Ether	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-Di-n-Propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
65-85-0	Benzoic Acid	2000	U
111-91-1	bis(2-Chloroethoxy)Methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
120-82-1	1,2,4-Trichlorobenzene	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
59-50-7	4-Chloro-3-Methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	2000	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	410	U
131-11-3	Dimethyl Phthalate	410	U
208-96-8	Acenaphthylene	410	U
606-20-2	2,6-Dinitrotoluene	410	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-19BRE

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC2 SAS No.: NA SDG No.: 1139

Matrix: (soil/water) SOIL Lab Sample ID: 311139-2RE

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 3111392R

Level: (low/med) LOW Date Received: 11/04/93

% Moisture: not dec. 20 dec. Date Extracted: 11/11/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/18/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	410	U
83-32-9	Acenaphthene	410	U
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	2000	U
132-64-9	Dibenzofuran	410	U
121-14-2	2,4-Dinitrotoluene	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-10-6	4-Nitroaniline	410	U
534-52-1	4,6-Dinitro-2-Methylphenol	2000	U
86-30-6	N-Nitrosodiphenylamine	410	U
122-66-7	1,2-Diphenylhydrazine	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
87-86-5	Pentachlorophenol	2000	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
84-74-2	Di-n-Butylphthalate	410	U
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	2000	U
56-55-3	Benzo(a)Anthracene	410	U
218-01-9	Chrysene	410	U
117-81-7	bis(2-Ethylhexyl)Phthalate	410	U
117-84-0	Di-n-OctylPhthalate	410	U
205-99-2	Benzo(b)Fluoranthene	410	U
207-08-9	Benzo(k)Fluoranthene	410	U
50-32-8	Benzo(a)Pyrene	410	U
193-39-5	Indeno(1,2,3-cd)Pyrene	410	U
53-70-3	Dibenz(a,h)Anthracene	410	U
191-24-2	Benzo(g,h,i)Perylene	410	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-19BRE

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC2 SAS No.: NA SDG No.: 1139

Matrix: (soil/water) SOIL Lab Sample ID: 311139-2RE

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 3111392R

Level: (low/med) LOW Date Received: 11/04/93

% Moisture: not dec. 20 dec. Date Extracted: 11/11/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/18/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOA TCL	6.73	300	J
2.	UNKNOWN ALKANOIC ACID	21.52	300	J
3.	UNKNOWN ALKANE	29.45	500	J
4.	UNKNOWN ALKANE	31.20	300	J
5.	UNKNOWN ALKANE	31.32	200	J
6.	UNKNOWN HYDROCARBON	33.48	200	J

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B-19B

b Name: ANALYTICAL_TECHNOLOGIES__ Contract: N/A_____

Code: ATI___ Case No.: N/A___ SAS No.: N/A___ SDG No.: N/A___

trix (soil/water): SOIL_ Lab Sample ID: 311139-2

vel (low/med): LOW__ Date Received: 11/04/93

olids: _82.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3260			P
7440-36-0	Antimony	4.7	B	N	P
7440-38-2	Arsenic	0.60	B	N	F
7440-39-3	Barium	18.0	B		P
7440-41-7	Beryllium	0.16	B		P
7440-43-9	Cadmium	0.33	U		P
7440-70-2	Calcium	86100			P
7440-47-3	Chromium	6.2			P
7440-48-4	Cobalt	3.3	B		P
7440-50-8	Copper	8.6			P
7439-89-6	Iron	7020		E	P
7439-92-1	Lead	5.3			F
7439-95-4	Magnesium	39000			P
7439-96-5	Manganese	311			P
7439-97-6	Mercury	0.04	U		AV
7440-02-0	Nickel	6.3			P
7440-09-7	Potassium	537	B		P
7782-49-2	Selenium	0.19	U	WN	F
7440-22-4	Silver	1.6	U		P
7440-23-5	Sodium	112	B		P
7440-28-0	Thallium	0.16	U		F
7440-62-2	Vanadium	10.3			P
7440-66-6	Zinc	16.4		E	P
	Cyanide				NR

lor Before: _____ Clarity Before: _____ Texture: _____

lor After: _____ Clarity After: _____ Artifacts: _____

mments:

FORM I - IN

ILMO2.1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-19A

Lab Name: A.T.I. Contract: _____

Code: FINNMAT Case No.: 11024 SAS No.: _____ SDG No.: 311024

Matrix: (soil/water) SOIL Lab Sample ID: 311139-1

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 111391

Level: (low/med) LOW Date Received: 11/04/93

% Moisture: not dec. 17 Date Analyzed: 11/05/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	U
75-01-4	Vinyl Chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene Chloride	12	B
67-64-1	Acetone	15	
75-15-0	Carbon Disulfide	6	U
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	6	U
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	12	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	12	U
591-78-6	2-Hexanone	12	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
	o,p-XYLENE	6	U
108-38-3	M-XYLENE	6	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-19A

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11024 SAS No.: N/A SDG No.: 311024

Matrix: (soil/water) SOIL Lab Sample ID: 311139-1

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 111391

Level (low/med) LOW Date Received: 11/04/93

% Moisture: not dec. 17 Date Analyzed: 11/05/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) _____

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-19A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC2 SAS No.: NA SDG No.: 1139

Matrix: (soil/water) SOIL Lab Sample ID: 311139-1

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 3111391

Level: (low/med) LOW Date Received: 11/04/93

% Moisture: not dec. 18 dec. Date Extracted: 11/09/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/11/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	400	U
111-44-4	bis(2-Chloroethyl)Ether	400	U
95-57-8	2-Chlorophenol	400	U
541-73-1	1,3-Dichlorobenzene	400	U
106-46-7	1,4-Dichlorobenzene	400	U
100-51-6	Benzyl Alcohol	400	U
95-50-1	1,2-Dichlorobenzene	400	U
95-48-7	2-Methylphenol	400	U
39638-32-9	bis(2-Chloroisopropyl)Ether	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-Di-n-Propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
65-85-0	Benzoic Acid	1900	U
111-91-1	bis(2-Chloroethoxy)Methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
120-82-1	1,2,4-Trichlorobenzene	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
59-50-7	4-Chloro-3-Methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	1900	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	400	U
131-11-3	Dimethyl Phthalate	400	U
208-96-8	Acenaphthylene	400	U
606-20-2	2,6-Dinitrotoluene	400	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-19A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC2 SAS No.: NA SDG No.: 1139

Matrix: (soil/water) SOIL Lab Sample ID: 311139-1

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 3111391

Level: (low/med) LOW Date Received: 11/04/93

% Moisture: not dec. 18 dec. Date Extracted: 11/09/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/11/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	400	U
83-32-9	Acenaphthene	400	U
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	1900	U
132-64-9	Dibenzofuran	400	U
121-14-2	2,4-Dinitrotoluene	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-10-6	4-Nitroaniline	400	U
534-52-1	4,6-Dinitro-2-Methylphenol	1900	U
86-30-6	N-Nitrosodiphenylamine	400	U
122-66-7	1,2-Diphenylhydrazine	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
87-86-5	Pentachlorophenol	1900	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
84-74-2	Di-n-Butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	1900	U
56-55-3	Benzo(a)Anthracene	400	U
218-01-9	Chrysene	400	U
117-81-7	bis(2-Ethylhexyl)Phthalate	400	U
117-84-0	Di-n-OctylPhthalate	400	U
205-99-2	Benzo(b)Fluoranthene	400	U
207-08-9	Benzo(k)Fluoranthene	400	U
50-32-8	Benzo(a)Pyrene	400	U
193-39-5	Indeno(1,2,3-cd)Pyrene	400	U
53-70-3	Dibenz(a,h)Anthracene	400	U
191-24-2	Benzo(g,h,i)Perylene	400	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-19A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC2 SAS No.: NA SDG No.: 1139

Matrix: (soil/water) SOIL Lab Sample ID: 311139-1

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 3111391

Level: (low/med) LOW Date Received: 11/04/93

% Moisture: not dec. 18 dec. Date Extracted: 11/09/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/11/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

Number TICs found: 9

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	4.62	600	J
2.	UNKNOWN ALCOHOL	5.25	8000	J
3.	VOA TCL	6.62	200	J
4.	UNKNOWN HYDROCARBON	7.38	200	J
5.	UNKNOWN KETONE	7.60	1000	A
6.	UNKNOWN HYDROCARBON	18.07	700	J
7.	UNKNOWN HYDROCARBON	21.38	200	J
8.	UNKNOWN ALKANOIC ACID	25.53	10000	J
9.	UNKNOWN HYDROCARBON	28.57	200	J
10.				J
11.				J
12.				J

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B-19A

Lab Name: ANALYTICAL_TECHNOLOGIES__ Contract: N/A_____

Lab Code: ATI___ Case No.: N/A___ SAS No.: N/A___ SDG No.: N/A___

Matrix (soil/water): SOIL_ Lab Sample ID: 311139-1

Level (low/med): LOW__ Date Received: 11/04/93

% Solids: _84.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	275			P
7440-36-0	Antimony_	2.6	U	N	P
7440-38-2	Arsenic__	1.6	B	N	F
7440-39-3	Barium___	6.2	B		P
7440-41-7	Beryllium	0.09	B		P
7440-43-9	Cadmium__	0.32	U		P
7440-70-2	Calcium__	290	B		P
7440-47-3	Chromium_	1.3			P
7440-48-4	Cobalt___	1.0	B		P
7440-50-8	Copper___	0.74	B		P
7439-89-6	Iron____	987		E	P
7439-92-1	Lead____	1.7			F
7439-95-4	Magnesium	145	B		P
7439-96-5	Manganese	3.7			P
7439-97-6	Mercury__	0.04	U		AV
7440-02-0	Nickel___	1.0	B		P
7440-09-7	Potassium	53.1	B		P
7782-49-2	Selenium_	0.19	U	N	F
7440-22-4	Silver___	1.6	U		P
7440-23-5	Sodium___	20.9	U		P
7440-28-0	Thallium_	0.16	U		F
7440-62-2	Vanadium_	1.2	B		P
7440-66-6	Zinc____	2.4		E	P
	Cyanide__				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

FORM I - IN

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-20B

Lab Name: A.T.I. Contract: _____

Lab Code: FINNMAT Case No.: 11024 SAS No.: _____ SDG No.: 311024

Matrix: (soil/water) SOIL Lab Sample ID: 311024-2

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 110242

Level: (low/med) LOW Date Received: 10/30/93

% Moisture: not dec. 19 Date Analyzed: 11/04/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	U
75-01-4	Vinyl Chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene Chloride	3	J
67-64-1	Acetone	15	
75-15-0	Carbon Disulfide	6	U
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	45	
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	12	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	12	U
591-78-6	2-Hexanone	12	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
----------	o,p-XYLENE	6	U
108-38-3	M-XYLENE	6	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-20B

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11024 SAS No.: N/A SDG No.: 311024

Matrix: (soil/water) SOIL Lab Sample ID: 311024-2

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 110242

Level (low/med) LOW Date Received: 10/30/93

% Moisture: not dec. 19 Date Analyzed: 11/04/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) _____

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B-20B

ab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

b Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

trix (soil/water): SOIL Lab Sample ID: 311024-2

vel (low/med): LOW Date Received: 10/30/93

olids: 80.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3570			P
7440-36-0	Antimony	4.3	B	N	P
7440-38-2	Arsenic	0.73	B	N	F
7440-39-3	Barium	29.2			P
7440-41-7	Beryllium	0.17	B		P
7440-43-9	Cadmium	0.32	U		P
7440-70-2	Calcium	80900			P
7440-47-3	Chromium	7.0			P
7440-48-4	Cobalt	2.7	B		P
7440-50-8	Copper	8.1			P
7439-89-6	Iron	8290		E	P
7439-92-1	Lead	5.8			F
7439-95-4	Magnesium	38700			P
7439-96-5	Manganese	284			P
7439-97-6	Mercury	0.05	U		AV
7440-02-0	Nickel	5.9			P
7440-09-7	Potassium	537	B		P
7782-49-2	Selenium	0.20	B	N	F
7440-22-4	Silver	1.6	U		P
7440-23-5	Sodium	704			P
7440-28-0	Thallium	0.17	U		F
7440-62-2	Vanadium	12.1			P
7440-66-6	Zinc	17.9		E	P
	Cyanide				NR

lor Before: Clarity Before: Texture:

or After: Clarity After: Artifacts:

mments:

FORM I - IN

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1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-21A(6-8)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC5 SAS No.: NA SDG No.: 252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-1

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 3112521

Level: (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 18 dec. Date Extracted: 11/15/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 12/02/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		VOA TCL	6.60	300	BJ
2.		UNKNOWN ALKANOIC ACID	21.35	500	BJ
3.		UNKNOWN HYDROCARBON	28.53	300	BJ
4.					
5.					
6.					
7.					
8.					
9.					
10.					
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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-21A(48-50)

Lab Name: A.T.I. Contract: NA

Code: FINNMAT Case No.: 11252 SAS No.: _____ SDG No.: 311252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-2

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 112522

Level: (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 26 Date Analyzed: 11/10/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	14	U
74-83-9	Bromomethane	14	U
75-01-4	Vinyl Chloride	14	U
75-00-3	Chloroethane	14	U
75-09-2	Methylene Chloride	7	U
67-64-1	Acetone	56	
75-15-0	Carbon Disulfide	7	U
75-35-4	1,1-Dichloroethene	7	U
75-34-3	1,1-Dichloroethane	7	U
540-59-0	1,2-Dichloroethene (total)	7	U
67-66-3	Chloroform	7	U
107-06-2	1,2-Dichloroethane	7	U
78-93-3	2-Butanone	14	U
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
108-05-4	Vinyl Acetate	14	U
75-27-4	Bromodichloromethane	7	U
78-87-5	1,2-Dichloropropane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
79-01-6	Trichloroethene	7	U
124-48-1	Dibromochloromethane	7	U
79-00-5	1,1,2-Trichloroethane	7	U
71-43-2	Benzene	7	U
10061-02-6	trans-1,3-Dichloropropene	7	U
75-25-2	Bromoform	7	U
108-10-1	4-Methyl-2-Pentanone	14	U
591-78-6	2-Hexanone	14	U
127-18-4	Tetrachloroethene	7	U
79-34-5	1,1,2,2-Tetrachloroethane	7	U
108-88-3	Toluene	7	U
108-90-7	Chlorobenzene	7	U
100-41-4	Ethylbenzene	7	U
100-42-5	Styrene	7	U
----------	o,p-XYLENE	7	U
108-38-3	M-XYLENE	7	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-21A(48-50)

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11252 SAS No.: N/A SDG No.: 311252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-2

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 112522

Level (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 26 Date Analyzed: 11/10/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-21A(48-50)

Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC5 SAS No.: NA SDG No.: 252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 3112522

Level: (low/med) LOW Date Received: 11/09/93

Moisture: not dec. 26 dec. Date Extracted: 11/15/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 12/02/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	450	U
111-44-4	bis(2-Chloroethyl)Ether	450	U
95-57-8	2-Chlorophenol	450	U
541-73-1	1,3-Dichlorobenzene	450	U
106-46-7	1,4-Dichlorobenzene	450	U
100-51-6	Benzyl Alcohol	450	U
95-50-1	1,2-Dichlorobenzene	450	U
95-48-7	2-Methylphenol	450	U
39638-32-9	bis(2-Chloroisopropyl)Ether	450	U
106-44-5	4-Methylphenol	450	U
621-64-7	N-Nitroso-Di-n-Propylamine	450	U
67-72-1	Hexachloroethane	450	U
98-95-3	Nitrobenzene	450	U
78-59-1	Isophorone	450	U
88-75-5	2-Nitrophenol	450	U
105-67-9	2,4-Dimethylphenol	450	U
65-85-0	Benzoic Acid	2200	U
111-91-1	bis(2-Chloroethoxy)Methane	450	U
120-83-2	2,4-Dichlorophenol	450	U
120-82-1	1,2,4-Trichlorobenzene	450	U
91-20-3	Naphthalene	450	U
106-47-8	4-Chloroaniline	450	U
87-68-3	Hexachlorobutadiene	450	U
59-50-7	4-Chloro-3-Methylphenol	450	U
91-57-6	2-Methylnaphthalene	450	U
77-47-4	Hexachlorocyclopentadiene	450	U
88-06-2	2,4,6-Trichlorophenol	450	U
95-95-4	2,4,5-Trichlorophenol	2200	U
91-58-7	2-Chloronaphthalene	450	U
88-74-4	2-Nitroaniline	450	U
131-11-3	Dimethyl Phthalate	450	U
208-96-8	Acenaphthylene	450	U
606-20-2	2,6-Dinitrotoluene	450	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-21A(48-50)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC5 SAS No.: NA SDG No.: 252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 3112522

Level: (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 26 dec. Date Extracted: 11/15/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 12/02/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	450	U
83-32-9	Acenaphthene	450	U
51-28-5	2,4-Dinitrophenol	2200	U
100-02-7	4-Nitrophenol	2200	U
132-64-9	Dibenzofuran	450	U
121-14-2	2,4-Dinitrotoluene	450	U
84-66-2	Diethylphthalate	450	U
7005-72-3	4-Chlorophenyl-phenylether	450	U
86-73-7	Fluorene	450	U
100-10-6	4-Nitroaniline	450	U
534-52-1	4,6-Dinitro-2-Methylphenol	2200	U
86-30-6	N-Nitrosodiphenylamine	450	U
122-66-7	1,2-Diphenylhydrazine	450	U
101-55-3	4-Bromophenyl-phenylether	450	U
118-74-1	Hexachlorobenzene	450	U
87-86-5	Pentachlorophenol	2200	U
85-01-8	Phenanthrene	450	U
120-12-7	Anthracene	450	U
84-74-2	Di-n-Butylphthalate	180	BJ
206-44-0	Fluoranthene	450	U
129-00-0	Pyrene	450	U
85-68-7	Butylbenzylphthalate	450	U
91-94-1	3,3'-Dichlorobenzidine	2200	U
56-55-3	Benzo(a)Anthracene	450	U
218-01-9	Chrysene	450	U
117-81-7	bis(2-Ethylhexyl)Phthalate	450	U
117-84-0	Di-n-OctylPhthalate	450	U
205-99-2	Benzo(b)Fluoranthene	450	U
207-08-9	Benzo(k)Fluoranthene	450	U
50-32-8	Benzo(a)Pyrene	450	U
193-39-5	Indeno(1,2,3-cd)Pyrene	450	U
53-70-3	Dibenz(a,h)Anthracene	450	U
191-24-2	Benzo(g,h,i)Perylene	450	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-21A(48-50)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC5 SAS No.: NA SDG No.: 252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 3112522

Level: (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 26 dec. Date Extracted: 11/15/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 12/02/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOA TCL	6.60	300	BJ
2.	UNKNOWN ALKANOIC ACID	21.35	500	BJ
3.	UNKNOWN HYDROCARBON	26.63	200	J
4.	UNKNOWN HYDROCARBON	28.53	600	BJ
5.	UNKNOWN ALKANE	29.27	1000	J
6.	UNKNOWN ALKANE	30.93	1000	J
7.	UNKNOWN ALKANE	33.18	200	J
8.	UNKNOWN HYDROCARBON	33.57	300	J
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

21A(48-50)

Lab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

Lab Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix (soil/water): SOIL Lab Sample ID: 311252-2

Level (low/med): LOW Date Received: 11/09/93

Solids: 76.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	779			P
7440-36-0	Antimony	2.9	U	N	P
7440-38-2	Arsenic	3.8		N	F
7440-39-3	Barium	17.5	B		P
7440-41-7	Beryllium	0.43	B		P
7440-43-9	Cadmium	0.35	U		P
7440-70-2	Calcium	1340			P
7440-47-3	Chromium	1.4			P
7440-48-4	Cobalt	4.0	B		P
7440-50-8	Copper	2.9	B		P
7439-89-6	Iron	12000		E	P
7439-92-1	Lead	4.5			F
7439-95-4	Magnesium	437	B		P
7439-96-5	Manganese	16.2			P
7439-97-6	Mercury	0.05	U		AV
7440-02-0	Nickel	5.6			P
7440-09-7	Potassium	183	B		P
7782-49-2	Selenium	0.21	U	N	F
7440-22-4	Silver	1.7	U		P
7440-23-5	Sodium	36.8	B		P
7440-28-0	Thallium	0.17	U		F
7440-62-2	Vanadium	3.1	B		P
7440-66-6	Zinc	4.8		E	P
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

21A(48-50)=B-21_A_(48'-50')

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-22A(22-24)

Lab Name: A. T. I. Contract: NA

Lab Code: FINNMAT Case No.: 11252 SAS No.: _____ SDG No.: 311252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-3

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 112523

Level: (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 19 Date Analyzed: 11/10/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	U
75-01-4	Vinyl Chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene Chloride	9	B
67-64-1	Acetone	130	
75-15-0	Carbon Disulfide	5	J
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	1800	E
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	32	
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	12	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	12	U
591-78-6	2-Hexanone	12	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
	o,p-XYLENE	6	U
108-38-3	M-XYLENE	6	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-22A(22-24)

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11252 SAS No.: N/A SDG No.: 311252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-3

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 112523

Level (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 19 Date Analyzed: 11/10/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

B-22A(22-24)

Lab Name: A. T. I. Contract: NA

Lab Code: FINNMAT Case No.: 11252 SAS No.: _____ SDG No.: 311252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-3D

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 112523D

Level: (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 19 Date Analyzed: 11/11/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	62	U
74-83-9	Bromomethane	62	U
75-01-4	Vinyl Chloride	62	U
75-00-3	Chloroethane	62	U
75-09-2	Methylene Chloride	31	U
67-64-1	Acetone	150	
75-15-0	Carbon Disulfide	31	U
75-35-4	1,1-Dichloroethene	31	U
75-34-3	1,1-Dichloroethane	31	U
540-59-0	1,2-Dichloroethene (total)	31	U
67-66-3	Chloroform	830	*
107-06-2	1,2-Dichloroethane	31	U
78-93-3	2-Butanone	62	U
71-55-6	1,1,1-Trichloroethane	31	U
56-23-5	Carbon Tetrachloride	31	U
108-05-4	Vinyl Acetate	62	U
75-27-4	Bromodichloromethane	31	U
78-87-5	1,2-Dichloropropane	31	U
10061-01-5	cis-1,3-Dichloropropene	31	U
79-01-6	Trichloroethene	31	U
124-48-1	Dibromochloromethane	31	U
79-00-5	1,1,2-Trichloroethane	31	U
71-43-2	Benzene	31	U
10061-02-6	trans-1,3-Dichloropropene	31	U
75-25-2	Bromoform	31	U
108-10-1	4-Methyl-2-Pentanone	62	U
591-78-6	2-Hexanone	62	U
127-18-4	Tetrachloroethene	31	U
79-34-5	1,1,2,2-Tetrachloroethane	31	U
108-88-3	Toluene	31	U
108-90-7	Chlorobenzene	31	U
100-41-4	Ethylbenzene	31	U
100-42-5	Styrene	31	U
----------	o,p-XYLENE	31	U
108-38-3	M-XYLENE	31	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-22A(22-24)D

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11252 SAS No.: N/A SDG No.: 311252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-3

Sample wt/vol: 1.0 (g/mL) G Lab File ID: 112523D

Level (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 19 Date Analyzed: 11/10/93

Column (pack/cap) PACK Dilution Factor: 5

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-22A(22-24)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC5 SAS No.: NA SDG No.: 252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 3112523

Level: (low/med) LOW Date Received: 11/09/93

Moisture: not dec. 21 dec. Date Extracted: 11/15/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 12/02/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	420	U
111-44-4	bis(2-Chloroethyl)Ether	420	U
95-57-8	2-Chlorophenol	420	U
541-73-1	1,3-Dichlorobenzene	420	U
106-46-7	1,4-Dichlorobenzene	420	U
100-51-6	Benzyl Alcohol	420	U
95-50-1	1,2-Dichlorobenzene	420	U
95-48-7	2-Methylphenol	420	U
39638-32-9	bis(2-Chloroisopropyl)Ether	420	U
106-44-5	4-Methylphenol	420	U
621-64-7	N-Nitroso-Di-n-Propylamine	420	U
67-72-1	Hexachloroethane	420	U
98-95-3	Nitrobenzene	420	U
78-59-1	Isophorone	420	U
88-75-5	2-Nitrophenol	420	U
105-67-9	2,4-Dimethylphenol	420	U
65-85-0	Benzoic Acid	2000	U
111-91-1	bis(2-Chloroethoxy)Methane	420	U
120-83-2	2,4-Dichlorophenol	420	U
120-82-1	1,2,4-Trichlorobenzene	420	U
91-20-3	Naphthalene	420	U
106-47-8	4-Chloroaniline	420	U
87-68-3	Hexachlorobutadiene	420	U
59-50-7	4-Chloro-3-Methylphenol	420	U
91-57-6	2-Methylnaphthalene	420	U
77-47-4	Hexachlorocyclopentadiene	420	U
88-06-2	2,4,6-Trichlorophenol	420	U
95-95-4	2,4,5-Trichlorophenol	2000	U
91-58-7	2-Chloronaphthalene	420	U
88-74-4	2-Nitroaniline	420	U
131-11-3	Dimethyl Phthalate	420	U
208-96-8	Acenaphthylene	420	U
606-20-2	2,6-Dinitrotoluene	420	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-22A(22-24)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC5 SAS No.: NA SDG No.: 252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 3112523

Level: (low/med) LOW Date Received: 11/09/93

Moisture: not dec. 21 dec. Date Extracted: 11/15/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 12/02/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	420	U
83-32-9	Acenaphthene	420	U
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	2000	U
132-64-9	Dibenzofuran	420	U
121-14-2	2,4-Dinitrotoluene	420	U
84-66-2	Diethylphthalate	420	U
7005-72-3	4-Chlorophenyl-phenylether	420	U
86-73-7	Fluorene	420	U
100-10-6	4-Nitroaniline	420	U
534-52-1	4,6-Dinitro-2-Methylphenol	2000	U
86-30-6	N-Nitrosodiphenylamine	420	U
122-66-7	1,2-Diphenylhydrazine	420	U
101-55-3	4-Bromophenyl-phenylether	420	U
118-74-1	Hexachlorobenzene	420	U
87-86-5	Pentachlorophenol	2000	U
85-01-8	Phenanthrene	420	U
120-12-7	Anthracene	420	U
84-74-2	Di-n-Butylphthalate	210	BJ
206-44-0	Fluoranthene	420	U
129-00-0	Pyrene	420	U
85-68-7	Butylbenzylphthalate	420	U
91-94-1	3,3'-Dichlorobenzidine	2000	U
56-55-3	Benzo(a)Anthracene	420	U
218-01-9	Chrysene	420	U
117-81-7	bis(2-Ethylhexyl)Phthalate	420	U
117-84-0	Di-n-OctylPhthalate	420	U
205-99-2	Benzo(b)Fluoranthene	420	U
207-08-9	Benzo(k)Fluoranthene	420	U
50-32-8	Benzo(a)Pyrene	420	U
193-39-5	Indeno(1,2,3-cd)Pyrene	420	U
53-70-3	Dibenz(a,h)Anthracene	420	U
191-24-2	Benzo(g,h,i)Perylene	420	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-22A(22-24)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC5 SAS No.: NA SDG No.: 252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 3112523

Level: (low/med) LOW Date Received: 11/09/93

Moisture: not dec. 21 dec. Date Extracted: 11/15/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 12/02/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOA TCL	6.59	300	BJ
2.	UNKNOWN ALKANOIC ACID	21.35	400	BJ
3. 10544-50-0	MOLECULAR SULFUR	22.68	200	J
4.	UNKNOWN HYDROCARBON	28.53	400	BJ
5.	UNKNOWN ALKANE	29.25	900	J
6.	UNKNOWN HYDROCARBON	29.33	400	J
7.	UNKNOWN ALKANE	30.93	600	J
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

22~~A~~B(22-24)

Lab Name: ANALYTICAL_TECHNOLOGIES__ Contract: N/A_____

Lab Code: ATI___ Case No.: N/A___ SAS No.: N/A___ SDG No.: N/A___

Matrix (soil/water): SOIL_ Lab Sample ID: 311252-3

Level (low/med): LOW__ Date Received: 11/09/93

Solids: _81.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3900			P
7440-36-0	Antimony	4.7	B	N	P
7440-38-2	Arsenic	1.6	B	N	F
7440-39-3	Barium	61.6			P
7440-41-7	Beryllium	0.20	B		P
7440-43-9	Cadmium	0.32	U		P
7440-70-2	Calcium	70600			P
7440-47-3	Chromium	6.5			P
7440-48-4	Cobalt	3.9	B		P
7440-50-8	Copper	10.8			P
7439-89-6	Iron	10100		E	P
7439-92-1	Lead	6.7			F
7439-95-4	Magnesium	35100			P
7439-96-5	Manganese	404			P
7439-97-6	Mercury	0.04	U		AV
7440-02-0	Nickel	9.2			P
7440-09-7	Potassium	700			P
7782-49-2	Selenium	0.18	U	WN	F
7440-22-4	Silver	1.6	U		P
7440-23-5	Sodium	7010			P
7440-28-0	Thallium	0.22	B		F
7440-62-2	Vanadium	13.1			P
7440-66-6	Zinc	21.3		E	P
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

22A(22-24)=B-22_A_(22'-24')

FORM I - IN

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-23A(22-24)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11252 SAS No.: _____ SDG No.: 311252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-5

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 112525

Level: (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 16 Date Analyzed: 11/10/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	U
75-01-4	Vinyl Chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene Chloride	5	BJ
67-64-1	Acetone	9	J
75-15-0	Carbon Disulfide	6	U
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	6	U
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	12	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	12	U
591-78-6	2-Hexanone	12	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
----------	o,p-XYLENE	6	U
108-38-3	M-XYLENE	6	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-23A(22-24)

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11252 SAS No.: N/A SDG No.: 311252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-5

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 112525

Level (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 16 Date Analyzed: 11/10/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-23B(22-24)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC5 SAS No.: NA SDG No.: 252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-5

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 3112525

Level: (low/med) LOW Date Received: 11/09/93

Moisture: not dec. 18 dec. Date Extracted: 11/15/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 12/02/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	400	U
111-44-4	bis(2-Chloroethyl)Ether	400	U
95-57-8	2-Chlorophenol	400	U
541-73-1	1,3-Dichlorobenzene	400	U
106-46-7	1,4-Dichlorobenzene	400	U
100-51-6	Benzyl Alcohol	400	U
95-50-1	1,2-Dichlorobenzene	400	U
95-48-7	2-Methylphenol	400	U
39638-32-9	bis(2-Chloroisopropyl)Ether	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-Di-n-Propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
65-85-0	Benzoic Acid	1900	U
111-91-1	bis(2-Chloroethoxy)Methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
120-82-1	1,2,4-Trichlorobenzene	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
59-50-7	4-Chloro-3-Methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	1900	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	400	U
131-11-3	Dimethyl Phthalate	400	U
208-96-8	Acenaphthylene	400	U
606-20-2	2,6-Dinitrotoluene	400	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-23A(22-24)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC5 SAS No.: NA SDG No.: 252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-5

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 3112525

Level: (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 18 dec. Date Extracted: 11/15/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 12/02/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	400	U
83-32-9	Acenaphthene	400	U
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	1900	U
132-64-9	Dibenzofuran	400	U
121-14-2	2,4-Dinitrotoluene	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-10-6	4-Nitroaniline	400	U
534-52-1	4,6-Dinitro-2-Methylphenol	1900	U
86-30-6	N-Nitrosodiphenylamine	400	U
122-66-7	1,2-Diphenylhydrazine	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
87-86-5	Pentachlorophenol	1900	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
84-74-2	Di-n-Butylphthalate	200	BJ
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	1900	U
56-55-3	Benzo(a)Anthracene	400	U
218-01-9	Chrysene	400	U
117-81-7	bis(2-Ethylhexyl)Phthalate	400	U
117-84-0	Di-n-OctylPhthalate	400	U
205-99-2	Benzo(b)Fluoranthene	400	U
207-08-9	Benzo(k)Fluoranthene	400	U
50-32-8	Benzo(a)Pyrene	400	U
193-39-5	Indeno(1,2,3-cd)Pyrene	400	U
53-70-3	Dibenz(a,h)Anthracene	400	U
191-24-2	Benzo(g,h,i)Perylene	400	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-23A(22-24)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC5 SAS No.: NA SDG No.: 252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-5

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 3112525

Level: (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 18 dec. Date Extracted: 11/15/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 12/02/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

23A(22-24)
B

Lab Name: ANALYTICAL_TECHNOLOGIES__ Contract: N/A_____

Lab Code: ATI___ Case No.: N/A___ SAS No.: N/A___ SDG No.: N/A___

Matrix (soil/water): SOIL_ Lab Sample ID: 311252-5

Level (low/med): LOW__ Date Received: 11/09/93

Solids: _85.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	790			P
7440-36-0	Antimony	2.5	U	N	P
7440-38-2	Arsenic	0.56	B	N	F
7440-39-3	Barium	23.2			P
7440-41-7	Beryllium	0.13	B		P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	607			P
7440-47-3	Chromium	1.9			P
7440-48-4	Cobalt	1.00	B		P
7440-50-8	Copper	2.3	B		P
7439-89-6	Iron	628		E	P
7439-92-1	Lead	3.4			F
7439-95-4	Magnesium	366	B		P
7439-96-5	Manganese	13.2			P
7439-97-6	Mercury	0.04	U		AV
7440-02-0	Nickel	1.0	B		P
7440-09-7	Potassium	69.0	B		P
7782-49-2	Selenium	0.67	B	N	F
7440-22-4	Silver	1.5	U		P
7440-23-5	Sodium	29.5	B		P
7440-28-0	Thallium	0.16	U		F
7440-62-2	Vanadium	2.4	B		P
7440-66-6	Zinc	4.2		E	P
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

23A(22-24)=B-23_A_(22'-24')

FORM I - IN

ILMO2.1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-23A(48-50)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11252 SAS No.: _____ SDG No.: 311252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-4

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 112524

Level: (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 22 Date Analyzed: 11/10/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	13	U
74-83-9	Bromomethane	13	U
75-01-4	Vinyl Chloride	13	U
75-00-3	Chloroethane	13	U
75-09-2	Methylene Chloride	7	B
67-64-1	Acetone	18	
75-15-0	Carbon Disulfide	6	U
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	26	
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	13	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	13	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	13	U
591-78-6	2-Hexanone	13	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
	o,p-XYLENE	6	U
108-38-3	M-XYLENE	6	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-23A(48-50)

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11252 SAS No.: N/A SDG No.: 311252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-4

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 112524

Level (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 22 Date Analyzed: 11/10/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-23A(48-50)R

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11252 SAS No.: _____ SDG No.: 311252

Matrix: (soil/water) SOIL Lab Sample ID: 3112524RE

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 112524RE

Level: (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 22 Date Analyzed: 11/11/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	13	U
74-83-9	Bromomethane	13	U
75-01-4	Vinyl Chloride	13	U
75-00-3	Chloroethane	13	U
75-09-2	Methylene Chloride	2	J
67-64-1	Acetone	20	
75-15-0	Carbon Disulfide	6	U
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	6	U
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	13	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	13	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	13	U
591-78-6	2-Hexanone	13	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
	o,p-XYLENE	6	U
108-38-3	M-XYLENE	6	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-23A(48-50)

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11252 SAS No.: N/A SDG No.: 311252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-4RE

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 112524RE

Level (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. 22 Date Analyzed: 11/11/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-23A(48-50)

ab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC5 SAS No.: NA SDG No.: 252

..atrix: (soil/water) SOIL Lab Sample ID: 311252-4

ample wt/vol: 30.0 (g/mL) G Lab File ID: 3112524

Level: (low/med) LOW Date Received: 11/09/93

Moisture: not dec. 27 dec. Date Extracted: 11/15/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 12/02/93

?C Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	450	U
111-44-4	bis(2-Chloroethyl)Ether	450	U
95-57-8	2-Chlorophenol	450	U
541-73-1	1,3-Dichlorobenzene	450	U
106-46-7	1,4-Dichlorobenzene	450	U
100-51-6	Benzyl Alcohol	450	U
95-50-1	1,2-Dichlorobenzene	450	U
95-48-7	2-Methylphenol	450	U
39638-32-9	bis(2-Chloroisopropyl)Ether	450	U
106-44-5	4-Methylphenol	450	U
621-64-7	N-Nitroso-Di-n-Propylamine	450	U
67-72-1	Hexachloroethane	450	U
98-95-3	Nitrobenzene	450	U
78-59-1	Isophorone	450	U
88-75-5	2-Nitrophenol	450	U
105-67-9	2,4-Dimethylphenol	450	U
65-85-0	Benzoic Acid	2200	U
111-91-1	bis(2-Chloroethoxy)Methane	450	U
120-83-2	2,4-Dichlorophenol	450	U
120-82-1	1,2,4-Trichlorobenzene	450	U
91-20-3	Naphthalene	450	U
106-47-8	4-Chloroaniline	450	U
87-68-3	Hexachlorobutadiene	450	U
59-50-7	4-Chloro-3-Methylphenol	450	U
91-57-6	2-Methylnaphthalene	450	U
77-47-4	Hexachlorocyclopentadiene	450	U
88-06-2	2,4,6-Trichlorophenol	450	U
95-95-4	2,4,5-Trichlorophenol	2200	U
91-58-7	2-Chloronaphthalene	450	U
88-74-4	2-Nitroaniline	450	U
131-11-3	Dimethyl Phthalate	450	U
208-96-8	Acenaphthylene	450	U
606-20-2	2,6-Dinitrotoluene	450	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-23A(48-50)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC5 SAS No.: NA SDG No.: 252

Matrix: (soil/water) SOIL Lab Sample ID: 311252-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 3112524

Level: (low/med) LOW Date Received: 11/09/93

Moisture: not dec. 27 dec. Date Extracted: 11/15/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 12/02/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	450	U
83-32-9	Acenaphthene	450	U
51-28-5	2,4-Dinitrophenol	2200	U
100-02-7	4-Nitrophenol	2200	U
132-64-9	Dibenzofuran	450	U
121-14-2	2,4-Dinitrotoluene	450	U
84-66-2	Diethylphthalate	450	U
7005-72-3	4-Chlorophenyl-phenylether	450	U
86-73-7	Fluorene	450	U
100-10-6	4-Nitroaniline	450	U
534-52-1	4,6-Dinitro-2-Methylphenol	2200	U
86-30-6	N-Nitrosodiphenylamine	450	U
122-66-7	1,2-Diphenylhydrazine	450	U
101-55-3	4-Bromophenyl-phenylether	450	U
118-74-1	Hexachlorobenzene	450	U
87-86-5	Pentachlorophenol	2200	U
85-01-8	Phenanthrene	450	U
120-12-7	Anthracene	450	U
84-74-2	Di-n-Butylphthalate	430	BJ
206-44-0	Fluoranthene	450	U
129-00-0	Pyrene	450	U
85-68-7	Butylbenzylphthalate	450	U
91-94-1	3,3'-Dichlorobenzidine	2200	U
56-55-3	Benzo(a)Anthracene	450	U
218-01-9	Chrysene	450	U
117-81-7	bis(2-Ethylhexyl)Phthalate	450	U
117-84-0	Di-n-OctylPhthalate	450	U
205-99-2	Benzo(b)Fluoranthene	450	U
207-08-9	Benzo(k)Fluoranthene	450	U
50-32-8	Benzo(a)Pyrene	450	U
193-39-5	Indeno(1,2,3-cd)Pyrene	450	U
53-70-3	Dibenz(a,h)Anthracene	450	U
191-24-2	Benzo(g,h,i)Perylene	450	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-23A(48-50)

ıb Name: A.T.I. Contract: NA

J Code: FINNMAT Case No.: WCC5 SAS No.: NA SDG No.: 252

ıtrix: (soil/water) SOIL Lab Sample ID: 311252-4

ımple wt/vol: 30.0 (g/mL) G Lab File ID: 3112524

Level: (low/med) LOW Date Received: 11/09/93

Moisture: not dec. 27 dec. Date Extracted: 11/15/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 12/02/93

C Cleanup: (Y/N) N pH: Dilution Factor: 1.00

ımber TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
.	VOA TCL	6.58	200	BJ
2.	UNKNOWN ALKANOIC ACID	21.37	700	BJ
.	UNKNOWN HYDROCARBON	28.53	500	BJ
4.	UNKNOWN HYDROCARBON	33.38	200	J
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

23A(48-50)

Lab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

Lab Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix (soil/water): SOIL Lab Sample ID: 311252-4

Level (low/med): LOW Date Received: 11/09/93

Solids: 75.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2590			P
7440-36-0	Antimony	2.6	U	N	P
7440-38-2	Arsenic	1.8	B	N	F
7440-39-3	Barium	61.9			P
7440-41-7	Beryllium	1.1			P
7440-43-9	Cadmium	0.32	U		P
7440-70-2	Calcium	6420			P
7440-47-3	Chromium	2.4			P
7440-48-4	Cobalt	2.2	B		P
7440-50-8	Copper	8.5			P
7439-89-6	Iron	1990		E	P
7439-92-1	Lead	9.6			F
7439-95-4	Magnesium	2200			P
7439-96-5	Manganese	31.4			P
7439-97-6	Mercury	0.05	U		AV
7440-02-0	Nickel	4.1	B		P
7440-09-7	Potassium	487	B		P
7782-49-2	Selenium	0.32	B	N	F
7440-22-4	Silver	1.5	U		P
7440-23-5	Sodium	119	B		P
7440-28-0	Thallium	0.21	B		F
7440-62-2	Vanadium	3.2	B		P
7440-66-6	Zinc	10.4		E	P
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

23A(48-50)=B-23_A_(48'-50')

FORM I - IN

ILMO2.1

VOLATILE ORGANICS ANALYSIS DATA SHEET

B-24B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11399 SAS No.: _____ SDG No.: 311399

Matrix: (soil/water) SOIL Lab Sample ID: 311399-1

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 113991

Level: (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. 30 Date Analyzed: 11/19/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	14	U
74-83-9	Bromomethane	14	U
75-01-4	Vinyl Chloride	14	U
75-00-3	Chloroethane	14	U
75-09-2	Methylene Chloride	4	BJ
67-64-1	Acetone	110	B
75-15-0	Carbon Disulfide	3	J
75-35-4	1,1-Dichloroethene	7	U
75-34-3	1,1-Dichloroethane	7	U
540-59-0	1,2-Dichloroethene (total)	7	U
67-66-3	Chloroform	7	U
107-06-2	1,2-Dichloroethane	7	U
78-93-3	2-Butanone	16	
71-55-6	1,1,1-Trichloroethane	7	U
56-23-5	Carbon Tetrachloride	7	U
108-05-4	Vinyl Acetate	14	U
75-27-4	Bromodichloromethane	7	U
78-87-5	1,2-Dichloropropane	7	U
10061-01-5	cis-1,3-Dichloropropene	7	U
79-01-6	Trichloroethene	7	U
124-48-1	Dibromochloromethane	7	U
79-00-5	1,1,2-Trichloroethane	7	U
71-43-2	Benzene	7	U
10061-02-6	trans-1,3-Dichloropropene	7	U
75-25-2	Bromoform	7	U
108-10-1	4-Methyl-2-Pentanone	14	U
591-78-6	2-Hexanone	14	U
127-18-4	Tetrachloroethene	7	U
79-34-5	1,1,2,2-Tetrachloroethane	7	U
108-88-3	Toluene	7	U
108-90-7	Chlorobenzene	7	U
100-41-4	Ethylbenzene	7	U
100-42-5	Styrene	7	U
	o,p-XYLENE	7	U
108-38-3	M-XYLENE	7	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-24B(28'-30'

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11399 SAS No.: N/A SDG No.: 311399

Matrix: (soil/water) SOIL Lab Sample ID: 311399-1

Sample wt/vol: 5 (g/mL) G Lab File ID: 113991

Level (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. 30 Date Analyzed: 11/19/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-24B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC4 SAS No.: NA SDG No.: 399

Matrix: (soil/water) SOIL Lab Sample ID: 311399-1

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 3113991

Level: (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. 31 dec. Date Extracted: 11/13/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/17/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	480	U
111-44-4	bis(2-Chloroethyl)Ether	480	U
95-57-8	2-Chlorophenol	480	U
541-73-1	1,3-Dichlorobenzene	480	U
106-46-7	1,4-Dichlorobenzene	480	U
100-51-6	Benzyl Alcohol	480	U
95-50-1	1,2-Dichlorobenzene	480	U
95-48-7	2-Methylphenol	480	U
39638-32-9	bis(2-Chloroisopropyl)Ether	480	U
106-44-5	4-Methylphenol	480	U
621-64-7	N-Nitroso-Di-n-Propylamine	480	U
67-72-1	Hexachloroethane	480	U
98-95-3	Nitrobenzene	480	U
78-59-1	Isophorone	480	U
88-75-5	2-Nitrophenol	480	U
105-67-9	2,4-Dimethylphenol	480	U
65-85-0	Benzoic Acid	2300	U
111-91-1	bis(2-Chloroethoxy)Methane	480	U
120-83-2	2,4-Dichlorophenol	480	U
120-82-1	1,2,4-Trichlorobenzene	480	U
91-20-3	Naphthalene	480	U
106-47-8	4-Chloroaniline	480	U
87-68-3	Hexachlorobutadiene	480	U
59-50-7	4-Chloro-3-Methylphenol	480	U
91-57-6	2-Methylnaphthalene	480	U
77-47-4	Hexachlorocyclopentadiene	480	U
88-06-2	2,4,6-Trichlorophenol	480	U
95-95-4	2,4,5-Trichlorophenol	2300	U
91-58-7	2-Chloronaphthalene	480	U
88-74-4	2-Nitroaniline	480	U
131-11-3	Dimethyl Phthalate	480	U
208-96-8	Acenaphthylene	480	U
606-20-2	2,6-Dinitrotoluene	480	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

B-24B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC4 SAS No.: NA SDG No.: 399

Matrix: (soil/water) SOIL Lab Sample ID: 311399-1

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 3113991

Level: (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. 31 dec. Date Extracted: 11/13/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/17/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	480	U
83-32-9	Acenaphthene	480	U
51-28-5	2,4-Dinitrophenol	2300	U
100-02-7	4-Nitrophenol	2300	U
132-64-9	Dibenzofuran	480	U
121-14-2	2,4-Dinitrotoluene	480	U
84-66-2	Diethylphthalate	480	U
7005-72-3	4-Chlorophenyl-phenylether	480	U
86-73-7	Fluorene	480	U
100-10-6	4-Nitroaniline	480	U
534-52-1	4,6-Dinitro-2-Methylphenol	2300	U
86-30-6	N-Nitrosodiphenylamine	480	U
122-66-7	1,2-Diphenylhydrazine	480	U
101-55-3	4-Bromophenyl-phenylether	480	U
118-74-1	Hexachlorobenzene	480	U
87-86-5	Pentachlorophenol	2300	U
85-01-8	Phenanthrene	480	U
120-12-7	Anthracene	480	U
84-74-2	Di-n-Butylphthalate	480	U
206-44-0	Fluoranthene	480	U
129-00-0	Pyrene	480	U
85-68-7	Butylbenzylphthalate	480	U
91-94-1	3,3'-Dichlorobenzidine	2300	U
56-55-3	Benzo(a)Anthracene	480	U
218-01-9	Chrysene	480	U
117-81-7	bis(2-Ethylhexyl)Phthalate	480	U
117-84-0	Di-n-OctylPhthalate	480	U
205-99-2	Benzo(b)Fluoranthene	480	U
207-08-9	Benzo(k)Fluoranthene	480	U
50-32-8	Benzo(a)Pyrene	480	U
193-39-5	Indeno(1,2,3-cd)Pyrene	480	U
53-70-3	Dibenz(a,h)Anthracene	480	U
191-24-2	Benzo(g,h,i)Perylene	480	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-24B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC4 SAS No.: NA SDG No.: 399

Matrix: (soil/water) SOIL Lab Sample ID: 311399-1

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 3113991

Level: (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. 31 dec. Date Extracted: 11/13/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/17/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

Number TICs found: 15

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN ALKANOIC ACID	21.50	300	J
2.	UNKNOWN ALKANOIC ACID	26.38	600	J
3.	UNKNOWN ALKANOIC ACID	27.98	1000	J
4.	UNKNOWN HYDROCARBON	28.72	300	J
5.	UNKNOWN ALKANE	29.45	2000	J
6.	UNKNOWN HYDROCARBON	29.52	1000	J
7.	UNKNOWN HYDROCARBON	30.27	200	J
8.	UNKNOWN DECANAL	30.42	200	J
9.	UNKNOWN ALCOHOL	31.10	200	J
10.	UNKNOWN ALKANE	31.22	2000	J
11.	UNKNOWN HYDROCARBON	31.33	1000	J
12.	UNKNOWN HYDROCARBON	31.52	200	J
13.	UNKNOWN DECANAL	32.95	400	J
14.	UNKNOWN ALKANE	33.57	400	J
15.	UNKNOWN DECANAL	33.68	600	J

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

24B(28-30)

Lab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

Lab Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix (soil/water): SOIL Lab Sample ID: 311399-1

Level (low/med): LOW Date Received: 11/12/93

% Solids: 61.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5440			P
7440-36-0	Antimony	3.6	U	N	P
7440-38-2	Arsenic	4.9		N	F
7440-39-3	Barium	80.7			P
7440-41-7	Beryllium	0.50	B		P
7440-43-9	Cadmium	0.43	U		P
7440-70-2	Calcium	29400			P
7440-47-3	Chromium	8.1			P
7440-48-4	Cobalt	3.9	B		P
7440-50-8	Copper	14.3			P
7439-89-6	Iron	9890		E	P
7439-92-1	Lead	9.0			F
7439-95-4	Magnesium	10100			P
7439-96-5	Manganese	297			P
7439-97-6	Mercury	0.06	U		AV
7440-02-0	Nickel	11.8			P
7440-09-7	Potassium	680	B		P
7782-49-2	Selenium	0.39	B	N	F
7440-22-4	Silver	2.1	U		P
7440-23-5	Sodium	80.8	B		P
7440-28-0	Thallium	0.32	B		F
7440-62-2	Vanadium	15.7			P
7440-66-6	Zinc	37.0		E	P
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

24B(28-30)=B-24B(28'-30')

FORM I - IN

ILMO2.1

VOLATILE ORGANICS ANALYSIS DATA SHEET

B-24A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11399 SAS No.: _____ SDG No.: 311399

Matrix: (soil/water) SOIL Lab Sample ID: 311399-2

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 113992

Level: (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. 19 Date Analyzed: 11/19/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	U
75-01-4	Vinyl Chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene Chloride	5	BJ
67-64-1	Acetone	19	B
75-15-0	Carbon Disulfide	6	U
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	6	U
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	12	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	12	U
591-78-6	2-Hexanone	12	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
----------	o,p-XYLENE	6	U
108-38-3	M-XYLENE	6	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-24A(48'-49'

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11399 SAS No.: N/A SDG No.: 311399

Matrix: (soil/water) SOIL Lab Sample ID: 311399-2

Sample wt/vol: 5 (g/mL) G Lab File ID: 113992

Level (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. 19 Date Analyzed: 11/19/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
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16.				
17.				
18.				
19.				
20.				

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-24A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC4 SAS No.: NA SDG No.: 399

Matrix: (soil/water) SOIL Lab Sample ID: 311399-2

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 3113992

Level: (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. 23 dec. Date Extracted: 11/13/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/17/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	430	U
111-44-4	bis(2-Chloroethyl)Ether	430	U
95-57-8	2-Chlorophenol	430	U
541-73-1	1,3-Dichlorobenzene	430	U
106-46-7	1,4-Dichlorobenzene	430	U
100-51-6	Benzyl Alcohol	430	U
95-50-1	1,2-Dichlorobenzene	430	U
95-48-7	2-Methylphenol	430	U
39638-32-9	bis(2-Chloroisopropyl)Ether	430	U
106-44-5	4-Methylphenol	430	U
621-64-7	N-Nitroso-Di-n-Propylamine	430	U
67-72-1	Hexachloroethane	430	U
98-95-3	Nitrobenzene	430	U
78-59-1	Isophorone	430	U
88-75-5	2-Nitrophenol	430	U
105-67-9	2,4-Dimethylphenol	430	U
65-85-0	Benzoic Acid	2100	U
111-91-1	bis(2-Chloroethoxy)Methane	430	U
120-83-2	2,4-Dichlorophenol	430	U
120-82-1	1,2,4-Trichlorobenzene	430	U
91-20-3	Naphthalene	430	U
106-47-8	4-Chloroaniline	430	U
87-68-3	Hexachlorobutadiene	430	U
59-50-7	4-Chloro-3-Methylphenol	430	U
91-57-6	2-Methylnaphthalene	430	U
77-47-4	Hexachlorocyclopentadiene	430	U
88-06-2	2,4,6-Trichlorophenol	430	U
95-95-4	2,4,5-Trichlorophenol	2100	U
91-58-7	2-Chloronaphthalene	430	U
88-74-4	2-Nitroaniline	430	U
131-11-3	Dimethyl Phthalate	430	U
208-96-8	Acenaphthylene	430	U
606-20-2	2,6-Dinitrotoluene	430	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-24A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC4 SAS No.: NA SDG No.: 399

Matrix: (soil/water) SOIL Lab Sample ID: 311399-2

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 3113992

Level: (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. 23 dec. Date Extracted: 11/13/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/17/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	430	U
83-32-9	Acenaphthene	430	U
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	2100	U
132-64-9	Dibenzofuran	430	U
121-14-2	2,4-Dinitrotoluene	430	U
84-66-2	Diethylphthalate	430	U
7005-72-3	4-Chlorophenyl-phenylether	430	U
86-73-7	Fluorene	430	U
100-10-6	4-Nitroaniline	430	U
534-52-1	4,6-Dinitro-2-Methylphenol	2100	U
86-30-6	N-Nitrosodiphenylamine	430	U
122-66-7	1,2-Diphenylhydrazine	430	U
101-55-3	4-Bromophenyl-phenylether	430	U
118-74-1	Hexachlorobenzene	430	U
87-86-5	Pentachlorophenol	2100	U
85-01-8	Phenanthrene	430	U
120-12-7	Anthracene	430	U
84-74-2	Di-n-Butylphthalate	430	U
206-44-0	Fluoranthene	430	U
129-00-0	Pyrene	430	U
85-68-7	Butylbenzylphthalate	430	U
91-94-1	3,3'-Dichlorobenzidine	2100	U
56-55-3	Benzo(a)Anthracene	430	U
218-01-9	Chrysene	430	U
117-81-7	bis(2-Ethylhexyl)Phthalate	430	U
117-84-0	Di-n-OctylPhthalate	430	U
205-99-2	Benzo(b)Fluoranthene	430	U
207-08-9	Benzo(k)Fluoranthene	430	U
50-32-8	Benzo(a)Pyrene	430	U
193-39-5	Indeno(1,2,3-cd)Pyrene	430	U
53-70-3	Dibenz(a,h)Anthracene	430	U
191-24-2	Benzo(g,h,i)Perylene	430	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-24A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC4 SAS No.: NA SDG No.: 399

Matrix: (soil/water) SOIL Lab Sample ID: 311399-2

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 3113992

Level: (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. 23 dec. Date Extracted: 11/13/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/17/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOA TCL	6.73	400	J
2.	UNKNOWN ALKANOIC ACID	21.52	800	J
3.	UNKNOWN ALKANOIC ACID	25.65	4000	J
4.	UNKNOWN ALKANE	26.38	400	J
5.	UNKNOWN HYDROCARBON	29.43	200	J
6.	UNKNOWN HYDROCARBON	29.85	400	J
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

24A(48-49)

Lab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

Lab Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix (soil/water): SOIL Lab Sample ID: 311399-2

Level (low/med): LOW Date Received: 11/12/93

Solids: 79.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2040			P
7440-36-0	Antimony	2.8	U	N	P
7440-38-2	Arsenic	2.0	B	N	F
7440-39-3	Barium	26.5			P
7440-41-7	Beryllium	0.39	B		P
7440-43-9	Cadmium	0.34	U		P
7440-70-2	Calcium	15400			P
7440-47-3	Chromium	3.7			P
7440-48-4	Cobalt	1.7	B		P
7440-50-8	Copper	2.8	B		P
7439-89-6	Iron	4280		E	P
7439-92-1	Lead	6.6			F
7439-95-4	Magnesium	1360			P
7439-96-5	Manganese	65.0			P
7439-97-6	Mercury	0.05	U		AV
7440-02-0	Nickel	3.3	B		P
7440-09-7	Potassium	414	B		P
7782-49-2	Selenium	0.19	U	WN	F
7440-22-4	Silver	1.6	U		P
7440-23-5	Sodium	53.2	B		P
7440-28-0	Thallium	0.16	U		F
7440-62-2	Vanadium	5.2	B		P
7440-66-6	Zinc	9.6		E	P
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

24A(48-49)=B-24A(48'-49')

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VOLATILE ORGANICS ANALYSIS DATA SHEET

B-25B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11399 SAS No.: _____ SDG No.: 311399

Matrix: (soil/water) SOIL Lab Sample ID: 311460-2

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 114602

Level: (low/med) LOW Date Received: 11/15/93

% Moisture: not dec. 15 Date Analyzed: 11/19/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	12	U
74-83-9	Bromomethane	12	U
75-01-4	Vinyl Chloride	12	U
75-00-3	Chloroethane	12	U
75-09-2	Methylene Chloride	4	BJ
67-64-1	Acetone	35	B
75-15-0	Carbon Disulfide	6	U
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	6	U
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	12	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	12	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-Pentanone	12	U
591-78-6	2-Hexanone	12	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
	o,p-XYLENE	6	U
108-38-3	M-XYLENE	6	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

B-25B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC3 SAS No.: NA SDG No.: 460

Matrix: (soil/water) SOIL Lab Sample ID: 311460-2

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 3114602

Level: (low/med) LOW Date Received: 11/15/93

% Moisture: not dec. 20 dec. Date Extracted: 11/19/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/27/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	410	U
83-32-9	Acenaphthene	410	U
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	2000	U
132-64-9	Dibenzofuran	410	U
121-14-2	2,4-Dinitrotoluene	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-10-6	4-Nitroaniline	410	U
534-52-1	4,6-Dinitro-2-Methylphenol	2000	U
86-30-6	N-Nitrosodiphenylamine	410	U
122-66-7	1,2-Diphenylhydrazine	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
87-86-5	Pentachlorophenol	2000	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
84-74-2	Di-n-Butylphthalate	410	U
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	2000	U
56-55-3	Benzo(a)Anthracene	410	U
218-01-9	Chrysene	410	U
117-81-7	bis(2-Ethylhexyl)Phthalate	410	U
117-84-0	Di-n-OctylPhthalate	410	U
205-99-2	Benzo(b)Fluoranthene	410	U
207-08-9	Benzo(k)Fluoranthene	410	U
50-32-8	Benzo(a)Pyrene	410	U
193-39-5	Indeno(1,2,3-cd)Pyrene	410	U
53-70-3	Dibenz(a,h)Anthracene	410	U
191-24-2	Benzo(g,h,i)Perylene	410	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-25B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC3 SAS No.: NA SDG No.: 460

Matrix: (soil/water) SOIL Lab Sample ID: 311460-2

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 3114602

Level: (low/med) LOW Date Received: 11/15/93

% Moisture: not dec. 20 dec. Date Extracted: 11/19/93

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/27/93

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOA TCL	6.68	200	J
2.	UNKNOWN DECANE	29.35	400	J
3.	UNKNOWN ALKANE	31.07	400	J

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

25B(36-38)

Lab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

Lab Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix (soil/water): SOIL Lab Sample ID: 311460-2

Level (low/med): LOW Date Received: 11/15/93

Solids: 78.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5030			P
7440-36-0	Antimony	3.5	B	N	P
7440-38-2	Arsenic	1.9	B	N	F
7440-39-3	Barium	51.0			P
7440-41-7	Beryllium	0.23	B		P
7440-43-9	Cadmium	0.32	U		P
7440-70-2	Calcium	52100			P
7440-47-3	Chromium	8.1			P
7440-48-4	Cobalt	4.1	B		P
7440-50-8	Copper	12.9			P
7439-89-6	Iron	10700		E	P
7439-92-1	Lead	5.8			F
7439-95-4	Magnesium	25500			P
7439-96-5	Manganese	373			P
7439-97-6	Mercury	0.05	U		AV
7440-02-0	Nickel	9.2			P
7440-09-7	Potassium	698			P
7782-49-2	Selenium	0.20	U	WN	F
7440-22-4	Silver	1.6	U		P
7440-23-5	Sodium	93.8	B		P
7440-28-0	Thallium	0.17	U		F
7440-62-2	Vanadium	14.7			P
7440-66-6	Zinc	24.8		E	P
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

25B(36-38)=B-25B(36'-38')

FORM I - IN

ILMO2.1

000018

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B-19_TB

Lab Name: A.T.I. Contract: _____

Lab Code: FINNMAT Case No.: 11024 SAS No.: _____ SDG No.: 311024

Matrix: (soil/water) WATER Lab Sample ID: 311139-3

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 111393

Level: (low/med) LOW Date Received: 11/04/93

% Moisture: not dec. ____ Date Analyzed: 11/05/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	BJ
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
----------	o,p-XYLENE	5	U
108-38-3	M-XYLENE	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B-19TB

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11024 SAS No.: N/A SDG No.: 311024

Matrix: (soil/water) WATER Lab Sample ID: 311139-3

Sample wt/vol: 5 (g/mL) ML Lab File ID: 111393

Level (low/med) LOW Date Received: 11/04/93

% Moisture: not dec. ____ Date Analyzed: 11/05/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) _____

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE N

TB(B20A_B20

Lab Name: A.T.I. Contract: _____

Lab Code: FINNMAT Case No.: 11024 SAS No.: _____ SDG No.: 311024

Matrix: (soil/water) WATER Lab Sample ID: 311024-3

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110243

Level: (low/med) LOW Date Received: 10/30/93

% Moisture: not dec. ____ Date Analyzed: 11/04/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	J
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
----------	o,p-XYLENE	5	U
108-38-3	M-XYLENE	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB(B20A+B20B)

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11024 SAS No.: N/A SDG No.: 311024

Matrix: (soil/water) WATER Lab Sample ID: 311024-3

Sample wt/vol: 5 (g/mL) ML Lab File ID: 110243

Level (low/med) LOW Date Received: 10/30/93

% Moisture: not dec. ____ Date Analyzed: 11/04/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) _____

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TRIP_BLANK
21,22,23

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11252 SAS No.: _____ SDG No.: 311252

Matrix: (soil/water) WATER Lab Sample ID: 311252-6

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 112526

Level: (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. ____ Date Analyzed: 11/10/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	o,p-XYLENE	5	U
108-38-3	M-XYLENE	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TRIP BLANK (21,22,23)

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11252 SAS No.: N/A SDG No.: 311252

Matrix: (soil/water) WATER Lab Sample ID: 311252-6

Sample wt/vol: 5 (g/mL) ML Lab File ID: 112526

Level (low/med) LOW Date Received: 11/09/93

% Moisture: not dec. ____ Date Analyzed: 11/10/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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VOLATILE ORGANICS ANALYSIS DATA SHEET

TRIP_BLANK_4

Lab Name: A. T. I. Contract: NA

Lab Code: FINNMAT Case No.: 11399 SAS No.: _____ SDG No.: 311399

Matrix: (soil/water) WATER Lab Sample ID: 311399-5

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 113995

Level: (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. ____ Date Analyzed: 11/19/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	o,p-XYLENE	5	U
108-38-3	M-XYLENE	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TRIP BLANK #4

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11399 SAS No.: N/A SDG No.: 311399

Matrix: (soil/water) WATER Lab Sample ID: 311399-5

Sample wt/vol: 5 (g/mL) ML Lab File ID: 113995

Level (low/med) LOW Date Received: 11/12/93

% Moisture: not dec. N/A Date Analyzed: 11/19/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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VOLATILE ORGANICS ANALYSIS DATA SHEET

TRIP_BLANK_5

Lab Name: A. T. I. Contract: NA

Lab Code: FINNMAT Case No.: 11399 SAS No.: _____ SDG No.: 311399

Matrix: (soil/water) WATER Lab Sample ID: 311460-4

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 114604

Level: (low/med) LOW Date Received: 11/15/93

% Moisture: not dec. ____ Date Analyzed: 11/19/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	o,p-XYLENE	5	U
108-38-3	M-XYLENE	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TRIP BLANK #5

Lab Name: ANALYTICAL TECHNOLOGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11399 SAS No.: N/A SDG No.: 311399

Matrix: (soil/water) WATER Lab Sample ID: 311460-4

Sample wt/vol: 5 (g/mL) ML Lab File ID: 114604

Level (low/med) LOW Date Received: 11/15/93

% Moisture: not dec. N/A Date Analyzed: 11/19/93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

RS-PZ

ab Name: A.T.I. Contract: NA

ode: FINNMAT Case No.: WCC3 SAS No.: NA SDG No.: 460

atrix: (soil/water) WATER Lab Sample ID: 311460-3

ample wt/vol: 1000 (g/mL) ML Lab File ID: 3114603

evel: (low/med) LOW Date Received: 11/15/93

Moisture: not dec. dec. Date Extracted: 11/17/93

xtraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/23/93

PC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-10-6	4-Nitroaniline	10	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	50	U
56-55-3	Benzo(a)Anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0	Di-n-OctylPhthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

1) - Cannot be separated from Diphenylamine

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

RS-PZ

Lab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

Lab Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix (soil/water): WATER Lab Sample ID: 311460-3

Level (low/med): LOW Date Received: 11/15/93

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	22.0	U		P
7440-36-0	Antimony	22.2	U		P
7440-38-2	Arsenic	0.40	B		F
7440-39-3	Barium	23.1	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	2.7	U		P
7440-70-2	Calcium	15200			P
7440-47-3	Chromium	4.1	U		P
7440-48-4	Cobalt	3.5	U		P
7440-50-8	Copper	4.6	B		P
7439-89-6	Iron	60.4	B		P
7439-92-1	Lead	0.90	U	N	F
7439-95-4	Magnesium	694	B		P
7439-96-5	Manganese	3.8	B		P
7439-97-6	Mercury	0.08	U		AV
7440-02-0	Nickel	6.3	B		P
7440-09-7	Potassium	1430	B		P
7782-49-2	Selenium	0.40	B		F
7440-22-4	Silver	13.1	U		P
7440-23-5	Sodium	4420	B		P
7440-28-0	Thallium	0.70	U	N	F
7440-62-2	Vanadium	3.8	U		P
7440-66-6	Zinc	89.7			P
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

ILMO2.1

ATI LAB. I.D.# 311024

AnalyticalTechnologies, Inc.
11 EAST OLIVE ROAD
PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

PART 1 — Bottle Shipment Information

CLIENT: Woodward Clyde Cons.
CLIENT PROJECT NUMBER: 92B007-4001

SAMPLE CONTAINERS SHIPPED QTY.	H_2SO_4	HNO_3	HCl	Zn ACETATE	$Na_2S_2O_3$	UNPRESERVED	NaOH	4 oz.	8 oz.	16 oz.	32 oz.	½ gallon	1 gallon	Whirl-pak	100-ML SPECIMEN CUP	120 ml (A)	120 ml (C)	1 liter (A)	1 liter (C)	40 ml Vial	4 oz. wm	8 oz. wm	16 oz. wm	32 oz. wm	OI Trip Blank
42						✓															✓				

PRESERVATIVE / PLASTIC CONTAINERS / GLASS CONTAINERS

RELINQUISHED	TIME	DATE	RECEIVED	TIME	DATE
Prathania Catching	1735	10-20-93	[signature]	1030	10/26/93

PART 2 — Sample Information

SAMPLE MATRIX
DW DRINKINGWATER
WW WASTEWATER
GW GROUNDWATER
SW SURFACEWATER
SO SOIL
OL OIL
AR AIR
SL SLUDGE

PARAMETERS AND PRESERVATIVES

SAMPLE I.D.	DATE	TIME	MATRIX	TCL 8240 (VOA CLP)	TCL 8270 (SEMI-VOA CLP)	Metals CLP	TOTAL	LAB USE ONLY
B-20A	10/21/93	1805	SO	1	1	1	3	
B-20B	10/20/93	1515	SO	1	1	1	3	
TB (B20A+B20B)	10/19/93	1435		2			2	

TOTAL NUMBER OF BOTTLES/CONTAINERS: 8

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
Yong Goh	10/29	14:40	Anita Johnson	10/30/93	1205

CLIENT Woodward-Clyde Consultants
ADDRESS 2822 O'Neal Lane
CITY Baton Rouge
STATE LA ZIP 70816
PHONE NO. 504 751-1873
PROJECT MANAGER (person to receive data) Richard Karkkainen

PROJECT NUMBER 92B007C4001
PROJECT NAME Vicksburg Chemical
SAMPLED BY Y. Goh / M. Olson
SAMPLE SITE Vicksburg, MS.
PURCHASE ORDER NUMBER

REQUEST FAX DATA BY ______ (FAX #)
REQUEST VERBAL RESULTS BY ______ (DATE)
NEED DATA PACKAGE BY ______ (DATE)
QUALITY CONTROL REPORTING LEVEL (circle one)
NONE 1 2 3 4
NEED ______ EXTRA COPIES OF REPORT

TURN AROUND TIMES (check one)

STANDARD - 14 TO 21 DAYS ☐
RUSH: (MUST BE APPROVED IN ADVANCE)
0-48 HOURS - 2 x STD PRICE ☐
3-7 DAYS - 1.5 x STD PRICE ☐
TCLP - 1 WEEK RUSH - 1.5 x STD PRICE ☐

SPECIAL INSTRUCTIONS:

U.S. ENVIRONMENTAL PROTECTION AGENCY

CONTRACT LABORATORY PROGRAM

SAMPLE LOG - IN SHEET

Lab Name: Analytical Technologies, Inc. Page 1 of 1

Received By (Print): David R. Barr Log-in Date: 05-NOV-93

Case Number:

Sample Delivery Group No.:

SAS Number:

CIRCLE THE APPROPRIATE RESPONSE

1. Custody Seal(s): Present/Absent*
   Intact/Broken
2. Custody Seal Nos.:
3. Chain-of-Custody Records: Present/Absent*
4. Traffic Reports or Packing List: Present/Absent*
5. Airbill: Airbill/Sticker
   Present/Absent*
6. Airbill No.: 0136331216 6
7. Sample Tags: Present/Absent*
   Sample Tag Numbers: Listed/Not Listed on Chain-of-Custody
8. Sample Condition: Intact/Broken*/Leaking
9. Does information on custody records, traffic reports and sample tags agree? Yes/No*
10. Date Received at Lab: 04-NOV-93
11. Time Received: 0950

EPA SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT ETC.
	B-19A	311139-1	
	B-19B	311139-2	
	B-19TB	311139-3	

Sample Transfer

Area#: GCMS

By: David R. Barr

On: Nov 5, 1993

*If Circled, contact SMO and attach record of resolution

Received by: N

Date: 11-5-93

Logbook No.: 93-2

Logbook Page No.: 157

FORM AADC-1

PROJECT SAMPLE INSPECTION FORM

Accession #: 311139

Date received: 04-NOV-93

1. Was there a Chain of Custody? YES NO
2. Was Chain of Custody properly relinquished? YES NO
3. Were samples received cold? (At 4° or on ice) YES NO
4. Were all containers properly labeled and identified? YES NO
5. Were samples received in proper containers for analysis requested? YES NO
6. Were all sample containers received intact? YES NO
7. Are samples correctly preserved for analysis required? YES NO
8. Is there sufficient volume for analysis requested? YES NO
9. Were samples received within holding time? YES NO
10. Was there headspace greater than ¼" in diameter in volatile bottles? YES NO N/A
11. If sent, were matrix spike bottles returned? YES NO N/A

Tracking Number: 0136331216 6

Shipped By: UPS

Cooler Number: N/S

Out of Control Events and Inspection Comments:

Inspected By: DRB Date: 11/4/93 Logged By: DRB Date: 11/4/93

BLR WPS1/SAMPLECO/SAMPLE.INS

VOLATILES CASE NARRATIVE

LABORATORY NAME: ANALYTICAL TECHNOLOGIES, INC.
CASE NUMBER: 11399
SDG#: 311399
PROJECT NAME: VICKSBURG CHEMICAL

RECEIVED NOV 12, 1993/NOV 15,1993
ATI BATCH 93-NS-107

CLIENT ID#	ATI ID #
B-24B(28'-30')	311399-1
B-24A(48'-49')	311399-2
B-12B(R)(32'-34')	311399-3
TRIP BLANK #4	311399-5
B-12A(R)(63'-65')	311460-1
B-25B(36'-38')	311460-2
RS-PZ	311460-3
TRIP BLANK #5	311460-4

The samples were received in good condition. No problems were associated with the analysis of the samples. The client sample ID numbers had to be shortened since they exceeded the space available on the forms.

Larry Dilmore
CLP Reviewer
12-02-93

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or her designee, as verified by the following signature.

Kelly Swanson
QA Officer
12-02-93

Bill Rubert
GC/MS Supervisor
12-02-93

CHAIN OF CUSTODY

JM 93-661

ATI LAB. I.D. # 311399

Analytical Technologies, Inc.
11 EAST OLIVE ROAD PHONE (904) 474-1001
PENSACOLA, FLORIDA 32514

PART 1 — Bottle Shipment Information

CLIENT:	CLIENT PROJECT NUMBER:
Vicksburg Chemical	92B007C-4001

SAMPLE CONTAINERS SHIPPED	PRESERVATIVE							PLASTIC CONTAINERS								GLASS CONTAINERS									
QTY.	H_2SO_4	HNO_3	HCl	Zn ACETATE	$Na_2S_2O_3$	UNPRESERVED	NaOH	4 oz.	8 oz.	16 oz.	32 oz.	½ gallon	1 gallon	Whirl-pak	100-ML SPECIMEN CUP	120 ml (A)	120 ml (C)	1 liter (A)	1 liter (C)	40 ml Vial	4 oz. wm	8 oz. wm	16 oz. wm	32 oz. wm	DI Trip Blank
2						✓																	✓		

RELINQUISHED	TIME	DATE	RECEIVED	TIME	DATE
Prathena Catchings	1350	11-8-93	[signature]	1400	11/09/93

PART 2 — Sample Information

SAMPLE MATRIX

DW DRINKINGWATER
WW WASTEWATER
GW GROUNDWATER
SW SURFACEWATER
SO SOIL
OL OIL
AR AIR
SL SLUDGE

PARAMETERS AND PRESERVATIVES

SAMPLE I.D.	DATE	TIME	MATRIX	CLP VOA Method 8240	CLP Sem.-VOA Method 8270 AB	CLP Metals	TCLP-VOA, Pest, Sem. VOA, Herb.	TCLP Metals						TOTAL	LAB USE ONLY
B-24B (28'-30')	11/9/93	0837	SO	1	1	1	—	—	—	—	—	—	—	3	
B-24A (48'-49')	11/9/93	1315	SO	1	1	1	—	—	—	—	—	—	—	3	
North Pond	11/9/93	1630	SL	—	—	—	1	1	—	—	—	—	—	2	
B-12B(R)(32'-34')	11/10/93	1508	SO	1	1	1	—	—	—	—	—	—	—	3	
Trip Blank #4	11/11/93	0745	—	2	—	—	—	—	—	—	—	—	—	2	

TOTAL NUMBER OF BOTTLES/CONTAINERS 13

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
[signature] (WCC)	11/11/93	0750	[signature] Johnson	11/12/93	0950

CLIENT Woodward-Clyde Consultants
ADDRESS 2822 O'Neal Ln.
CITY Baton Rouge
STATE LA ZIP 70816
PHONE NO. (504) 751-1873
PROJECT MANAGER (person to receive data) Nick Karkkainen

PROJECT NUMBER 92B007C-4001
PROJECT NAME Vicksburg Chemical
SAMPLED BY Yeoh/McOlson
SAMPLE SITE Vicksburg, MS.
PURCHASE ORDER NUMBER

REQUEST FAX DATA BY _____ (FAX #)
REQUEST VERBAL RESULTS BY _____ (DATE)
NEED DATA PACKAGE BY _____ (DATE)
QUALITY CONTROL REPORTING LEVEL (circle one)
NONE 1 2 3 4
NEED _____ EXTRA COPIES OF REPORT

TURN AROUND TIMES (check one)

STANDARD - 14 TO 21 DAYS ☒
RUSH: (MUST BE APPROVED IN ADVANCE)
0-48 HOURS - 2 x STD PRICE ☐
3-7 DAYS - 1.5 x STD PRICE ☐
TCLP - 1 WEEK RUSH - 1.5 x STD PRICE ☐

SPECIAL INSTRUCTIONS:

CHAIN OF CUSTODY

PS 93-549

ATI LAB. I.D. # 311460

AnalyticalTechnologies, Inc.
11 EAST OLIVE ROAD
PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

PART 1 — Bottle Shipment Information

CLIENT: Woodward Clyde Cons.

CLIENT PROJECT NUMBER: 92B007C-4001

SAMPLE CONTAINERS SHIPPED	PRESERVATIVE						PLASTIC CONTAINERS								GLASS CONTAINERS								
QTY.	H_2SO_4	HNO3	HCl	Zn ACETATE	$Na_2S_2O_3$	UNPRESERVED	NaOH	4 oz.	8 oz.	16 oz.	32 oz.	½ gallon	1 gallon	Whirl-pak	100-ML SPECIMEN CUP	120 ml (A)	120 ml (C)	1 liter (A)	1 liter (C)	40 ml Vial	4 oz. wm	8 oz. wm	16 oz. wm	32 oz. wm	Oil Trip Blank
6						✓															✓				

RELINQUISHED	TIME	DATE	RECEIVED	TIME	DATE
Matthew Catalinas	1645	10-20-93	[illegible]	1030	10/26/93

PART 2 — Sample Information

SAMPLE MATRIX

DW DRINKINGWATER
WW WASTEWATER
GW GROUNDWATER
SW SURFACEWATER
SO SOIL
OL OIL
AR AIR
SL SLUDGE

PARAMETERS AND PRESERVATIVES

SAMPLE I.D.	DATE	TIME	MATRIX	CLP VOA Method 8240	CLP Semi VOA Method 8270 AB	CLP Metals							TOTAL	LAB USE ONLY
B-12A (R) (63'-65')	11/11/93	1135	SO	1	1	1							3	
B-25B (36'-38')	11/12/93	1100	SO	1	1	1							3	
RS-PZ	11/12/93	1310	—	2	1	1							4	
Trip Blank #5	11/12/93	1335	—	2									2	

TOTAL NUMBER OF BOTTLES/CONTAINERS 12

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
[illegible] (WCC)	11/12/93	1345	Linda L. Kitt	11/15/93	0936

CLIENT Woodward-Clyde Consultants
ADDRESS 2877 O'Neal Ln.
CITY Baton Rouge, LA.
STATE LA ZIP 70816
PHONE NO. (504) 751-1873
PROJECT MANAGER (person to receive data) Dick Karkkainen

PROJECT NUMBER 92B007C-4001
PROJECT NAME Vicksburg Chemical
SAMPLED BY Y. Goh / M. Olson
SAMPLE SITE Vicksburg, MS
PURCHASE ORDER NUMBER

REQUEST FAX DATA BY _____ (FAX #)
REQUEST VERBAL RESULTS BY _____ (DATE)
NEED DATA PACKAGE BY _____ (DATE)
QUALITY CONTROL REPORTING LEVEL (circle one)
NONE 1 2 3 4
NEED _____ EXTRA COPIES OF REPORT

TURN AROUND TIMES (check one)

STANDARD - 14 TO 21 DAYS ☒

RUSH: (MUST BE APPROVED IN ADVANCE)
0-48 HOURS - 2 x STD PRICE ☐
3-7 DAYS - 1.5 x STD PRICE ☐
TOUR - 1 WEEK RUSH - 1.5 x STD PRICE ☐

SPECIAL INSTRUCTIONS:

U.S. ENVIRONMENTAL PROTECTION AGENCY

CONTRACT LABORATORY PROGRAM

SAMPLE LOG - IN SHEET

Lab Name: ANALYTICAL TECHNOLOGIES, INC. Page 1 of 1

Received By (Print): ANITA S. JOHNSON Log-in Date: NOVEMBER 12, 199

Case Number:

Sample Delivery Group No.:

SAS Number:

CIRCLE THE APPROPRIATE RESPONSE

1. Custody Seal(s): Present/Absent* Intact/Broken
2. Custody Seal Nos.:
3. Chain-of-Custody Records: Present/Absent*
4. Traffic Reports or Packing List: Present/Absent*
5. Airbill: Airbill/Sticker Present/Absent*
6. Airbill No.: 0136331 2280
7. Sample Tags: Present/Absent* Sample Tag Numbers: Listed/Not Listed on Chain-of-Custody
8. Sample Condition: Intact/Broken*/Leaking
9. Does information on custody records, traffic reports and sample tags agree? Yes/No*
10. Date Received at Lab:
11. Time Received:

EPA SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT ETC.
	B-24B(26'-30')	311349-1	
	B-24A(48'-49')	311349-2	
	B-(28(R)(32'-34')	311349-3	
	TRIPBLANK #4	311349-4	

Sample Transfer

Area#: GC/MS

By: ANITA JOHNSON

On: NOV. 12, 1993

*If Circled, contact SMO and attach record of resolution

Received by: JM

Date: 11-12-93

Logbook No.: 93-1

Logbook Page No.: 169

FORM AADC-1

U.S. ENVIRONMENTAL PROTECTION AGENCY

CONTRACT LABORATORY PROGRAM

SAMPLE LOG - IN SHEET

Lab Name: Analytical Technologies, Inc

Page 2 of 3

Received By (Print): David R. Barr II

Log-in Date: 16-NOV-93

ase Number:

ample Delivery Group No.:

SAS Number:

IRCLE THE APPROPRIATE RESPONSE

. Custody Seal(s): Present/Absent*
Intact/Broken

. Custody Seal Nos.:

. Chain-of-Custody Records: Present/Absent*

. Traffic Reports or Packing List: Present/Absent*

. Airbill: Airbill/Sticker
Present/Absent*

. Airbill No.:

. Sample Tags: Present/Absent*

Sample Tag Numbers: Listed/Not Listed on Chain-of-Custody

. Sample Condition: Intact/Broken*/Leaking

. Does information on custody records, traffic reports and sample tags agree? Yes/No*

). Date Received at Lab: 15-NOV-93

l. Time Received: 0935

EPA SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT ETC.
	B-12ALR/(63'-65')	311460-1	
	B-25B(36'-38')	311460-2	
	AS-PZ	311460-3	
	Trip blank #5	311460-4	

Sample Transfer

rea#: GCMS

y: David R. Barr

n: 11-16-93

f Circled, contact SMO and attach record of resolution

Received by: [illegible]

Date: 11-16-93

Logbook No.: 93-2

Logbook Page No.: 173

FORM AADC-1

PROJECT SAMPLE INSPECTION FORM

Accession #: 311399

Date received: 12-NOV-93

1. Was there a Chain of Custody? YES NO
2. Was Chain of Custody properly relinquished? YES NO
3. Were samples received cold? (At 4° or on ice) YES NO
4. Were all containers properly labeled and identified? YES NO
5. Were samples received in proper containers for analysis requested? YES NO
6. Were all sample containers received intact? YES NO
7. Are samples correctly preserved for analysis required? YES NO
8. Is there sufficient volume for analysis requested? YES NO
9. Were samples received within holding time? YES NO
10. Was there headspace greater than ¼" in diameter in volatile bottles? YES NO
11. If sent, were matrix spike bottles returned? YES NO

Tracking Number: 013633127288

Shipped By: UPS

Cooler Number: 1215

Out of Control Events and Inspection Comments:

Inspected By: GG Date: 11/12/93 Logged By: GG Date: 11/12/93

BLR WP51/SAMPLECO/SAMPLE.INS

AnalyticalTechnologies,Inc.

PROJECT SAMPLE INSPECTION FORM

Accession #: 311460 Date received: 11-15-93

1.	Was there a Chain of Custody?	YES	NO	7.	Are samples correctly preserved for analysis required?	YES	NO
2.	Was Chain of Custody properly relinquished?	YES	NO	8.	Is there sufficient volume for analysis requested?	YES	NO
3.	Were samples received cold? (At 4° or on ice)	YES	NO	9.	Were samples received within holding time?	YES	NO
4.	Were all containers properly labeled and identified?	YES	NO	10.	Was there headspace greater than ¼" in diameter in volatile bottles?	YES	NO N/A
5.	Were samples received in proper containers for analysis requested?	YES	NO	11.	If sent, were matrix spike bottles returned?	YES	NO N/A
6.	Were all sample containers received intact?	YES	NO				

Tracking Number: 8136-3312-219 Shipped By: UPS

Cooler Number: 39

Out of Control Events and Inspection Comments:

Inspected By: DRB Date: 11/16/93 Logged By: DRB Date: 11/16/93

BLR WPS1/SAMPLECO/SAMPLE.INS

October 11, 1993

SEMIVOLATILES CASE NARRATIVE

LABORATORY NAME: ANALYTICAL TECHNOLOGIES, INC.
CASE NUMBER: WCC3
SDG#: 460
PROJECT NAME: VICKSBURG CHEMICAL

RECEIVED NOV 15, 1993
ATI BATCH 93-AW-188

CLIENT ID#	ATI ID #
RS-PZ	311460-3

RECEIVED NOV 15, 1993
ATI BATCH 93-AS-193

CLIENT ID#	ATI ID #
B-12A(R) (63'-65)	311460-1
B-25B(36'-38')	311460-2

The samples were received in good condition. No problems were associated with the analysis of the samples. The matrix spike and matrix spike duplicate each had one spike recovery out of limits. The compound out of limits was 2,4-Dinitrotoluene. It recovered just over the upper spike recovery limit. The client sample ID numbers had to be shortened since they exceeded the space available on the forms.

Larry A. Dilmore

Larry Dilmore
CLP Reviewer
11-30-93

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or her designee, as verified by the following signature.

Kelly Swanson
QA Officer
11-30-93

Bill Rubert
GC/MS Supervisor
11-30-93

CHAIN OF CUSTODY

PS 93-549

ATI LAB. I.D. # 311460

Analytical Technologies, Inc.
11 EAST OLIVE ROAD
PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

PART 1 — Bottle Shipment Information

CLIENT: Woodward Clyde Cons.

CLIENT PROJECT NUMBER: 92B007C-4001

SAMPLE CONTAINERS SHIPPED

QTY.	PRESERVATIVE: H_2SO_4	HNO_3	HCl	Zn ACETATE	$Na_2S_2O_3$	UNPRESERVED	NaOH	PLASTIC CONTAINERS: 4 oz.	8 oz.	16 oz.	32 oz.	½ gallon	1 gallon	Whirl-pak	100-ML SPECIMEN CUP	GLASS CONTAINERS: 120 ml (A)	120 ml (C)	1 liter (A)	1 liter (C)	40 ml Vial	4 oz. wm	8 oz. wm	16 oz. wm	32 oz. wm	DI Trip Blank
6						✓															✓				

RELINQUISHED	TIME	DATE	RECEIVED	TIME	DATE
Pattern Catching	1645	10-20-93	[signature]	1030	10/26/93

PART 2 — Sample Information

SAMPLE MATRIX

DW DRINKINGWATER
WW WASTEWATER
GW GROUNDWATER
SW SURFACEWATER
SO SOIL
OL OIL
AR AIR
SL SLUDGE

PARAMETERS AND PRESERVATIVES

SAMPLE I.D.	DATE	TIME	MATRIX	CLP VOA Method 8240	CLP Semi VOA Method 8270 AB	CLP Metals								TOTAL	LAB USE ONLY
B-12A(R)(63'-65')	11/11/93	1135	SO	1	1	1								3	
B-25B(36'-38')	11/12/93	1100	SO	1	1	1								3	
RS-PZ	11/12/93	1310	—	2	1	1								4	
Trip Blank #5	11/12/93	1335	—	2										2	

TOTAL NUMBER OF BOTTLES/CONTAINERS 12

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
[signature] (WCC)	11/12/93	1345	Linda L. Kitt	11/15/93	0936

CLIENT Woodward-Clyde Consultants
ADDRESS 2877 O'Neal Ln
CITY Baton Rouge, LA
STATE LA ZIP 70816
PHONE NO. (504) 751-1873
PROJECT MANAGER (person to receive data) Dick Karkkainen

PROJECT NUMBER 92B007C-4001
PROJECT NAME Vicksburg Chemical
SAMPLED BY Y. Goh / McOlson
SAMPLE SITE Vicksburg, MS
PURCHASE ORDER NUMBER

REQUEST FAX DATA BY _____ (FAX #)
REQUEST VERBAL RESULTS BY _____ (DATE)
NEED DATA PACKAGE BY _____ (DATE)
QUALITY CONTROL REPORTING LEVEL (circle one)
NONE 1 2 3 4
NEED _____ EXTRA COPIES OF REPORT

TURN AROUND TIMES (check one)

STANDARD - 14 TO 21 DAYS ☒
RUSH: (MUST BE APPROVED IN ADVANCE)
0-48 HOURS - 2 x STD PRICE ☐
3-7 DAYS - 1.5 x STD PRICE ☐
TCLP - 1 WEEK RUSH - 1.5 x STD PRICE ☐

SPECIAL INSTRUCTIONS:

U.S. ENVIRONMENTAL PROTECTION AGENCY

CONTRACT LABORATORY PROGRAM

SAMPLE LOG - IN SHEET

Lab Name: Analytical Technologies, Inc

Page 3 of 3

Received By (Print): David R. Barr II

Log-in Date: 16-NOV-93

	EPA SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT ETC.
:ase Number:		B-12ALR(63-65)	311460-1	
:ample Delivery Group No.:		B-25B(36'-38')	311460-2	
SAS Number:		AS-PZ	311460-3	
		Trip Blank#5	311460-4	

:IRCLE THE APPROPRIATE RESPONSE

. Custody Seal(s): Present/Absent* Intact/Broken

. Custody Seal Nos.:

. Chain-of-Custody Records: Present/Absent*

. Traffic Reports or Packing List: Present/Absent*

. Airbill: Airbill/Sticker Present/Absent*

. Airbill No.:

. Sample Tags: Present/Absent*

Sample Tag Numbers: Listed/Not Listed on Chain-of-Custody

. Sample Condition: Intact/Broken*/Leaking

. Does information on custody records, traffic reports and sample tags agree? Yes/No*

0. Date Received at Lab: 15-NOV-93

1. Time Received: 0935

Sample Transfer

rea#: EXTRACTIONS

y: David R. Barr

n: 11-16-93

f Circled, contact SMO and attach record of resolution

Received by: [signature]

Date: 11-16-93

Logbook No.: 93-2

Logbook Page No.: 173

FORM AADC-1

AnalyticalTechnologies,Inc.

PROJECT SAMPLE INSPECTION FORM

Accession #: 311460 Date received: 11-15-93

1.	Was there a Chain of Custody?	YES NO	7.	Are samples correctly preserved for analysis required?	YES NO
2.	Was Chain of Custody properly relinquished?	YES NO	8.	Is there sufficient volume for analysis requested?	YES NO
3.	Were samples received cold? (At 4° or on ice)	YES NO	9.	Were samples received within holding time?	YES NO
4.	Were all containers properly labeled and identified?	YES NO	10.	Was there headspace greater than ¼" in diameter in volatile bottles?	YES NO
5.	Were samples received in proper containers for analysis requested?	YES NO	11.	If sent, were matrix spike bottles returned?	YES NO
6.	Were all sample containers received intact?	YES NO			

Tracking Number: 8136-3312-219 Shipped By: UPS

Cooler Number: 39

Out of Control Events and Inspection Comments:

Inspected By: DRB Date: 11/16/93 Logged By: DRB Date: 11/16/93

BLR WPS1/SAMPLECO/SAMPLE.INS

SEMIVOLATILES CASE NARRATIVE

LABORATORY NAME: ANALYTICAL TECHNOLOGIES, INC.
CASE NUMBER: WCC4
SDG#: 399
PROJECT NAME: VICKSBURG CHEMICAL

RECEIVED NOV 12, 1993
ATI BATCH 93-AS-185

CLIENT ID#	ATI ID #
B-24B(28'-30')	311399-1
B-24A(48'-49')	311399-2
B-12B(R)(32'-34')	311399-3

The samples were received in good condition. No problems were associated with the analysis of the samples. The client sample ID numbers had to be shortened since they exceeded the space available on the forms.

Larry A. Dilmore

Larry Dilmore
CLP Reviewer
12-02-93

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or her designee, as verified by the following signature.

Kelly Swanson

Kelly Swanson
QA Officer
12-02-93

Bill Rubert

Bill Rubert
GC/MS Supervisor
12-02-93

CHAIN OF CUSTODY

JM 93-661

ATI LAB. I.D. # 311399

Analytical Technologies, Inc.
11 EAST OLIVE ROAD PHONE (904) 474-1001
PENSACOLA, FLORIDA 32514

PART 1 — Bottle Shipment Information

CLIENT:	CLIENT PROJECT NUMBER:
Vicksburg Chemical	92B007C-4001

SAMPLE CONTAINERS SHIPPED	PRESERVATIVE							PLASTIC CONTAINERS								GLASS CONTAINERS									
QTY.	H_2SO_4	HNO_3	HCl	Zn ACETATE	$Na_2S_2O_3$	UNPRESERVED	NaOH	4 oz.	8 oz.	16 oz.	32 oz.	½ gallon	1 gallon	Whirl-pak	100-ML SPECIMEN CUP	120 ml (A)	120 ml (C)	1 liter (A)	1 liter (C)	40 ml Vial	4 oz. wm	8 oz. wm	16 oz. wm	32 oz. wm	DI Trip Blank
2						✓																	✓		

RELINQUISHED	TIME	DATE	RECEIVED	TIME	DATE
Prathers Catchings	1350	11-8-93	[signature]	1400	11/09/93

PART 2 — Sample Information

SAMPLE MATRIX

DW DRINKINGWATER
WW WASTEWATER
GW GROUNDWATER
SW SURFACEWATER
SO SOIL
OL OIL
AR AIR
SL SLUDGE

PARAMETERS AND PRESERVATIVES

SAMPLE I.D.	DATE	TIME	MATRIX	CLP VOA Method 8240	CLP Semi-VOA Method 8270 AB	CLP Metals	TCLP-VOA, Pest, Semi VOA, Herb.	TCLP Metals						TOTAL	LAB USE ONLY
B-24B (28'-30')	11/9/93	0837	SO	1	1	1	—	—	—	—	—	—	—	3	
B-24A (48'-49')	11/9/93	1315	SO	1	1	1	—	—	—	—	—	—	—	3	
North Pond	11/9/93	1630	SL	—	—	—	1	1	—	—	—	—	—	2	
B-12B (R) (32'-34')	11/10/93	1508	SO	1	1	1	—	—	—	—	—	—	—	3	
Trip Blank #4	11/11/93	0745	—	2	—	—	—	—	—	—	—	—	—	2	

TOTAL NUMBER OF BOTTLES/CONTAINERS 13

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
[signature] (WCC)	11/11/93	0750	[signature]	11/12/93	0950

CLIENT Woodward-Clyde Consultants
ADDRESS 2822 O'Neal Ln.
CITY Baton Rouge
STATE LA ZIP 70816
PHONE NO. (504) 751-1873
PROJECT MANAGER (person to receive data) Dick Karkkainen

PROJECT NUMBER 92B007C-4001
PROJECT NAME Vicksburg Chemical
SAMPLED BY Y. Goh / McOlson
SAMPLE SITE Vicksburg, MS.
PURCHASE ORDER NUMBER

REQUEST FAX DATA BY _____ (FAX #)
REQUEST VERBAL RESULTS BY _____ (DATE)
NEED DATA PACKAGE BY _____ (DATE)
QUALITY CONTROL REPORTING LEVEL (circle one)
NONE 1 2 3 4
NEED _____ EXTRA COPIES OF REPORT

TURN AROUND TIMES (check one)

STANDARD - 14 TO 21 DAYS ☒
RUSH: (MUST BE APPROVED IN ADVANCE)
0-48 HOURS - 2 x STD PRICE ☐
3-7 DAYS - 1.5 x STD PRICE ☐
TCLP - 1 WEEK RUSH - 1.5 x STD PRICE ☐

SPECIAL INSTRUCTIONS:

U.S. ENVIRONMENTAL PROTECTION AGENCY

CONTRACT LABORATORY PROGRAM

SAMPLE LOG - IN SHEET

Lab Name: ANALYTICAL TECHNOLOGIES, INC. Page 1 of 1

Received By (Print): ANITA S. JOHNSON Log-in Date: NOVEMBER 12, 1993

Case Number: / Sample Delivery Group No.: / SAS Number:	EPA SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT ETC.
CIRCLE THE APPROPRIATE RESPONSE		R-24B (28'-38')	311391-1	
1. Custody Seal(s): (Present)/Absent*		B-24A (48'-48')	311399-2	
(Intact)/Broken		B-(28'-32')	311399-3	
2. Custody Seal Nos.:		TRIP BLANK #4	311399-4	
3. Chain-of-Custody Records: (Present)/Absent*				
4. Traffic Reports or Packing List: (Present)/Absent*				
5. Airbill: (Airbill)/Sticker				
(Present)/Absent*				
6. Airbill No.: 0136331220				
7. Sample Tags: (Present)/Absent*				
Sample Tag Numbers: (Listed)/Not Listed on Chain-of-Custody				
8. Sample Condition: (Intact)/Broken*/Leaking				
9. Does information on custody records, traffic reports and sample tags agree? Yes/No*				
10. Date Received at Lab:				
11. Time Received:				
Sample Transfer				
Area#: EXTRACTIONS				
By: ANITA JOHNSON				
On: NOVEMBER 12, 1993				

*If Circled, contact SMO and attach record of resolution

Received by: AS Logbook No.: 93-2

Date: 11-12-93 Logbook Page No.: 169

FORM AADC-1

PROJECT SAMPLE INSPECTION FORM

Accession #: 311399

Date received: 12-NOV-93

1. Was there a Chain of Custody? YES NO
2. Was Chain of Custody properly relinquished? YES NO
3. Were samples received cold? (At 4° or on ice) YES NO
4. Were all containers properly labeled and identified? YES NO
5. Were samples received in proper containers for analysis requested? YES NO
6. Were all sample containers received intact? YES NO
7. Are samples correctly preserved for analysis required? YES NO
8. Is there sufficient volume for analysis requested? YES NO
9. Were samples received within holding time? YES NO
10. Was there headspace greater than ¼" in diameter in volatile bottles? YES NO N/A
11. If sent, were matrix spike bottles returned? YES NO N/A

Tracking Number: 013633122008

Shipped By: UPS

Cooler Number: 1215

Out of Control Events and Inspection Comments:

Inspected By: AJ Date: 11/12/93 Logged By: AJ Date: 11/12/93

BLR WP51/SAMPLECO/SAMPLE.INS

SEMIVOLATILES CASE NARRATIVE

LABORATORY NAME: ANALYTICAL TECHNOLOGIES, INC.
CASE NUMBER: WCC5
SDG#: 252
PROJECT NAME: VICKSBURG CHEMICAL

RECEIVED NOV 9, 1993
ATI BATCH 93-AS-187

CLIENT ID#	ATI ID #
B-21 A (6'-8')	311252-1
B-21 A (48'-50')	311252-2
B-22 A (22'-24')	311252-3
B-23 A (48-50)	311252-4
B-23 A (22'-24')	311252-5

The samples were received in good condition. No problems were associated with the analysis of the samples. The client sample ID numbers had to be shortened since they exceeded the space available on the forms.

Larry Dilmore
CLP Reviewer
12-03-93

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or her designee, as verified by the following signature.

Kelly Swanson
QA Officer
12-03-93

Bill Rubert
GC/MS Supervisor
12-03-93

CHAIN OF COSTODY

ATI LAB. I.D. # 311252

Analytical Technologies, Inc.
11 EAST OLIVE ROAD
PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

PART 1 — Bottle Shipment Information JM 93-644

CLIENT: WWC
CLIENT PROJECT NUMBER: Vicksburg

SAMPLE CONTAINERS SHIPPED

QTY.	PRESERVATIVE: H_2SO_4	HNO_3	HCl	Zn ACETATE	$Na_2S_2O_3$	UNPRESERVED	NaOH	PLASTIC CONTAINERS: 4 oz.	8 oz.	16 oz.	32 oz.	½ gallon	1 gallon	Whirl-pak	100-ML SPECIMEN CUP	GLASS CONTAINERS: 120 ml (A)	120 ml (C)	1 liter (A)	1 liter (C)	40 ml Vial	4 oz. wm	8 oz. wm	16 oz. wm	32 oz. wm	Ol Trip Blank
8						✓		✓																	
2						✓																			
2			✓																	✓					

RELINQUISHED: S Owen TIME: 1430 DATE: 11/02
RECEIVED: Yong Soon Lah TIME: 10:30 DATE: 10/20/93

PART 2 — Sample Information

SAMPLE MATRIX
DW DRINKINGWATER
WW WASTEWATER
GW GROUNDWATER
SW SURFACEWATER
SO SOIL
OL OIL
AR AIR
SL SLUDGE

PARAMETERS AND PRESERVATIVES

SAMPLE I.D.	DATE	TIME	MATRIX	8240 (TCL)	8270 AB (TCL)	TCL Metals	TOTAL	LAB USE ONLY
B-21A (6'-8')	11/3/93	14:55	soil	✓	✓	✓	3	
B-21A (48'-50')	11/5/93	07:42	soil	✓	✓	✓	3	
(22'-24') B-22A MSD	11/6/93	12:03	SO	✓	✓	✓	3	
(22'-24') B-22A MS	11/6/93	12:03	SO	✓	✓	✓	3	
(22'-24') B-22A	11/6/93	12:03	SO	✓	✓	✓	3	
B-23A (48-50)	11/7/93	13:45	SO	✓	✓	✓	3	
B-23A (22-24)	11/7/93	10:36	SO	✓	✓	✓	3	
Trip blank (21,22,23)	11/8/93	06:40	—	✓			2	

TOTAL NUMBER OF BOTTLES/CONTAINERS: 23

RELINQUISHED BY: [signature] (WCC) DATE: 11/8/93 TIME: 0645
RECEIVED BY: David R Barr DATE: 11/9/93 TIME: 1005

CLIENT: Woodward-Clyde Consultants
ADDRESS: 2822 O'Neal Ln.
CITY: Baton Rouge, LA
STATE: LA ZIP: 70816
PHONE NO.: (504) 757-1873
PROJECT MANAGER (person to receive data): Richard Karkkainen

PROJECT NUMBER: 928007C-4001
PROJECT NAME: Vicksburg Chemical
SAMPLED BY: Y. Goh / M. Olson
SAMPLE SITE: Vicksburg, MS
PURCHASE ORDER NUMBER:

REQUEST FAX DATA BY ________ (FAX #)
REQUEST VERBAL RESULTS BY ________ (DATE)
NEED DATA PACKAGE BY ________ (DATE)
QUALITY CONTROL REPORTING LEVEL (circle one)
NONE 1 2 3 4
NEED ________ EXTRA COPIES OF REPORT

TURN AROUND TIMES (check one)

- STANDARD - 14 TO 21 DAYS ☐
- RUSH: (MUST BE APPROVED IN ADVANCE)
- 0-48 HOURS - 2 x STD PRICE ☐
- 3-7 DAYS - 1.5 x STD PRICE ☐
- TCLP - 1 WEEK RUSH - 1.5 x STD PRICE ☐

SPECIAL INSTRUCTIONS:

U.S. ENVIRONMENTAL PROTECTION AGENCY

CONTRACT LABORATORY PROGRAM

SAMPLE LOG - IN SHEET

Lab Name: Analytical Technologies Inc. Page 1 of 3

Received By (Print): David R Barr Log-in Date: 09-NOV-93

Case Number:

Sample Delivery Group No.:

SAS Number:

CIRCLE THE APPROPRIATE RESPONSE

Custody Seal(s): Present/Absent*

Intact/Broken

Custody Seal Nos.:

Chain-of-Custody Records: Present/Absent*

Traffic Reports or Packing List: Present/Absent*

Airbill: Airbill/Sticker Present/Absent*

Airbill No.: 0136 3312 175

Sample Tags: Present/Absent*

Sample Tag Numbers: Listed/Not Listed on Chain-of-Custody

Sample Condition: Intact/Broken*/Leaking

Does information on custody records, traffic reports and sample tags agree? Yes/No*

Date Received at Lab: 09-NOV-93

Time Received: 0950

EPA SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT ETC.
	B-21A(6'9)	311252-1	
	B-21A(4'5)	311252-2	
	B-22A(2'4)	311252-3	
	B-23A(4'5)	311252-4	
	B-23A(2'4)	311252-5	

Sample Transfer

To: EXTRACTIONS

By: David R Barr

Date: 11-9-93

If circled, contact SMO and attach record of resolution

Received by: DM

Date: 11-9-93

Logbook No.: 93-2

Logbook Page No.: 161

FORM AADC-1

AnalyticalTechnologies, Inc.

PROJECT SAMPLE INSPECTION FORM

Accession #: 311252

Date received: 09-NOV-93

1. Was there a Chain of Custody? YES NO
2. Was Chain of Custody properly relinquished? YES NO
3. Were samples received cold? (At 4° or on ice) YES NO
4. Were all containers properly labeled and identified? YES NO
5. Were samples received in proper containers for analysis requested? YES NO
6. Were all sample containers received intact? YES NO
7. Are samples correctly preserved for analysis required? YES NO
8. Is there sufficient volume for analysis requested? YES NO
9. Were samples received within holding time? YES NO
10. Was there headspace greater than ¼" in diameter in volatile bottles? YES NO N/A DB 11/9/93
11. If sent, were matrix spike bottles returned? YES NO N/A

Tracking Number: 0136-3312-175

Shipped By: UPS

Cooler Number: DB 11/9/93 ~~N/S~~ 8842

Out of Control Events and Inspection Comments:

Inspected By: DRB Date: 11/9/93 Logged By: DRB Date: 11/9/93

WP51/SAMPLECO/SAMPLE.INS

VOLATILES CASE NARRATIVE

LABORATORY NAME: ANALYTICAL TECHNOLOGIES, INC.
CASE NUMBER: 11252
SDG#: 311252
PROJECT NAME: VICKSBURG CHEMICAL

RECEIVED NOV 9, 1993
ATI BATCH 93-NS-101

CLIENT ID#	ATI ID #
B-21 AB(6'-8')	311252-1
B-21 A (48'-50')	311252-2
B-22 A (22'-24')	311252-3
B-23 A (48'-50')	311252-4
B-23 AB(22'-24')	311252-5
TRIP BLANK (21,22,23)	311252-6

The samples were received in good condition. No problems were associated with the analysis of the samples. The client sample ID numbers had to be shortened since they exceeded the space available on the forms.

Larry Dilmore
CLP Reviewer
12-03-93

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or her designee, as verified by the following signature.

Kelly Swanson
QA Officer
12-03-93

Bill Rubert
GC/MS Supervisor
12-03-93

CHAIN OF CUSTODY

ATI LAB. I.D. # 311252

Analytical**Technologies**, Inc.

11 EAST OLIVE ROAD
PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

PART 1 — Bottle Shipment Information JM 93-644

CLIENT: WWC

CLIENT PROJECT NUMBER: Vicksburg

SAMPLE CONTAINERS SHIPPED

	PRESERVATIVE							PLASTIC CONTAINERS								GLASS CONTAINERS									
QTY.	H_2SO_4	HNO_3	HCl	Zn ACETATE	$Na_2S_2O_3$	UNPRESERVED	NaOH	4 oz.	8 oz.	16 oz.	32 oz.	½ gallon	1 gallon	Whirl-pak	100-ML SPECIMEN CUP	120 ml (A)	120 ml (C)	1 liter (A)	1 liter (C)	40 ml Vial	4 oz. wm	8 oz. wm	16 oz. wm	32 oz. wm	DI Trip Blank
8						✓		✓																	
2						✓														✓					
2			✓																	✓					

RELINQUISHED	TIME	DATE	RECEIVED	TIME	DATE
S. Owen	1430	11/06	Yong Boon Goh	10:30	10/20/93

PART 2 — Sample Information

SAMPLE MATRIX

DW DRINKINGWATER
WW WASTEWATER
GW GROUNDWATER
SW SURFACEWATER
SO SOIL
OL OIL
AR AIR
SL SLUDGE

PARAMETERS AND PRESERVATIVES

SAMPLE I.D.	DATE	TIME	MATRIX	8240 (TCL)	8270 AB (TCL)	TCL Metals	TOTAL	LAB USE ONLY
B-21A (6'-8')	11/3/93	14:55	soil	✓	✓	✓	3	
B-21A (48'-50')	11/5/93	07:42	soil	✓	✓	✓	3	
(22'-24') B-22A MSD	11/6/93	12:03	SO	✓	✓	✓	3	
(22'-24') B-22A MS	11/6/93	12:03	SO	✓	✓	✓	3	
(22'-24') B-22A	11/6/93	12:03	SO	✓	✓	✓	3	
B-23A (48-50)	11/7/93	1345	SO	✓	✓	✓	3	
B-23A (22'-24')	11/7/93	10:36	SO	✓	✓	✓	3	
TripBlank (21, 22, 23)	11/8/93	06:40	—	✓			2	

TOTAL NUMBER OF BOTTLES/CONTAINERS 23

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
[illegible signature] (WCC)	11/8/93	0645	David R Barr	11/9/93	1005

CLIENT Woodward-Clyde Consultants
ADDRESS 2822 O'Neal Ln.
CITY Baton Rouge, LA.
STATE LA. ZIP 70816
PHONE NO. (504) 751-1873
PROJECT MANAGER (person to receive data) Richard Karkkainen

PROJECT NUMBER 92B007C-4001
PROJECT NAME Vicksburg Chemical
SAMPLED BY Y. Goh / M. Olson
SAMPLE SITE Vicksburg, MS.
PURCHASE ORDER NUMBER

REQUEST FAX DATA BY ______ (FAX #)
REQUEST VERBAL RESULTS BY ______ (DATE)
NEED DATA PACKAGE BY ______ (DATE)
QUALITY CONTROL REPORTING LEVEL (circle one)
NONE 1 2 3 4
NEED ______ EXTRA COPIES OF REPORT

TURN AROUND TIMES (check one)

- STANDARD - 14 TO 21 DAYS ☐
- RUSH: (MUST BE APPROVED IN ADVANCE)
- 0-48 HOURS - 2 x STD PRICE ☐
- 3-7 DAYS - 1.5 x STD PRICE ☐
- TCLP - 1 WEEK RUSH - 1.5 x STD PRICE ☐

SPECIAL INSTRUCTIONS:

U.S. ENVIRONMENTAL PROTECTION AGENCY

CONTRACT LABORATORY PROGRAM

SAMPLE LOG - IN SHEET

Lab Name: Analytical Technologies, Inc. Page 3 of 3

Received By (Print): David R. Barr Log-in Date: 09-NOV-93

ase Number:

ple Delivery Group No.:

SAS Number:

IRCLE THE APPROPRIATE RESPONSE

Custody Seal(s): Present/Absent*

Intact/Broken

Custody Seal Nos.:

Chain-of-Custody Records: Present/Absent*

Traffic Reports or Packing List: Present/Absent*

Airbill: Airbill/Sticker

Present/Absent*

Airbill No.: 0136 3312 175

Sample Tags: Present/Absent*

ample Tag Numbers: Listed/Not Listed on Chain-of-Custody

ample Condition: Intact/Broken*/Leaking

Does information on ustody records, traffic eports and sample tags agree? Yes/No*

Date Received at Lab: 09-NOV-93

ime Received: 0950

Sample Transfer

#: GCMS

David R Barr

11-9-93

EPA SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT ETC.
	B-21A(6'-8')	311252-1	
	B-21A(48'-50)	311252-2	
	B-23A(20-21)	311252-3	
	B-23A(48-50)	311252-4	
	B-23A(22-24)	311252-5	
	TripBlankK2223	311252-6	

ircled, contact SMO and attach record of resolution

Received by: GM

Date: 11-9-93

Logbook No.: 93-2

Logbook Page No.: 161

FORM AADC-1

AnalyticalTechnologies,Inc.

PROJECT SAMPLE INSPECTION FORM

Accession #: 311252

Date received: 09-NOV-93

1. Was there a Chain of Custody? YES NO
2. Was Chain of Custody properly relinquished? YES NO
3. Were samples received cold? (At 4° or on ice) YES NO
4. Were all containers properly labeled and identified? YES NO
5. Were samples received in proper containers for analysis requested? YES NO
6. Were all sample containers received intact? YES NO
7. Are samples correctly preserved for analysis required? YES NO
8. Is there sufficient volume for analysis requested? YES NO
9. Were samples received within holding time? YES NO
10. Was there headspace greater than ¼" in diameter in volatile bottles? YES NO N/A DB 11/9/93
11. If sent, were matrix spike bottles returned? YES NO N/A

Tracking Number: 0136-3312-175

Shipped By: UPS

Cooler Number: ~~N/S~~ DB 11/9/93 8842

Out of Control Events and Inspection Comments:

Checked By: DRB Date: 11/9/93 Logged By: DRB Date: 11/9/93

SEMIVOLATILES CASE NARRATIVE

LABORATORY NAME: ANALYTICAL TECHNOLOGIES, INC.
CASE NUMBER: WCC2
SDG#: 1139
PROJECT NAME: VICKSBURG CHEMICAL

RECEIVED NOV 4, 1993
ATI BATCH 93-AS-180

CLIENT ID#	ATI ID #
B-19A	311139-1
B-19B	311139-2

The samples were received in good condition. No problems were associated with the analysis of the samples.

Larry Dilmore
CLP Reviewer
11-19-93

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or her designee, as verified by the following signature.

Kelly Swanson
QA Officer
11-19-93

Bill Rubert
GC/MS Supervisor
11-19-93

CHAIN OF CUSTODY

PS 93-550

AnalyticalTechnologies,Inc.
11 EAST OLIVE ROAD PHONE (904) 474-1001
PENSACOLA, FLORIDA 32514

ATI LAB. I.D. # 311139

PART 1 — Bottle Shipment Information

CLIENT: Woodward Clyde CONS.

CLIENT PROJECT NUMBER: 92B007G 4001

SAMPLE CONTAINERS SHIPPED — PRESERVATIVE: H_2SO_4, HNO3, HCl, Zn ACETATE, $Na_2S_2O_3$, UNPRESERVED, NaOH; PLASTIC CONTAINERS: 4 oz, 8 oz, 16 oz, 32 oz, ½ gallon, 1 gallon, Whirl-pak, 100-ML SPECIMEN CUP; GLASS CONTAINERS: 120 ml (A), 120 ml (C), 1 liter (A), 1 liter (C), 40 ml Vial, 4 oz wm, 8 oz wm, 16 oz wm, 32 oz wm, DI Trip Blank

QTY.	UNPRESERVED	4 oz wm
27	✓	✓

RELINQUISHED	TIME	DATE	RECEIVED	TIME	DATE
Bathoria Catchings	1745	10-20-93	[signature]	1030	10/26/93

PART 2 — Sample Information

PARAMETERS AND PRESERVATIVES

SAMPLE MATRIX
DW DRINKINGWATER
WW WASTEWATER
GW GROUNDWATER
SW SURFACEWATER
SO SOIL
OL OIL
AR AIR
SL SLUDGE

SAMPLE I.D.	DATE	TIME	MATRIX	VOA CLP Method 8240	Semi-VOA CLP Method 8270 AB	Metals CLP	TOTAL	LAB USE ONLY
B-19A	11/02/93	0930	SO	1	1	1	3	
B-19B	11/02/93	1600	SO	1	1	1	3	
B-19 TB	11/03/93	0745	—	2			2	

TOTAL NUMBER OF BOTTLES/CONTAINERS: 8

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
[signature]	11/03/93	7:47	David R Barrett	11/4/93	0950

CLIENT Woodward-Clyde Consultants
ADDRESS 2822 O'Neal Ln.
CITY Baton Rouge
STATE Louisiana ZIP 70816
PHONE NO. (504) 751-1873
PROJECT MANAGER (person to receive data) Richard Karkkainen

PROJECT NUMBER 92B007G 4001
PROJECT NAME Vicksburg Chemical
SAMPLED BY Y. Goh / M. Olson
SAMPLE SITE Vicksburg, MS.
PURCHASE ORDER NUMBER

REQUEST FAX DATA BY ________ (FAX #)
REQUEST VERBAL RESULTS BY ______ (DATE)
NEED DATA PACKAGE BY ________ (DATE)
QUALITY CONTROL REPORTING LEVEL (circle one)
NONE 1 2 3 4
NEED ________ EXTRA COPIES OF REPORT

TURN AROUND TIMES *(check one)*

STANDARD - 14 TO 21 DAYS ☒
RUSH: (MUST BE APPROVED IN ADVANCE)
0-48 HOURS - 2 x STD PRICE ☐
3-7 DAYS - 1.5 x STD PRICE ☐
TCLP - 1 WEEK RUSH - 1.5 x STD PRICE ☐

SPECIAL INSTRUCTIONS:

U.S. ENVIRONMENTAL PROTECTION AGENCY

CONTRACT LABORATORY PROGRAM

SAMPLE LOG - IN SHEET

Lab Name: Analytical Technologies, Inc. Page 1 of 1

Received By (Print): David R. Barr Log-in Date: 05-NOV-93

Case Number:

Sample Delivery Group No.:

SAS Number:

CIRCLE THE APPROPRIATE RESPONSE

1. Custody Seal(s): Present/Absent* Intact/Broken
2. Custody Seal Nos.:
3. Chain-of-Custody Records: Present/Absent*
4. Traffic Reports or Packing List: Present/Absent*
5. Airbill: Airbill/Sticker Present/Absent*
6. Airbill No.: 0156331216 6
7. Sample Tags: Present/Absent* Sample Tag Numbers: Listed/Not Listed on Chain-of-Custody
8. Sample Condition: Intact/Broken*/Leaking
9. Does information on custody records, traffic reports and sample tags agree? Yes/No*
10. Date Received at Lab: 04-NOV-93
11. Time Received: 0950

EPA SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT ETC.
	B-19A	311139-1	
	B-19B	311139-2	
	B-19TB	311139-3	

Sample Transfer

Area#: GCMS

By: David R. Barr

On: NOV 5, 1993

*If Circled, contact SMO and attach record of resolution

Received by: N

Date: 11-5-93

Logbook No.: 93-2

Logbook Page No.: 157

FORM AADC-1

AnalyticalTechnologies,Inc

PROJECT SAMPLE INSPECTION FORM

Accession #: 311139

Date received: 04-NOV-93

1. Was there a Chain of Custody? YES NO
2. Was Chain of Custody properly relinquished? YES NO
3. Were samples received cold? (At 4° or on ice) YES NO
4. Were all containers properly labeled and identified? YES NO
5. Were samples received in proper containers for analysis requested? YES NO
6. Were all sample containers received intact? YES NO
7. Are samples correctly preserved for analysis required? YES NO
8. Is there sufficient volume for analysis requested? YES NO
9. Were samples received within holding time? YES NO
10. Was there headspace greater than ¼" in diameter in volatile bottles? YES NO N/A
11. If sent, were matrix spike bottles returned? YES NO N/A

Tracking Number: 0136331216 6

Shipped By: UPS

Cooler Number: N/S

Out of Control Events and Inspection Comments:

Inspected By: DRB Date: 11/4/93 Logged By: DRB Date: 11/4/93

BLR WP51/SAMPLECO/SAMPLE.INS

October 11, 1993

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ANALYTICAL_TECHNOLOGIES__ Contract: N/A

Lab Code: ATI___ Case No.: N/A__ SAS No.: N/A___ SDG No. N/A

SOW No.: 3/90_

EPA Sample No.	Lab Sample ID
B-19A	311139-1
B-19B	311139-2
B-20A	311024-1
B-20B	311024-2
B-12A(R) (63'-65')	311460-1
B-12B(R) (32'-34')	311399-3
B-21A (48'-50')	311252-2
B-21A (6'-8')	311252-1
B-22A (22'-24')	311252-3
B-23A (22'-24')	311252-5
B-23A (48'-50')	311252-4
B-24A (48'-49')	311399-2
B-24B (28'-30')	311399-1
B-25B (36'-38')	311460-2

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied? Yes/No YES
If yes- were raw data generated before application of background corrections ? Yes/No NO_

Comments:

This package contains data for soil samples from lab accession numbers 311024, 311139, 311252, 311399, and 311460.

The Lead (Pb) LCS was out of control limits for the initial furnace digestion batch 93F-S076. The entire batch was redigested for furnace analysis (redigestion batch number 93F-S079). Two additional samples (311460-1,2) not included in batch 93F-S076 were received and added to this redigestion batch. Successful analysis of Thallium (Tl) (by GFAA) was already complete for batch 93F-S076 prior to the redigestion. Therefore, lab accession number 311450 samples 1 and 2, with associated batch QC samples, were analyzed from batch 93F-S079 for Thallium (Tl). All other Thallium (Tl) analyses were from digestion batch 93F-S076. QC samples are reported from each batch for Thallium only. All other furnace (metal) analyses are entirely from batch 93F-S079.

The matrix spike recovery was out of control limits for Arsenic (As) by GFAA on sample 311252-1. The analytical (post) spike recovery was 106.5%. All associated samples are flagged with a "N".

The matrix spike recovery was also out of control limits for Selenium (Se) for 311252-1. The analytical (post) spike recovery was 40%. All associated samples are flagged with a "N".

The matrix spike for Antimony (Sb) by ICAP on sample 311252-1 was out of control limits. The post digestion spike recovery was 101.2%, reported on Form 5B. All associated samples are flagged with a "N".

Recovery for ICAP serial dilution analysis was out of control for Iron (Fe) and Zinc (Zn). All associated samples are flagged with an "E".

Samples 31399-3, 311252-3, 311139-2, 311024-2 required a 2X dilution from Calcium (Ca) by ICAP.

Due to the length of the client sample ID's, it was not possible to fit the entire client ID in the sample number field. Client ID's were abbreviated to conform to the software limitations. The abbreviation and the full client sample ID is listed at the bottom of each Form 1 in the comment section.

No other problems were associated with the analysis of these samples.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or the manager's designee, as verified by the following signature.

Signature: Kelly S Hered Name: Kelly S. Hered

Date: 12-7-93 Title: QA Manager

WARD'S CLP SOFTWARE PACKAGE
EXPLANATION OF FORMS

FORM 3

Blanks are flagged with a "U" when they are less than (<) the Instrument Detection Limit (IDL). The IDL will show up next to the "U" flag. Blanks are flagged with a "B" when they are greater than (>) IDL but less than (<) CRDL (EPA Contract Required Detection Limit).

FORM 5A

Calcium, Magnesium, Potassium, and Sodium are not required in the CLP spiking solution.

FORM 6

If BOTH the sample (S) and the duplicate (D) are less than (<) IDL, the RPD IS NOT calculable and NO control limits apply. Both sample and duplicate will be flagged with a "U" under the C qualifier. The RPD field will be left empty.

RPDs are calculated for all analytes detected above the IDL in either the sample (S) or the duplicate (D). If BOTH the sample (S) and the duplicate (D) are less than (<) CRDL, the RPD IS calculable; however, NO control limits apply.

If one sample is flagged with a "U" and one is not flagged with a "U", a zero will be substituted for the value that is flagged wtih "U". A "200" will then always be the calculated RPD result.

If the sample (S) and the duplicate (D) are greater than (>) 5 x CRDL, a control limit of 20% will be used.

If the sample (S) and/or the duplicate (D) is less than (<) 5 x CRDL, a control limit of ± CRDL will be used and the absolute value of the difference between the sample and the duplicate will be used for the RPD value.

If the sample (S) and the duplicate (D) values are less than the CRDL or ≥ 5X the CRDL, the control limit field will be left empty.

FORM 9

If the sample (S) is less than (<) IDL, the sample and the duplicate will be flagged with "U"s and the %D will be left blank. If the serial dilution is **not required** due to the sample (S) result less than (<) 50 X IDL, the %D will still be calculated and will appear to be out of control at greater than (>) 10%.

EXPLANATION OF FLAGS

* = Duplicate analyses not within control limits.

: = Sample result is estimated due to the presence of interference.

= The Standard Additions Correlation Coefficient is <0.995.

N = The spiked sample recovery is not within control limits.

S = The reported value was determined by the Method of Standard Additions.

W = If post-digestion spike for GFAA (Graphite Furnace Atomic Absorption) recovery is less than 85% or greater than 115%, while sample absorbance is less than 50% of spike absorbance and post spike recovery is greater than or equal to 40%, the sample result is flagged with a "W" and no further action is required.

M = The duplicate injection precision is not met.

APPENDIX E

DATA SUMMARY SHEETS - GROUNDWATER

PZ-12B(R)	Volatiles, Semivolatiles, Inorganics
PZ-12A(R)	Volatiles, Semivolatiles, Inorganics
PZ-19B	Volatiles, Semivolatiles, Inorganics
PZ-19A	Volatiles, Semivolatiles, Inorganics
PZ-20B	Volatiles, Semivolatiles, Inorganics
PZ-20A	Volatiles, Semivolatiles, Inorganics
PZ-21A	Volatiles, Semivolatiles, Inorganics
PZ-22B	Volatiles, Semivolatiles, Inorganics
PZ-22A	Volatiles, Semivolatiles, Inorganics
PZ-23B	Volatiles, Semivolatiles, Inorganics
PZ-23A	Volatiles, Semivolatiles, Inorganics
PZ-24B	Volatiles, Semivolatiles, Inorganics
PZ-25B	Volatiles, Semivolatiles, Inorganics
PZ-21A-FB	Volatiles, Semivolatiles, Inorganics
Trip Blank	Volatiles

Lab Certification Statements, Chain-of-Custody

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-12B(R)

Lab Name: A. T. I. Contract: NA

Lab Code: FINNMAT Case No.: 11610 SAS No.: _____ SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-11

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1161011

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. ____ Date Analyzed: 11/23/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	BJ
67-64-1	Acetone	13	B
75-15-0	Carbon Disulfide	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	2	J
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	XYLENE (total)	5	U
	o,p Xylene	5	U

108-38-3	m-Xylene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-12B(R)

Lab Name: ANALYTICAL TECHNOLIGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-11

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-11

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-22-93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-12B(R)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-11

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 31161011

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
39638-32-9	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	10	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-12B(R)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-11

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 31161011

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-10-6	4-Nitroaniline	10	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	50	U
56-55-3	Benzo(a)Anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0	Di-n-OctylPhthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-12B(R)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-11

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 31161011

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	13.12	100	J
2.	UNKNOWN HYDROCARBON	24.73	40	J
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U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PZ-12B(R)

Lab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

Lab Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix (soil/water): WATER Lab Sample ID: 311610-11

Level (low/med): LOW Date Received: 11/19/93

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	31.3	B		P
7440-36-0	Antimony	22.2	U		P
7440-38-2	Arsenic	0.90	B		F
7440-39-3	Barium	195	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	2.7	U		P
7440-70-2	Calcium	149000			P
7440-47-3	Chromium	4.1	U		P
7440-48-4	Cobalt	3.5	U		P
7440-50-8	Copper	3.3	B		P
7439-89-6	Iron	35.5	B		P
7439-92-1	Lead	0.90	U	N	F
7439-95-4	Magnesium	75200			P
7439-96-5	Manganese	1280			P
7439-97-6	Mercury	0.08	U		AV
7440-02-0	Nickel	5.7	U		P
7440-09-7	Potassium	3480	B		P
7782-49-2	Selenium	0.50	B		F
7440-22-4	Silver	13.1	U		P
7440-23-5	Sodium	23000			P
7440-28-0	Thallium	0.70	U	N	F
7440-62-2	Vanadium	3.8	U		P
7440-66-6	Zinc	26.3			P
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

ILMO2.1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-12A(R)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11610 SAS No.: _____ SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-12

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1161012

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. ____ Date Analyzed: 11/23/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	BJ
67-64-1	Acetone	20	B
75-15-0	Carbon Disulfide	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	4	J
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	XYLENE (total)	5	U
	o,p Xylene	5	U

108-38-3	m-Xylene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-12A(R)

Lab Name: ANALYTICAL TECHNOLIGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-12

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-12

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-23-93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-12A(R)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-12

Sample wt/vol: 850 (g/mL) ML Lab File ID: 31161012

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	12	U
111-44-4	bis(2-Chloroethyl)Ether	12	U
95-57-8	2-Chlorophenol	12	U
541-73-1	1,3-Dichlorobenzene	12	U
106-46-7	1,4-Dichlorobenzene	12	U
100-51-6	Benzyl Alcohol	12	U
95-50-1	1,2-Dichlorobenzene	12	U
95-48-7	2-Methylphenol	12	U
39638-32-9	bis(2-Chloroisopropyl)Ether	12	U
106-44-5	4-Methylphenol	12	U
621-64-7	N-Nitroso-Di-n-Propylamine	12	U
67-72-1	Hexachloroethane	12	U
98-95-3	Nitrobenzene	12	U
78-59-1	Isophorone	12	U
88-75-5	2-Nitrophenol	12	U
105-67-9	2,4-Dimethylphenol	12	U
65-85-0	Benzoic Acid	59	U
111-91-1	bis(2-Chloroethoxy)Methane	12	U
120-83-2	2,4-Dichlorophenol	12	U
120-82-1	1,2,4-Trichlorobenzene	12	U
91-20-3	Naphthalene	12	U
106-47-8	4-Chloroaniline	12	U
87-68-3	Hexachlorobutadiene	12	U
59-50-7	4-Chloro-3-Methylphenol	12	U
91-57-6	2-Methylnaphthalene	12	U
77-47-4	Hexachlorocyclopentadiene	12	U
88-06-2	2,4,6-Trichlorophenol	12	U
95-95-4	2,4,5-Trichlorophenol	59	U
91-58-7	2-Chloronaphthalene	12	U
88-74-4	2-Nitroaniline	12	U
131-11-3	Dimethyl Phthalate	12	U
208-96-8	Acenaphthylene	12	U
606-20-2	2,6-Dinitrotoluene	12	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-12A(R)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-12

Sample wt/vol: 850 (g/mL) ML Lab File ID: 31161012

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	12	U
83-32-9	Acenaphthene	12	U
51-28-5	2,4-Dinitrophenol	59	U
100-02-7	4-Nitrophenol	59	U
132-64-9	Dibenzofuran	12	U
121-14-2	2,4-Dinitrotoluene	12	U
84-66-2	Diethylphthalate	12	U
7005-72-3	4-Chlorophenyl-phenylether	12	U
86-73-7	Fluorene	12	U
100-10-6	4-Nitroaniline	12	U
534-52-1	4,6-Dinitro-2-Methylphenol	59	U
86-30-6	N-Nitrosodiphenylamine	12	U
122-66-7	1,2-Diphenylhydrazine	12	U
101-55-3	4-Bromophenyl-phenylether	12	U
118-74-1	Hexachlorobenzene	12	U
87-86-5	Pentachlorophenol	59	U
85-01-8	Phenanthrene	12	U
120-12-7	Anthracene	12	U
84-74-2	Di-n-Butylphthalate	12	U
206-44-0	Fluoranthene	12	U
129-00-0	Pyrene	12	U
85-68-7	Butylbenzylphthalate	12	U
91-94-1	3,3'-Dichlorobenzidine	59	U
56-55-3	Benzo(a)Anthracene	12	U
218-01-9	Chrysene	12	U
117-81-7	bis(2-Ethylhexyl)Phthalate	12	U
117-84-0	Di-n-OctylPhthalate	12	U
205-99-2	Benzo(b)Fluoranthene	12	U
207-08-9	Benzo(k)Fluoranthene	12	U
50-32-8	Benzo(a)Pyrene	12	U
193-39-5	Indeno(1,2,3-cd)Pyrene	12	U
53-70-3	Dibenz(a,h)Anthracene	12	U
191-24-2	Benzo(g,h,i)Perylene	12	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-12A(R)

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-12

Sample wt/vol: 850 (g/mL) ML Lab File ID: 31161012

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	12.73	20	J
2.				
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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-12A(R)R

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-12R

Sample wt/vol: 850 (g/mL) ML Lab File ID: 31161012R

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/05/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	12	U
111-44-4	bis(2-Chloroethyl)Ether	12	U
95-57-8	2-Chlorophenol	12	U
541-73-1	1,3-Dichlorobenzene	12	U
106-46-7	1,4-Dichlorobenzene	12	U
100-51-6	Benzyl Alcohol	12	U
95-50-1	1,2-Dichlorobenzene	12	U
95-48-7	2-Methylphenol	12	U
39638-32-9	bis(2-Chloroisopropyl)Ether	12	U
106-44-5	4-Methylphenol	12	U
621-64-7	N-Nitroso-Di-n-Propylamine	12	U
67-72-1	Hexachloroethane	12	U
98-95-3	Nitrobenzene	12	U
78-59-1	Isophorone	12	U
88-75-5	2-Nitrophenol	12	U
105-67-9	2,4-Dimethylphenol	12	U
65-85-0	Benzoic Acid	59	U
111-91-1	bis(2-Chloroethoxy)Methane	12	U
120-83-2	2,4-Dichlorophenol	12	U
120-82-1	1,2,4-Trichlorobenzene	12	U
91-20-3	Naphthalene	12	U
106-47-8	4-Chloroaniline	12	U
87-68-3	Hexachlorobutadiene	12	U
59-50-7	4-Chloro-3-Methylphenol	12	U
91-57-6	2-Methylnaphthalene	12	U
77-47-4	Hexachlorocyclopentadiene	12	U
88-06-2	2,4,6-Trichlorophenol	12	U
95-95-4	2,4,5-Trichlorophenol	59	U
91-58-7	2-Chloronaphthalene	12	U
88-74-4	2-Nitroaniline	12	U
131-11-3	Dimethyl Phthalate	12	U
208-96-8	Acenaphthylene	12	U
606-20-2	2,6-Dinitrotoluene	12	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-12A(R)R

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-12R

Sample wt/vol: 850 (g/mL) ML Lab File ID: 31161012R

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/05/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	12	U
83-32-9	Acenaphthene	12	U
51-28-5	2,4-Dinitrophenol	59	U
100-02-7	4-Nitrophenol	59	U
132-64-9	Dibenzofuran	12	U
121-14-2	2,4-Dinitrotoluene	12	U
84-66-2	Diethylphthalate	12	U
7005-72-3	4-Chlorophenyl-phenylether	12	U
86-73-7	Fluorene	12	U
100-10-6	4-Nitroaniline	12	U
534-52-1	4,6-Dinitro-2-Methylphenol	59	U
86-30-6	N-Nitrosodiphenylamine	12	U
122-66-7	1,2-Diphenylhydrazine	12	U
101-55-3	4-Bromophenyl-phenylether	12	U
118-74-1	Hexachlorobenzene	12	U
87-86-5	Pentachlorophenol	59	U
85-01-8	Phenanthrene	12	U
120-12-7	Anthracene	12	U
84-74-2	Di-n-Butylphthalate	12	U
206-44-0	Fluoranthene	12	U
129-00-0	Pyrene	12	U
85-68-7	Butylbenzylphthalate	12	U
91-94-1	3,3'-Dichlorobenzidine	59	U
56-55-3	Benzo(a)Anthracene	12	U
218-01-9	Chrysene	12	U
117-81-7	bis(2-Ethylhexyl)Phthalate	12	U
117-84-0	Di-n-OctylPhthalate	12	U
205-99-2	Benzo(b)Fluoranthene	12	U
207-08-9	Benzo(k)Fluoranthene	12	U
50-32-8	Benzo(a)Pyrene	12	U
193-39-5	Indeno(1,2,3-cd)Pyrene	12	U
53-70-3	Dibenz(a,h)Anthracene	12	U
191-24-2	Benzo(g,h,i)Perylene	12	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-12A(R)R

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-12R

Sample wt/vol: 850 (g/mL) ML Lab File ID: 31161012R

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/05/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	12.73	30	J
2.				
3.				
4.				
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PZ-12A(R)

ab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

Lab Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

atrix (soil/water): WATER Lab Sample ID: 311610-12

Level (low/med): LOW Date Received: 11/19/93

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	425			P
7440-36-0	Antimony	27.8	B		P
7440-38-2	Arsenic	1.8	B		F
7440-39-3	Barium	89.3	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	2.7	U		P
7440-70-2	Calcium	319000			P
7440-47-3	Chromium	4.1	U		P
7440-48-4	Cobalt	3.5	U		P
7440-50-8	Copper	23.5	B		P
7439-89-6	Iron	316			P
7439-92-1	Lead	4.1		N	F
7439-95-4	Magnesium	123000			P
7439-96-5	Manganese	407			P
7439-97-6	Mercury	0.08	U		AV
7440-02-0	Nickel	5.7	U		P
7440-09-7	Potassium	5830			P
7782-49-2	Selenium	4.9	B	S	F
7440-22-4	Silver	13.1	U		P
7440-23-5	Sodium	34000			P
7440-28-0	Thallium	0.70	U	N	F
7440-62-2	Vanadium	8.1	B		P
7440-66-6	Zinc	5.0	B		P
	Cyanide				NR

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-19B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11610 SAS No.: _____ SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-9

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 116109

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. ____ Date Analyzed: 11/22/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	G
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	B
67-64-1	Acetone	14	
75-15-0	Carbon Disulfide	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	XYLENE (total)	5	U
	o,p Xylene	5	U

108-38-3	m-Xylene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-19B

Lab Name: ANALYTICAL TECHNOLIGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-9

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-9

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-22-93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-19B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-9

Sample wt/vol: 860 (g/mL) ML Lab File ID: 3116109

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	12	U
111-44-4	bis(2-Chloroethyl)Ether	12	U
95-57-8	2-Chlorophenol	12	U
541-73-1	1,3-Dichlorobenzene	12	U
106-46-7	1,4-Dichlorobenzene	12	U
100-51-6	Benzyl Alcohol	12	U
95-50-1	1,2-Dichlorobenzene	12	U
95-48-7	2-Methylphenol	12	U
39638-32-9	bis(2-Chloroisopropyl)Ether	12	U
106-44-5	4-Methylphenol	12	U
621-64-7	N-Nitroso-Di-n-Propylamine	12	U
67-72-1	Hexachloroethane	12	U
98-95-3	Nitrobenzene	12	U
78-59-1	Isophorone	12	U
88-75-5	2-Nitrophenol	12	U
105-67-9	2,4-Dimethylphenol	12	U
65-85-0	Benzoic Acid	58	U
111-91-1	bis(2-Chloroethoxy)Methane	12	U
120-83-2	2,4-Dichlorophenol	12	U
120-82-1	1,2,4-Trichlorobenzene	12	U
91-20-3	Naphthalene	12	U
106-47-8	4-Chloroaniline	12	U
87-68-3	Hexachlorobutadiene	12	U
59-50-7	4-Chloro-3-Methylphenol	12	U
91-57-6	2-Methylnaphthalene	12	U
77-47-4	Hexachlorocyclopentadiene	12	U
88-06-2	2,4,6-Trichlorophenol	12	U
95-95-4	2,4,5-Trichlorophenol	58	U
91-58-7	2-Chloronaphthalene	12	U
88-74-4	2-Nitroaniline	12	U
131-11-3	Dimethyl Phthalate	12	U
208-96-8	Acenaphthylene	12	U
606-20-2	2,6-Dinitrotoluene	12	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-19B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-9

Sample wt/vol: 860 (g/mL) ML Lab File ID: 3116109

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	12	U
83-32-9	Acenaphthene	12	U
51-28-5	2,4-Dinitrophenol	58	U
100-02-7	4-Nitrophenol	58	U
132-64-9	Dibenzofuran	12	U
121-14-2	2,4-Dinitrotoluene	12	U
84-66-2	Diethylphthalate	12	U
7005-72-3	4-Chlorophenyl-phenylether	12	U
86-73-7	Fluorene	12	U
100-10-6	4-Nitroaniline	12	U
534-52-1	4,6-Dinitro-2-Methylphenol	58	U
86-30-6	N-Nitrosodiphenylamine	12	U
122-66-7	1,2-Diphenylhydrazine	12	U
101-55-3	4-Bromophenyl-phenylether	12	U
118-74-1	Hexachlorobenzene	12	U
87-86-5	Pentachlorophenol	58	U
85-01-8	Phenanthrene	12	U
120-12-7	Anthracene	12	U
84-74-2	Di-n-Butylphthalate	12	U
206-44-0	Fluoranthene	12	U
129-00-0	Pyrene	12	U
85-68-7	Butylbenzylphthalate	12	U
91-94-1	3,3'-Dichlorobenzidine	58	U
56-55-3	Benzo(a)Anthracene	12	U
218-01-9	Chrysene	12	U
117-81-7	bis(2-Ethylhexyl)Phthalate	12	U
117-84-0	Di-n-OctylPhthalate	12	U
205-99-2	Benzo(b)Fluoranthene	12	U
207-08-9	Benzo(k)Fluoranthene	12	U
50-32-8	Benzo(a)Pyrene	12	U
193-39-5	Indeno(1,2,3-cd)Pyrene	12	U
53-70-3	Dibenz(a,h)Anthracene	12	U
191-24-2	Benzo(g,h,i)Perylene	12	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-19B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-9

Sample wt/vol: 860 (g/mL) ML Lab File ID: 3116109

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TICs found: 3

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	13.25	200	J
2.	UNKNOWN HYDROCARBON	24.72	30	J
3.	UNKNOWN HYDROCARBON	33.67	30	J
4.				
5.				
6.				
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11.				
12.				
13.				
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15.				

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-19A

Lab Name: ANALYTICAL TECHNOLIGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-10

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-10

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-22-93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-20B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11610 SAS No.: _____ SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-13

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1161013

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. ____ Date Analyzed: 11/23/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	12	B
67-64-1	Acetone	9	BJ
75-15-0	Carbon Disulfide	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	3	J
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	1700	E
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	4	J
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	36	
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	1	J
124-48-1	Dibromochloromethane	14	
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-dichloropropene	5	U
75-25-2	Bromoform	18	
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	XYLENE (total)	5	U
	o,p Xylene	5	U

108-38-3---------m-Xylene	5	U
541-73-1---------1,3-Dichlorobenzene	5	U
95-50-1----------1,2-Dichlorobenzene	5	U
106-46-7---------1,4-Dichlorobenzene	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-20B

Lab Name: ANALYTICAL TECHNOLIGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-13

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-13

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-23-93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-20B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-13

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 31161013

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
39638-32-9	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	10	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-20B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-13

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 31161013

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-10-6	4-Nitroaniline	10	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	50	U
56-55-3	Benzo(a)Anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0	Di-n-OctylPhthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-20B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-13

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 31161013

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	13.03	90	J
2.	UNKNOWN HYDROCARBON	14.17	20	J
3.	UNKNOWN HYDROCARBON	19.82	20	J
4.	UNKNOWN HYDROCARBON	24.72	20	J
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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-20BRE

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-13RE

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 31161013R

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 12/07/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/14/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
39638-32-9	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	10	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-20BRE

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-13RE

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 31161013R

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 12/07/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/14/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-10-6	4-Nitroaniline	10	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	9	J
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	50	U
56-55-3	Benzo(a)Anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0	Di-n-OctylPhthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-20BRE

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-13RE

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 31161013R

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 12/07/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/14/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 6

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ISOMER OF BROMOCYCLOHEXANOL	10.27	400	J
2.	UNKNOWN CYCLIC COMPOUND	10.93	30	J
3.	UNKNOWN HYDROCARBON	11.95	200	J
4.	UNKNOWN CYCLIC COMPOUND	12.32	20	J
5.	UNKNOWN CYCLIC COMPOUND	12.63	100	J
6.	UNKNOWN HYDROCARBON	12.73	40	J
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U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PZ-20B

Lab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

Lab Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix (soil/water): WATER Lab Sample ID: 311610-13

Level (low/med): LOW Date Received: 11/19/93

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	51.8	B		P
7440-36-0	Antimony	35.1	B		P
7440-38-2	Arsenic	1.4	B	W	F
7440-39-3	Barium	272			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	2.7	U		P
7440-70-2	Calcium	322000			P
7440-47-3	Chromium	4.1	U		P
7440-48-4	Cobalt	4.2	B		P
7440-50-8	Copper	4.9	B		P
7439-89-6	Iron	56.5	B		P
7439-92-1	Lead	1.8	U	WN	F
7439-95-4	Magnesium	226000			P
7439-96-5	Manganese	2500			P
7439-97-6	Mercury	0.11	B		AV
7440-02-0	Nickel	5.7	U		P
7440-09-7	Potassium	152000			P
7782-49-2	Selenium	6.8	B	W	F
7440-22-4	Silver	13.1	U		P
7440-23-5	Sodium	3700000			P
7440-28-0	Thallium	3.5	U	WN	F
7440-62-2	Vanadium	3.8	U		P
7440-66-6	Zinc	16.7	B		P
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

ILMO2.1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-20A

Lab Name: A. T. I. Contract: NA

Lab Code: FINNMAT Case No.: 11610 SAS No.: _____ SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-14

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1161014

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. _____ Date Analyzed: 11/23/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	BJ
67-64-1	Acetone	12	B
75-15-0	Carbon Disulfide	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	23	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	XYLENE (total)	5	U
	o,p Xylene	5	U

108-38-3	m-Xylene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-20A

Lab Name: ANALYTICAL TECHNOLIGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-14

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-14

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-23-93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-20A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-14

Sample wt/vol: 890 (g/mL) ML Lab File ID: 31161014

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	11	U
111-44-4	bis(2-Chloroethyl)Ether	11	U
95-57-8	2-Chlorophenol	11	U
541-73-1	1,3-Dichlorobenzene	11	U
106-46-7	1,4-Dichlorobenzene	11	U
100-51-6	Benzyl Alcohol	11	U
95-50-1	1,2-Dichlorobenzene	11	U
95-48-7	2-Methylphenol	11	U
39638-32-9	bis(2-Chloroisopropyl)Ether	11	U
106-44-5	4-Methylphenol	11	U
621-64-7	N-Nitroso-Di-n-Propylamine	11	U
67-72-1	Hexachloroethane	11	U
98-95-3	Nitrobenzene	11	U
78-59-1	Isophorone	11	U
88-75-5	2-Nitrophenol	11	U
105-67-9	2,4-Dimethylphenol	11	U
65-85-0	Benzoic Acid	56	U
111-91-1	bis(2-Chloroethoxy)Methane	11	U
120-83-2	2,4-Dichlorophenol	11	U
120-82-1	1,2,4-Trichlorobenzene	11	U
91-20-3	Naphthalene	11	U
106-47-8	4-Chloroaniline	11	U
87-68-3	Hexachlorobutadiene	11	U
59-50-7	4-Chloro-3-Methylphenol	11	U
91-57-6	2-Methylnaphthalene	11	U
77-47-4	Hexachlorocyclopentadiene	11	U
88-06-2	2,4,6-Trichlorophenol	11	U
95-95-4	2,4,5-Trichlorophenol	56	U
91-58-7	2-Chloronaphthalene	11	U
88-74-4	2-Nitroaniline	11	U
131-11-3	Dimethyl Phthalate	11	U
208-96-8	Acenaphthylene	11	U
606-20-2	2,6-Dinitrotoluene	11	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-20A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-14

Sample wt/vol: 890 (g/mL) ML Lab File ID: 31161014

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	11	U
83-32-9	Acenaphthene	11	U
51-28-5	2,4-Dinitrophenol	56	U
100-02-7	4-Nitrophenol	56	U
132-64-9	Dibenzofuran	11	U
121-14-2	2,4-Dinitrotoluene	11	U
84-66-2	Diethylphthalate	11	U
7005-72-3	4-Chlorophenyl-phenylether	11	U
86-73-7	Fluorene	11	U
100-10-6	4-Nitroaniline	11	U
534-52-1	4,6-Dinitro-2-Methylphenol	56	U
86-30-6	N-Nitrosodiphenylamine	11	U
122-66-7	1,2-Diphenylhydrazine	11	U
101-55-3	4-Bromophenyl-phenylether	11	U
118-74-1	Hexachlorobenzene	11	U
87-86-5	Pentachlorophenol	56	U
85-01-8	Phenanthrene	11	U
120-12-7	Anthracene	11	U
84-74-2	Di-n-Butylphthalate	11	U
206-44-0	Fluoranthene	11	U
129-00-0	Pyrene	11	U
85-68-7	Butylbenzylphthalate	11	U
91-94-1	3,3'-Dichlorobenzidine	56	U
56-55-3	Benzo(a)Anthracene	11	U
218-01-9	Chrysene	11	U
117-81-7	bis(2-Ethylhexyl)Phthalate	11	U
117-84-0	Di-n-OctylPhthalate	11	U
205-99-2	Benzo(b)Fluoranthene	11	U
207-08-9	Benzo(k)Fluoranthene	11	U
50-32-8	Benzo(a)Pyrene	11	U
193-39-5	Indeno(1,2,3-cd)Pyrene	11	U
53-70-3	Dibenz(a,h)Anthracene	11	U
191-24-2	Benzo(g,h,i)Perylene	11	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-20A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-14

Sample wt/vol: 890 (g/mL) ML Lab File ID: 31161014

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	12.95	80	J
2.	UNKNOWN HYDROCARBON	24.67	10	J
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PZ-20A

Lab Name: ANALYTICAL_TECHNOLOGIES__ Contract: N/A_____

Lab Code: ATI___ Case No.: N/A___ SAS No.: N/A___ SDG No.: N/A___

Matrix (soil/water): WATER Lab Sample ID: 311610-14

Level (low/med): LOW__ Date Received: 11/19/93

Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	184	B		P
7440-36-0	Antimony	22.2	U		P
7440-38-2	Arsenic	0.80	B		F
7440-39-3	Barium	92.2	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	2.7	U		P
7440-70-2	Calcium	216000			P
7440-47-3	Chromium	4.1	U		P
7440-48-4	Cobalt	3.5	U		P
7440-50-8	Copper	118			P
7439-89-6	Iron	245			P
7439-92-1	Lead	9.0		N	F
7439-95-4	Magnesium	85600			P
7439-96-5	Manganese	764			P
7439-97-6	Mercury	0.08	U		AV
7440-02-0	Nickel	5.7	U		P
7440-09-7	Potassium	6630			P
7782-49-2	Selenium	0.70	B		F
7440-22-4	Silver	13.1	U		P
7440-23-5	Sodium	50200			P
7440-28-0	Thallium	0.70	U	N	F
7440-62-2	Vanadium	3.8	U		P
7440-66-6	Zinc	8.0	B		P
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

FORM I - IN

ILMO2.1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-21A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11610 SAS No.: _____ SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-2

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 116102

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. ____ Date Analyzed: 11/22/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	BJ
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	3	J
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	XYLENE (total)	5	U
	o,p Xylene	5	U

108-38-3	m-Xylene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-21A

Lab Name: ANALYTICAL TECHNOLIGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-2

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-2

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-22-93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-21A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-2

Sample wt/vol: 870 (g/mL) ML Lab File ID: 3116102

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	12	U
111-44-4	bis(2-Chloroethyl)Ether	12	U
95-57-8	2-Chlorophenol	12	U
541-73-1	1,3-Dichlorobenzene	12	U
106-46-7	1,4-Dichlorobenzene	12	U
100-51-6	Benzyl Alcohol	12	U
95-50-1	1,2-Dichlorobenzene	12	U
95-48-7	2-Methylphenol	12	U
39638-32-9	bis(2-Chloroisopropyl)Ether	12	U
106-44-5	4-Methylphenol	12	U
621-64-7	N-Nitroso-Di-n-Propylamine	12	U
67-72-1	Hexachloroethane	12	U
98-95-3	Nitrobenzene	12	U
78-59-1	Isophorone	12	U
88-75-5	2-Nitrophenol	12	U
105-67-9	2,4-Dimethylphenol	12	U
65-85-0	Benzoic Acid	58	U
111-91-1	bis(2-Chloroethoxy)Methane	12	U
120-83-2	2,4-Dichlorophenol	12	U
120-82-1	1,2,4-Trichlorobenzene	12	U
91-20-3	Naphthalene	12	U
106-47-8	4-Chloroaniline	12	U
87-68-3	Hexachlorobutadiene	12	U
59-50-7	4-Chloro-3-Methylphenol	12	U
91-57-6	2-Methylnaphthalene	12	U
77-47-4	Hexachlorocyclopentadiene	12	U
88-06-2	2,4,6-Trichlorophenol	12	U
95-95-4	2,4,5-Trichlorophenol	58	U
91-58-7	2-Chloronaphthalene	12	U
88-74-4	2-Nitroaniline	12	U
131-11-3	Dimethyl Phthalate	12	U
208-96-8	Acenaphthylene	12	U
606-20-2	2,6-Dinitrotoluene	12	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-21A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-2

Sample wt/vol: 870 (g/mL) ML Lab File ID: 3116102

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	12	U
83-32-9	Acenaphthene	12	U
51-28-5	2,4-Dinitrophenol	58	U
100-02-7	4-Nitrophenol	58	U
132-64-9	Dibenzofuran	12	U
121-14-2	2,4-Dinitrotoluene	12	U
84-66-2	Diethylphthalate	12	U
7005-72-3	4-Chlorophenyl-phenylether	12	U
86-73-7	Fluorene	12	U
100-10-6	4-Nitroaniline	12	U
534-52-1	4,6-Dinitro-2-Methylphenol	58	U
86-30-6	N-Nitrosodiphenylamine	12	U
122-66-7	1,2-Diphenylhydrazine	12	U
101-55-3	4-Bromophenyl-phenylether	12	U
118-74-1	Hexachlorobenzene	12	U
87-86-5	Pentachlorophenol	58	U
85-01-8	Phenanthrene	12	U
120-12-7	Anthracene	12	U
84-74-2	Di-n-Butylphthalate	12	U
206-44-0	Fluoranthene	12	U
129-00-0	Pyrene	12	U
85-68-7	Butylbenzylphthalate	12	U
91-94-1	3,3'-Dichlorobenzidine	58	U
56-55-3	Benzo(a)Anthracene	12	U
218-01-9	Chrysene	12	U
117-81-7	bis(2-Ethylhexyl)Phthalate	12	U
117-84-0	Di-n-OctylPhthalate	12	U
205-99-2	Benzo(b)Fluoranthene	12	U
207-08-9	Benzo(k)Fluoranthene	12	U
50-32-8	Benzo(a)Pyrene	12	U
193-39-5	Indeno(1,2,3-cd)Pyrene	12	U
53-70-3	Dibenz(a,h)Anthracene	12	U
191-24-2	Benzo(g,h,i)Perylene	12	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-21A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-2

Sample wt/vol: 870 (g/mL) ML Lab File ID: 3116102

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN ALKANOIC ACID	12.68	40	J
2.				
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PZ-21A

Lab Name: ANALYTICAL_TECHNOLOGIES__ Contract: N/A_____

Lab Code: ATI___ Case No.: N/A___ SAS No.: N/A___ SDG No.: N/A___

Matrix (soil/water): WATER Lab Sample ID: 311610-2

Level (low/med): LOW__ Date Received: 11/19/93

Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	406			P
7440-36-0	Antimony	22.2	U		P
7440-38-2	Arsenic	1.4	B		F
7440-39-3	Barium	212			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	2.7	U		P
7440-70-2	Calcium	101000			P
7440-47-3	Chromium	4.1	U		P
7440-48-4	Cobalt	3.5	U		P
7440-50-8	Copper	2.2	U		P
7439-89-6	Iron	404			P
7439-92-1	Lead	0.90	U	N	F
7439-95-4	Magnesium	34700			P
7439-96-5	Manganese	220			P
7439-97-6	Mercury	0.08	U		AV
7440-02-0	Nickel	5.7	U		P
7440-09-7	Potassium	5570			P
7782-49-2	Selenium	0.70	B		F
7440-22-4	Silver	13.1	U		P
7440-23-5	Sodium	29600			P
7440-28-0	Thallium	0.70	U	N	F
7440-62-2	Vanadium	4.0	B		P
7440-66-6	Zinc	23.2			P
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

FORM I - IN

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-22B

Lab Name: A. T. I. Contract: NA

Lab Code: FINNMAT Case No.: 11610 SAS No.: _____ SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-3

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 116103

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. ____ Date Analyzed: 11/22/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	1	J
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	18	B
67-64-1	Acetone	140	
75-15-0	Carbon Disulfide	9	
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	4	J
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	1600	E
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	46	
71-55-6	1,1,1-Trichloroethane	1	J
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	66	
78-87-5	1,2-Dichloropropane	2	J
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	78	
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-dichloropropene	5	U
75-25-2	Bromoform	160	
108-10-1	4-Methyl-2-Pentanone	3	J
591-78-6	2-Hexanone	6	J
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	XYLENE (total)	5	U
	o,p Xylene	5	U

108-38-3---------m-Xylene	5	U
541-73-1---------1,3-Dichlorobenzene	5	U
95-50-1----------1,2-Dichlorobenzene	5	U
106-46-7---------1,4-Dichlorobenzene	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-22B

Lab Name: ANALYTICAL TECHNOLIGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-3

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-3

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-22-93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 74-95-3	Methane, Dibromo	11:23	5	J
2.				
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-22B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11610 SAS No.: NA SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-3D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 116103DL

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. ____ Date Analyzed: 11/23/93

Column: (pack/cap) PACK Dilution Factor: 100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1000	U
74-83-9	Bromomethane	1000	U
75-01-4	Vinyl Chloride	1000	U
75-00-3	Chloroethane	1000	U
75-09-2	Methylene Chloride	120	J
67-64-1	Acetone	230	J
75-15-0	Carbon Disulfide	500	U
75-69-4	Trichlorofluoromethane	500	U
75-35-4	1,1-Dichloroethene	500	U
75-34-3	1,1-Dichloroethane	500	U
540-59-0	1,2-Dichloroethene (total)	500	U
67-66-3	Chloroform	6200	
107-06-2	1,2-Dichloroethane	500	U
78-93-3	2-Butanone	1000	U
71-55-6	1,1,1-Trichloroethane	500	U
56-23-5	Carbon Tetrachloride	500	U
108-05-4	Vinyl Acetate	1000	U
75-27-4	Bromodichloromethane	500	U
78-87-5	1,2-Dichloropropane	500	U
10061-01-5	cis-1,3-Dichloropropene	500	U
79-01-6	Trichloroethene	500	U
124-48-1	Dibromochloromethane	500	U
79-00-5	1,1,2-Trichloroethane	500	U
71-43-2	Benzene	500	U
10061-02-6	trans-1,3-dichloropropene	500	U
75-25-2	Bromoform	500	U
108-10-1	4-Methyl-2-Pentanone	1000	U
591-78-6	2-Hexanone	1000	U
127-18-4	Tetrachloroethene	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U
108-88-3	Toluene	500	U
108-90-7	Chlorobenzene	500	U
100-41-4	Ethylbenzene	500	U
100-42-5	Styrene	500	U
	XYLENE (total)	500	U
	o,p Xylene	500	U

*

108-38-3--------m-Xylene	500	U
541-73-1--------1,3-Dichlorobenzene	500	U
95-50-1---------1,2-Dichlorobenzene	500	U
106-46-7--------1,4-Dichlorobenzene	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-22B

Lab Name: ANALYTICAL TECHNOLIGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-3D

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-3DL

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-23-93

Column (pack/cap) PACK Dilution Factor: 100

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-22B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-3

Sample wt/vol: 980 (g/mL) ML Lab File ID: 3116103

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
39638-32-9	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	51	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	10	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-22B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-3

Sample wt/vol: 980 (g/mL) ML Lab File ID: 3116103

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	51	U
100-02-7	4-Nitrophenol	51	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-10-6	4-Nitroaniline	10	U
534-52-1	4,6-Dinitro-2-Methylphenol	51	U
86-30-6	N-Nitrosodiphenylamine	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	51	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	51	U
56-55-3	Benzo(a)Anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0	Di-n-OctylPhthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-22B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-3

Sample wt/vol: 980 (g/mL) ML Lab File ID: 3116103

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TICs found: 11

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOA TCL	6.60	100	J
2.	UNKNOWN ALKANE	7.98	50	J
3.	UNKNOWN HYDROCARBON	10.73	20	J
4.	UNKNOWN HYDROCARBON	11.07	20	J
5.	UNKNOWN AROMATIC	12.92	20	J
6.	UNKNOWN HYDROCARBON	14.02	20	J
7.	UNKNOWN AROMATIC	16.50	20	J
8.	UNKNOWN PHENOL COMPOUND	19.83	10	J
9.	UNKNOWN ALKANOIC ACID	21.38	20	J
10.	UNKNOWN ALKANOIC ACID	23.33	20	J
11.	UNKNOWN HYDROCARBON	24.75	20	J
12.				
13.				
14.				
15.				

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-22BR

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-3R

Sample wt/vol: 980 (g/mL) ML Lab File ID: 3116103R

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/04/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
39638-32-9	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	51	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	51	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	10	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-22BR

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-3R

Sample wt/vol: 980 (g/mL) ML Lab File ID: 3116103R

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/04/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	51	U
100-02-7	4-Nitrophenol	51	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-10-6	4-Nitroaniline	10	U
534-52-1	4,6-Dinitro-2-Methylphenol	51	U
86-30-6	N-Nitrosodiphenylamine	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	51	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	51	U
56-55-3	Benzo(a)Anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0	Di-n-OctylPhthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-22BR

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-3R

Sample wt/vol: 980 (g/mL) ML Lab File ID: 3116103R

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/04/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TICs found: 12

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOA TCL	6.60	100	J
2.	ISOMER OF DIBROMOPENTANE	7.97	50	J
3.	UNKNOWN HYDROCARBON	10.72	20	J
4.	UNKNOWN HYDROCARBON	11.05	20	J
5.	ISOMER OF METHYLBENZOIC ACID	12.93	30	J
6.	UNKNOWN HYDROCARBON	13.02	20	J
7.	UNKNOWN HYDROCARBON	14.00	20	J
8.	ISOMER OF DICHLOROBENZOIC AC	16.50	20	J
9.	UNKNOWN ALKANOIC ACID	19.82	20	J
10.	UNKNOWN ALKANOIC ACID	21.37	20	J
11.	UNKNOWN HYDROCARBON	23.32	20	J
12.	UNKNOWN HYDROCARBON	24.77	30	J
13.				
14.				
15.				

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PZ-22B

Lab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

Lab Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix (soil/water): WATER Lab Sample ID: 311610-3

Level (low/med): LOW Date Received: 11/19/93

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	110	U		P
7440-36-0	Antimony	111	U		P
7440-38-2	Arsenic	2.0	U		F
7440-39-3	Barium	450	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	13.5	U		P
7440-70-2	Calcium	624000			P
7440-47-3	Chromium	20.5	U		P
7440-48-4	Cobalt	22.8	B		P
7440-50-8	Copper	11.0	U		P
7439-89-6	Iron	50.2	B		P
7439-92-1	Lead	9.0	U	WN	F
7439-95-4	Magnesium	124000			P
7439-96-5	Manganese	5940			P
7439-97-6	Mercury	0.08	B		AV
7440-02-0	Nickel	32.2	B		P
7440-09-7	Potassium	273000			P
7782-49-2	Selenium	118		S	F
7440-22-4	Silver	65.5	U		P
7440-23-5	Sodium	16500000			P
7440-28-0	Thallium	35.0	U	WN	F
7440-62-2	Vanadium	19.0	U		P
7440-66-6	Zinc	51.4	B		P
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-22A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11610 SAS No.: _____ SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 11610-4

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 116104

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. ____ Date Analyzed: 11/22/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	BJ
67-64-1	Acetone	11	
75-15-0	Carbon Disulfide	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	44	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	XYLENE (total)	5	U
	o,p Xylene	5	U

108-38-3--------m-Xylene	5	U
541-73-1--------1,3-Dichlorobenzene	5	U
95-50-1---------1,2-Dichlorobenzene	5	U
106-46-7--------1,4-Dichlorobenzene	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-22A

Lab Name: ANALYTICAL TECHNOLIGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-4

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-4

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-22-93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-22A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-4

Sample wt/vol: 880 (g/mL) ML Lab File ID: 3116104

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	11	U
111-44-4	bis(2-Chloroethyl)Ether	11	U
95-57-8	2-Chlorophenol	11	U
541-73-1	1,3-Dichlorobenzene	11	U
106-46-7	1,4-Dichlorobenzene	11	U
100-51-6	Benzyl Alcohol	11	U
95-50-1	1,2-Dichlorobenzene	11	U
95-48-7	2-Methylphenol	11	U
39638-32-9	bis(2-Chloroisopropyl)Ether	11	U
106-44-5	4-Methylphenol	11	U
621-64-7	N-Nitroso-Di-n-Propylamine	11	U
67-72-1	Hexachloroethane	11	U
98-95-3	Nitrobenzene	11	U
78-59-1	Isophorone	11	U
88-75-5	2-Nitrophenol	11	U
105-67-9	2,4-Dimethylphenol	11	U
65-85-0	Benzoic Acid	57	U
111-91-1	bis(2-Chloroethoxy)Methane	11	U
120-83-2	2,4-Dichlorophenol	11	U
120-82-1	1,2,4-Trichlorobenzene	11	U
91-20-3	Naphthalene	11	U
106-47-8	4-Chloroaniline	11	U
87-68-3	Hexachlorobutadiene	11	U
59-50-7	4-Chloro-3-Methylphenol	11	U
91-57-6	2-Methylnaphthalene	11	U
77-47-4	Hexachlorocyclopentadiene	11	U
88-06-2	2,4,6-Trichlorophenol	11	U
95-95-4	2,4,5-Trichlorophenol	57	U
91-58-7	2-Chloronaphthalene	11	U
88-74-4	2-Nitroaniline	11	U
131-11-3	Dimethyl Phthalate	11	U
208-96-8	Acenaphthylene	11	U
606-20-2	2,6-Dinitrotoluene	11	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-22A

Lab Name: A.T.I. Contract: NA

Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-4

Sample wt/vol: 880 (g/mL) ML Lab File ID: 3116104

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	11	U
83-32-9	Acenaphthene	11	U
51-28-5	2,4-Dinitrophenol	57	U
100-02-7	4-Nitrophenol	57	U
132-64-9	Dibenzofuran	11	U
121-14-2	2,4-Dinitrotoluene	11	U
84-66-2	Diethylphthalate	11	U
7005-72-3	4-Chlorophenyl-phenylether	11	U
86-73-7	Fluorene	11	U
100-10-6	4-Nitroaniline	11	U
534-52-1	4,6-Dinitro-2-Methylphenol	57	U
86-30-6	N-Nitrosodiphenylamine	11	U
122-66-7	1,2-Diphenylhydrazine	11	U
101-55-3	4-Bromophenyl-phenylether	11	U
118-74-1	Hexachlorobenzene	11	U
87-86-5	Pentachlorophenol	57	U
85-01-8	Phenanthrene	11	U
120-12-7	Anthracene	11	U
84-74-2	Di-n-Butylphthalate	11	U
206-44-0	Fluoranthene	11	U
129-00-0	Pyrene	11	U
85-68-7	Butylbenzylphthalate	11	U
91-94-1	3,3'-Dichlorobenzidine	57	U
56-55-3	Benzo(a)Anthracene	11	U
218-01-9	Chrysene	11	U
117-81-7	bis(2-Ethylhexyl)Phthalate	11	U
117-84-0	Di-n-OctylPhthalate	11	U
205-99-2	Benzo(b)Fluoranthene	11	U
207-08-9	Benzo(k)Fluoranthene	11	U
50-32-8	Benzo(a)Pyrene	11	U
193-39-5	Indeno(1,2,3-cd)Pyrene	11	U
53-70-3	Dibenz(a,h)Anthracene	11	U
191-24-2	Benzo(g,h,i)Perylene	11	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-22A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-4

Sample wt/vol: 880 (g/mL) ML Lab File ID: 3116104

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	13.25	200	J
2.	UNKNOWN ALKANOIC ACID	21.18	10	J
3.	UNKNOWN ALKANOIC ACID	21.37	30	J
4.	UNKNOWN ALKANOIC ACID	23.50	20	J
5.	UNKNOWN HYDROCARBON	24.78	30	J
6.				
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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PZ-22A

Lab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

Lab Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix (soil/water): WATER Lab Sample ID: 311610-4

Level (low/med): LOW Date Received: 11/19/93

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	693			P
7440-36-0	Antimony	22.2	U		P
7440-38-2	Arsenic	1.8	B		F
7440-39-3	Barium	309			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	2.7	U		P
7440-70-2	Calcium	131000			P
7440-47-3	Chromium	4.1	U		P
7440-48-4	Cobalt	4.4	B		P
7440-50-8	Copper	3.2	B		P
7439-89-6	Iron	948			P
7439-92-1	Lead	1.4	B	N	F
7439-95-4	Magnesium	39100			P
7439-96-5	Manganese	825			P
7439-97-6	Mercury	0.08	U		AV
7440-02-0	Nickel	5.7	U		P
7440-09-7	Potassium	5000			P
7782-49-2	Selenium	1.0	B	W	F
7440-22-4	Silver	13.1	U		P
7440-23-5	Sodium	73500			P
7440-28-0	Thallium	0.70	U	N	F
7440-62-2	Vanadium	3.8	U		P
7440-66-6	Zinc	9.1	B		P
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-23B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11610 SAS No.: _____ SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-5

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 116105

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. ____ Date Analyzed: 11/22/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	BJ
67-64-1	Acetone	13	
75-15-0	Carbon Disulfide	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	79	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	440	E
71-55-6	1,1,1-Trichloroethane	1	J
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	1	J
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	1	J
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-dichloropropene	5	U
75-25-2	Bromoform	8	
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	XYLENE (total)	5	U
	o,p Xylene	5	U

108-38-3--------m-Xylene	5	U
541-73-1--------1,3-Dichlorobenzene	5	U
95-50-1---------1,2-Dichlorobenzene	5	U
106-46-7--------1,4-Dichlorobenzene	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-23B

Lab Name: ANALYTICAL TECHNOLIGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-5

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-5

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-22-93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 109-99-9	Tetrahydrofuran	9:03	30	J
2.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-23B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-5

Sample wt/vol: 870 (g/mL) ML Lab File ID: 3116105

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	12	U
111-44-4	bis(2-Chloroethyl)Ether	12	U
95-57-8	2-Chlorophenol	12	U
541-73-1	1,3-Dichlorobenzene	12	U
106-46-7	1,4-Dichlorobenzene	12	U
100-51-6	Benzyl Alcohol	12	U
95-50-1	1,2-Dichlorobenzene	12	U
95-48-7	2-Methylphenol	12	U
39638-32-9	bis(2-Chloroisopropyl)Ether	12	U
106-44-5	4-Methylphenol	12	U
621-64-7	N-Nitroso-Di-n-Propylamine	12	U
67-72-1	Hexachloroethane	12	U
98-95-3	Nitrobenzene	12	U
78-59-1	Isophorone	12	U
88-75-5	2-Nitrophenol	12	U
105-67-9	2,4-Dimethylphenol	12	U
65-85-0	Benzoic Acid	58	U
111-91-1	bis(2-Chloroethoxy)Methane	12	U
120-83-2	2,4-Dichlorophenol	12	U
120-82-1	1,2,4-Trichlorobenzene	12	U
91-20-3	Naphthalene	12	U
106-47-8	4-Chloroaniline	12	U
87-68-3	Hexachlorobutadiene	12	U
59-50-7	4-Chloro-3-Methylphenol	12	U
91-57-6	2-Methylnaphthalene	12	U
77-47-4	Hexachlorocyclopentadiene	12	U
88-06-2	2,4,6-Trichlorophenol	12	U
95-95-4	2,4,5-Trichlorophenol	58	U
91-58-7	2-Chloronaphthalene	12	U
88-74-4	2-Nitroaniline	12	U
131-11-3	Dimethyl Phthalate	12	U
208-96-8	Acenaphthylene	12	U
606-20-2	2,6-Dinitrotoluene	12	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-23B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-5

Sample wt/vol: 870 (g/mL) ML Lab File ID: 3116105

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	12	U
83-32-9	Acenaphthene	12	U
51-28-5	2,4-Dinitrophenol	58	U
100-02-7	4-Nitrophenol	58	U
132-64-9	Dibenzofuran	12	U
121-14-2	2,4-Dinitrotoluene	12	U
84-66-2	Diethylphthalate	12	U
7005-72-3	4-Chlorophenyl-phenylether	12	U
86-73-7	Fluorene	12	U
100-10-6	4-Nitroaniline	12	U
534-52-1	4,6-Dinitro-2-Methylphenol	58	U
86-30-6	N-Nitrosodiphenylamine	12	U
122-66-7	1,2-Diphenylhydrazine	12	U
101-55-3	4-Bromophenyl-phenylether	12	U
118-74-1	Hexachlorobenzene	12	U
87-86-5	Pentachlorophenol	58	U
85-01-8	Phenanthrene	12	U
120-12-7	Anthracene	12	U
84-74-2	Di-n-Butylphthalate	12	U
206-44-0	Fluoranthene	12	U
129-00-0	Pyrene	12	U
85-68-7	Butylbenzylphthalate	12	U
91-94-1	3,3'-Dichlorobenzidine	58	U
56-55-3	Benzo(a)Anthracene	12	U
218-01-9	Chrysene	12	U
117-81-7	bis(2-Ethylhexyl)Phthalate	12	U
117-84-0	Di-n-OctylPhthalate	12	U
205-99-2	Benzo(b)Fluoranthene	12	U
207-08-9	Benzo(k)Fluoranthene	12	U
50-32-8	Benzo(a)Pyrene	12	U
193-39-5	Indeno(1,2,3-cd)Pyrene	12	U
53-70-3	Dibenz(a,h)Anthracene	12	U
191-24-2	Benzo(g,h,i)Perylene	12	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-23B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-5

Sample wt/vol: 870 (g/mL) ML Lab File ID: 3116105

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	9.60	10	J
2.	UNKNOWN HYDROCARBON	12.80	40	J
3.	UNKNOWN HYDROCARBON	13.22	20	J
4.	UNKNOWN HYDROCARBON	24.65	10	J
5.	UNKNOWN HYDROCARBON	33.63	10	J
6.				
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PZ-23B

Lab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

Lab Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix (soil/water): WATER Lab Sample ID: 311610-5

Level (low/med): LOW Date Received: 11/19/93

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	494			P
7440-36-0	Antimony	29.4	B		P
7440-38-2	Arsenic	0.40	U		F
7440-39-3	Barium	2020			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	2.7	U		P
7440-70-2	Calcium	408000			P
7440-47-3	Chromium	4.1	U		P
7440-48-4	Cobalt	4.3	B		P
7440-50-8	Copper	2.2	U		P
7439-89-6	Iron	418			P
7439-92-1	Lead	0.90	U	N	F
7439-95-4	Magnesium	228000			P
7439-96-5	Manganese	2040			P
7439-97-6	Mercury	0.11	B		AV
7440-02-0	Nickel	5.7	U		P
7440-09-7	Potassium	10100			P
7782-49-2	Selenium	3.2	B	W	F
7440-22-4	Silver	13.1	U		P
7440-23-5	Sodium	376000			P
7440-28-0	Thallium	0.70	U	WN	F
7440-62-2	Vanadium	5.6	B		P
7440-66-6	Zinc	6.4	B		P
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE N

PZ-23A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11610 SAS No.: _____ SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-6

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 116106

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. _____ Date Analyzed: 11/22/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	BJ
67-64-1	Acetone	6	J
75-15-0	Carbon Disulfide	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	6	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	XYLENE (total)	5	U
	o,p Xylene	5	U

108-38-3--------m-Xylene	5	U
541-73-1--------1,3-Dichlorobenzene	5	U
95-50-1---------1,2-Dichlorobenzene	5	U
106-46-7--------1,4-Dichlorobenzene	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-23A

Lab Name: ANALYTICAL TECHNOLIGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-6

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-6

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-22-93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
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1E

OLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-24B

ECHNOLIGIES Contract: N/A

se No.: 11610 SAS No.: N/A SDG No.: 311610

WATER Lab Sample ID: 311610-7

5 (g/mL) ML Lab File ID: 11610-7

LOW Date Received: 11-19-93

Date Analyzed: 11-22-93

PACK Dilution Factor: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

COMPOUND NAME	RT	EST. CONC.	Q

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-23A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-6

Sample wt/vol: 850 (g/mL) ML Lab File ID: 3116106

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	12	U
111-44-4	bis(2-Chloroethyl)Ether	12	U
95-57-8	2-Chlorophenol	12	U
541-73-1	1,3-Dichlorobenzene	12	U
106-46-7	1,4-Dichlorobenzene	12	U
100-51-6	Benzyl Alcohol	12	U
95-50-1	1,2-Dichlorobenzene	12	U
95-48-7	2-Methylphenol	12	U
39638-32-9	bis(2-Chloroisopropyl)Ether	12	U
106-44-5	4-Methylphenol	12	U
621-64-7	N-Nitroso-Di-n-Propylamine	12	U
67-72-1	Hexachloroethane	12	U
98-95-3	Nitrobenzene	12	U
78-59-1	Isophorone	12	U
88-75-5	2-Nitrophenol	12	U
105-67-9	2,4-Dimethylphenol	12	U
65-85-0	Benzoic Acid	59	U
111-91-1	bis(2-Chloroethoxy)Methane	12	U
120-83-2	2,4-Dichlorophenol	12	U
120-82-1	1,2,4-Trichlorobenzene	12	U
91-20-3	Naphthalene	12	U
106-47-8	4-Chloroaniline	12	U
87-68-3	Hexachlorobutadiene	12	U
59-50-7	4-Chloro-3-Methylphenol	12	U
91-57-6	2-Methylnaphthalene	12	U
77-47-4	Hexachlorocyclopentadiene	12	U
88-06-2	2,4,6-Trichlorophenol	12	U
95-95-4	2,4,5-Trichlorophenol	59	U
91-58-7	2-Chloronaphthalene	12	U
88-74-4	2-Nitroaniline	12	U
131-11-3	Dimethyl Phthalate	12	U
208-96-8	Acenaphthylene	12	U
606-20-2	2,6-Dinitrotoluene	12	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-23A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-6

Sample wt/vol: 850 (g/mL) ML Lab File ID: 3116106

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	12	U
83-32-9	Acenaphthene	12	U
51-28-5	2,4-Dinitrophenol	59	U
100-02-7	4-Nitrophenol	59	U
132-64-9	Dibenzofuran	12	U
121-14-2	2,4-Dinitrotoluene	12	U
84-66-2	Diethylphthalate	12	U
7005-72-3	4-Chlorophenyl-phenylether	12	U
86-73-7	Fluorene	12	U
100-10-6	4-Nitroaniline	12	U
534-52-1	4,6-Dinitro-2-Methylphenol	59	U
86-30-6	N-Nitrosodiphenylamine	12	U
122-66-7	1,2-Diphenylhydrazine	12	U
101-55-3	4-Bromophenyl-phenylether	12	U
118-74-1	Hexachlorobenzene	12	U
87-86-5	Pentachlorophenol	59	U
85-01-8	Phenanthrene	12	U
120-12-7	Anthracene	12	U
84-74-2	Di-n-Butylphthalate	12	U
206-44-0	Fluoranthene	12	U
129-00-0	Pyrene	12	U
85-68-7	Butylbenzylphthalate	12	U
91-94-1	3,3'-Dichlorobenzidine	59	U
56-55-3	Benzo(a)Anthracene	12	U
218-01-9	Chrysene	12	U
117-81-7	bis(2-Ethylhexyl)Phthalate	12	U
117-84-0	Di-n-OctylPhthalate	12	U
205-99-2	Benzo(b)Fluoranthene	12	U
207-08-9	Benzo(k)Fluoranthene	12	U
50-32-8	Benzo(a)Pyrene	12	U
193-39-5	Indeno(1,2,3-cd)Pyrene	12	U
53-70-3	Dibenz(a,h)Anthracene	12	U
191-24-2	Benzo(g,h,i)Perylene	12	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-23A

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-6

Sample wt/vol: 850 (g/mL) ML Lab File ID: 3116106

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	12.82	50	J
2.				
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U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PZ-23A

ab Name: ANALYTICAL_TECHNOLOGIES__ Contract: N/A_____

b Code: ATI___ Case No.: N/A___ SAS No.: N/A___ SDG No.: N/A___

trix (soil/water): WATER Lab Sample ID: 311610-6

vel (low/med): LOW__ Date Received: 11/19/93

Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	29.6	B		P
7440-36-0	Antimony_	22.2	U		P
7440-38-2	Arsenic__	0.40	U		F
7440-39-3	Barium___	350			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium__	2.7	U		P
7440-70-2	Calcium__	139000			P
7440-47-3	Chromium_	4.1	U		P
7440-48-4	Cobalt___	3.9	B		P
7440-50-8	Copper___	2.2	U		P
7439-89-6	Iron_____	18.0	B		P
7439-92-1	Lead_____	0.90	U	WN	F
7439-95-4	Magnesium	45200			P
7439-96-5	Manganese	514			P
7439-97-6	Mercury__	0.08	U		AV
7440-02-0	Nickel___	5.7	U		P
7440-09-7	Potassium	11100			P
7782-49-2	Selenium_	0.90	B		F
7440-22-4	Silver___	13.1	U		P
7440-23-5	Sodium___	116000			P
7440-28-0	Thallium_	0.70	U	N	F
7440-62-2	Vanadium_	3.8	U		P
7440-66-6	Zinc_____	7.6	B		P
	Cyanide__				NR

lor Before: _____ Clarity Before: _____ Texture: _____

r After: _____ Clarity After: _____ Artifacts: _____

mments:

FORM I - IN

ILMO2.1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-24B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11610 SAS No.: _____ SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-7

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 116107

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. ____ Date Analyzed: 11/22/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	BJ
67-64-1	Acetone	28	
75-15-0	Carbon Disulfide	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	XYLENE (total)	5	U
	o,p Xylene	5	U

108-38-3	m-Xylene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-24B

Lab Name: ANALYTICAL TECHNOLIGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-7

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-7

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-22-93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-24B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-7

Sample wt/vol: 880 (g/mL) ML Lab File ID: 3116107

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	11	U
111-44-4	bis(2-Chloroethyl)Ether	11	U
95-57-8	2-Chlorophenol	11	U
541-73-1	1,3-Dichlorobenzene	11	U
106-46-7	1,4-Dichlorobenzene	11	U
100-51-6	Benzyl Alcohol	11	U
95-50-1	1,2-Dichlorobenzene	11	U
95-48-7	2-Methylphenol	11	U
39638-32-9	bis(2-Chloroisopropyl)Ether	11	U
106-44-5	4-Methylphenol	11	U
621-64-7	N-Nitroso-Di-n-Propylamine	11	U
67-72-1	Hexachloroethane	11	U
98-95-3	Nitrobenzene	11	U
78-59-1	Isophorone	11	U
88-75-5	2-Nitrophenol	11	U
105-67-9	2,4-Dimethylphenol	11	U
65-85-0	Benzoic Acid	57	U
111-91-1	bis(2-Chloroethoxy)Methane	11	U
120-83-2	2,4-Dichlorophenol	11	U
120-82-1	1,2,4-Trichlorobenzene	11	U
91-20-3	Naphthalene	11	U
106-47-8	4-Chloroaniline	11	U
87-68-3	Hexachlorobutadiene	11	U
59-50-7	4-Chloro-3-Methylphenol	11	U
91-57-6	2-Methylnaphthalene	11	U
77-47-4	Hexachlorocyclopentadiene	11	U
88-06-2	2,4,6-Trichlorophenol	11	U
95-95-4	2,4,5-Trichlorophenol	57	U
91-58-7	2-Chloronaphthalene	11	U
88-74-4	2-Nitroaniline	11	U
131-11-3	Dimethyl Phthalate	11	U
208-96-8	Acenaphthylene	11	U
606-20-2	2,6-Dinitrotoluene	11	U

1C

TILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-24B

EPA SAMPLE NO.

PZ-24B

Contract: NA

se No.: WCC6

SAS No.: NA

SDG No.: 610

No.: 610

) WATER

Lab Sample ID: 311610-7

311610-7

880 (g/mL) ML

Lab File ID: 3116107

3116107

LOW

Date Received: 11/19/93

11/19/93

dec.

Date Extracted: 11/20/93

i: 11/20/93

Cont/Sonc) CONT

Date Analyzed: 12/03/93

: 12/03/93

N pH: 7.0

Dilution Factor: 1.0

or: 1.0

COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	:: 'L ST. CONC.	Q
---3-Nitroaniline	11	U		
--Acenaphthene	11	U		
--2,4-Dinitrophenol	57	U		
--4-Nitrophenol	57	U		
---Dibenzofuran	11	U		
--2,4-Dinitrotoluene	11	U		
--Diethylphthalate	11	U		
---4-Chlorophenyl-phenylether	11	U		
--Fluorene	11	U		
-4-Nitroaniline	11	U		
--4,6-Dinitro-2-Methylphenol	11	U		
--N-Nitrosodiphenylamine	57	U		
-1,2-Diphenylhydrazine	11	U		
-4-Bromophenyl-phenylether	11	U		
--Hexachlorobenzene	11	U		
-Pentachlorophenol	11	U		
-Phenanthrene	57	U		
--Anthracene	11	U		
-Di-n-Butylphthalate	11	U		
Fluoranthene	11	U		
-Pyrene	11	U		
-Butylbenzylphthalate	11	U		
3,3'-Dichlorobenzidine	11	U		
Benzo(a)Anthracene	57	U		
-Chrysene	11	U		
is(2-Ethylhexyl)Phthalate	11	U		
i-n-OctylPhthalate	11	U		
Benzo(b)Fluoranthene	11	U		
Benzo(k)Fluoranthene	11	U		
enzo(a)Pyrene	11	U		
ndeno(1,2,3-cd)Pyrene	11	U		
Dibenz(a,h)Anthracene	11	U		
enzo(g,h,i)Perylene	11	U		
	11	U		

ed from Diphenylamine

FORM I SV-2

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1/87 Rev.

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PZ-24B

Lab Name: ANALYTICAL_TECHNOLOGIES__ Contract: N/A_____

Lab Code: ATI___ Case No.: N/A___ SAS No.: N/A___ SDG No.: N/A___

Matrix (soil/water): WATER Lab Sample ID: 311610-7

Level (low/med): LOW__ Date Received: 11/19/93

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	103	B		P
7440-36-0	Antimony_	22.2	U		P
7440-38-2	Arsenic__	0.40	U		F
7440-39-3	Barium___	476			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium__	2.7	U		P
7440-70-2	Calcium__	198000			P
7440-47-3	Chromium_	4.1	U		P
7440-48-4	Cobalt___	3.5	U		P
7440-50-8	Copper___	2.2	U		P
7439-89-6	Iron____	144			P
7439-92-1	Lead____	0.90	U	N	F
7439-95-4	Magnesium	92700			P
7439-96-5	Manganese	1260			P
7439-97-6	Mercury__	0.08	U		AV
7440-02-0	Nickel___	5.7	U		P
7440-09-7	Potassium	19800			P
7782-49-2	Selenium_	0.50	B		F
7440-22-4	Silver___	13.1	U		P
7440-23-5	Sodium___	27000			P
7440-28-0	Thallium_	0.70	U	N	F
7440-62-2	Vanadium_	3.8	U		P
7440-66-6	Zinc____	8.3	B		P
	Cyanide__				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

FORM I - IN

ILMO2.1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-25B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11610 SAS No.: _____ SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-8

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 116108

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. ____ Date Analyzed: 11/22/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	BJ
67-64-1	Acetone	16	
75-15-0	Carbon Disulfide	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	XYLENE (total)	5	U
	o,p Xylene	5	U

108-38-3	m-Xylene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-25B

Lab Name: ANALYTICAL TECHNOLIGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-8

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-8

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-22-93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-25B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-8

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3116108

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
39638-32-9	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	10	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-25B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-8

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3116108

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-10-6	4-Nitroaniline	10	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	50	U
56-55-3	Benzo(a)Anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0	Di-n-OctylPhthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-25B

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-8

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3116108

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 13

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	10.73	10	J
2.	UNKNOWN HYDROCARBON	11.07	10	J
3.	UNKNOWN HYDROCARBON	12.98	100	J
4.	UNKNOWN ALKANOIC ACID	21.37	20	J
5.	UNKNOWN ALCOHOL	22.50	9	J
6.	UNKNOWN HYDROCARBON	23.13	10	J
7.	UNKNOWN ALKANOIC ACID	23.33	40	J
8.	UNKNOWN HYDROCARBON	24.72	20	J
9.	UNKNOWN HYDROCARBON	28.55	10	J
10.	UNKNOWN ALKANE	29.27	10	J
11.	UNKNOWN HYDROCARBON	30.05	10	J
12.	UNKNOWN HYDROCARBON	30.93	9	J
13.	UNKNOWN DECANAL	33.98	20	J
14.				
15.				

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PZ-25B

Lab Name: ANALYTICAL_TECHNOLOGIES Contract: N/A

Lab Code: ATI Case No.: N/A SAS No.: N/A SDG No.: N/A

Matrix (soil/water): WATER Lab Sample ID: 311610-8

Level (low/med): LOW Date Received: 11/19/93

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	22.0	U		P
7440-36-0	Antimony	28.9	B		P
7440-38-2	Arsenic	0.40	U		F
7440-39-3	Barium	58.3	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	2.7	U		P
7440-70-2	Calcium	518000			P
7440-47-3	Chromium	4.1	U		P
7440-48-4	Cobalt	7.7	B		P
7440-50-8	Copper	2.9	B		P
7439-89-6	Iron	7.8	U		P
7439-92-1	Lead	0.90	U	N	F
7439-95-4	Magnesium	332000			P
7439-96-5	Manganese	1630			P
7439-97-6	Mercury	0.08	U		AV
7440-02-0	Nickel	5.7	U		P
7440-09-7	Potassium	4250	B		P
7782-49-2	Selenium	0.60	B	W	F
7440-22-4	Silver	13.1	U		P
7440-23-5	Sodium	27200			P
7440-28-0	Thallium	0.70	U	N	F
7440-62-2	Vanadium	4.3	B		P
7440-66-6	Zinc	11.8	B		P
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

ILMO2.1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-21A-FB

Lab Name: A. T. I. Contract: NA

Lab Code: FINNMAT Case No.: 11610 SAS No.: _____ SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-1

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 116101

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. ____ Date Analyzed: 11/22/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	BJ
67-64-1	Acetone	7	J
75-15-0	Carbon Disulfide	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	XYLENE (total)	5	U
	o,p Xylene	5	U

108-38-3--------m-Xylene	5	U
541-73-1--------1,3-Dichlorobenzene	5	U
95-50-1---------1,2-Dichlorobenzene	5	U
106-46-7--------1,4-Dichlorobenzene	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-21A-FB

Lab Name: ANALYTICAL TECHNOLIGIES Contract: _____

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-1

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-1

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-22-93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-82-7	Cyclohepane (DOT)	12:47	5	J
2.				
3.				
4.				
5.				
6.				
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11.				
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13.				
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16.				
17.				
18.				
19.				
20.				

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-21A-FB

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3116101

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
39638-32-9	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	10	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-21A-FB

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3116101

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-10-6	4-Nitroaniline	10	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	50	U
56-55-3	Benzo(a)Anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0	Di-n-OctylPhthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-21A-FB

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3116101

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/03/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
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13.				
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15.				

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-21A-FBR

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-1R

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3116131R

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/04/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
39638-32-9	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	10	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PZ-21A-FBR

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-1R

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3116131R

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/04/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-10-6	4-Nitroaniline	10	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	50	U
56-55-3	Benzo(a)Anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
117-84-0	Di-n-OctylPhthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

PZ-21A-FBR

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: WCC6 SAS No.: NA SDG No.: 610

Matrix: (soil/water) WATER Lab Sample ID: 311610-1R

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 3116131R

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. dec. Date Extracted: 11/20/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/04/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
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14.				
15.				

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

21A-FB

Lab Name: ANALYTICAL_TECHNOLOGIES__ Contract: N/A_____

Lab Code: ATI___ Case No.: N/A___ SAS No.: N/A___ SDG No.: N/A___

Matrix (soil/water): WATER Lab Sample ID: 311610-1

Level (low/med): LOW__ Date Received: 11/19/93

Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	22.3	B		P
7440-36-0	Antimony_	22.2	U		P
7440-38-2	Arsenic__	0.40	B		F
7440-39-3	Barium___	22.8	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium__	2.7	U		P
7440-70-2	Calcium__	15300			P
7440-47-3	Chromium_	4.1	U		P
7440-48-4	Cobalt___	3.5	U		P
7440-50-8	Copper___	2.2	U		P
7439-89-6	Iron____	24.1	B		P
7439-92-1	Lead____	0.90	U	N	F
7439-95-4	Magnesium	687	B		P
7439-96-5	Manganese	1.7	B		P
7439-97-6	Mercury__	0.08	U		AV
7440-02-0	Nickel___	5.7	U		P
7440-09-7	Potassium	629	B		P
7782-49-2	Selenium_	0.40	B		F
7440-22-4	Silver___	13.1	U		P
7440-23-5	Sodium___	4680	B		P
7440-28-0	Thallium_	0.70	B	N	F
7440-62-2	Vanadium_	3.8	U		P
7440-66-6	Zinc____	83.0			P
	Cyanide__				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

21A-FB=PZ-21A-FB

FORM I - IN

ILMO2.1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TRIP_BLANK

Lab Name: A.T.I. Contract: NA

Lab Code: FINNMAT Case No.: 11610 SAS No.: _____ SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-15

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1161015

Level: (low/med) LOW Date Received: 11/19/93

% Moisture: not dec. ____ Date Analyzed: 11/23/93

Column: (pack/cap) PACK Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	1	BJ
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
	XYLENE (total)	5	U
	o,p Xylene	5	U

108-38-3---------m-Xylene	5	U
541-73-1---------1,3-Dichlorobenzene	5	U
95-50-1----------1,2-Dichlorobenzene	5	U
106-46-7---------1,4-Dichlorobenzene	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TRIP BLANK

Lab Name: ANALYTICAL TECHNOLIGIES Contract: N/A

Lab Code: FINNMAT Case No.: 11610 SAS No.: N/A SDG No.: 311610

Matrix: (soil/water) WATER Lab Sample ID: 311610-15

Sample wt/vol: 5 (g/mL) ML Lab File ID: 11610-15

Level (low/med) LOW Date Received: 11-19-93

% Moisture: not dec. ____ Date Analyzed: 11-23-93

Column (pack/cap) PACK Dilution Factor: 1

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				

VOLATILES CASE NARRATIVE

LABORATORY NAME: ANALYTICAL TECHNOLOGIES, INC.
CASE NUMBER: 11610
SDG#: 311610
PROJECT NAME: VICKSBURG CHEMICAL

RECEIVED NOV 19, 1993
ATI BATCH 93-VW-153

CLIENT ID#	ATI ID #
PZ-21A-FB	311610-1
PZ-21A	311610-2
PZ-22B	311610-3
PZ-22A	311610-4
PZ-23B	311610-5
PZ-23A	311610-6
PZ-24B	311610-7
PZ-25B	311610-8
PZ-19B	311610-9
PZ-19A	311610-10
PZ-12B(R)	311610-11
PZ-12A(R)	311610-12
PZ-20B	311610-13
PZ-20A	311610-14
TRIP BLANK	311610-15

The samples were received in good condition. Sample PZ-23B had one compound exceed upper calibration range of the five point curve. The sample was not reshot due to technician error.

Larry Dilmore
CLP Reviewer
12-15-93

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or her designee, as verified by the following signature.

Kelly Swanson
QA Officer
12-15-93

Bill Rubert
GC/MS Supervisor
12-15-93

CHAIN OF CUSTODY

PS 93-550

ATI LAB. I.D. # 311610

AnalyticalTechnologies, Inc.
11 EAST OLIVE ROAD
PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

PART 1 — Bottle Shipment Information

CLIENT: Woodward Clyde

CLIENT PROJECT NUMBER: 92B007C-4001

SAMPLE CONTAINERS SHIPPED	PRESERVATIVE						PLASTIC CONTAINERS										GLASS CONTAINERS						
QTY.	H_2SO_4	HNO3	HCl	Zn ACETATE	$Na_2S_2O_3$	UNPRESERVED	NaOH	4 oz.	8 oz.	16 oz.	32 oz.	½ gallon	1 gallon	Whirl-pak	100 ML SPECIMEN CUP	120 ml (A)	120 ml (C)	1 liter (A)	1 liter (C)	40 ml Vial	4 oz. wm	8 oz. wm	16 oz. wm	32 oz. wm	Oil Trip Blank
30						✓															✓				

RELINQUISHED	TIME	DATE	RECEIVED	TIME	DATE
Christian Catchings	0816	10-21-93			

PART 2 — Sample Information

SAMPLE MATRIX

DW DRINKINGWATER
WW WASTEWATER
GW GROUNDWATER
SW SURFACEWATER
SO SOIL
OL OIL
AR AIR
SL SLUDGE

PARAMETERS AND PRESERVATIVES

SAMPLE I.D.	DATE	TIME	MATRIX	VOA/CLP	SEMI-VOA CLP	METALS CLP * PZ-25	METALS PZ-25 SEMI-VOA FORMIC ACID						TOTAL	LAB USE ONLY
PZ-21A-FB	11/17/93	0940	W	2	1	1							4	
PZ-21A	11/17/93	1102	GW	2	1	1							4	
PZ-22B	11/17/93	1358	GW	2	1	1							4	
PZ-22A	11/17/93	1530	GW	2	1	1							4	
PZ-23B	11/17/93	1618	GW	2	1	1							4	
PZ-23A	11/17/93	1718	GW	2	1	1							4	
PZ-24B	11/18/93	0759	GW	2	1	1							4	
PZ-25B	11/18/93	0835	GW	2	1	1	2	✓					6	
PZ-19B	11/18/93	1055	GW	2	1	1							4	
PZ-19A	11/18/93	1100	GW	2	1	1							4	
PZ-12B (R)	11/18/93	1158	GW	2	1	1							4	
PZ-12A (R)	11/18/93	1225	GW	2	1	1							4	
PZ-20B	11/18/93	1340	GW	2	1	1							4	
PZ-20BMS	11/18/93	1340	GW	2	1	1							4	
PZ-20BMSD	11/18/93	1340	GW	2	1	1							4	
PZ-20A	11/18/93	1345	GW	2	1	1							4	
												TOTAL NUMBER OF BOTTLES/CONTAINERS	66	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
Charles T Kerr	11/18/93	1700	David R Bass	11/19/93	0953

CLIENT WOODWARD-CLYDE CONSULTANTS
ADDRESS 2822 O'NEAL LANE
CITY BATON ROUGE
STATE LA. ZIP 70896
PHONE NO. (504) 751-1873
PROJECT MANAGER (person to receive data) DICK KARVKAINEN

PROJECT NUMBER 92B007C-4001
PROJECT NAME VICKSBURG CHEMICAL CO.
SAMPLED BY M. OLSON / G. KEARNS
SAMPLE SITE VICKSBURG CHEM.
PURCHASE ORDER NUMBER

REQUEST FAX DATA BY _____ (FAX #)
REQUEST VERBAL RESULTS BY _____ (DATE)
NEED DATA PACKAGE BY _____ (DATE)
QUALITY CONTROL REPORTING LEVEL (circle one)
NONE 1 2 3 4
NEED _____ EXTRA COPIES OF REPORT

NOTE: TRIP BLANKS (3 SETS) IN EACH VOA COOLER

TURN AROUND TIMES (check one)

STANDARD - 14 TO 21 DAYS ☒
RUSH: (MUST BE APPROVED IN ADVANCE)
0-48 HOURS - 2 x STD PRICE ☐
3-7 DAYS - 1.5 x STD PRICE ☐
TCLP - 1 WEEK RUSH - 1.5 x STD PRICE ☐

SPECIAL INSTRUCTIONS:
*Excluding PZ-21A-FB: Filter AND Add Preservative To All Samples Provided For METALS Analysis.

U.S. ENVIRONMENTAL PROTECTION AGENCY

CONTRACT LABORATORY PROGRAM

SAMPLE LOG - IN SHEET

Lab Name: Analytical Technologies Inc Page 1 of 3

Received By (Print): David R Barr Log-in Date: 11-19-93

Case Number:

Sample Delivery Group No.:

SAS Number:

CIRCLE THE APPROPRIATE RESPONSE

1. Custody Seal(s): Present/Absent*
   Intact/Broken
2. Custody Seal Nos.:
3. Chain-of-Custody Records: Present/Absent*
4. Traffic Reports or Packing List: Present/Absent*
5. Airbill: Airbill/Sticker Present/Absent*
6. Airbill No.: 4844848875
7. Sample Tags: Present/Absent*
   Sample Tag Numbers: Listed/Not Listed on Chain-of-Custody
8. Sample Condition: Intact/Broken*/Leaking
9. Does information on custody records, traffic reports and sample tags agree? Yes/No*
10. Date Received at Lab: ~~0953~~ 19-NOV-93
11. Time Received: 0953

Sample Transfer

Area#: GCMS

By: David R Barr

On: 11-19-93

EPA SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT ETC.
	PZ-21A-FB	311610-1	
	PZ-21A	311610-2	
	PZ-22B	311610-3	
	PZ-22A	311610-4	
	PZ-23B	311610-5	
	PZ-23A	311610-6	
	PZ-24B	311610-7	
	PZ-25B	311610-8	
	PZ-19B	311610-9	
	PZ-19A	311610-10	
	PZ-12B(R)	311610-11	
	PZ-12A(R)	311610-12	
	PZ-20B	311610-13	
	PZ-20A	311610-14	
	Trip Blank	311610-15	

*If Circled, contact SMO and attach record of resolution

Received by: DM Logbook No.: 93-2

Date: 11-19-93 Logbook Page No.: 179

FORM AADC-1

AnalyticalTechnologies,Inc.

PROJECT SAMPLE INSPECTION FORM

Accession #: 311610 Date received: 19-NOV-93

1.	Was there a Chain of Custody?	YES	NO	7.	Are samples correctly preserved for analysis required?	YES	NO
2.	Was Chain of Custody properly relinquished?	YES	NO	8.	Is there sufficient volume for analysis requested?	YES	NO
3.	Were samples received cold? (At 4° or on ice)	YES	NO	9.	Were samples received within holding time?	YES	NO
4.	Were all containers properly labeled and identified?	YES	NO	10.	Was there headspace greater than ¼" in diameter in volatile bottles?	YES	NO N/A
5.	Were samples received in proper containers for analysis requested?	YES	NO	11.	If sent, were matrix spike bottles returned?	YES	NO N/A
6.	Were all sample containers received intact?	YES	NO				

Tracking Number: 4844848875 Shipped By: FEDX

Cooler Number: PO36L, 8373, 880, N/S

Out of Control Events and Inspection Comments:

Client requested lab filter CLP Metals, results to be reported as dissolved.

Inspected By: ARB Date: 11/19/93 Logged By: ARB Date: 11/19/9

BER WP51/SAMPLE CO/SAMPLE INS

SEMIVOLATILES CASE NARRATIVE

LABORATORY NAME: ANALYTICAL TECHNOLOGIES, INC.
CASE NUMBER: WCC6
SDG#: 610
PROJECT NAME: VICKSBURG CHEMICAL

RECEIVED NOV 19, 1993
ATI BATCH 93-AW-196

CLIENT ID#	ATI ID #
PZ-21A-FB	311610-1
PZ-21A	311610-2
PZ-22B	311610-3
PZ-22A	311610-4
PZ-23B	311610-5
PZ-23A	311610-6
PZ-24B	311610-7
PZ-25B	311610-8
PZ-19B	311610-9
PZ-19A	311610-10
PZ-12B(R)	311610-11
PZ-12A(R)	311610-12
PZ-20B	311610-13
PZ-20A	311610-14

The samples were received in good condition. The blank extracted with the samples failed surrogate recovery limits. Samples 311610-1, 3, 12 and 13 failed surrogate recovery limits. The matrix spike and duplicate had spike and surrogate recoveries fail. The blank, matrix spike and duplicate and sample 311610-13 were reextracted. Samples 311610-1, 3, and 12 could not be reextracted since no extra sample was sent with SDG. Sample 311610-13 and the blank reextract (BLKB1207) passed surrogate recovery limits. The matrix spike and duplicate reextract failed surrogate and spike recovery limits in the same manner as the first matrix spike and duplicate.

Larry Dilmore

Larry Dilmore
CLP Reviewer
12-15-93

CHAIN OF CUSTODY

PS 93-550

ATI LAB. I.D. # 311610

Analytical Technologies, Inc.
11 EAST OLIVE ROAD
PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

PART 1 — Bottle Shipment Information

CLIENT: Woodward Clyde

CLIENT PROJECT NUMBER: 92B007C-4001

SAMPLE CONTAINERS SHIPPED	PRESERVATIVE						PLASTIC CONTAINERS									GLASS CONTAINERS							
QTY.	H_2SO_4	HNO3	HCl	Zn ACETATE	Na_2SO_3	UNPRESERVED	NaOH	4 oz.	8 oz.	16 oz.	32 oz.	½ gallon	1 gallon	Whirl-pak	100-ML SPECIMEN CUP	120 ml (C)	120 ml (A)	1 liter (A)	1 liter (C)	40 ml Vial	4 oz. wm	8 oz. wm	16 oz. wm	32 oz. wm	Qt Trip Blank
30						✓															✓				

RELINQUISHED	TIME	DATE	RECEIVED	TIME	DATE
Victoria Catchings	0816	11-21-93			

PART 2 — Sample Information

SAMPLE MATRIX

DW DRINKINGWATER
WW WASTEWATER
GW GROUNDWATER
SW SURFACEWATER
SO SOIL
OL OIL
AR AIR
SL SLUDGE

PARAMETERS AND PRESERVATIVES

SAMPLE I.D.	DATE	TIME	MATRIX	VOA/CLP	SEMI-VOA CLP	METALS CLP *	PZ-25 METHANOL	PZ-25 SEMI-VOA FORMIC ACID						TOTAL	LAB USE ONLY
PZ-21A-FB	11/17/93	0940	W	2	1	1								4	
PZ-21A	11/17/93	1102	GW	2	1	1								4	
PZ-22B	11/17/93	1358	GW	2	1	1								4	
PZ-22A	11/17/93	1530	GW	2	1	1								4	
PZ-23B	11/17/93	1618	GW	2	1	1								4	
PZ-23A	11/17/93	1718	GW	2	1	1								4	
PZ-24B	11/18/93	0759	GW	2	1	1								4	
PZ-25B	11/18/93	0835	GW	2	1	1	2	✓						6	
PZ-19B	11/18/93	1055	GW	2	1	1								4	
PZ-19A	11/18/93	1100	GW	2	1	1								4	
PZ-12B (R)	11/18/93	1158	GW	2	1	1								4	
PZ-12A (R)	11/18/93	1225	GW	2	1	1								4	
PZ-20B	11/18/93	1340	GW	2	1	1								4	
PZ-20B MS	11/18/93	1340	GW	2	1	1								4	
PZ-20BMSD	11/18/93	1340	GW	2	1	1								4	
PZ-20A	11/18/93	1345	GW	2	1	1								4	
													TOTAL NUMBER OF BOTTLES/CONTAINERS	66	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
Charles T Kerr	11/18/93	1700	David R Barr	11/19/93	0953

CLIENT Woodward-Clyde Consultants
ADDRESS 2822 O'Neal Lane
CITY Baton Rouge
STATE LA. ZIP 70896
PHONE NO. (504) 751-1873
PROJECT MANAGER (person to receive data) Dick Karkkainen

PROJECT NUMBER 92B007C-4001
PROJECT NAME Vicksburg Chemical Co.
SAMPLED BY M. Olson / C. Kerrans
SAMPLE SITE Vicksburg Chem.
PURCHASE ORDER NUMBER

REQUEST FAX DATA BY _____ (FAX #)
REQUEST VERBAL RESULTS BY _____ (DATE)
NEED DATA PACKAGE BY _____ (DATE)
QUALITY CONTROL REPORTING LEVEL (circle one)
NONE 1 2 3 4
NEED _____ EXTRA COPIES OF REPORT

NOTE: TRIP BLANKS (3 SETS) IN EACH VOA COOLER

TURN AROUND TIMES (check one)

STANDARD - 14 TO 21 DAYS ☒
RUSH: (MUST BE APPROVED IN ADVANCE)
0-48 HOURS - 2 x STD PRICE ☐
3-7 DAYS - 1.5 x STD PRICE ☐
TCLP - 1 WEEK RUSH - 1.5 x STD PRICE ☐

SPECIAL INSTRUCTIONS:

*Excluding PZ-21A-FB: Filter AND Add Preservative To All Samples Provided For METALS Analysis.

U.S. ENVIRONMENTAL PROTECTION AGENCY

CONTRACT LABORATORY PROGRAM

SAMPLE LOG - IN SHEET

Lab Name: Analytical Technologies Inc Page 2 of 3

Received By (Print): David R Barr Log-in Date: 11-19-93

Case Number:

Sample Delivery Group No.:

SAS Number:

CIRCLE THE APPROPRIATE RESPONSE

1. Custody Seal(s): Present/Absent* Intact/Broken
2. Custody Seal Nos.:
3. Chain-of-Custody Records: Present/Absent*
4. Traffic Reports or Packing List: Present/Absent*
5. Airbill: Airbill/Sticker Present/Absent*
6. Airbill No.: 4844840875
7. Sample Tags: Present/Absent* Sample Tag Numbers: Listed/Not Listed on Chain-of-Custody
8. Sample Condition: Intact/Broken*/Leaking
9. Does information on custody records, traffic reports and sample tags agree? Yes/No*
10. Date Received at Lab: ~~0953~~ 11-19-93
11. Time Received: 0953

EPA SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE - SHIPMENT ETC.
	PZ21A-FB	311610-1	
	PZ-21A	311610-2	
	PZ22B	311610-3	
	PZ22A	311610-4	
	PZ23B	311610-5	
	PZ-23A	311610-6	
	PZ-24B	311610-7	
	PZ25B	311610-8	
	PZ19B	311610-9	
	PZ-19A	311610-10	
	PZ-12B(R)	311610-11	
	PZ-12A(R)	311610-12	
	PZ-20B	311610-13	
	PZ-20A	311610-14	
	Trip Blank	311610-15	

Sample Transfer

Area#: EXTRACTIONS

By: David R Barr

On: 11-19-93

*If Circled, contact SMO and attach record of resolution

Received by: LC Logbook No.: 93-2

Date: 11/19/93 Logbook Page No.: 179

FORM AADC-1

Analytical Technologies, Inc. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

QAF 2
REVISION 1
8-20-93

REQUEST FOR RE-EXTRACTION/OUT OF CONTROL EVENTS FORM

CLIENT: _____ ACCN #: 311610-13 BATCH#: 196

(CIRCLE ONE) WATER SOIL TCLP OTHER _____

PERSON: Larry Dilmore / Rita Wingo
(RECOGNIZING OUT OF CONTROL EVENT/REQUESTING RE-EXTRACTION)

DESCRIPTION OF EVENT OR PROBLEM / POSSIBLE CAUSE: See Page 2

DATE RECOGNIZED: _____ DATE OCCURRED: _____

ANALYTICAL METHOD: EPA METHOD 625/EPA SW-846 METHOD 8270/CLP SOW

ITEMS TO BE REEXTRACTED (PLEASE CHECK THE APPROPRIATE ITEM AND INCLUDE SPECIFICS):

✓ SAMPLE ACCESSN#s: 1, 3, 12, 13

___ RS/RSD

X MS/MSD LAB ID#: #13 (do not reextract)

✓ BLANK

CORRECTIVE ACTION: _____

DATE OF CORRECTIVE MEASURE/RE-EXTRACTION: No extra sample for 1,3,12

RESULTS OF RE-EXTRACTION: See Page 2

SIGNATURES This form must be turned in to the QA department within 5 days

EXTRACTION SUPERVISOR: [signature] DATE: 12-3-93

ANALYTICAL SUPERVISOR: [signature] DATE: 12-3-93

ANALYST: [signature] DATE: 12-3-93

QA MANAGER: Kelly S Herod DATE: 12-3-93

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U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ANALYTICAL_TECHNOLOGIES__ Contract: N/A

Lab Code: ATI___ Case No.: N/A__ SAS No.: N/A___ SDG No. N/A

SOW No.: 3/90_

EPA Sample No.	Lab Sample ID
_PZ-12A(R)____	__311610-12___
_PZ-12B(R)____	__311610-11___
_PZ-19A_____	__311610-10___
_PZ-19B_____	__311610-9____
_PZ-20A_____	__311610-14___
_PZ-20B_____	__311610-13___
_PZ-21A_____	__311610-2____
_PZ-22A_____	__311610-4____
_PZ-22B_____	__311610-3____
_PZ-23A_____	__311610-6____
_PZ-23B_____	__311610-5____
_PZ-24B_____	__311610-7____
_PZ-25B_____	__311610-8____
_RS-PZ_____	__311460-3____
_PZ-21A-FB____	__311610-1____

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied? Yes/No YES
If yes- were raw data generated before application of background corrections ? Yes/No NO_

Comments:

This package contains results for lab accession numbers 311610 (1-14) and 311460 (3).

All sample results, except 311610-1 and 311460-3, are dissolved results. All dissolved samples were filtered and acidified prior to digestion. All samples in this package were digested. Samples 311610-1 and 311460-3, identified as field blank and rinsate blank respectively, were reanalyzed without digestion to confirm reported hits.

Sample 311610-3 was diluted 5X prior to ICAP analysis. This dilution was sufficient for all ICAP metals except calcium and sodium which required a 10X and 100X dilution, respectively. This sample was diluted 10X prior to GFAA thallium analysis.

All metals were reported for the serial dilution sample (311610-8) except calcium, which was over the calibration range. The dilution used to report sodium (100X) on 311610-3 was used for the calcium serial dilution, with the initial calcium sample result reported from the 10X dilution of 311610-3.

The Method of Standard Additions was used to report selenium for accession numbers 311610 (3, 10, and 12).

The matrix spike recovery was out of control for lead (311610-3) at 66% recovery and thallium at 61.0% recovery. The analytical spike (post spike)

recovery for lead on this sample was 47%. The analytical spike recovery for thallium on this sample was 56%.

No other problems were associated with the analysis of these samples.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or the manager's designee, as verified by the following signature.

Signature: Kelly S Hered Name: Kelly S. Hered

Date: 12-15-93 Title: QA Manager

WARD'S CLP SOFTWARE PACKAGE
EXPLANATION OF FORMS

FORM 3

Blanks are flagged with a "U" when they are less than (<) the Instrument Detection Limit (IDL). The IDL will show up next to the "U" flag. Blanks are flagged with a "B" when they are greater than (>) IDL but less than (<) CRDL (EPA Contract Required Detection Limit).

FORM 5A

Calcium, Magnesium, Potassium, and Sodium are not required in the CLP spiking solution.

FORM 6

If BOTH the sample (S) and the duplicate (D) are less than (<) IDL, the RPD IS NOT calculable and NO control limits apply. Both sample and duplicate will be flagged with a "U" under the C qualifier. The RPD field will be left empty.

RPDs are calculated for all analytes detected above the IDL in either the sample (S) or the duplicate (D). If BOTH the sample (S) and the duplicate (D) are less than (<) CRDL, the RPD IS calculable; however, NO control limits apply.

If one sample is flagged with a "U" and one is not flagged with a "U", zero will be substituted for the value that is flagged wtih "U". "200" will then always be the calculated RPD result.

If the sample (S) and the duplicate (D) are greater than (>) 5 x CRDL, control limit of 20% will be used.

If the sample (S) and/or the duplicate (D) is less than (<) 5 x CRDL, control limit of ± CRDL will be used and the absolute value of the difference between the sample and the duplicate will be used for the RPD value.

If the sample (S) and the duplicate (D) values are less than the CRDL ≥ 5X the CRDL, the control limit field will be left empty.

FORM 9

If the sample (S) is less than (<) IDL, the sample and the duplicate will be flagged with "U"s and the %D will be left blank. If the serial dilution is **not required** due to the sample (S) result less than (<) 50 X IDL, the %D will still be calculated and will appear to be out of control at greater than (>) 10%.

EXPLANATION OF FLAGS

= Duplicate analyses not within control limits.

= Sample result is estimated due to the presence of interference.

= The Standard Additions Correlation Coefficient is <0.995.

= The spiked sample recovery is not within control limits.

= The reported value was determined by the Method of Standard Additions.

= If post-digestion spike for GFAA (Graphite Furnace Atomic Absorption) recovery is less than 85% or greater than 115%, while sample absorbance is less than 50% of spike absorbance and post spike recovery is greater than or equal to 40%, the sample result is flagged with a "W" and no further action is required.

= The duplicate injection precision is not met.

CHAIN OF CUSTODY

PS 93-550

TI LAB. I.D. # 311610

AnalyticalTechnologies, Inc.
11 EAST OLIVE ROAD
PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

PART 1 — Bottle Shipment Information

FROM: Woodward Clyde

CLIENT PROJECT NUMBER: 92B007C-4001

SAMPLE CONTAINERS SHIPPED	PRESERVATIVE						PLASTIC CONTAINERS								GLASS CONTAINERS							
QTY.	H_2SO_4	HNO3	HCl	Zn ACETATE	$Na_2S_2O_3$	UNPRESERVED	NaOH	4 oz.	8 oz.	16 oz.	32 oz.	½ gallon	1 gallon	Whirl-pak	100-ML SPECIMEN CUP	120 ml (N)	120 ml (C)	1 liter (N)	1 liter (C)	40 ml Vial	4 oz. wm	8 oz. wm	16 oz. wm	32 oz. wm	Di Trip Blank
30					✓																✓				

RELINQUISHED	TIME	DATE	RECEIVED	TIME	DATE
Catherine Catchings	0816	11-21-93			

PART 2 — Sample Information

SAMPLE MATRIX

DW DRINKINGWATER
WW WASTEWATER
GW GROUNDWATER
SW SURFACEWATER
SO SOIL
OL OIL
AR AIR
SL SLUDGE

PARAMETERS AND PRESERVATIVES

SAMPLE I.D.	DATE	TIME	MATRIX	VOA CLP	SEMI-VOA CLP	METALS CLP *	PZ-25 METHANOL	PZ-25 Semi-VOA FORMIC ACID						TOTAL	LAB USE ONLY
PZ-21A-FB	11/17/93	0940	W	2	1	1								4	
PZ-21A	11/17/93	1102	GW	2	1	1								4	
PZ-22B	11/17/93	1358	GW	2	1	1								4	
PZ-22A	11/17/93	1530	GW	2	1	1								4	
PZ-23B	11/17/93	1618	GW	2	1	1								4	
PZ-23A	11/17/93	1718	GW	2	1	1								4	
PZ-24B	11/18/93	0759	GW	2	1	1								4	
PZ-25B	11/18/93	0835	GW	2	1	1	2	✓						6	
PZ-19B	11/18/93	1055	GW	2	1	1								4	
PZ-19A	11/18/93	1100	GW	2	1	1								4	
PZ-12B (R)	11/18/93	1158	GW	2	1	1								4	
PZ-12A (R)	11/18/93	1225	GW	2	1	1								4	
PZ-20B	11/18/93	1340	GW	2	1	1								4	
PZ-20B MS	11/18/93	1340	GW	2	1	1								4	
PZ-20BMSD	11/18/93	1340	GW	2	1	1								4	
PZ-20A	11/18/93	1345	GW	2	1	1								4	
													TOTAL NUMBER OF BOTTLES/CONTAINERS	66	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
Charles T Kerr	11/18/93	1700	Donald R Barr	11/19/93	0953

CLIENT: WOODWARD-CLYDE CONSULTANTS
ADDRESS: 2822 O'NEAL LANE
CITY: BATON ROUGE
STATE: LA. ZIP: 70896
PHONE NO. (504) 751-1873
PROJECT MANAGER (person to receive data): ERIK KARKKAINEN

PROJECT NUMBER: 92B007C-4001
PROJECT NAME: VICKSBURG CHEMICAL CO.
SAMPLED BY: M. OLSON / G. KEARNS
SAMPLE SITE: VICKSBURG CHEM.
PURCHASE ORDER NUMBER:

REQUEST FAX DATA BY _____ (FAX #)
REQUEST VERBAL RESULTS BY _____ (DATE)
NEED DATA PACKAGE BY _____ (DATE)
QUALITY CONTROL REPORTING LEVEL (circle one)
NONE 1 2 3 4
NEED _____ EXTRA COPIES OF REPORT

NOTE: TRIP BLANKS (3 SETS) IN EACH VOA COOLER

TURN AROUND TIMES (check one)

STANDARD - 14 TO 21 DAYS ☒
RUSH: (MUST BE APPROVED IN ADVANCE)
0-48 HOURS - 2 x STD PRICE ☐
3-7 DAYS - 1.5 x STD PRICE ☐
TCLP - 1 WEEK RUSH - 1.5 x STD PRICE ☐

***SPECIAL INSTRUCTIONS:**
Excluding PZ-21A-FB: Filter AND Add Preservative To All Samples Provided For METALS Analysis.

11490 — METRO PRINTING INC. HUNTSVILLE, ALABAMA 35801

WHITE — LAB CANARY — CLIENT PINK — REPORT

AnalyticalTechnologies,Inc.

PROJECT SAMPLE INSPECTION FORM

Accession #: 311610 Date received: 19-NOV-93

1.	Was there a Chain of Custody?	YES	NO	7.	Are samples correctly preserved for analysis required?	YES	NO
2.	Was Chain of Custody properly relinquished?	YES	NO	8.	Is there sufficient volume for analysis requested?	YES	NO
3.	Were samples received cold? (At 4° or on ice)	YES	NO	9.	Were samples received within holding time?	YES	NO
4.	Were all containers properly labeled and identified?	YES	NO	10.	Was there headspace greater than ¼" in diameter in volatile bottles?	YES	NO N/A
5.	Were samples received in proper containers for analysis requested?	YES	NO	11.	If sent, were matrix spike bottles returned?	YES	NO N/A
6.	Were all sample containers received intact?	YES	NO				

Tracking Number: 4844848875 Shipped By: FEDX

Cooler Number: PO36L, 8373, 880, N/S

Out of Control Events and Inspection Comments:

Client requested lab filter CLP Metals, results to be reported as dissolved.

Inspected By: ARB Date: 11/19/93 Logged By: ARB Date: 11/19/93

BLR WPS1/SAMPLECO/SAMPLE.INS

APPENDIX F

TCLP DATA SUMMARY FOR SOIL (SLUDGE) IN BOTTOM OF NORTH POND

AnalyticalTechnologies, Inc. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

SIGNATURE PAGE

Reviewed by: _____
ATI Project Manager

Client:	WOODWARD-CLYDE CONSULTANTS BATON ROUGE, LOUISIANA
Project Name:	VICKSBURG CHEMICAL
Project Number:	92B007C-4001
Project Location:	VICKSBURG, MS.
Accession Number:	311405
Project Manager:	DICK KARKKAINEN
Sampled By:	Y. GOH/M. OLSON

ANALYTICAL TECHNOLOGIES, INC. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

Analysis Report

Analysis: TCLP HAZARDOUS WASTE EVALUATION, METALS

Accession:	311405
Client:	WOODWARD-CLYDE CONSULTANTS
Project Number:	92B007C-4001
Project Name:	VICKSBURG CHEMICAL
Project Location:	VICKSBURG, MS.
Department:	METALS

ANALYTICAL TECHNOLOGIES, INC. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

Date 23-Nov-93

Accession: 311405
Client: WOODWARD-CLYDE CONSULTANTS
Project Number: 92B007C-4001
Project Name: VICKSBURG CHEMICAL
Project Location: VICKSBURG, MS.
Test: TCLP HAZARDOUS WASTE EVALUATION, METALS
Matrix: NON-AQUEOUS LEACHATE
QC Level: II

Lab Id: 001
Client Sample Id: NORTH POND
Sample Date/Time: 09-NOV-93 1630
Received Date: 12-NOV-93

Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
SILVER, TCLP (6010)	MG/L	ND	0.5		A6T099	JLH
ARSENIC, TCLP (6010)	MG/L	ND	0.5		R6T099	JLH
BARIUM, TCLP (6010)	MG/L	ND	10		B6T099	JLH
CADMIUM, TCLP (6010)	MG/L	ND	0.1		C6T099	JLH
CHROMIUM, TCLP (6010)	MG/L	ND	0.5		H6T099	JLH
MERCURY, TCLP (7470)	MG/L	ND	0.002		M7T058	JP
LEAD, TCLP (6010)	MG/L	ND	0.5		P6T099	JLH
SELENIUM, TCLP (6010)	MG/L	ND	0.1		S6T099	JLH

Comments:

ANALYTICAL TECHNOLOGIES, INC. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

Analysis Report

Analysis: TCLP PESTICIDES

Accession:	311405
Client:	WOODWARD-CLYDE CONSULTANTS
Project Number:	92B007C-4001
Project Name:	VICKSBURG CHEMICAL
Project Location:	VICKSBURG, MS.
Department:	PESTICIDES

ANALYTICAL TECHNOLOGIES, INC. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

Date 23-Nov-93

Accession: 311405
Client: WOODWARD-CLYDE CONSULTANTS
Project Number: 92B007C-4001
Project Name: VICKSBURG CHEMICAL
Project Location: VICKSBURG, MS.
Test: TCLP PESTICIDES
Analysis Method: 8080, SW 846, 3rd Edition, September 1986 and Rev. 1, July 1992.
Extraction Method: 1311 / 3510 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.
Matrix: NON-AQUEOUS LEACHATE
QC Level: I

Lab Id: 001
Client Sample Id: NORTH POND
Sample Date/Time: 09-NOV-93 1630
Received Date: 12-NOV-93

Batch: PSW292
Blank: A
Dry Weight %: N/A
Extraction Date: 17-NOV-93
Analysis Date: 23-NOV-93

Parameter:	Units:	Results:	Rpt Lmts:	Q:
CHLORDANE	UG/L	ND	0.5	
ENDRIN	UG/L	ND	0.10	
HEPTACHLOR	UG/L	ND	0.05	
HEPTACHLOR EPOXIDE	UG/L	ND	0.05	
LINDANE	UG/L	ND	0.05	
METHOXYCHLOR	UG/L	ND	0.5	
TOXAPHENE	UG/L	ND	3.0	
DCB	%REC/SURR	26	22-147	
TCMX	%REC/SURR	41	14-134	
ANALYST	INITIALS	CG		

Comments:

ANALYTICAL TECHNOLOGIES, INC. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

Analysis Report

Analysis: TCLP HERBICIDES

Accession:	311405
Client:	WOODWARD-CLYDE CONSULTANTS
Project Number:	92B007C-4001
Project Name:	VICKSBURG CHEMICAL
Project Location:	VICKSBURG, MS.
Department:	PESTICIDES

ANALYTICAL TECHNOLOGIES, INC. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

Accession: 311405
Client: WOODWARD-CLYDE CONSULTANTS
Project Number: 92B007C-4001
Project Name: VICKSBURG CHEMICAL
Project Location: VICKSBURG, MS.
Test: TCLP HERBICIDES
Analysis Method: 8150, SW 846, 3rd Edition, September 1986 and Rev. 1, July 1992.
Extraction Method: 1311 / 8150 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.
Matrix: NON-AQUEOUS LEACHATE
QC Level: II

Lab Id: 001
Client Sample Id: NORTH POND
Sample Date/Time: 09-NOV-93 1630
Received Date: 12-NOV-93

Batch: HEW061
Blank: A
Dry Weight %: N/A
Extraction Date: 17-NOV-93
Analysis Date: 22-NOV-93

Parameter:	Units:	Results:	Rpt Lmts:	Q:
2,4-DICHLOROPHENOXYACETIC ACID	UG/L	ND	10	
2,4,5-TP (SILVEX)	UG/L	ND	2.0	
DCAA	%REC/SURR	116	47-137	
ANALYST	INITIALS	CG		

Comments:

ANALYTICAL TECHNOLOGIES, INC. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

Analysis Report

Analysis: TCLP VOLATILES (8240)

Accession:	311405
Client:	WOODWARD-CLYDE CONSULTANTS
Project Number:	92B007C-4001
Project Name:	VICKSBURG CHEMICAL
Project Location:	VICKSBURG, MS.
Department:	ORGANIC/MS

ANALYTICAL TECHNOLOGIES, INC. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

Date 23-Nov-93

Accession: 311405
Client: WOODWARD-CLYDE CONSULTANTS
Project Number: 92B007C-4001
Project Name: VICKSBURG CHEMICAL
Project Location: VICKSBURG, MS.
Test: TCLP VOLATILES (8240)
Analysis Method: 8240, SW 846, 3rd Edition, September 1986 and Rev. 1, July 1992.
Extraction Method: 1311 / SW-846, 3rd Edition, September 1986, and Rev. 1, July 1992.
Matrix: NON-AQUEOUS LEACHATE
QC Level: II

Lab Id: 001
Client Sample Id: NORTH POND
Sample Date/Time: 09-NOV-93 1630
Received Date: 12-NOV-93

Batch: VIW152
Blank: B
Dry Weight %: N/A
Extraction Date: 18-NOV-93
Analysis Date: 19-NOV-93

Parameter:	Units:	Results:	Rpt Lmts:	Q:
BENZENE	MG/L	ND	0.001	
CARBON TETRACHLORIDE	MG/L	0.029	0.002	
CHLOROBENZENE	MG/L	ND	0.001	
CHLOROFORM	MG/L	0.44	0.02	
1,4-DICHLOROBENZENE	MG/L	ND	0.002	
1,2-DICHLOROETHANE	MG/L	ND	0.002	
1,1 DICHLOROETHYLENE	MG/L	ND	0.002	
METHYL ETHYL KETONE	MG/L	ND	0.010	
TETRACHLOROETHYLENE	MG/L	ND	0.002	
TRICHLOROETHYLENE	MG/L	ND	0.001	
VINYL CHLORIDE	MG/L	ND	0.001	
BROMOFLUOROBENZENE	%REC/SURR	100	86-115	
1,2-DICHLOROETHANE-D4	%REC/SURR	106	76-114	
TOLUENE-D8	%REC/SURR	97	88-115	
ANALYST	INITIALS	LP		

Comments:

ANALYTICAL TECHNOLOGIES, INC. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

"Method Report Summary"

Accession Number: 311405
Client: WOODWARD-CLYDE CONSULTANTS
Project Number: 92B007C-4001
Project Name: VICKSBURG CHEMICAL
Project Location: VICKSBURG, MS.
Test: TCLP VOLATILES (8240)

Client Sample Id:	Parameter:	Unit:	Result:
NORTH POND	CARBON TETRACHLORIDE	MG/L	0.029
	CHLOROFORM	MG/L	0.44

ANALYTICAL TECHNOLOGIES, INC. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

Analysis Report

Analysis: TCLP ACID & BASE EXTRACTABLES (8270)

Accession:	311405
Client:	WOODWARD-CLYDE CONSULTANTS
Project Number:	92B007C-4001
Project Name:	VICKSBURG CHEMICAL
Project Location:	VICKSBURG, MS.
Department:	ORGANIC/MS

ANALYTICAL TECHNOLOGIES, INC. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

Date 10-Dec-93

Accession: 311405
Client: WOODWARD-CLYDE CONSULTANTS
Project Number: 92B007C-4001
Project Name: VICKSBURG CHEMICAL
Project Location: VICKSBURG, MS.
Test: TCLP ACID & BASE EXTRACTABLES (8270)
Analysis Method: 8270, SW 846, 3rd Edition, September 1986 and Rev. 1, July 1992.
Extraction Method: 1311 / 3520 / SW-846, 3rd Edition, September 1986 and Rev. 1, July 1992.
Matrix: NON-AQUEOUS LEACHATE
QC Level: II

Lab Id: 001
Client Sample Id: NORTH POND
Sample Date/Time: 09-NOV-93 1630
Received Date: 12-NOV-93

Batch: ALW188
Blank: A
Dry Weight %: N/A
Extraction Date: 16-NOV-93
Analysis Date: 23-NOV-93

Parameter:	Units:	Results:	Rpt Lmts:	Q:
CRESOL, TOTAL	MG/L	ND	0.05	
O-CRESOL	MG/L	ND	0.05	
M,P CRESOL	MG/L	ND	0.05	
PENTACHLOROPHENOL	MG/L	ND	0.05	
2,4,5-TRICHLOROPHENOL	MG/L	ND	0.05	
2,4,6-TRICHLOROPHENOL	MG/L	ND	0.05	
2,4-DINITROTOLUENE	MG/L	ND	0.02	
HEXACHLOROBENZENE	MG/L	ND	0.02	
HEXACHLOROBUTADIENE	MG/L	ND	0.02	
HEXACHLOROETHANE	MG/L	ND	0.02	
NITROBENZENE	MG/L	ND	0.02	
PYRIDINE	MG/L	ND	0.02	
2-FLUOROPHENOL	%REC/SURR	44	21-100	
PHENOL-D6	%REC/SURR	52	10-100	
2,4,6-TRIBROMOPHENOL	%REC/SURR	60	10-123	
2-FLUOROBIPHENYL	%REC/SURR	95	43-116	
NITROBENZENE-D5	%REC/SURR	86	35-114	
TERPHENYL-D14	%REC/SURR	97	33-141	
ANALYST	INITIALS	LD		

Comments:

- NORTH POND RFI FIELD INVESTIGATION WORKPLAN
- DATA COLLECTION QUALITY ASSURANCE PLAN
- DATA MANAGEMENT PLAN
- HEALTH AND SAFETY PLAN

VICKSBURG CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

October 1993

Woodward-Clyde Consultants

Consulting Engineers, Geologists, and Environmental Scientists
2822 O'Neal Lane, Baton Rouge, LA 70896

NORTH POND RCRA FACILITY INVESTIGATION WORKPLAN

VICKSBURG CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

October 1993

Woodward-Clyde

Woodward-Clyde Consultants
2822 O'Neal Lane (70816)
P.O. Box 66317 (70896)
Baton Rouge, Louisiana

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LIST OF FIGURES

Figure 1 RFI Background Sampling Locations
Figure 2 RFI Field Investigation Sampling Locations
Figure 3 RFI Work Plan Schedule

1.0
INTRODUCTION

Vicksburg Chemical Corporation (VCC) has retained Woodward-Clyde Consultants (WCC) to perform activities associated with a RCRA corrective action program. The corrective action program is in response to a Consent Decree. The Consent Decree requires that a RCRA Facility Investigation (RFI) be conducted at the Vicksburg, Mississippi manufacturing facility.

The purpose of the RFI is to determine the nature and extent of releases of hazardous wastes and/or constituents from regulated units, solid waste management units (SWMUs), and other areas of concern (AOCs) at the facility and to gather all necessary data to support a Corrective Measures Study.

The RFI constitutes the second phase of the RCRA corrective action program. The program's initial phase consists of the RCRA Facility Assessment (RFA) which is conducted by EPA and precedes the RFI. The RFI itself is divided into five separate tasks which includes the Preliminary Report (previously submitted as a separate document), the RFI Work Plan, the Facility Investigation, and the Investigative Analysis and Reports. In addition to these phases, a Groundwater Assessment Work Plan and Annual Groundwater Assessment Reports are required by the Consent Decree.

This document is the RFI Work Plan for the North Pond and includes the following plans:

- Site Characterization Plan
- Data Collection Quality Assurance Plan
- Data Management Plan
- Health and Safety Plan

The RFI Work Plan for the North Pond is guided by the information contained in the Preliminary Report (Report of Current Conditions) and is expedited because of VCC's plans to construct a new manufacturing facility in the vicinity of the North Pond.

In conjunction with the development of the RFI Work Plan, a draft Preinvestigation Evaluation of Corrective Measure Technologies (PECMT) Report has been developed. The PECMT report identifies the potential corrective measures technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination. This report also identifies the field, laboratory, bench, or pilot scale data that needs to be collected during the field investigation to facilitate the evaluation and selection of the final corrective measure or measures. The PECMT Report will be submitted as a separate document on a schedule to be determined by activity of the U.S. EPA.

The RCRA Facility Investigation is intended to obtain information to characterize the nature and extent of releases of hazardous waste or constituents, if any. This information will be used to determine whether a Corrective Measures Study (CMS) will be necessary. The purpose of a CMS is to develop and evaluate the corrective action alternatives and to recommend the corrective measure or measures to be taken at the facility. The CMS will combine information obtained during RFI sampling and technology evaluated in the PECMT, if necessary, would be the final step in the RCRA corrective action program for the VCC facility.

Prior to determination of a long term solution for the facility, Interim Measures will be taken. The purpose of Interim Measures is to mitigate the potential threat to human health and the environment. An Interim Measures Work Plan has been developed as a separate document by WCC for VCC and was submitted to the U.S. EPA in May 1992. No interim measures are involved with the North Pond.

2.0
NORTH POND RFI WORK PLAN STRATEGY

The Preliminary Report provides an overview of the investigations and analyses to date. These efforts were undertaken to characterize the potential contaminants of concern as well as the environmental setting and to determine those areas requiring additional investigation. Completed work tasks include:

- Compilation of site background information
- Review of facility's history and file data
- Characterization of the facility's environmental setting
- Establishment of boundaries of SWMUs and AOCs
- Identification of surface SWMUs not requiring further investigation
- Characterization of waste sources to fullest extent possible
- Identification of Potential Receptor Population

The North Pond RFI Work Plan objectives, strategy, and approach are presented below. Several attached plans are needed to insure an accurate and complete field investigation of the facility. These attached plans include the following:

- Data Collection Quality Assurance Plan
- Data Management Plan
- Health and Safety Plan

2.1 RFI WORK PLAN OBJECTIVES

The primary objectives for the North Pond RFI Work Plan shall be to provide procedures for collecting information as necessary to protect human health and the environment. Specifically, these objectives are to:

- Identify specific constituents of concern.
- Determine whether or not the North Pond is releasing hazardous constituents into the environment.
- If a release of hazardous constituents is occurring, identify the source(s) of contamination.
- Determine the horizontal and vertical extent of contamination.
- Evaluate migration rates, pathways, and potential receptors.
- Provide data for the evaluation of remedial alternatives and associated health risk assessments for the site.
- Determine if the construction of a manufacturing facility in the vicinity of the North Pond and perhaps atop the North Pond area would interfere with any remedial measures required.

These objectives will be obtained by establishing data quality objectives to be met during the investigation and then implementing the North Pond RFI Work Plan as discussed in the Section 4.0 Project Schedule. For quality objectives, strict quality assurance and quality control (QA/QC) procedures will be followed as delineated in the Data Collection Quality Assurance Plan.

2.2 RFI WORK PLAN RATIONALE

The rationale which forms the basis for the work plan described below is based on WCC's present knowledge.

The location of the North Pond is shown in Figure 1. Boundaries are defined in the Preliminary Report. The environmental setting and potential receptors/pathways are generally understood. The question of groundwater contamination and plume migration within the entire VCC facility will also be studied in the Groundwater Assessment Program. Additional information to be gathered includes the following:

- The vertical and horizontal extent of releases that have or are occurring within the North Pond boundaries which could potentially impact human health or the environment.

- The transport mechanisms, rates, and pathways for migration of hazardous constituents from the North Pond.

3.0
SITE CHARACTERIZATION PLAN

The overall approach is designed to accomplish the objectives as stated in Section 2.1.

3.1 SAMPLING

The primary purpose of the sampling will be to determine if the North Pond is releasing hazardous constituents into the environment and to confirm the constituents of concern. To accomplish this, the effort will involve specific field sampling, data assessment, and development of a field investigation report which summarizes the results of the work.

The general location of the North Pond is depicted in Figure 1.

The plan view of the North Pond along with the geotechnical borings (B-1 through B-15) that have been made in order to design the foundations of the new manufacturing facility are shown in Figure 2. During the geotechnical boring program, composite soil samples were obtained and submitted for chemical analysis. The following chemicals were detected:

- Bromodichloromethane
- Bromoform
- Carbon tetrachloride
- Chloroform
- 1,1-dichloroethane
- cis-1,3-dichloropropane
- Tetrachloroethene
- Trichloroethene

The North Pond was a former holding basin for effluent from the North Plant.

The generalized soils profile developed from the geotechnical borings in the North Pond area is shown on Figures 3 and 4. The stratigraphy is consistent with that developed

around the inactive disposal area and surface impoundment in the South Plant. In the assessment work to date there is indication that the uppermost aquifier contains two zones in which water is encountered. The investigation will provide information on the hydraulic communication between the zones.

The general strategy is to perform environmental borings from the surface (110 to 130 feet msl) to auger refusal (approximately 60 feet msl) and continuously sample. A field screening instrument (microtip - PID) will be utilized to help determine which soil samples are sent for chemical analysis. For each boring location at least two samples will be sent for chemical analysis:

- The 2- to 5-foot interval just above the clay lens separating the two groundwater zones

- The 2- to 5-foot interval just above auger refusal, that is, the marl interface.

As sample will also be sent for chemical analysis if during field screening it is apparent there is greater contamination present at some sample interval from the surface to the clay lens than the sample interval just above the clay lens. An additional sample will be sent for chemical analysis if during field screening it is apparent there is greater contamination present at some sample interval from the clay lens to the marl than the sample interval just above the marl. There are six environmental boring locations; they are shown on Figures 2, 3, and 4.

After completion of the borings, two nested piezometers will be installed at each location (except location B-24 where there is one piezometer existing). One piezometer will be screened in the 10-foot interval just above the clay lens. The other piezometer will be screened in the 10-foot interval just above the marl. The piezometers will be baled after taking water elevation levels and groundwater samples will be taken from each for chemical analysis.

The sampling and analysis program is summarized in Tables 1 and 2. The program may be expanded in the field as conditions warrant.

3.2 EVALUATION OF DATA

Upon completion of the field investigation of Phase I, the next step will involve the analysis of data collected during the first task. Methods, procedures and data base tools, detailed in the Data Management Plan, will be implemented to ascertain trends, constituents of concern, and possible indications of release.

The analysis of data will be summarized and presented to the VCC in a report. The report will discuss the sampling and analytical results and present the data in a concise manner along with conclusions and recommendations. In the event that a release or potential release of established contaminants of concern is not indicated, the report could include recommendations for no further action. If a release is indicated, recommendations would include submittal of conceptual plans for corrective action and recommendations on manufacturing facility construction activities to avoid interference with the corrective action, which may take place subsequent to completion of the manufacturing facility construction activity. The report would include recommendations for aquifer testing to allow detailed design of corrective action. Depending on the findings of Phase I, the report may also include a detailed Phase II plan to fully determine the extent of contamination. Phase II may be conducted as a part of, and in conjuction with, the RCRA Facility Investigation for the entire VCC Facility.

4.0
PROJECT SCHEDULE

4.1 NORTH POND RFI FIELD INVESTIGATION WORK PLAN SCHEDULE

The schedule for the completion of the project is as follows:

- Week of October 18, 1993 - Finalize plan and purpose for field work.
- Week of October 25, 1993 - Begin borings, soil sampling, and piezometer installation. Send samples to Analytical Technologies, Inc. in Pensacola, Florida for analysis.
- Week of November 15, 1993 - Complete groundwater sampling. Send samples to Analytical Technologies, Inc. in Pensacola, Florida for analysis.
- Week of December 6, 1993 - Receive results of soil analyses.
- Week of December 13, 1993 - Receive results of groundwater analses.
- Week of December 20, 1993 - Finalize first draft of North Pond RFI Field Investigaiton Report. Data validation may not be complete in first draft.

The rationale, approach, and strategy for the RFI discussed above will be implemented in accordance with the attached Data Collection Quality Assurance Plan, Health and Safety Plan, and Data Management Plan. Minor changes in the procedures outlined in these plans will be documented.

4.2 NORTH POND RFI FIELD INVESTIGATION REPORTS

A report will be compiled at the conclusion of the field investigation. The report will include the following:

- Discussion of work accomplished to date
- Summary of findings
- Conclusions and recommendations
- Supporting analytical and field data

In addition, the interim reports will include discussion of QA/QC results, changes in project personnel and any new significant issues that would impact the North Pond RFI. It is anticipated that each report will have appropriate drawings, tables, figures, charts, bar graphs, maps, cross-sections, and other diagrams as needed to allow for a clear understanding of the nature and extent of any potential contaminations that may exist at the site.

5.0
PROJECT MANAGEMENT PLAN

The Project Management Plan consists of the following elements:

- Project task definition
- Specific personnel positions within the project organizational structure

5.1 PROJECT TASK DEFINITION

Vicksburg Chemical Corporation (VCC) has retained the services of Woodward-Clyde Consultants (WCC) to develop the North Pond RFI Field Investigation Plan and associated plans and complete the field investigation phases of the RFI.

5.2 PROJECT PERSONNEL

Duties of key personnel are described below.

5.2.1 Vicksburg Chemical Project Director

The Vicksburg Chemical Project Director is Steve Boswell and is the official representative for VCC. He is in charge of administration of the work and the completion of the project.

5.2.2 Woodward-Clyde Consultants (WCC) Project Manager

The WCC Project Manager will develop the plans required and oversee implementing the work plan on behalf of Vicksburg Chemical, and will be the primary contact with the Vicksburg Chemical. The WCC Project Manager is Richard D. Karkkainen. Mr. Karkkainen is an experienced remedial manager and is a Vice President and Principal in WCC.

5.2.3 WCC North Pond RFI Field Investigation Site Coordinator

The WCC North Pond RFI Field Investigation Site Coordinator will handle day to day work plan activities. He will coordinate efforts and oversee and assist their implementation. The WCC site coordinator is Dr. Yong Goh. His Ph.D. degree is in soil chemistry and he has extensive experience in groundwater assessments, field sampling and RCRA site evaluations.

5.2.4 WCC Health and Safety Officer

A WCC Health and Safety (H&S) officer will be responsible for the administration and implementation of site Health and Safety for work plan activities. The H&S officer will have the overall responsibility for safety and health and will:

- Ensure that an employee medical surveillance program which meets the requirements of 29 CFR 1910.120 is instituted and maintained.

- Be responsible for the initial pre-construction indoctrination of all on-site personnel with regard to the H&S Plan and other safety requirements to be observed during the construction, including but not limited to:
  - potential hazards
  - personal hygiene principles
  - personnel protective equipment
  - respiratory protection equipment usage and fit testing, and
  - emergency response including site evacuation, dealing with fire and medical situations

- Be responsible for the maintenance of separate exclusion, contamination reduction, and support zones as described in the Contractor's H&S Plan and, if appropriate.

- Ensure that personnel exposure air monitoring is properly conducted and recorded when appropriate.

- Maintain a record keeping system which will include daily records of all site activity, waste quantities produced, waste transportation activity information, laboratory results, and other information as required when appropriate.

5.2.5 QA/QC Manager

The QA/QC Manager will be responsible for coordination with the analytical laboratory and for validation of data.

TABLES

TABLE 1

Location (See Figures 2, 3, and 4) Approximate Surface Elevation (msl)	Environmental Soil Sampling for Lab Analysis (Discussion)	Piezometer Installation
x 130 feet	Composite sample within pond by hand augering through 5 feet of sludge. Four sample points-one composite sample for TCLP analysis. If sludge is deeper than 5 feet another sample is to be taken for the deeper interval. Assumption is that sludge will not be adequate. Foundation material will have to be removed.	None
B-19 130 feet	Drill to refusal (marl at approximately 60 feet msl). Soil sample for analysis at approximately 100 to 105 feet msl. If during field screening there is greater contamination evident from 130 to 105 feet msl, then also submit for lab analysis the 5-foot interval with the highest reading. Soil sample for analysis at approximately 60 to 65 feet msl. If during field screening there is greater contamination evident from 100 to 65 feet msl, then also submit for lab analysis the 5-foot interval with the highest reading.	Temporary Nested Piezometers 130 to 100 feet msl screen bottom 10 feet 130 - 60 feet msl screen bottom 10 feet
B-20 130 feet	Drill to refusal (marl at approximately 60 feet msl) Soil sample for analysis at approximately 95 to 100 feet msl. If during field screening there is greater contamination evident from 130 to 100 feet msl, then also submit for lab analysis the 5-foot interval with the highest reading. Soil sample for analysis at approximately 60 to 65 feet msl. If during field screening there is greater contamination evident from 95 to 65 feet msl, then also submit for lab analysis the 5-foot interval with the highest reading.	Temporary Nested Piezometers 130 to 95 feet msl screen bottom 10 feet 130 to 60 feet msl screen bottom 10 feet

TABLE 1 (Continued)

Location (See Figures 2, 3, and 4) Approximate Surface Elevation (msl)	Environmental Soil Sampling for Lab Analysis (Discussion)	Piezometer Installation
B-21 113 feet	Drill to refusal (marl at approximately 60 feet msl) Soil sample for analysis at approximately 95 to 100 feet msl. If during field screening there is greater contamination evident from 113 to 100 feet msl, then also submit for lab analysis the 5-foot interval with the highest reading. Soil sample for analysis at approximately 60 to 65 feet msl. If during field screening there is greater contamination evident from 95 to 65 feet msl, then also submit for lab analysis the 5-foot interval with the highest reading.	Permanent Nested Piezometers 113 to 95 feet msl screen bottom 10 feet 113 to 60 feet msl screen bottom 10 feet
B-22 110 feet	Drill to refusal (marl at approximately 60 feet msl) Soil sample for analysis at approximately 85 to 95 feet msl. If during field screening there is greater contamination evident from 110 to 90 feet msl, then also submit for lab analysis the 5-foot interval with the highest reading. Soil sample for analysis at approximately 60 to 65 feet msl. If during field screening there is greater contamination evident from 85 to 65 feet msl, then also submit for lab analysis the 5-foot interval with the highest reading.	Permanent Nested Piezometers 110 to 85 feet msl screen bottom 10 feet 110 to 60 feet msl screen bottom 10 feet

TABLE 1 (Continued)

Location (See Figures 2, 3, and 4) Approximate Surface Elevation (msl)	Environmental Soil Sampling for Lab Analysis (Discussion)	Piezometer Installation
B-23 110 feet	Drill to refusal (marl at approximately 60 feet msl) Soil sample for analysis at approximately 85 to 90 feet msl. If during field screening there is greater contamination evident from 110 to 90 feet msl, then also submit for lab analysis the 5-foot interval with the highest reading. Soil sample for analysis at approximately 60 to 65 feet msl. If during field screening there is greater contamination evident from 85 to 65 feet msl, then also submit for lab analysis the 5-foot interval with the highest reading.	Permanent Piezometers 110 to 85 feet msl screen bottom 10 feet 110 to 60 feet msl screen bottom 10 feet
B-24 100 feet	Drill to refusal (marl at approximately 60 feet msl) Soil sample for analysis at approximately 85 to 90 feet msl. If during field screening there is greater contamination evident from 110 to 90 feet msl, then also submit for lab analysis the 5-foot interval with the highest reading. Soil sample for analysis at approximately 60 to 65 feet msl. If during field screening there is greater contamination evident from 85 to 65 feet msl, then also submit for lab analysis the 5-foot interval with the highest reading.	Permanent Piezometers 110 to 85 feet msl screen bottom 10 feet An existing piezometer (PZ-4) at B-24 Location from 110 to 60 feet msl is screened in the bottom 10 feet

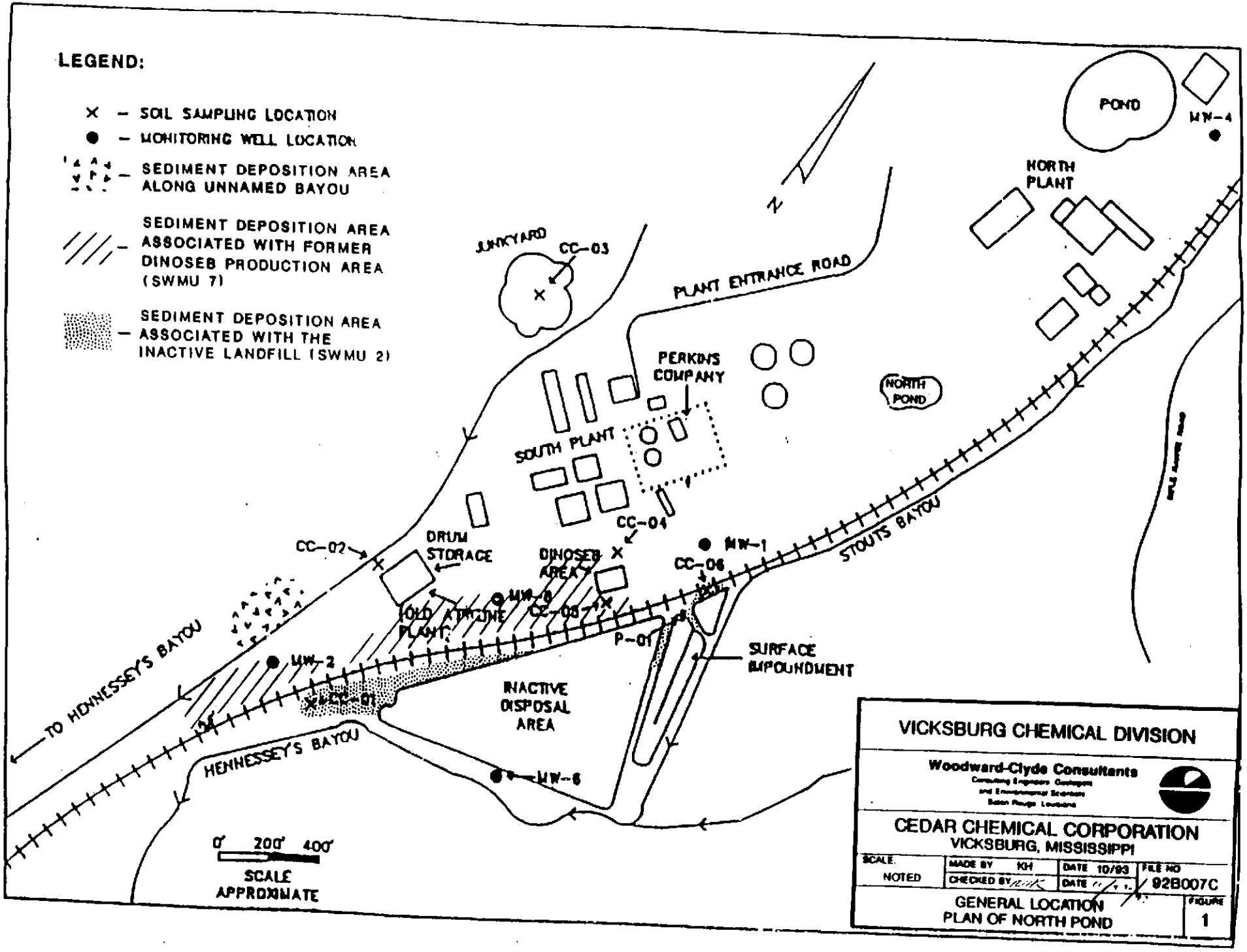
TABLE 2

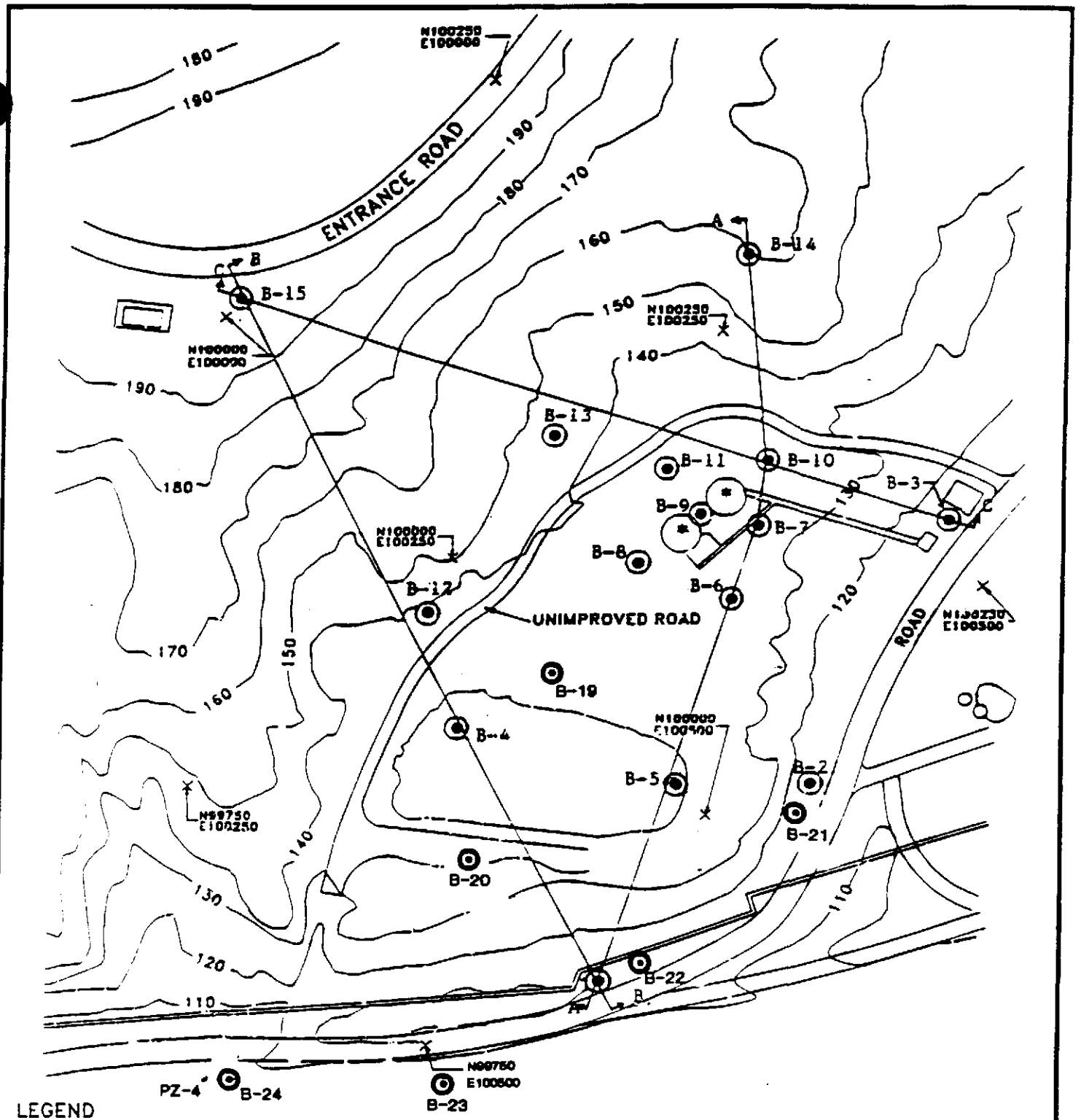
SOILS SAMPLE SUMMARY:				
Number	**Analysis**	**Container Size/Type**	**Preservation**	**Holding Time**
1	TCLP 1311	32 ounce glass	Cool 4° C	7 days
10 (but as high as 20)	VOA CLP	4 ounce glass teflon lined cap	Cool 4° C	10 days
	Semi-VOA CLP	8 ounce glass teflon lined cap	Cool 4° C	10 days
	Metals CLP	4 ounce glass teflon lined cap	Cool 4° C	6 months
GROUNDWATER SAMPLE SUMMARY:				
10	VOA CLP	2 to 5 ml glass teflon lined septum	Cool 4° C	10 days
	Semi-VOA CLP	1 liter glass teflon lined cap	Cool 4° C	10 days
	Metals CLP	4 ounce glass teflon lined cap	Cool 4° C	6 months

QA/QC:

Soil:
- 1 matrix spike
- 1 matrix spike duplicate
- 1 rinsate
- 1 trip

Groundwater:
- 1 matrix spike
- 1 matrix spike duplicate
- 1 field blank
- 1 trip


LEGEND:
X – SOIL SAMPLING LOCATION
● – MONITORING WELL LOCATION
SEDIMENT DEPOSITION AREA ALONG UNNAMED BAYOU
SEDIMENT DEPOSITION AREA ASSOCIATED WITH FORMER DINOSEB PRODUCTION AREA (SWMU 7)
SEDIMENT DEPOSITION AREA ASSOCIATED WITH THE INACTIVE LANDFILL (SWMU 2)
N
POND
MW-4
NORTH PLANT
JUNKYARD
CC-03
PLANT ENTRANCE ROAD
PERKINS COMPANY
NORTH POND
SOUTH PLANT
CC-04
DRUM STORAGE
CC-02
DINOSEB AREA
MW-1
CC-06
STOUTS BAYOU
OLD ATRAZINE PLANT
MW-5
CC-05
P-01
SURFACE IMPOUNDMENT
TO HENNESSEY'S BAYOU
MW-2
CC-01
INACTIVE DISPOSAL AREA
HENNESSEY'S BAYOU
MW-6
0' 200' 400'
SCALE APPROXIMATE
VICKSBURG CHEMICAL DIVISION
Woodward-Clyde Consultants
CEDAR CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI
SCALE NOTED
MADE BY KH
DATE 10/93
CHECKED BY
DATE
FILE NO 92B007C
GENERAL LOCATION PLAN OF NORTH POND
FIGURE 1



LEGEND

- * ABANDONED FUEL OIL TANK
- GEOTECHNICAL BORINGS
- ENVIRONMENTAL BORINGS & PIEZOMETER LOCATION

REFERENCE : SOIL TESTING ENGINEERS, INC. FILE NO. 93-3076

SCALE

100 0 100 200 FEET

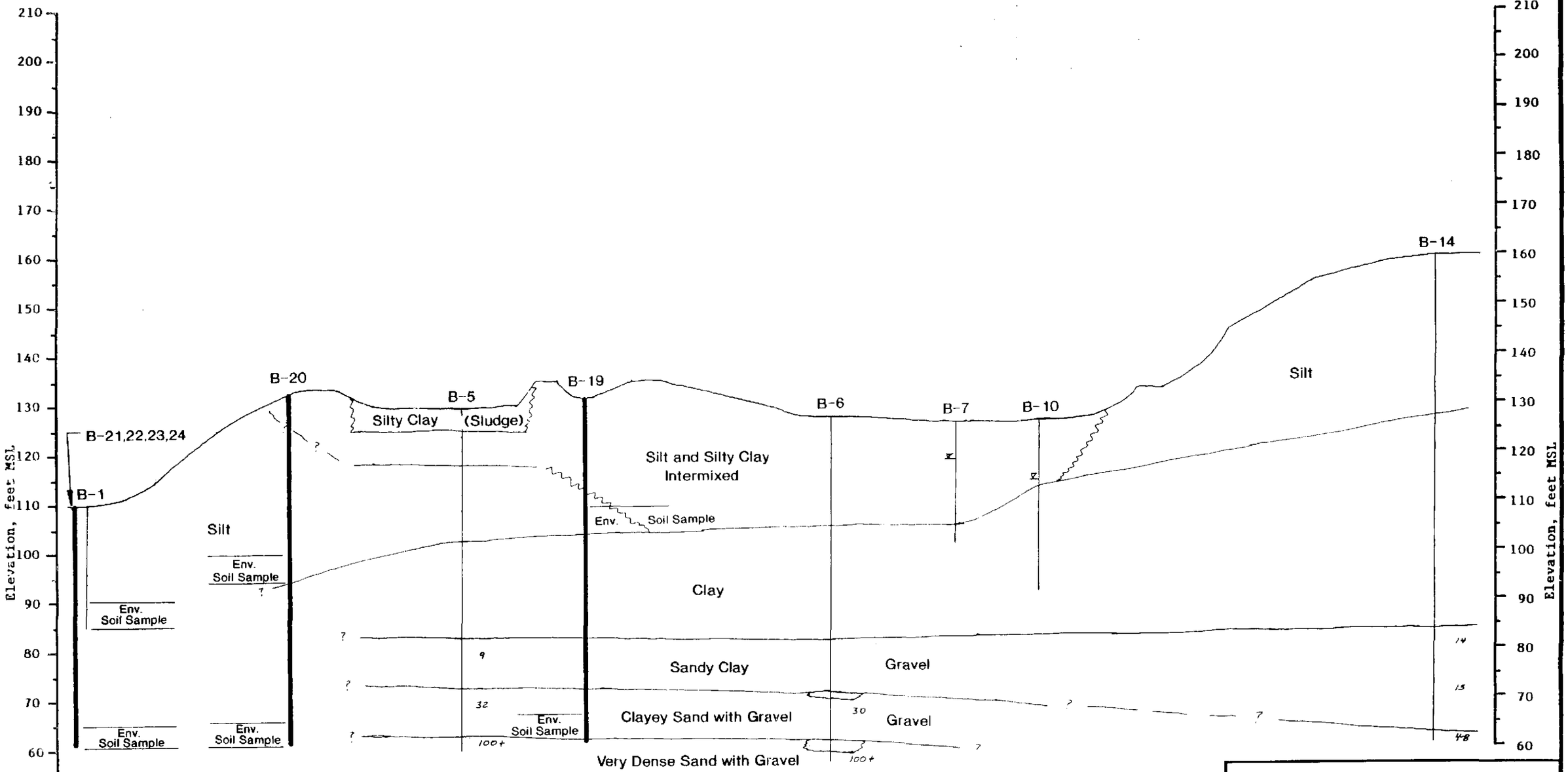
CEDAR CHEMICAL
VICKSBURG, MISSISSIPPI

Woodward-Clyde Consultants
Consulting Engineers, Geologists and Environmental Scientists
Baton Rouge, Louisiana

SCALE:	DRAWN BY: KH	DATE: 10/93
NOTED	CHKD. BY: RDK	DATE: 10/22/93

FILE NO. 92B007C

FIG. NO. 2



ENVIRONMENTAL BORINGS & PIEZOMETER LOCATIONS

GEOTECHNICAL BORINGS

GENERALIZED SOILS PROFILE

SECTION A-A
Horizontal Scale: 1"=40'
Vertical Scale: 1"=20'

STE
Soil Testing Engineers, Inc.

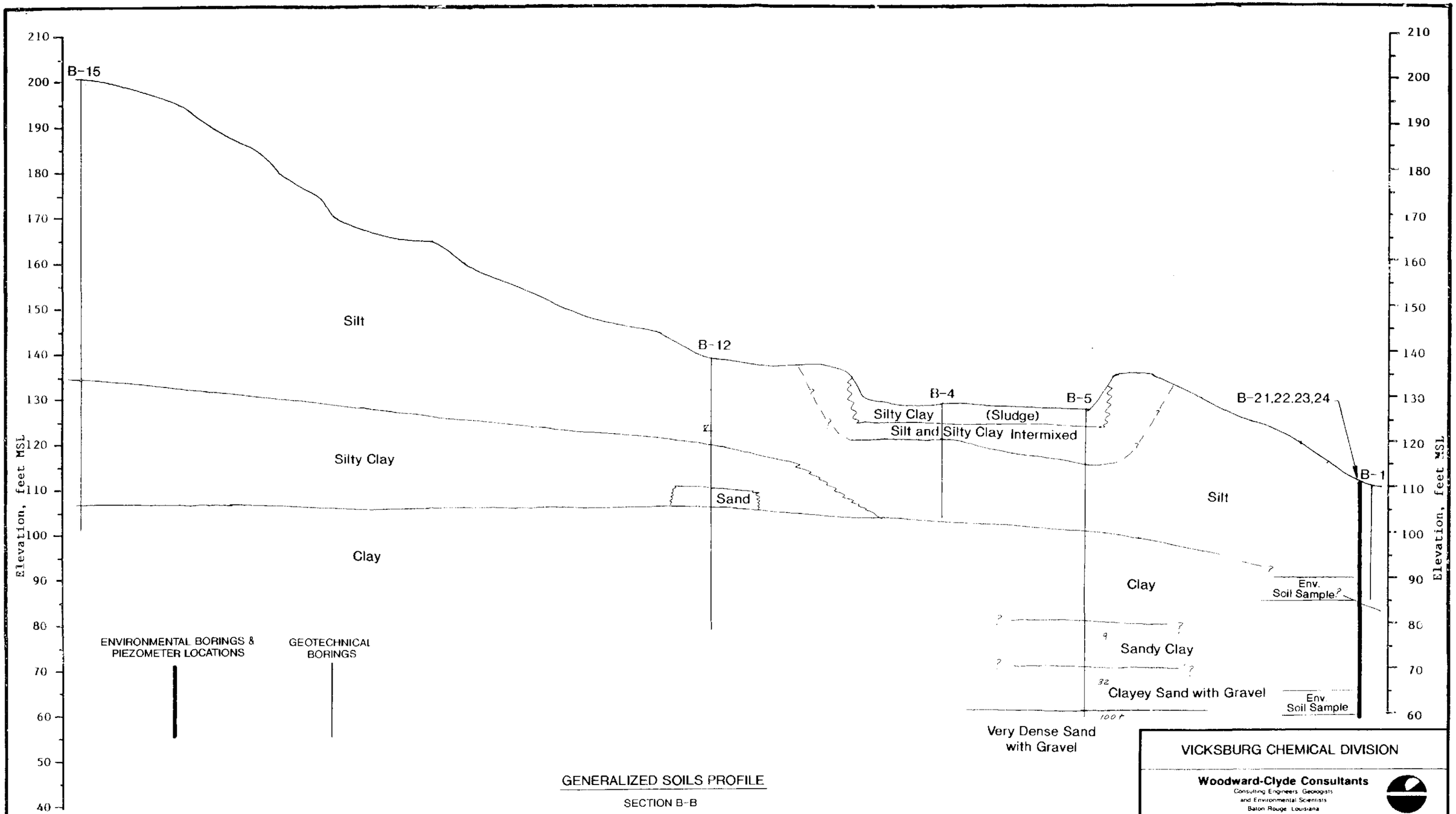
VICKSBURG CHEMICAL DIVISION

Woodward-Clyde Consultants
Consulting Engineers, Geologists and Environmental Scientists
Baton Rouge, Louisiana

CEDAR CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

SCALE	MADE BY KH	DATE 10/93	FILE NO
NOTED	CHECKED BY RDK	DATE 11/22/93	92B007C

FIGURE 3



GENERALIZED SOILS PROFILE

SECTION B-B

Horizontal Scale: 1"=40'

Vertical Scale: 1"=20'

STE
Soil Testing Engineers, Inc.

VICKSBURG CHEMICAL DIVISION

Woodward-Clyde Consultants
Consulting Engineers Geologists and Environmental Scientists
Baton Rouge Louisiana

CEDAR CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

SCALE:	MADE BY KH	DATE 10/93	FILE NO
NOTED	CHECKED BY RVK	DATE 7/22/93	92B007C

FIGURE 4

DATA COLLECTION QUALITY ASSURANCE PLAN

VICKSBURG CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

October 1993

Woodward-Clyde

Woodward-Clyde Consultants
2822 O'Neal Lane (70816)
P.O. Box 66317 (70896)
Baton Rouge, Louisiana

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1.0
INTRODUCTION

The Vicksburg Chemical Corporation manufacturing facility (VCC) is located in Vicksburg, Mississippi. The facility is a manufacturer of chemicals. An U.S. Environmental Protection Agency (EPA) Determination of Release was issued for the facility in December, 1989. Negotiations for a Consent Decree began in January, 1990.

VCC has retained Woodward-Clyde Consultants (WCC) to perform an investigation that is technically consistent with a RCRA Facility Investigation (RFI) at the North Pond of the Vicksburg facility. WCC will conduct the investigation in compliance with the guidelines of the Consent Decree. Among the requirements and/or guidelines include in the decree are procedures to control the quality of data acquired in during the investigation. This document presents the overall approach that WCC will undertake to verify that the information, data, and procured results meets the quality objectives. A detailed discussion of sampling procedures and methodologies for specific media is also given. For information on the description and background of the RFI for the entire facility, refer to the Preliminary Report.

2.0
DATA COLLECTION OBJECTIVES

2.1 DATA OBJECTIVES

The primary objectives of the North Pond RFI are as follows:

- Identify or verify the contaminants of concern for the North Pond area.
- Determine whether or not the North Pond area is releasing hazardous constituents into the environment.
- Identify the source of contamination
- Determine vertical and horizontal extent of contamination.
- Collect data to be used in determining the necessity and feasibility of corrective action measures.

To meet the overall objectives of the investigation, WCC will collect subsurface soil and groundwater samples. The following sections present the data requirements and strategy for collection of samples from each media.

2.2 QUALITY ASSURANCE OBJECTIVES

The objectives of the Quality Assurance/Quality Control (QA/QC) procedures are to produce data that meet (or exceed) the requirements of standard analytical methods and satisfies the project requirements. The objectives of the QA efforts for this project are as follows:

- To provide the mechanism for ongoing control and evaluation of the quality of data measurement throughout the project.
- Utilizing quality control data to define data quality for various measurement parameters in terms of precision and accuracy.
- To verify that all chemical samples are accurately and precisely collected, analyzed and documented so that proper treatment and/or disposal of waste material can occur.

- To verify compliance with the Department of Transportation and other agency requirements.
- To verify that samples are properly collected, analyzed and documented to provide data as part of the H&S Plan.

2.2.1 Definitions of Quality Assurance Terms

Definitions of precision, accuracy, completeness, representativeness, and comparability are presented in Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans (QAMS-0050/80, Office of Monitoring Systems and Quality Assurance and Office of research and Development, U.S. Environmental Protection Agency, Washington, D.C. 20460, December 29, 1980).

2.2.1.1 Precision

Precision is "a measure of mutual agreement among individual measurements of the same property. It is a measure of variability of individual sample measurements. Precision will be assessed from the laboratory duplicate analyses of field samples and from the set of duplicate matrix spiked samples. Precision will be measured as the percent difference in the duplicate measurements.

Average precision and its standard deviation of the concentration data for individual parameters will be used to evaluate the data collected and its acceptability for the objectives of the sampling. Data to be used in evaluation will meet the criteria defined herein and in Section 4.73 of this QAP. Confidence intervals will be derived for data sets using standard statistical methods. The precision criteria for laboratory QC samples is presented in Table 5.

2.2.1.2 Accuracy

Accuracy is "the degree of agreement of a measurement with an accepted reference or true value" and is a measure of a system bias. Bias is the difference between the mean of the true sample values and the mean of the laboratory analysis. Accuracy will be assessed using laboratory spiked standard matrix samples in conjunction with field and

trip blank samples and laboratory method and reagent blanks. Average accuracy and its standard deviation of the concentration data will be used if sufficient data are collected for a specific sampling activity. The accuracy criteria for the laboratory QC samples is presented in Table 5. Accuracy criteria for samples tested in accordance with SW 846, 3rd Edition procedures or equivalent will be in accordance with the appropriate analytical method.

2.2.1.3 Completeness

Completeness is "a measure of the amount of the valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions." The completeness of data objectives reflect the degree to which required samples specified in the appropriate sampling plan have been collected and the necessary analysis performed, in order to create a sufficient data base to meet the objectives.

The completeness objective for laboratory samples is presented in Table 5. If the completeness objective is not met, an evaluation will be undertaken to determine if resampling is required to provide adequate data to meet specific task objectives.

2.2.1.4 Representativeness

Representativeness "expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition." Representativeness is a function of the sample site selection and sample collection and analysis techniques. The objective of this program is to obtain samples which are representative of the media to be measured. The rationale of the selection of sample sites is provided in the project plans (including this QAP).

2.2.1.5 Comparability

Comparability "expresses the confidence with which one set of data can be compared with another." Comparability can be related to precision and accuracy since these

quantities are measures of data reliability. Qualitatively, data subjected to strict QA/QC procedures will be deemed more reliable than data obtained from another project or previous study. To maintain comparability, the sampling method used, chain-of-custody procedures, EPA analytical methods and qualified laboratories and establishment of strict QA procedures and sampling guidelines provide the basis for uniformity in all data collection and analysis activities.

2.2.2 Accuracy, Precision, and Sensitivity of Laboratory Analysis

The QA objective with respect to accuracy, precision, and sensitivity of laboratory analytical data is to achieve the QC acceptance criteria of the analytical protocols.

The TCL and TAL parameters to be analyzed in the first round of samples are listed in Tables 2 and 3. The detection limits for metals analyses in accordance with SW846, 3rd Edition are presented on Table 4.

Accuracy and precision criteria for the parameters to be tested in accordance with EPA CLP protocols and SW846 is shown in Table 5. The accuracy and precision of laboratory analyses for samples tested in accordance with CLP and SW846 protocols will be determined by testing of laboratory blanks, duplicates, and spiked samples in accordance with the frequencies shown in Table 1. Compounds that are often used as matrix and surrogate spikes for CLP and SW846 organic analyses, and their control limits from CLP Protocols, are included in Tables 6 and 7.

2.2.3 Quality of Field Samples

Field duplicates, rinsate blanks, trip blanks, and matrix spikes/matrix spike duplicates will be taken in the field and submitted to the analytical laboratory to provide a means to assess the quality of the data resulting from field investigation tasks. Field duplicate samples will be analyzed to check for sampling and analytical reproducibility. Field and trip blank samples will be analyzed to check for procedural contamination and cross-contamination during shipment and storage of samples. Matrix spike/matrix spike duplicate samples will be analyzed to verify that recoveries falling outside acceptance

windows are attributable to sample matrix interferences and not to laboratory analytical errors.

Field duplicates will be obtained at the frequencies indicated in Table 9. The samples will consist of obtaining a duplicate sample set for analysis from the sample. Rinsate samples will be prepared by rinsing decontaminated equipment with deionized water and collecting the rinsate sample. Matrix spike and matrix spike duplicates will be collected in the field but they will be spiked in the laboratory. Trip blanks will be prepared by the laboratory and shipped with the sample containers. The trip blanks will be kept with collected samples and shipped back to the laboratory for analysis.

2.2.4 Accuracy of Field Measurements

Measurement data will be generated in many field activities that are incidental to collecting samples for analytical testing or unrelated to sampling. These activities include, but are not limited to, the following:

- Documenting time and weather conditions
- Determining depths in a borehole or piezometer and static water levels
- Measuring pH and conductivity of ground water samples
- Screening samples with an organic vapor analyzer (OVA) or photoionization detector (PID)

The general QA objective for such measurement data is to obtain reproducible and comparable measurements to a degree of accuracy consistent with the intended use of such data through the documented use of standard procedures.

The QC level of effort for the field measurement of pH consists of pre-measurement calibration and post-measurement verification using two standard reference solutions each time to sample pH. This procedure will be performed for each sample tested. The QC effort for field conductivity measurements will include daily calibration of the instrument using standard solutions of known conductivity.

The accuracy of field measurements of pH will be assessed through pre-measurement calibrations and pH-measurements verifications using at least two standard buffer solutions. The two measurements must each be within $\pm$ 0.1 standard unit of buffer solution values. If measurements not within $\pm$ 0.1, the problem will be evaluated. A fresh portion of buffer solution will be utilized. If the problem persists, a different (new) buffer solution will be used. Precision will be assessed through replicate measurements. (The electrode will be withdrawn, rinsed and de-ionized water and re-immersed between each replicate). The instrument used will be capable of providing measurements to 0.1 standard unit. A total of four replicates for pH and conductivity will be performed.

The accuracy of measuring depths (for boreholes and static water levels) will be assessed by using a measuring device (weighted tape or electronic water level indicator such as an M-scope) that has been calibrated before use by measuring two known lengths. Any measurements taken with the device will be adjusted by the difference (if any) in length over the appropriate depth interval. At least three replicate depth measurements will be made and the average depth measurement will be used.

The data from the OVA or PID is used for screening only to select samples for analysis. After receiving laboratory data the OVA or PID and lab data will be evaluated for comparability.

3.0
SAMPLING OBJECTIVES

The specific objectives of the collection of the data are further discussed in the subsequent paragraphs.

3.1 GROUNDWATER SAMPLING DATA OBJECTIVES

As stated in the Preliminary Report water-bearing zones have been identified in previous investigations. Additional groundwater data may be needed to characterize these zones if contamination is found. Groundwater data needed could include:

- Approximate vertical boundaries of zones and stratigraphic relationships.
- Basic flow characteristics of each zone (direction, lateral flow rate, hydraulic conductivity, transmissivity and storage capacity).
- Hydraulic inter-relationships of the zones (vertical interconnection transmissivity between zones, etc).
- Effect of stratigraphic variations within each zone on contaminant transport.
- Nature and extent of contamination in each zone (approximate boundaries of contaminant accumulation).

Identification of water-bearing zone boundaries and relevant soil strata will required a detailed description of soil features (such as color, lithology, bedding, identifying features and relative degree of water saturation) to a depth sufficient to identify the base of the deepest contaminated water-bearing zone. The description will require accuracy to the nearest foot and professional geologic judgment to recognize and describe pertinent features.

The zones to be monitored will require sufficient screening intervals to characterize each zone. For low density immiscible contaminants (floaters), the screen will extend approximately two feet above the top of the zone to provide for fluctuations in water

levels. If dense non aqueous phase contaminants are the concern (sinkers) the screen will cover the base of the upper pervious zones and extend slightly below the base of the zone (± 6 inches). If dissolved constituents are the concern, the screened interval will correspond to that portion of the zone which is judged to have the highest hydraulic conductivity. If required, deeper zones will be monitored utilizing similar approaches as describe above.

Determination of groundwater flow direction will require measurement of elevations of the top of the piezometric surface of each zone. A sufficient number and spacing of measurement stations will be installed to construct idealized contours of the piezometric surface elevations. The locations of measuring stations will be established such that they can be plotted on a site location map. Locations should be to the nearest 0.1 foot. Water level measurements should be made to the nearest 0.01 foot accuracy and reported in feet mean sea level (MSL). This data will be evaluated to verify the designated upgradient shallow well location and to identify upgradient background wells. As additional samplings are performed, the data will be reevaluated to verify results of previous sampling.

Determination of the nature and extent of groundwater contamination will require sampling and chemical analysis of groundwater from each water-bearing zone. A sufficient number of samples will be required to identify approximate lateral limits of contamination and establish and nature and concentrations of contaminants. Investigation of zones below the upper pervious zone will be performed if data does not define the vertical extent of groundwater contamination.

The samples will require analysis for Target Compound List (TCL) and Target Analyte List (TAL) constituents plus dinoseb as presented in the Contract Laboratory Program CLP Statement of Work to identify or verify contaminants of concern. Sample collection and handling will require strict adherence to EPA approved procedures and close QA/QC surveillance. Sample analysis will be performed by CLP methods.

3.2 AQUIFER TESTING OBJECTIVES

Determination of lateral and vertical flow rates, hydraulic conductivities, transmissivities, storage capacities and vertical interconnection will require in situ flow testing data. Lateral hydraulic conductivity/transmissivity data should be collected by at least two different methods in order to evaluate the credibility of the data and subsequent calculations. Storage capacity calculations and vertical interconnection determinations should be based on field pumping test data. Aquifer testing will be done in conjunction with detailed design of corrective action, if required.

3.3 SURFACE SOIL SAMPLING DATA OBJECTIVES

The primary purpose of collecting surface soil data is to aid in determining potential for contamination of site runoff-water, potential for off-site migration of contaminated sediments (water transported) and/or potential for human/animal contact and/or ingestion. Consequently, sampling need not extend beyond about 12 inches below the natural ground surface. Background samples at 0 to 12 inches to 12 to 36 inches will be obtained in the site vicinity. The background sample locations are selected based upon the lack of hazardous waste activities in those areas. The surface soil data must include laboratory analysis for soil classification and contaminant content. Soil classification data is needed to estimate the erosion susceptibility and transportability of the soil. Atterberg limits for cohesive soil and sieve analysis data for noncohesive soils will be adequate for erosion susceptibility and transportability purposes. Laboratory analysis for contaminant content shall consist of TCL and TAL analyses using CLP methods.

3.4 SUBSURFACE SOIL SAMPLING DATA OBJECTIVES

The primary purpose of collecting subsurface soil (vadose zone) and soil structure data is to aid in determining the potential for downward percolation of contaminants into the shallow groundwater. Consequently sampling must be of sufficient quantity to identify lateral limits of contamination and must extent to a sufficient depth of identify and quantify accumulation of contaminants above and within the first occurring water-bearing zone. The data shall consist of laboratory analyses of the contaminated soil.

Laboratory analyses shall consist of analysis for TCL and TAL compounds in accordance with CLP protocol plus dinoseb .

3.5 SUBSURFACE SLUDGE SAMPLING DATA OBJECTIVES

The primary purpose of sludge sampling will be to determine toxicity characteristics for removal and treatment and/or disposal. Laboratory analysis shall consist of TCLP analysis.

3.6 SAMPLING ACTIVITIES

The sampling activities will occur during the North Pond RFI to address the data objectives for the media of concern identified above. A general location map of the North Pond area is presented as Figure 1 and sampling location maps are presented as Figures 2, 3, and 4. The field investigation tasks to obtain the data will generally consist of the following:

- Obtaining sampling location characteristic information from topographic and information surveys.
- Obtaining background and current groundwater quality data from the existing site monitor wells (already completed).
- Subsurface soil sampling to evaluate the vertical and horizontal extent of contamination and constituents if released.
- Groundwater assessment and sampling (piezometer installation, sampling and evaluation) to determine the areal and vertical extent of groundwater contamination and determine groundwater flow discretion.

4.0 SAMPLING EQUIPMENT, PROCEDURES, AND MEASUREMENTS

The sampling locations, depths, type (grab vs. composite), number of samples, and analytical parameters were discussed in the North Pond RFI Work Plan approach and scope of work. The procedures and equipment to perform the sampling for the North Pond RFI were discussed only in general terms in that document and are presented in more detail herein. In addition, procedures for piezometer or monitor well installation and aquifer testing are presented. The sampling procedures presented below will be implemented along the North Pond RFI Work Plan approach and scope of work as appropriate. Changes in the procedures discussed here in will be documented and included in the interim reports. Additional specifications with respect to documentation, equipment, and procedures as required by VCC standard policies and manuals which do not affect data quality objectives may be incorporated into the work plan as appropriate.

4.1 SUBSURFACE SOIL SAMPLING

Subsurface soil sampling will be performed to characterize the wastes and to evaluate the extent of subsurface soil contamination, if any. A series of borings have been drilled to evaluate the stratigraphy and determine locations for discrete sampling as well as for piezometers. The equipment and methods are discussed below along with an alternative method.

4.1.1 Equipment

Subsurface sampling will be performed by rotary auger or hollow-stem drilling methods. The drilling apparatus will consist of a truck-mounted drilling rig. Samples will be obtained by drilling using a 3-inch diameter Shelby tube, or 2-inch diameter split spoon sampler.

Only petroleum jelly, teflon tape, lithium grease, or vegetable-based lubricants shall be used on the threads of downhole drilling equipment. Additives containing lead or

copper shall not be used. Any hydraulic or other fluids used in the drilling rig, pumps, or other field equipment/vehicles shall not contain any polychlorinated biphenyls (PCBs).

If antifreeze is added to any pump, hose, etc., in an area in contact with drilling fluids, this antifreeze shall be completely purged prior to the equipment's use in drilling, mud mixing, or any other part of the overall drilling operation. Only antifreeze without rust inhibitors and/or sealants may be used.

Drilling equipment that has a visible loss of grease, hydraulic fluids, oils, fuels and/or transmission oil to drilling fluids to the borehole will not be allowed for borings and/or well installation until the problem is corrected.

Hydraulic rotary drilling operations will use portable recirculation tanks/pans for the "mud pit" and for mixing grout. Dug pits or sumps will not be used.

4.1.2 Procedure

The borings shall be continuously sampled with a thin-walled Shelby tube sampler or split-spoon sampler, extruded in the field and described or logged, following the guidelines of the appropriate and most current American Society for Testing and Materials (ASTM) Standards:

- D 1452 Practice for Soil Investigation and Sampling by Auger Borings,
- D 1586 Method for Penetration Test and Split-Barrel Sampling of Soils,
- D 1587 Practice for Thin-Walled Tube Sampling of Soils,
- D 2487 Test Method for Classification of Soils for Engineering Purposes, and
- D 2488 Practice for Description and Identification of Soils (Visual-Manual Procedure).

All borings shall be sampled and described by a qualified WCC representative. The qualified WCC representative is to be on-site during all boring and sampling operations. Samples taken from borings will be handled as described later in this section.

All soil borings will be advanced with rotary or hollow-stem drilling techniques with continuous soil sampling techniques unless it is determined to be unnecessary for strata identification and sample collection by the qualified WCC representative based on consistent site conditions. If the borehole becomes unstable and caving or sloughing of the walls develop, temporary surface casing may be used in the drilling operations. Dry rotary auger or hollow-stem techniques will utilize an auger and cut and clear the borehole for sampling. Rotary wash will utilize potable water that is recirculated through the borehole to remove cuttings. Bentonite drilling mud (organic free) will be used only if required to maintain borehole stability.

The samples obtained from the borings will be screened in the field for head-space analysis using an on-site OVA or PID. Immediately upon removal of the soil sample from the Shelby tube or split spoon, the field geologist will visually log it. The visual logging will describe soil type and secondary color, penetration resistance and inclusions as described above. A portion of the sample will then be shaved with a clean knife or spatula to remove at a minimum the outer approximately one-fourth inch which may have come in contact with the downhole fluids. This shaved sample will then be divided into two parts, each of which will be labeled based on boring number and sample depth. One portion of the sample will be placed in a glass jar, labeled, and placed on ice. The other portion will be placed in a wide mouth glass jar covered with aluminum foil and capped. The headspace will be sampled by inserting the probe of the OVA into a predrilled hole in the cap through the aluminum foil. The OVA or PID reading will be made immediately and the reading recorded on the boring log.

Based on the OVA or PID readings or visible contamination and paragraph 3.1 of the RFI Field Investigation Work Plan for the North Pond, the qualified WCC representative will select samples for chemical analysis (as described above) to consist of TCL and, TAL constituents. The testing protocols to be followed are discussed in the Data Management Plan. Samples will be retained on ice or refrigerated until delivery to the laboratory. One sample in 20 will be split to provide field duplicate

samples for analysis and one rinsate blank will be collected for analysis from each drilling rig decontamination during drilling.

Shallow rotary borings will be drilled to the water table and will be advanced by dry-auger methods until free water is encountered. For borings drilled for shallow piezometer installation, drilling operations will be stopped for ten minutes when water is encountered to allow the water level to rise. Both the initial and second water level will be measured and recorded. Borings drilled for shallow piezometer installation will be drilled to the base of the first water-bearing zone encountered.

Borings drilled prior to deep piezometer installation will be drilled to the base of the deep water-bearing zone. The borings will be drilled in a manner similar to that previously described. The boring will be advanced by dry auger methods to the water table. Drilling will be stopped for approximately 10 minutes to allow the water level to rise. Both the initial and second water level will be measured and recorded.

The borings will be continuously sampled and field screened with an OVA or PID (as described previously). The deep borings may be cased, at the discretion of the WCC Site Coordinator, to a depth to be determined in the field based upon the OVA or PID screening (to a nondetectable level) or the shallow water-bearing zone, whichever is deeper. Drilling will resume through the casing to the boring completion depth. Upon completion of drilling, the casing will be pulled and the borehole will be grouted as the casing is advanced out of the hole from the base of the borehole to ground surface. Grouting will be performed as described later in this section. The deep piezometer will be installed in the deep boring.

4.1.3 Documentation

Subsurface soil sampling will be documented in the filed log book as well as on a boring log form for each boring drilled. The boring log will be of a form equal to or similar to Figure 5. Pertinent information will, at a minimum, include boring number, date, logger, lithologic description, core recover, OVA or HNu readings, depth of water table and boring completion data.

The following information shall be routinely entered or attached to the soil boring log:

- Depths/heights shall be recorded in feet and fractions thereof (tenths).
- Soil classifications shall be in accordance with the Unified Soil Classification System (equivalent to ASTM D 2487 and 2488).
- Soil classifications which have been prepared in the field at the time of sampling by a WCC representative and are subject to change based upon laboratory tests and/or subsequent review. Factors to consider before changing a field determination include the expertise of the field geologist and laboratory personnel, representative character of the tested sample, labeling errors, etc.

Each soil sample taken shall be fully described in the log. The descriptions of intact samples shall include the following parameters:

- Lithologic Classification and Unified Soil Classification
- Color
- Plasticity
- Consistency (cohesive soil)
- Density (noncohesive soil)
- Moisture Content. Use relative term.

Other information to be placed on the soil boring logs, as appropriate, include:

- The drilling equipment used will be generally described either on each log or in a general legend.
- Each log will record the drilling sequence.
- All special problems and their resolution will be recorded on the log; e.g., hole caving, recurring problems at a particular depth, sudden tool drops, excessive grout takes, drilling fluid losses, unrecovered tools in hole, lost casing, etc.
- The dates for the start and completion of borings shall be recorded on the log.

- Each sequential boundary between the various soils and individual lithologies shall be noted on the log by depth. When depths are estimated, the estimated range shall be noted along the boundary.
- The depth of first encountered free water shall be indicated along with the method of determination. In addition, when free water is first encountered the following procedure will be followed; Allow the first encountered water to partially stabilize (10 to 15 minutes) and record this secondary level and time between measurements before proceeding.
- The estimated depth interval for each soil sample taken, classified, and/or retained shall be noted on the log. For each driven (split spoon), thin wall (shelby), and cored sample, the length of sample recovery and the sampler type and size (diameter and length) will be recorded.
- For thin wall samplers it should be indicated whether the sampler was pushed or driven. Blow counts shall be recorded in half foot increments when standard (1 3/8" ID by 2" OD) samplers are used. For penetration of less than a half foot, it will be noted in the log along with the blow count and the distance over which the count was taken.
- Special abbreviations used on a soil boring log and/or well diagram will be defined either in the log/diagram where used, or in a general legend.

4.2 SURFACE SOIL OR SLUDGE SAMPLING

Soil samples will be obtained from areas that are potential pathways for surficial contaminant migration. Sludge samples will be collected in areas as discussed in the Field Investigation Work Plan.

4.2.1 Equipment

Sampling equipment will consist of hand sampling tools such as trowels, shovels, a drive tube sampler or a hand auger. Stainless steel or PVC sampling tools will be used.

4.2.2 Procedure

The sample locations will be referenced to site coordinates. The sampling area will be first cleared of vegetation and/or debris. The sample will be collected to a depth of 12 inches such that minimal volatilization is allowed and then transferred in the appropriate container. The hole will be backfilled with native soils and vegetation.

4.2.3 Documentation

As previously stated, the sampling point will be referenced to the site coordinate system and ,if taken with an areal grid, the node number will be recorded. Visual classification and other observations will also be noted in the field log book along with sample number, time, date, and other pertinent information.

4.3 GROUNDWATER SAMPLING

4.3.1 Water Level Measurement

4.3.1.1 Water Level Determination

The elevation at the top of the casing (TOC) should be established at each piezometer. This information will be used to determine the water level elevation. To calculate the water level elevation, the distance to the water level from the TOC needs to be measured. This can be achieved by either of the following procedures:

4.3.1.1.1 Weighted Tape Procedure. A weighted tape must be decontaminated prior to use and between wells by procedures detailed in Standard Operating Procedures (SOP) 3.5. The weight should consist of an inert, open-ended object that will create a distinct sound when tapped on the water's surface. The weight should be lowered gently into the well until it is heard to have touched the water. The water level measurement from top of casing to water level should be determined to the ± 0.01 foot and recorded in a logbook. A measurement of well depth from the top of the casing to the bottom of the well should also be made. This measurement can be used to determine if a significant silt build-up has occurred at the bottom of the well or that the well casing

is not blocked. NOTE: When using a weighted tape, be sure that the weight is not secured using an adhesive tape (duct tape, strapping tape, etc.) as the adhesive may contain organic compounds which could contaminate the well.

4.3.1.1.2 **Electronic Water Level Indicator Procedure.** An electronic water level indicator must also be decontaminated prior to use and between wells. The indicator probe, connected to a graduated wire is lowered down the well casing. A light turning on or a meter deflection occurs when the electrical circuit is closed indicating that the probe tip has touched the water. The reading should be taken to the nearest 0.01 foot by recording the length of graduated wire between the TOC and the water level (probe tip) in a logbook. Additionally, a measurement of well depth should be made from TOC to the bottom of the well using the probe.

4.3.1.2 **Cross-Contamination Minimization**

In areas of known contamination, the sequence of water level measurement should be done, whenever possible, from the well least likely to be contaminated to the well most likely contaminated to reduce the potential for cross-contamination. If this information is not available, an attempt should be made to sample upgradient wells first and then downgradient wells.

4.3.1.3 Calculation of the Volume of Standing Water

The water level measurement is used to calculate the volume of standing water in the well from the linear feet of standing water and the well diameter. This calculation is then used to determine the volume of water to be purged from the well prior to sampling. To calculate the linear feet of water in the well, subtract the depth to the water from the total depth of the well. Form the table below determine the appropriate factor for the specific well inside diameter; multiply the linear feet by the appropriate factor listed on the table below to get the gallons of water present in the well.

Casing Diameter	Casing Volume
2 inches	0.163 gallons/foot
3 inches	0.367 gallons/foot
4 inches	0.653 gallons/foot

For example, if depth to water is 7.5 feet, and the total depth of the 2-inch diameter well is 20 feet, then 12.5 feet of standing water is in the well. Volumetrically, 0.163 x 12.5 (2-inch well), or 2.04 gallons of standing water are in the well.

4.3.1.4 Free-Phase Immiscible Contamination

If contamination of groundwater by free-phase immiscible chemicals is suspected, procedures for the detection of immiscible, or nonaqueous phase liquids (NAPL) should be employed. The presence of dense NAPL (heavier than water) or light NAPL (less dense than water) can be determined by the use of an electrical interface probe. The probe should be carefully and slowly lowered into the well. A deflection of the needle on the scale of the probe will indicate the air/light NAPL interface, light NAPL/water interface, and water/dense NAPL interface, respectively. The thickness of immiscible contaminants is to be recorded in a logbook.

4.3.2 Piezometer Evacuation - Purging

In order to obtain a representative sample of groundwater, the standing water in the well casing should be purged or evacuated. Evacuation allows fresh or formation groundwater to enter the well. The optimum method to ensure that formation water is sampled, is to monitor the water being purged by field measurements of pH, temperature and conductivity. For each volume of standing water purged from the well (as calculated earlier) a measurement of these three indicator parameters should be taken. When the subsequent sample are observed to have less that ± 10 percent variation in these parameters, the well is presumed to be adequately flushed. At a minimum, three standing water volumes as should be removed; however, in wells with very low recoveries this goal may not be practical. When full recovery exceeds two hours, the well should be purged to dryness. If the well is evacuated to dryness, samples of the groundwater should be collected within 24 hours of evacuation.

Evacuation rates should be kept well below 10 gallons per minute and in most cases should be below 5 gallons per minute. At no time should a well be pumped to dryness if recharge rates cause groundwater to vigorously cascade down the sides of the screen which can potentially cause an accelerated loss of volatiles. If at all possible, the water should be drawn down from above the screen in the uppermost part of the water column in high yield formation to ensure that fresh water from the formation will move upward in the screen. In low yield formations, water should be purged so that it is removed from the bottom of the screen.

Evacuation of a well can be accomplished in several different ways. In any instance it is paramount to ensure that the evacuation procedure does not cause cross-contamination from one well to the next. Therefore, the preferred method employs dedicated equipment whenever possible. The selection of an evacuation method often relies on the depth of the water in the well, as discussed below. The following are potential evacuation methods:

4.3.2.1 Bailer Purging

Bailers can be used to evacuate shallow wells, and through there are no prohibitive factors preventing their use in deeper wells, the time required and physical strain on the individual purging the well makes hand bailing a less desirable evacuation method for deeper wells. Ideally, if a bailer is used, it is dedicated to one well and often remains hanging from the well cap in the well between use. Regardless of whether the bailer is dedicated or not, it should be decontaminated before use. Decontamination procedures should be followed.

The preferable materials of bailer construction are teflon, stainless steel, polypropylene, polyethylene, vitron, and polyvinyl chloride (PVC). The bailer should be lowered into the well using a nonporous rope made out of material such as polypropylene or teflon-coated cord. Caution should be used when lowering the bailer into the water so as to avoid aeration of the well water. Retrieve the bailer after it is filled and pour water into a graduated container to measure the amount of water removed from the well. Care should be taken to keep the rope and bailer from touching the ground or other potentially contaminated surfaces. When the first standing water volume has been removed, a groundwater sample should be collected from the bailer for field measurements of pH, temperature, and conductivity. These field measurements should be repeated for each subsequent standing water volume removed.

4.3.2.2 Mechanical Pump Purging

Suction lift pumps such as centrifugal, diaphragm, or peristaltic pumps can be used to evacuate wells if the static water level is within 25 feet of ground surface. These pumps are utilized at ground surface with the intake line connected to dedicated teflon or high-density polyethylene tubing inserted into the well. The tubing should be equipped with a foot valve to avoid having aerated water from the pump fall back in the well. The outlet tubing should be placed so that the purge water is collected in a graduated container, and can be measured. Deionized water should be used if priming is necessary. Measurements of pH, conductivity, and temperature should be taken for each standing water volume evacuated from the well. If the well is pumped dry and the recharge rate is sufficiently rapid to cause water to cascade into the well, the well should

be allowed to recover. Then the pumping rate should be adjusted to a slower rate and the well re-evacuated of two standing water volumes before sampling.

4.3.2.3 Submersible Pump Purging

Portable submersible pumps are an option for evacuating wells with water levels greater than 25 feet below land surface. One such pump is an electrically powered (110 or 230 V AC) centrifugal pump with an isolated motor. Another is an air displacement pump in which a stainless steel reservoir with check valves at each end alternately fills from the bottom with water from the well, and evacuates when air or compressed gas (nitrogen) is discharged into the reservoir from the top. The decontaminated pump should be carefully lowered into the well, trailing a discharge hose, electrical cables or air liens, and a stainless steel security cable (which should bear most of the weight). If these items are to be bundled, use plastic ties and not electrical tape or duct tape.

If the pump is connected to a portable gasoline generator or air compressor, the generator should be placed some distance away from the well where fumes can not affect sample quality. An inline air filtration system at the discharge line should be used when an air compressor is used in conjunction with an air displacement pump. The submersible pump provides the advantage of high flow rates, however, care should be taken when operating to keep the flow rate within an acceptable limit for the particular well yield (recharge capacity). As with the suction lift pumps, these pumps should be equipped with a foot valve and fitted with dedicated tubing.

To evacuate, simply turn the pump on, prime with de-ionized water if needed, and measure the outlet water quantities. As with all other evacuation methods, pH, temperature, and conductivity should be measured for each standing water volume removed. These pumps need to be decontaminated prior to sampling and between sampling points.

4.3.2.4 Bladder Pump Purging

A bladder pump or gas squeeze pump consists of a housing that encloses a flexible membrane (bladder) that has check valves above and below. The pump is connected

to either bottled gas or an air compressor. When in operation, water enters the membrane/bladder through the bottom check valve; compressed gas is injected into cavity between the housing and the bladder, squeezing the bladder and forcing the water through the top check valve and ultimately out of the well. Another type of bladder pump is also available that works on the same principle except that the water enters the chamber between the membrane and the casing, and the gas is injected into bladder. Similar to the submersible pumps, the bladder pump should be carefully lowered into the well by a security cable. In low-yielding wells (i.e., wells incapable of producing three well volumes), the bladder pump should be placed at the bottom of the well screen so that water is removed from the bottom of the well screen.

The outlet tubing from the bladder pump should be placed so that purge water can be collected into a graduated container. Field measurements of temperature, pH, and conductivity should be taken for each standing water volume evacuated from the well.

4.3.2.5 Inertia Pump Purging

An inertia pump consists of a PTFE footing which is essentially a reservoir with check valves at the bottom inlet and top outlet, and a tube rising to the wellhead. An up-and-down movement of the tube pumps water through inertia derived from the upward movement of water with each stroke. The whole system is dedicated and can be pumped by hand, by the use of a hand-operated lever, or by using an electrically powered (110 V AC) motor. An optional bellows attachment provides suction to the tubing and greatly increases the pumping capacity.

To evacuate, simply pump by hand, or connect the motor. If a portable generator is used, take care to place it some distance away from the well where fumes cannot affect sample quality. Field measurements of pH, temperature, and specific conductivity should be taken for each standing water volume removed.

4.3.3 Piezometer Sampling

After evacuation of an adequate volume of water from the piezometer sampling can begin. Sampling of the piezometer should occur as soon as possible after evacuation,

preferably immediately and must occur within 24 hours of completion of purging activities. Of the methodologies used for monitor well evacuation it is recommended that samples be collected only by using either the bailer, inertia pump, or the bladder pump. Due to the manner in which the other pumps (suction lift and submersible pumps) operate and the potential effect on the quality of the samples, it is not advisable to collect samples for volatile organic analysis with them.

4.3.3.1 Sample Collection

Prior to collecting the groundwater samples, the appropriate sample containers and preservatives should be set out and readily available for sample collection. Ideally, the sample containers should be cleaned and prepared by the laboratory that is going to conduct the analysis. Some of the parameters for which samples are to be collected will require a preservative.

The monitor well cap of each well will be removed carefully to avoid the incorporation of any contaminants in the well. Any plants or small trees that will be close to the well will also be removed, if possible. Prior to sampling, the initial static water elevation will be measured and recorded. The water level will be measured from the top of the riser piper to the nearest 0.01 foot using a calibrated electronic probe water level sensor (M-scope) or weighted tape (with sounder). Three replicate measurements will be made to verify accuracy. The probe or tape will be cleaned with deionized water after each use.

Following water level measurements, the well will be purged to remove stagnant water which would otherwise bias a representative sample. The purging will be performed using a dedicated bailer. The well will be purged until water parameters of pH, specific conductance, and temperature have stabilized and at least three well volumes or the well is purged to dryness. Purged water will be containerized for treatment. Measurements of pH, specific conductance, and temperature will be taken and recorded during the purging.

Vehicles or any other equipment that might be a potential source of contamination will be placed at a distance far enough from the wells during purging or sampling.

After purging, the well will be sampled with a dedicated or clean bailer. Clean plastic sheeting will be placed on the ground around each well to prevent contamination of the ground or any sampling equipment which is dropped. Care will be taken so that the sample is taken from the screened interval of the well. Samples will be retained in appropriately preserved laboratory containers. No head space will be allowed in VOA vials.

Samples will be collected and containerized in the order of the parameters volatilization sensitivity. Samples for organic compounds should be collected initially. Care will be taken not to allow the bailer to come into contact with the container while pouring the samples.

The following are potential sampling methods:

4.3.3.1.1 **Bailer Sample Collection.** If a bailer is used for sample collecting, the same bailer used to purge the well may be used to sample it. An effort will be made to keep the rope from touching the ground or the casing. The bailer will be lowered slowly into the water. Do no let the bailer free fall into the water. Attempt to lower the bailer to the same depth in the well each time. Retrieve the bailer smoothly but quickly and empty the water into the sample container in a steady stream. Samples should be collected in the following order: Volatile Organics, Total Organic Carbon, Semivolatile Organics, and any other compounds. Once collected, the samples should be labeled using a waterproof label and waterproof ink, sealed in plastic bags, and placed on ice in an ice chest and cooled to 4°C. The sample number, amount collected, and time collected should be recorded on a chain-of-custody form and in a logbook.

4.3.3.1.2 **Bladder or Inertia Pump Sample Collection.** If a bladder pump or an inertia pump is used, the same tubing that was used to purge the well may be used to sample it. The samples should be collected in the following order: Volatile Organics, Total Organic Carbon, Semivolatile Organics, and any other compounds. When collecting samples for the analysis of volatile compounds, the pumping rate should not exceed 100 milliliters per minute. After these samples are collected the pumping rate can be increased for collection of other samples. Once collected, the samples should be labeled using a waterproof label and waterproof ink, sealed in plastic bags, and placed on ice

in an ice chest cooled to 4°C. The sample number, amount collected, and time collected should be recorded on a chain-of-custody form and in a logbook.

4.3.3.2 Cross-Contamination Minimization

As with purging, the sequence of monitor well sampling should be done, whenever possible, from the well least likely to be contaminated to the well most likely contaminated to reduce the potential for cross-contamination. If this information is not available, an attempt should be made to sample upgradient wells first and then downgradient wells.

4.3.3.3 Collection for Metal Analysis

If analysis for metals is required, water samples that contain high concentrations of sediment may be field filtered before the sample is collected for metal analysis. A hand pump and a filter device can be used, or an in-line filter (0.45 micron) in conjunction with the bladder or inertia pump. The groundwater sample should be run through the filter and collected in a clean sample container. it is recommended that a second sample should be sent to the laboratory for analysis. All equipment should be decontaminated before filtering and between sampling locations.

4.3.3.4 Use of Dedicated Equipment

If possible, the equipment used to sample a well should be dedicated equipment. If a bailer is used, each well should have a dedicated bailer that is stored in the well. Another alternative which is preferred over nondedicated sampling equipment is a disposable bailer which may be used for a single well sampling. If a bladder pump is used, each well should have dedicated tubing. Dedicated equipment should still be decontaminated prior to use. By using dedicated equipment, the chances of cross-contamination are greatly reduced.

4.3.3.5 Collection for Volatile Organic Analysis

Special care should be taken when collecting samples to be analyzed for volatile compounds. The water should be transferred slowly from the bailer, bladder, or inertia pump to the sample container to reduce the potential for aeration of the samples. Samples requiring the analysis for organics should not be filtered or transferred from one container to another because losses of organic compounds onto the walls of the containers or aeration may occur. Samples to be analyzed for Total Organic Carbon (TOC) should be handled and analyzed as materials containing volatile organics. No headspace should exist in the sample containers for volatile compounds or TOC to minimize the possibility of volatilization of organics.

4.4 QUALITY CONTROL SAMPLES

To attain the project quality assurance objectives discussed in this document, certain Quality Control (QC) samples need to be collected and sent to the laboratory. The following is a discussion of those samples:

4.4.1 Trip Blanks

These samples consist of laboratory-prepared VOA vials, filled with volatile organic-free water which are shipped with the sample containers. These vials remain in the sample cooler and are not to be opened. They will be analyzed in the same manner as the collected samples, and are used to monitor volatile organic compounds due to container contributions or contamination during shipment. A trip blank shall accompany each sampling event (defined as the duration of the sampling of the wells in the plant) for which sample for volatile organic analysis are being collected.

4.4.2 Rinsate Blanks

These samples are used to monitor contamination resulting from the sampling equipment and also to monitor the effectiveness of equipment decontamination procedures. Rinsate samples are collected by pouring reagent grade water over decontaminated sampling equipment, in such a manner as to contact the same surfaces

as the samples and collecting that water for analysis. Rinsate blanks will be collected at a minimum of one per sampling event. If there is more than one type of parameter being monitored in that sampling event, the rinsate blank will be analyzed for only the organic constituents (volatile and semivolatile, if applicable).

4.4.3 Sample Preservation and Shipment

The appropriate preservative will be added to each sample bottle by the laboratory prior to being taken into the field. Table 8 lists containers, preservatives, and holding times for the parameters being analyzed in this program.

Once the sample is placed in the bottle, a label should be affixed to the bottle. The label shall contain the following information: plant area, sample number (monitor well number), date, time of sample collection, parameter for analysis, preservative (if any), and the collector's name. The samples shall be placed in an ice chest containing an adequate volume of ice to maintain samples at 4 °C. The ice chest should be sealed for shipment.

All samples will be continuously tracked in the field and while in transit. A chain-of - custody form shall accompany the samples at all times. The sample custody procedures are further described in Section 4.4 of this document.

4.5 GROUTING

Following completion of each borehole, the borehole will be grouted with a cement/bentonite grout (4 to 8 percent bentonite by dry weight). The grout shall consist of Portland cement and powdered sodium bentonite. The grout mix will consist of a pumpable cement/bentonite slurry. The grout shall be mixed in clean, above ground, rigid containers with an appropriate quantity of water. The mixing of each component will be achieved by a mechanical paddle device or recirculation with a grout pump. Mixing activities will continue until a smooth, lump free consistency is achieved.

The grout mixture shall be pumped through a rigid, side discharge tremie pipe placed approximately 6 inches above the bentonite seal for monitor well installation or on the

bottom of the hole for plugging and abandonment of soil borings. The grout mixture shall be pumped until undiluted grout flows from the annulus at the ground surface. The tremie pipe may be slowly withdrawn during grouting operations. The estimated volume of grout will be computed for each boring or well, based upon borehole dimensions and well dimensions. If actual grout placed is less than or exceeds 50 percent of the computed volume, the grouting for that boring or well will be evaluated to determine if grouting problems are present (i.e. caving or excessive grout takes).

After a minimum 24-hour period, the boring or well will be inspected for settlement of the grout and more grout will be added as needed. This process shall be repeated until firm grout is at or within one foot of the ground surface.

The specifications for the materials making up the grout are:

- Bentonite will be powdered, granular, or chipped sodium montmorillonite furnished in moisture resistant sacks and without additives.
- Cement will be a low-alkaline Portland Cement, Type I in conformance with ASTM C-150 and without additives.

4.6 AQUIFER TESTING (To be implemented prior to detailed design of corrective action)

Single well tests are referred to as slug tests. These tests are performed by suddenly adding or removing a slug (known volume) of water from a monitor well and observing the recovery of the water surface to its original level. In systems where the entire depth of the aquifer formation is screened, such tests provide information on the horizontal component of hydraulic conductivity. When only a portion of the aquifer depth is screened, the slug test results give a hydraulic conductivity containing both horizontal and vertical components. Most of the pressure loss (head loss) is dissipated in a horizontal direction, therefore, the value of hydraulic conductivity evaluated is assumed to be most horizontal. Bower (1978) discusses a slug-test procedure applicable to fully or partially penetrating wells in unconfined aquifers. He discusses the use of

dimensionless solutions of the Thiem equation to determine the hydraulic conductivity from observed values of water level and elapsed time.

4.6.1 Equipment

Slug testing equipment will consist of:

- Pressure transducer(s)
- Suspended weight of known volume (slug).
- Electric water level probe and/or steel tape.
- Data logger (recorder)
- Field data printer.

Since the pumping test program will be developed as needed after performing the slug testing, it is not possible to identify equipment to be used in conducting the pumping test(s) at this time. A listing of such equipment will be compiled when the pumping test program has been developed.

4.6.2 Procedure

The specific slug test performed will be a falling head test followed by a rising head test. Measurements of the behavior of the piezometer system as it returns to equilibrium are then made and used for analysis. The test will be run until the system has achieved 90 percent equalization. Field procedures for slug testing are as follows:

- The magnitude of instantaneous head change resulting from introduction or removal of the slug shall not cause water to overflow the casing. To assure meeting these requirements, magnitude of head change shall be determined prior to introduction of the slug. The magnitude determination shall be based on the calculated volume of the slug and the inside diameter of the casing. The test shall proceed only when these requirement are met.

- All equipment shall be decontaminated prior to placing into the piezometer. Decontamination shall consist of triple rinsing with deionized water.

- The static water level shall be measured using an electronic water level sensor or weighted tape.

- When the transducer is lowered into the piezometer and in place, the slug shall be introduced as rapidly as possible without causing undue splashing or turbulence so as to produce an instantaneous head increase. The instant the slug is set in place, the reference time will be time zero.

- Water levels shall be measured continuously (millisecond intervals) with the transducer and recorded with the data logger unit. Measurements shall be terminated when the water level stabilizes or when the water level has reached a level within 10 percent of static level.

- Water level measurements recorded shall be checked for credibility before proceeding to the next testing stage (removal of the slug).

- When checking of data has been completed and the previous testing has been determined to be acceptable, the slug shall be removed as rapidly as possible to produce an instantaneous head reduction. The instant the slug is removed from the water, the reference time will be time zero.

- Water levels shall be measured continuously (as in the previous testing stage) using the transducer and shall be recorded using the data logger unit. Measurements shall be terminated when the water level stabilizes or reaches a level within 10 percent of initial static water level.

- When measurements are terminated, the transducer shall be removed.

- Water level measurements recorded shall be checked for credibility before proceeding.

- Any test or test stage shall be repeated if review of the recorded data indicates questionable validity.

The data from the slug test will be reduced to evaluated time versus change in water level using the methods of Cooper, et al. (1967) or Bower and Rice (1976). Upon evaluating the results of the slug test, a pumping test plan may be developed.

4.6.3 Documentation

Water level data shall be recorded with the data logger and preserved for offloading at the Woodward-Clyde Consultants office in Baton Rouge, Louisiana. To the extent possible, print outs shall be obtained for each set of tests during the data checking phase of testing. Printouts obtained shall be properly labelled to indicated the following and shall be preserved as raw field data:

- Piezometer location
- Piezometer number
- Date of Test
- Elevation of Base of Test Section
- Elevation of Top of Test Section
- Testing Stage (i.e., slug-in or slug-out)

If a printout cannot be obtained, the data shall be hand recorded in the field log book, if possible or the piezometer will be retested.

5.0
PIEZOMETER INSTALLATION

Upon completion of the drilling and sampling as described above for borings designated for piezometer installation, shallow and/or deep piezometers may be installed at locations noted in Figures 2, 3, and 4.

5.1 EQUIPMENT

In addition to drilling and sampling equipment described in Section 1.1, the material required for installation will consist of:

- A screen to allow entry of ground water.
- A bentonite pellet seal above the filter pack to prevent downward migration into the filter media.
- A filter pack to fill the space between the borehole and the screen with a stable material and to limit entry of fine materials into the well.
- Blank pipe or casing connecting the screen to the ground surface.
- A low permeability grout seal between the casing and the borehole to isolate the screened interval from the ground surface.
- Intermediate casings to seal off permeable zones above the target stratum, as needed.
- A protective casing at the surface (for permanent piezometers).
- A surface slab (for permanent piezometers).
- Protective posts (for permanent piezometers).

5.1.1 Procedure

The construction for piezometer involves drilling of borehole to the total depth and backfilling the hole in succession with the screen (with a cap and sump on the bottom), the blank pipe above the screen, a filter pack around the screen, a bentonite pellet layer and cement bentonite grout to the surface.

In the event that it is necessary to "case off" contamination from being carried further subsurface, the following procedure may be followed. Such piezometers will be constructed by drilling a borehole through the base of the upper permeable zone and one to three feet, at the discretion of the qualified WCC representative, into the underlying clay. A Schedule 40 PVC casing is lowered into the borehole and pushed about one foot into the clay at the base of the boring. The casing is then grouted in place by pumping a cement bentonite grout through a tremie pipe into the borehole between the outer casing wall and borehole wall. At completion of the grouting, the grout is allowed to cure for 24 hours and the downhole drilling equipment is decontaminated. During the grout set period the casing will be capped to prevent tampering until well installation is resumed. After the grout has set, the inside of the 12 inch casing is thoroughly flushed with clean water. The borehole and installation are then completed through the casing. Piezometers will be surveyed upon completion prior to sampling.

Screen.

Screens will be 2-inch diameter Schedule 40 PVC with No. 10 slot size. Connections between the screen and the casing will be threaded. No glues, solvents, epoxies, thermal processes (except welding) or rivets will be used.

A direct measurement of borehole depth by the use of a clean, chemically inert, weighted measuring tape shall be made before screen placement. The depth, to the nearest tenth of a foot shall be recorded on the construction log.

The borehole shall be purged or flushed with water, to the extent practical of drill cuttings and any bentonite drilling mud used during construction. If during construction unstable soils or other factors resulting in side wall caving or "blow-in", were encountered, the use of temporary casing will be required. The temporary casing shall be steam cleaned and free of coatings and rinsed with water prior to use.

The screen shall be new, commercially fabricated continuously wound or slotted screen with a four-inch nominal diameter. No fittings shall obstruct the inside diameter. The screen will be free of foreign matter and steam cleaned prior to use.

Screens shall be 0.01 inch slot and no longer than 10 feet in length nor shorter than five feet. Screens will be placed based on the qualified WCC representative's description of formation materials.

Filter Pack.

After the screen is placed in the borehole the filter pack will be placed around it. The filter pack material will consist of a clean graded sand (typically 20-40 mesh sand).

None of the filter pack aggregate is to come in contact with the ground surface. Any aggregate that comes in contact with the ground surface or is otherwise contaminated shall not be introduced into the well. Filter aggregate may be placed directly from the bag; however, care will be exercised not to include the dust and fines from the bottom of the sack.

The filter pack is to be placed by either tremie pipe or poured down and around the annulus in such a manner as to be distributed around the screen at a uniform height and density.

If temporary casing is used, the filter pack will be placed first and then the casing partially withdrawn to allow the filter pack to slump against the side walls of the boring. Additional filter aggregate will be added to allow for the slight increase in volume.

The filter pack will extend 1 to 2 feet above the top of the screen unless this height prevents proper placement of the bentonite seal. Placement of an adequate bentonite seal shall override the filter pack thickness except that the filter pack will come at least one foot over the top of screen. In no case shall the filter pack extend such that separate permeable zones are connected.

Pipe and Casing.

Blank pipe or casing made of 2-inch diameter Schedule 40 PVC will extend from the top of the screen to between three and four feet above ground surface. This blank pipe

will be attached to the screen by a threaded connection. The casing will be capped with a vented top cap.

Grout Seals.

A bentonite pellet seal shall be 2 or 3 feet in thickness and will be placed in such a manner as to be uniform in thickness around the casing. In placing the bentonite pellets, care will be exercised so as not to incorporate any of the accumulated bentonite fines from the bottom of the packaging container into the annulus.

However, if the soils in this area are unstable to the degree that slumping or collapse of these soils against the permanent wall casing is highly probable, then the bentonite pellet seal shall be placed first and the temporary casing withdrawn as expeditiously as practical. After placement of the bentonite seal, the seal will be given adequate time to hydrate as determined by the qualified WCC representative. After the hydration period, the top of the bentonite seal shall be determined by direct measurement and recorded on the construction log.

The annular space above the bentonite seal will be grouted. All grout materials shall be placed by pumping through rigid, side discharge tremie pipe.

Protective Casing

A 8-inch locking protective casing shall be placed around the PVC riser pipe as soon as possible after grout inspection has been completed. The protective casing shall be provided with a threaded, 1/4-inch hole and drain plug at a base of the exposed portion of the protective casing. The protective casing shall fit such that there is sufficient clearance for cap accessibility.

The inside of the locking cover of the protective casing shall have the following inscribed, stamped or otherwise permanently affixed:

- Identification number
- Top of casing elevation

- Depth
- Screen length
- Date of well installation
- Construction contractor's name

The locking protective casing, at a minimum, shall be five feet in length and extend just over the riser pipe, and be manufactured of new black iron, steel, or stainless steel pipe or will be protective covers commercially manufactured for that purpose. Prior to placement, the casing shall be steam cleaned and free of any asphaltic or resinous coatings except paint or primer applied by the manufacturer. The casing shall be provided with a locking cap that telescopes or in some similar manner extends over and down the casing to prevent the entrance of rainwater, wind-blown dust particles, or insects into the casing. All protective casings shall be provided with a padlock, which shall be locked until the time of sampling.

Surface Slab.

A concrete slab will be poured at the ground surface around each well after installation. The slab will be at least four inches thick and five feet square and sloped gently away from the well in all directions.

Protective Posts.

Wells located in areas of traffic will be further protected by the erection of four steel posts, or approved alternate, each radially located 4 feet from each well, placed 2 to 3 feet below ground surface, having 3 feet minimally above ground surface. Guard posts shall not be made a part of any protective slab constructed around the well.

5.1.2 Documentation

Each installed piezometer shall be depicted in an installation report. This report shall be attached to the boring log for that installation and shall graphically denote, by depth from ground surface (unless otherwise specified):

- The bottom of the boring (that part of the boring most deeply penetrated by drilling and/or sampling) and borehole diameter;
- Screen location;
- Granular filter pack;
- Bentonite pellet seal;
- Grout;
- Cave-in(s);
- Height of riser (without cap/plug) above ground surface;
- Protective casing detail;
  - height of protective casing without cap/cover
  - base of protective casing
  - drainage port location and size
  - guard post configuration

The construction report will include:

- The actual quantity and composition of the grout, seals, and granular filter pack used for each well.
- The screen slot size (in inches), outside diameter, schedule/thickness, composition, and manufacturer.
- The outside diameter, schedule/thickness, composition, and manufacturer of the well casing.
- The joint design and composition.
- Location of placement of bentonite pellet seal.
- Location of placement of annular grout.
- Protective casing composition and nominal inside diameter.
- Special problems and their resolutions; e.g., grout in wells, lost casing and/or screens, bridging, etc.
- Dates and times for the start and completion of well installation.

All abbreviations used on the boring logs/well diagrams shall be designated on the log-diagram or in an attached general legend.

6.0 DOCUMENTATION

For documentation purposes, all information pertinent to field observations and sampling will be recorded in a field logbook with consecutively numbered pages. Entries in the log book will include at least the following:

- Location and sampling activity and address,
- Purpose of sampling,
- Number and approximate volume of samples taken,
- Description of sampling point,
- Date and time of collection,
- Collector's sample identification number(s),
- Sample distribution (e.g., chemical laboratory, geotechnical laboratory, etc.),
- Sample preservation,
- Field observations,
- Any field measurements made, such as pH, temperature, specific conductivity, or other field parameters,
- Weather conditions.

The documentation in the log book will be sufficient to reconstruct the sampling situation without relying on the collector's memory.

6.1 BORING LOGS

Field boring logs of a type similar to that presented in Figure 5 will include at a minimum the following information for each boring location:

- Project name and number
- Boring number
- Location of boring (including measured offset and reason for offset)

- Drilling method
- Name of WCC representative

Each log will also include:

- Sample location number and depth
- Water levels and the respective times of each reading
- Description of subsurface materials using the Unified Soil Classification System (USCS) including classification, consistency, texture, plasticity, moisture content, color, stratification, etc.
- Sample recovery in inches
- Results of organic vapor monitoring, if required
- Sample interval

6.2 PIEZOMETER INSTALLATION/DEVELOPMENT REPORTS

A piezometer installation report will be completed for each newly installed piezometer at the site. Information on these reports shall include the screening interval, depth to sand pack and bentonite seal, and grout backfill. The report will be documented using a form as shown on Figure 7.

6.3 GROUNDWATER SAMPLING REPORT

A sample collection log specific to groundwater sampling will be completed for each monitor well sampled at the site. These reports shall include static groundwater elevation, volumes purged, weather conditions, etc. The report will be on a form similar to Figure 8.

6.4 SAMPLE CUSTODY DOCUMENTATION

Chain-of-custody will be maintained for each sample collected. The chain-of-custody will provide an accurate written record which can be used to trace the possession and holding of samples from the time of collection through data analysis and reporting. The following information will be specified for each sample on the chain-of-custody form:

- Sample number
- Sample date
- Sample time
- Sample location and depth where appropriate
- Analyses to be performed

The chain-of-custody form will be signed by the sample custodian. It will be placed in a water-tight plastic bag and taped to the underside of the lid of the cooler containing the samples designated on the form. The lid of the cooler will be securely taped shut and signed custody seals will be placed on the opening of the cooler lid to allow detection of any possible tampering. Upon arrival in the laboratory, samples will be received by the analytical laboratory representative. Samples contained in the shipment will be compared of the chain-of-custody form to verify that all samples designated have been received. Sample custody within the laboratory will be maintained on internal tracking forms.

The chain-of-custody procedures document sample possession from the time of collection to final disposition. A Sample Analysis Request Form will accompany the Chain-of-Custody form and will document the requested sample analysis.

For the purpose of these procedures, a sample is considered in custody if it is:

- In one's actual possession
- In view, after being in physical possession
- Locked so that no one can tamper with it, after having been in physical custody
- In a secured area, restricted to authorized personnel

A chain-of-custody record will be initiated in the field, and the original will accompany the samples with copies retained at intermediate steps.

Each time responsibility for custody of the sample changes, the new custodian will sign the record and denote the date. A copy of the signed record will be made and retained

by the immediately previous custodian to allow tracking of sample possession. All changes of custody of samples must be a person-to-person change of physical possession.

6.5 ANALYSIS REQUEST

Analysis of the samples collected shall be in accordance with the EPA CLP protocol. All samples shipped for analytical testing shall be accompanied by a Chain-of-Custody form and Sample Analysis Request form for document requested analyses, a copy of which is presented as Figures 9 and 10, respectively.

7.0 DECONTAMINATION

Personnel will wear appropriate protective clothing during decontamination as required by the Health and Safety Plan. All protective equipment (gloves, boots, etc.) will be decontaminated after use or they will be disposed in drums, labeled, dated, and stored until disposed at an approved facility.

7.1 CROSS-CONTAMINATION CONTROL PROCEDURES

In order to minimize the possibility of cross-contamination, strict cross-contamination control procedures should be followed. These procedures include:

- Sample jars should be kept in limited access areas until used.
- Clean equipment should be wrapped in aluminum foil or plastic sheeting prior to use.
- Clean plastic sheeting shall be placed at the sampling area and all equipment should be placed on the sheets. This plastic shall be discarded after each use.
- Equipment refueling shall be performed in designated areas. These areas should be at a distance from any sampling points, to minimize the potential that vapors from fuel will affect sample quality.
- All purge water, decontamination water, and discarded gloves should be containerized for disposal.

To prevent contamination prior to drilling operations, the following will be applied:

- Only new materials will be used. Only bagged cement, powdered bentonite in bags or bentonite pellets in well protectors will be used.
- PVC pipe for riser and well screen will be cured and free of plasticizers and oils.

- Workers will wear clean cotton or surgical gloves when handling riser and well screen.
- Electrical tape will not be used to band pumps.

7.2 SAMPLING EQUIPMENT DECONTAMINATION

All equipment used to collect groundwater samples should be decontaminated prior to the collection of the samples and in between sample locations. Decontamination of this equipment will be accomplished by the following procedures:

- Wash equipment thoroughly with laboratory, phosphate free detergent (i.e., Alconox) and de-ionized water using a brush to remove any particular matter or surface film.
- Triple rinse equipment thoroughly with clean deionized water.
- Rinse equipment thoroughly with methanol.
- Triple rinse with clean deionized water.

In the event that metals become a primary concern, sampling equipment will be rinsed with HCl prior to the methanol rinse. The sampling equipment will be wrapped in aluminum foil or visqueen after decontamination until reuse. This equipment will be decontaminated in areas established near the perimeter of the sampling area. Rinsate samples well be collected as indicated in the Quality Assurance Plan.

7.3 PUMP DECONTAMINATION

If a monitor well has been purged or sampled using any of the pumps as discussed, the pumps used need to be decontaminated between sample points. Decontamination of the pumps includes washing with soap and rinsing the outside portion of the pumps (especially those pumps that are placed inside the wells) as well as running water through the pump. It is recommended that a sufficient volume of distilled water or de-ionized water be run through the pumps to clean them out.

7.4 DOWNHOLE EQUIPMENT DECONTAMINATION

The drilling rig with associated tools and all sampling equipment will be decontaminated before entering the site and leaving the site. Downhole equipment (i.e., augers, bits, samplers, etc.) will be cleaned between boring or other sampling locations at a decontamination/washdown pad. Wash water will be containerized or transported to the wastewater treatment facility.

The equipment will be cleaned as described below:

- The drill rig, all auger flights, auger bits, drilling rods, drill bits, core barrel samplers, Shelby tubes, or other parts of the drilling and well development equipment that will contact the soil or groundwater should be cleaned with a steam cleaner or hand washed with a brush and detergent to remove oil, grease, and any contamination that has accumulated on the equipment.
- Any sampling equipment which can be safely steam cleaned shall be decontaminated as described above.
- These units should then be rinsed thoroughly with potable water

8.1 ANALYTICAL PROCEDURES

Analytical methods to be used in the investigation will be in accordance with CLP procedures utilizing the following statements of work:

- SOW February 1988 (or more recent) for organics
- SOW July 1988 (or more recent) for inorganics
- SOW September 1986 (or more recent) for 2,3,7,8-TCDD

CLP procedures provide step be step guidelines and requirements for the analysis of TCL and TAL constituents, including detection limits as shown in Tables 2 and 3.

8.2 CALIBRATION PROCEDURES AND FREQUENCY

Measuring and test equipment used in the field and laboratory shall be controlled by a formal calibration program. The program shall provide equipment of the proper type, range, accuracy, and precision to provide data compatible with the specified requirements and desired results. Calibration of measuring and test equipment may be performed internally using in-house reference standards, or externally by agencies or manufacturers.

8.2.1 Calibration Procedures

Documented and approved procedures shall be used for calibrating measuring and test equipment. Whenever possible, widely accepted procedures, such as those published by the ASTI or U.S. EPA, or procedures provided by manufacturers in equipment manuals, shall be adopted.

Calibrated equipment shall be uniquely identified by using either the manufacturer's serial number, an equipment identification number, or other means. This identification,

along with a label indicating when the next calibration is due (only for equipment not requiring daily calibration), shall be attached to the equipment. If this is not possible, records traceable to the equipment shall be readily available for reference. It is the responsibility of all personnel to check the calibration status from the due date labels or records prior to using the equipment.

Measuring and test equipment shall be calibrated at prescribed intervals and/or as part of operational use. Frequency shall be based on the type of equipment, inherent stability, manufacturer's recommendations, values given in national standards, intended use, and experience. Equipment shall be calibrated, whenever possible, using reference standards having known relationships to nationally recognized standards (e.g., National Bureau of Standards) or accepted values of physical constants. If national standards do not exist, the basis for calibration shall be documented.

Reference standards (physical and chemical) shall be used only for calibration. Physical standards shall be stored separately from working measuring and test equipment. Equipment that fails calibration or becomes inoperable during use shall be removed from service and segregated to prevent inadvertent use and shall be tagged to indicate it is out of calibration.

Records shall be prepared and maintained for each piece of calibrated measuring and test equipment to indicate that established calibration procedures have been followed. Laboratory calibration records shall be maintained by the laboratory.

8.2.2 Field Equipment Calibration

Field calibration procedures will be performed on field instrumentation as follows:

- pH Meter - Premeasurement calibration and post-measurement verification using at least two standard buffer solutions for each sample tested. The buffer solutions should bracket the sample pH. The two measurements must be within ± 0.05 standard unit of buffer solution values.

- Conductivity Meter - Daily calibration using potassium chloride (KCl) standard solution. The meter measurement must read ± 10 percent of the standard to be considered in control.

- Temperature - Temperature is measured using a thermostat built into the conductivity meter. The readings will be checked at least once at the start of the field use of the instrument using a quality grade thermometer.

- OVA - The instrument will be calibrated daily to a methane in air standard.

Calibration of field equipment shall be documented in the field log book for reference and maintained in the project files.

8.2.3 Laboratory Equipment Calibration

Laboratory calibration procedures for analytical testing will be performed in accordance with SW-846, 3rd Edition and EPA CLP protocols, as appropriate.

9.0 DATA REDUCTION, REPORTING, AND VALIDATION

Data reduction, validation and reporting will follow strict guidelines as presented in this section. The only data that will be reported will be data that meet the record keeping, quality assurance/quality control criteria and reporting formats as defined in this QA Protocol. Laboratory data review will follow documented data validation procedures. Data will be classified as accepted (quantified), estimated (qualified), or rejected based upon the validation procedures. For samples where the analytical data have been rejected, a decision will be made as to whether the results are critical and resampling is required. Only data that are classified as quantified or qualified will be reported.

The following sections describe the procedures to be used in data reduction, validation and reporting of analytical data. All analytical concentration reports will be reported unambiguously as concentration in μg/L or mg/L for aqueous samples.

9.1 DATA REDUCTION

All concentration associated with samples or prepared sample extracts or digestates will be taken directly from multiplied quantitation reports. Multiplied quantitation reports relate the instrumentally measured extract or digestate concentrations to those of the original sample. GC/MS concentration data will be taken, to the extent possible, directly from the data systems following an internal standard calibration for both the volatile and semivolatile base/neutral/acid compounds and following an external calibration for both the pesticide and herbicide compounds.

9.2 DATA REPORTING

The intention of these sampling data reporting procedures is to maintain accurate records of all samples taken and to follow the status of the sample location and analytical results, while minimizing the duplication of record keeping activities and the possibilities for errors.

The tabulation and flow of all data reporting information can be broken down into the following activities:

- Assignment of sample numbers, sample label preparation, and initial permanent record keeping,
- Preparation and labeling of all sample bottles,
- Sampling and in-the-field record keeping,
- Sample receiving and preparation for shipping, and
- Complete sample record book.

9.2.1 Sampling Record Keeping

Prior to collecting a group of samples, a sample coordinator will assign a sample number and a description to all samples to be collected within the group. Sample numbers will be assigned to all divisions of the original sample, all of which have the same identification number with letters denoting subset containers. The sample number and corresponding description will be entered into a permanent record book. The information in the record book will then be written onto the appropriate sample label. When written, the sample labels will be given to the individual responsible for preparing the sample bottles.

The typed/printed labels for a group of sequentially numbered samples and a copy of the data book pages that include these numbers will be given to the sample bottle preparer and/or the sampler. This individual is responsible for applying all labels on the appropriate types of bottles. The sample preparer may also be the person who will be doing the sampling. A copy of the data book pages that include information about the samples will also be given to the person doing the sampling in order to provide a list of samples to check off during the sampling activity.

The individual(s) doing the sampling is (are) responsible for verifying that each sample is put in the appropriate sample bottle. At the time of sampling this person must fill in the time sampled, the date sampled, and sign and complete the sample's label. By the end of the sampling day, the sampler must return all samples to the geologist or

engineer, who will oversee preparation of the samples for shipment (i.e., review chain-of-custody formes, inspect packaging, etc.

The person responsible for shipping the full sample bottles will compare the sample bottles with the appropriate sample data book pages. This person will then prepare the samples for shipping. Chain-of-custody forms must be completed for each sample; the originals must be sent with the samples, and copies will be sent to the sample coordinator to include in the appropriate project files.

9.2.2 Sample Custody and Shipment

When the samples are ready to be sent to the laboratory, the sample coordinator will examine the samples and note their condition. Information including the date sampled, time sampled, and method of preservation,for each sample will be entered in the sample record book.

At the time the samples are shipped, the sample coordinator will have a copy of the pages in the sample record book that include information on the sample numbers and the corresponding information on the date sampled, time sampled, and the date shipped.

The chain-of-custody record will document the fact that the evidentiary integrity of the samples was maintained.

9.2.3 Laboratory Response

The laboratory will be responsible for reviewing all sample analyses according to their internal QA/QC procedures. Data validation will be completed by the laboratory prior to the delivery of the data package. Completed data packages will be available for review by the project data validation coordinator and the project QA officer who will also evaluate the laboratory's checks. Any problems will be resolved and all data will be validated before the data are reported.

Laboratory data for all CLP TCL and TAL parameters will be maintained sufficient to be able to generate the standard CLP forms, if necessary at a later date. The quality

control data and sample data results will be presented in a concise and convenient tabulated summary. The calibration data, raw quality control data, and raw sample data will be sufficient to permit reproduction of the calculation of any of the reported values. In addition, routine laboratory reports will include the following:

- Chain-of-Custody Records
- Quality Control Summary
- Sample Data Results

When generated, each hard copy CLP data package will provide thorough coverage according to the following areas:

- Case Narrative
- Chain-of-Custody
- Quality Control Summary
- Sample Data Results
- Calibration Data
- Raw Quality Control Data
- Raw Sample Data

The case narrative will provide the following information:

- Sample Identification
- Parameters Characterized
- Analytical Methods Employed
- Any Deviation from the Project Work Plan
- All Problems Encountered
- Any Corrective Actions Taken

9.3 DATA VALIDATION

Data validation, according to Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans (QAMS-0050/80, Office of Monitoring System sand Quality Assurance and Office of Research and Development, U.S. Environmental

Protection Agency, Washington, D.C. 20460, December 29, 1980), is "a systematic process for reviewing a body of data against a set of criteria to provide assurance that data are suitable for their intended use", and entails editing, screening, checking, auditing, verification, certification, and review.

The purpose of data validation is to determine if the data conform to specifications and are suitable for the intended project usage. Therefore, all data will be subjected to screening in terms of conformance to project specifications and suitability for use. After completing a sampling program, the field data package (calibration records, chain-of-custody, field logs, etc), will be reviewed for completeness and accuracy. Data validation of analytical data will be completed before any of the results are released. The validation process described below will be done separately from the laboratory performing the analytical work as a separate process from internal laboratory data validation.

The following is a brief description of the methods that will be used during validation of the CLP laboratory data. These data will be reported in a summary data package and evaluated for conformance to the analytical limits set forth in Functional Guidelines for Evaluating Organic Analyses (Hazardous Site Evaluation Division, U.S. Environmental Protection Agency, February, 1988) and Functional Guidelines for Evaluating Inorganic Analyses (Hazardous Site Evaluation Division, U.S. Environmental Protection Agency, July, 1988). These checks will be performed on all samples analyzed, and the results will be summarized in a report for each lot of reported sample data. Qualified data will be reported as such and the appropriate qualifiers will be used for reporting. Non-CLP data and CLP data reported without the CLP summary data packages will be reviewed with respect to holding times, initial and continuing calibrations, method blanks, laboratory control samples, samples, matrix spikes and matrix spike duplicates or duplicates.

If problems occur which would reject data, the following procedures should detect these problems and the problem data will not be reported. However, rejected data will be addressed in the validation report to evaluate completeness goals.

- Compile a list of all investigative samples.

- Compile a list of all QC samples, including but not limited to:
  - Trip blanks
  - Laboratory blanks
  - Laboratory duplicates
  - Performance samples
  - Matrix spikes
  - Matrix spike duplicates
  - Laboratory control spikes
  - Laboratory control spike duplicate

- Review chain-of-custody documents for completeness and correctness.

- Review laboratory analytical procedures and instrument performance criteria.
  - Sample media identification
  - Sample location and descriptions
  - Proper concentration units
  - Proper significant figures

- This data summary will be reviewed for potential data quality problems including:
  - Unexpected results
  - Common laboratory contaminants
  - Unusual spacial concentration/identification relationships
  - Samples in which dilution was necessary
  - Samples which may have exhibited "carry over"

- A sample summary will be prepared to access precision, accuracy and completeness of the analytical data.

- Laboratory records and data package requirements will be checked to access completeness of the data package.

Laboratory performance results will be documented from the validation procedures or from precision or accuracy evaluations. The validation personnel will provide a means to notify the laboratory and initiate the appropriate corrective actions.

Despite all efforts to achieve the objectives of the laboratory QA/QC plan, the potential for error exists in laboratory chemical analyses and in the data reporting process. Every reasonable effort will be made to compare and double-check data reported from the laboratory, data entered into the data management system and data subsequently reported in accordance with the procedures described herein.

All analytical results are to be classified as quantified, qualified or rejected through data validation activities. Quantified data are to be used in laboratory reports at the numerical value identified. Qualified data are to be used as an estimate and are not to be used as a quantitative measurement. Rejected data are not to be included in the analytical report. No further use for design or other activities is to be made on the basis of rejected data.

10.0
INTERNAL QUALITY CONTROL

10.1 DATA TRANSCRIPTION

All data transcriptions for final reports will be reviewed before reporting. Data transcription requirements may vary, but should be monitored in accordance with requirements for accuracy and legibility.

10.2 FIELD SAMPLING QUALITY CONTROL

Quality control for field sampling includes duplicate samples, field blanks and rinsate blanks. Steps and checks used to validate precision and accuracy of the measured parameters and to support the representativeness, comparability, and completeness of the work include:

- Description of the calibration of methods and instruments,
- Description of routine instrument checks (noise levels, drift, linearity, etc).,
- Documentation of traceability of instrument standards, samples and data,
- Documentation on analytical methodology and QC methodology,
- Description of applicable performance audits with appropriate audit materials,
- Description of controls for interference contaminants in analytical methods (use of reference blanks and check standards for method accuracy and precision),
- Description of levels of routine maintenance to verify analytical reliability, and
- Documentation of sample preservation and transport.

10.3 VERIFICATION AND REVIEW

The laboratory analyst should review data to verify that where appropriate, the laboratory:

- Calculates the recoveries of surrogate spikes,
- Verifies that there are no contaminants in all associated blanks,
- Compares samples and duplicates for matches in data results,
- Reviews surrogate and spike recovery data to make sure they are within quality acceptance limits,
- Verifies calibration performance for acceptability,
- Reviews and verifies instrument tuning,
- Reviews internal areas of response for acceptability.

Upon meeting all technical criteria, the sample folder will then be review to:

- Make sure the surrogate recovery section has been completed
- Make sure that all analyzed compounds have been properly recorded
- Confirm identified sample spectra with standard spectra
- Verify accuracy of calculations on compound quantities.

The supervisor examines the entire sample folder to verify that all data transcriptions and documentation included meets wcc requirements. The supervisor also reviews all data enclosed to verify that the data transcriptions are error free and that all documents are legible and in contractual order.

The laboratory QA department performs the review of completed folders on a percent complete basis to verify that the data is present so the WCC can evaluate data quality.

11.0 PERFORMANCE AND SYSTEM AUDITS

In order to verity that procedures outlined in the Quality Assurance Plan and the Sampling Plan, performance and system audits should be conducted. Such audits help to verify that the integrity of the data and related information is maintained.

11.1 FIELD ACTIVITY AUDITS

A senior project personnel or designee should periodically conduct audits of the collection activities to verify that proper sampling protocol is being followed. Some of the items to evaluate include (but are not limited to): sampling operations, sampling labelling, sample handling, field notes, decontamination procedures, and chain-of-custody. The auditor will prepare a summary audit report containing the result of the evaluation and recommendations for any corrective actions.

At a minimum, the auditor will check the following items to determine the completeness and accuracy of field activities:

- Sample Labels: A selected number of sample labels will be examined to determine if they were filled out properly and completely.

- Chain-of-Custody Procedures: Several chain-of-custody records will be examined to determine if they were properly filled out; if parameters for analysis were properly identified; all custody transfers were documented; and date and time of transfer were recorded.

- Field Notebooks: The notebooks will be examined to determine if proper recording format is being followed; if al in situ measurements and filed observations are being documented suitably to explain and reconstruct field activities.

Intermittent audits may be performed by members of the sampling team for each filed sampling task. one independent team member may audit other members who are performing a separate task (i.e., sample handling member may audit sample collection). Results of audits will be included as part of the interim progress reports to the U.S. EPA.

11.2 LABORATORY PERFORMANCE AUDITS

The performance of laboratories in the U.S. EPA Contract Laboratory Program is monitored by the agency by using quarterly blind performance samples. Should the laboratory employed to analyze groundwater samples be in the CLP, then acceptable results on the most recent quarterly blind performance evaluation sample will be accepted as demonstrating laboratory capability to perform volatile, semivolatile and pesticide/PCB analyses. Performance evaluation samples should be obtained from a commercial supplier for laboratories that are not part of the EPA Contract Laboratory Program.

An on-site laboratory evaluation helps to verify that all the necessary quality control is being applied by the laboratory in order to deliver a high quality product. One laboratory audit of each laboratory used for sample analysis may be performed during the program. An internal laboratory audit by the respective laboratory QA officer will be performed during the program.

Quality assurance evaluations allow the evaluators to determine that:

- The organization and personnel are qualified to perform assigned tasks.
- Adequate facilities and equipment are available.
- Complete documentation, including chain-of-custody of samples, is being implemented
- Required analytical methodology is being used.
- Adequate analytical quality control, calibration including reference samples, control charts, and documented corrective action measures, is being provided.

- Acceptable data handling, documentation techniques, and data review are being used.

As described above, audit results will be transmitted to the U.S. EPA in the interim progress reports.

12.0 PREVENTIVE MAINTENANCE

In order to timely and effectively complete a measurement effort, an attempt should be made to minimize downtime of all instrumentation. This is achieved by regular inspections of equipment and the availability of spare parts or supplemental instrumentation should the equipment fail.

WCC's preventative maintenance program is designed to minimize the down time of crucial sampling and/or analytical equipment due to expected or unexpected component failure. In implementing this program, efforts are focused in three primary areas:

- Establishment of maintenance responsibilities
- Establishment of maintenance schedules for major and/or critical instrumentation and apparatus, and documentation of maintenance activities in equipment logs.
- Establishment of an adequate inventory of critical spare parts and equipment.

12.1 FIELD INSTRUMENTATION

All instrumentation to be used in collecting or testing the groundwater samples will be regularly serviced and at a minimum, inspected prior to going out in the field to collect samples.

When laboratory or field equipment is damaged or it cannot be verified that it will produce acceptable data, the equipment will be removed from service to be repaired or replaced. The equipment will not be returned to service until it has been verified that it is capable of producing acceptable data. Acceptable data as referenced here is data which meets quality assurance criteria for precision, accuracy, and representativeness. Equipment leased or purchased to replace damage equipment shall be capable of producing equivalent data. The WCC site managers will be responsible for the repair

and/or replacement of damaged field equipment and filed equipment provided by its subcontractors.

If nonanalytical type field equipment is damaged, it will be repaired immediately such that work may progress, or be replaced with similar or equivalent equipment such that the project objectives and the approved work plan will be met. The laboratory manager and site manager will retain documentation for the repair and/or replacement of laboratory and field equipment, respectively. All notable problems with equipment will be included in the interim progress reports to the U.S. EPA.

12.2 ANALYTICAL INSTRUMENTATION

The laboratory is expected to maintain and inspect their equipment. Instrument redundance, to the extent possible, coupled with an extensive stock of spare parts and expendable materials on-site will serve to minimize downtime.

Subcontract laboratories are inspected to verify that similar preventive maintenance programs are in operation, and are properly documented including the following:

- Accepting data with an acknowledged level of uncertainty.
- Resampling and analyzing.
- Recalibration of instruments using freshly prepared calibration standards.
- Replacement of solvent or other reagents that give unacceptable blank values.
- Additional training of laboratory personnel in correct implementation of sample preparation and analysis methods.

The laboratory manager will be responsible for the repair and/or replacement of damaged laboratory equipment.

13.0 CORRECTIVE ACTION

During the course of this investigation, it will be the responsibility of the supervisor and the sampling team members to see that all measurement and sampling procedures are followed as specified and that measurement data meet the prescribed acceptance criteria. In the event a problem is discovered, it is imperative that prompt and prescribed action to be taken to correct the problem. Corrective action will be initiated, for instance, if QC data are found to exceed acceptability limits.

Whenever corrective action is necessary to eliminate the cause of nonconformance, a closed-loop corrective action system will be used. As appropriate, the sample coordinator, analysis coordinator, or the program manager will verify that all of these steps are followed:

- The problem will be defined,
- Responsibility for investigating the problem will be assigned,
- The cause of the problem will be investigated and determined,
- A corrective action to eliminate the problem will be determined,
- Responsibility for implementing the corrective action will be assigned and accepted,
- The effectiveness of the corrective action will be established, and
- The fact that the corrective action has eliminated the problem will be verified.

13.1 CORRECTIVE ACTION FOR FIELD SITUATION

The need for corrective action will be identified as a result of the field audits previously described as well as by other means (e.g., equipment malfunction). If problems become apparent that are identified as originating in the field, corrective action will take place. If corrective action does not resolve the problem, appropriate personnel will be assigned to investigate and evaluate the cause of the problem. Once a corrective action is implemented, the effectiveness of the action will be verified.

13.2 CORRECTIVE ACTION FOR LABORATORY SITUATIONS

The need for corrective action resulting from QA audits will be initiated by the environmental programs coordinator in consultation with the environmental lab personnel. Corrective Action may include, but is not limited to :

- Accepting data with an acknowledged level of uncertainty,
- Resampling and analyzing,
- Recalibration of instruments using freshly prepared calibration standards,
- Replacement of solvent or other reagents that give unacceptable blank values,
- Additional training of laboratory personnel in correct implementation of sample preparation and analysis methods.

14.0
QUALITY ASSURANCE REPORTS TO MANAGEMENT

Quality Assurance reports will include a tabulation of the analytical data and an explanation of any sampling conditions or QA/QC problems and their possible effects on data quality. In addition, audit reports will be issued as appropriate

14.1 ANALYTICAL QA REPORTS

The laboratory analytical program manager, laboratory QA coordinators, QA officer, and the data validation coordinator will communicate as needed to verify that all QA/QC practices are being carried out and to review possible or potential problem areas. Data anomalies are to be investigated to assess whether they are a result of operator or instrument deviation, or if they are a true reflection of the site or task function.

Final analytical reports will contain a discussion of QA/QC evaluations summarizing the quality of the data collected an/or used as appropriate to each phase of the project. The objective of the project QA/QC summary will be to ensure that the data are sufficient in quality and quantity to support the remedial alternative. The QA/QC summary will include:

- Tabulated results of the analytical data.
- A report from the QA officer evaluating the results of field and laboratory audits as described in Section 11.0.
- As tabulation of the data validation work sheets for each batch analysis from the data validation personnel evaluating the validity of the analytical data with respect to accuracy, precision, and completeness.
- A summary of significant QA problems with the corrective actions taken to rectify the situation.
- A report by the QA officer summarizing the validity of the analytical data with respect to accuracy, precision, completeness, representativeness, and comparability.

14.2 AUDIT REPORTS

Audit reports will be issued upon completion of any audits. These reports will describe the person involved with audits, what was being audited, and the findings of the audit. Any follow-up or repeat audit to verify corrective action will also be reported.

TABLES

TABLE 1

QUALITY CONTROL LEVEL OF EFFORT

	PARAMETERS	FREQUENCY OF EPA CLP ANALYSIS	FREQUENCY FOR SW846 ANALYSIS
Metals	Calibration Blank (ICP and AA)	Each calibration, beginning and end of each run, 10% frequency	Each calibration, beginning and end of each run, 10% frequency
	Initial Calibration Verification	Daily and each instrument setup	Daily and each instrument setup
	Continuing Calibration Verification (ICP and AA)	Beginning and each of each run; 10% frequency or every 2 hours	End of each run and 10% frequency
	Preparation Blank (ICP and AA)	One per batch or one per 20 samples received	One per batch or one per 20 samples received
	Matrix Spike Analysis (ICP and AA)	One per case or one per 20 samples received	One per case or one per 20 samples received
	Duplicate Sample Analysis (ICP and AA)	One per case or one per 10 samples received	One per case or one per 20 samples received
	Laboratory QC Sample Analysis	One per batch or one per 20 samples received	One per batch or one per 20 samples received
	Duplicate Injections (AA-Furnace)	Each sample (at least a single analytical spike will be performed to determine if the method of standard addition is required for quantitation)	
	Interference Check Sample (ICP)	Beginning and end of each run or one per 4-hour shift	Beginning and end of each run or one per 4-hour shift
	Serial Dilution Analysis (ICP)	One per case or one per 20 samples received	One per case or one per 20 samples received

TABLE 1

QUALITY CONTROL LEVEL OF EFFORT

PARAMETERS		FREQUENCY OF EPA CLP ANALYSIS	FREQUENCY FOR SW846 ANALYSIS
Cyanide	Calibration Blank	One per analytical run or at least one per setup	One per analytical run or at least one per setup
	Matrix Spike Analysis	One per analytical run or at least one per setup	One per analytical run or at least one per setup
	Duplicate Sample Analysis	One per analytical run or at least one per setup	One per analytical run or at least one per setup
	Laboratory QC Sample Analysis	One per analytical run or at least one per setup	One per analytical run or at least one per setup
Organics (GC/MS)	Laboratory Blank	One per case or one per 20 samples received	One per case or one per 20 samples received
VOA, Semi-Volatile, Pesticide/ PCBs	Matrix Spike Analysis	One per case or one per 20 samples received	One per case or one per 20 samples received
	Matrix Spike Duplicate Analysis	One per case or one per 20 samples received	One per case or one per 20 samples received
	Surrogate Spike	Each sample	Each sample

TABLE 2
TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMIT (CRQL)*

Volatile Organics	Quantitation Limits[a] Groundwater µg/L	Low Soil/Sediment µg/Kg[b]
Chloromethane	10	10
Bromomethane	10	10
Vinyl Chloride	10	10
Chloroethane	10	10
Methylene Chloride	5	5
Acetone	10	10
Carbon Disulfide	5	5
1,1-Dichloroethene	5	5
1,1-Dichloroethane	5	5
1,2-Dichloroethene (Total)	5	5
Chloroform	5	5
1,2-Dichloroethane	5	5
2-Butanone	10	10
1,1,1-Trichloroethane	5	5
Carbon Tetrachloride	5	5
Vinyl Acetate	10	10
Bromodichloromethane	5	5
1,2-Dichloropropane	5	5
cis-1,3-Dichloropropane	5	5
Trichloroethene	5	5
Dibromochloromethane	5	5
1,1,2-Trichloroethane	5	5

TABLE 2
TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMIT (CRQL)*

Volatile Organics	Quantitation Limits[a] Groundwater µg/L	Low Soil/Sediment µg/Kg[b]
Benzene	5	5
trans-1,2-Dichloropropane	5	5
Bromoform	5	5
4-Methyl-2-pentanone	10	10
2-hexanone	10	10
Tetrachloroethene	5	5
Toluene	5	5
1,1,2,2-Tetrachloroethane	5	5
Chlorobenzene	5	5
Ethyl Benzene	5	5
Styrene	5	5
Xylenes (Total)	5	5

[a] Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

[b] Medium Soil/Sediment Contract Required Quantitation Limits (CRQL) for Volatile TCL Compounds are 125 times the individual Low Soil/Sediment CRDL.

* Specific quantitation limits are highly matrix dependent. The quantitation limits listed herein are provided for guidance and may not always be achievable.

Source: Statement of Work for Organic Analysis Multi-Media Multi-Concentration SOW 2/88, Revisions 9/88, 4/89, and 5/89, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C., May 1989.

TABLE 2
TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMIT (CRQL)*

Semivolatile Organics	Quantitation Limits[a] Groundwater µg/L	Low Soil/Sediment µg/Kg[b]
Phenol	10	330
bis-2-Chloroethyl)ether	10	330
2-Chlorophenol	10	330
1,3-Dichlorobenzene	10	330
1,4-Dichlorobenzene	10	330
Benzyl Alcohol	10	330
1,2-Dichlorobenzene	10	330
2-Methylphenol	10	330
bis(2-Chloroisopropyl)ether	10	330
4-Methylphenol	10	330
N-Nitro-di-n-dipropylamine	10	330
Hexachloroethane	10	330
Nitrobenzene	10	330
Isophorone	10	330
2-Nitrophenol	10	330
2,4-Dimethylphenol	10	330
Benzoic Acid	50	1600
bis(2-Chloroethoxy)methane	10	330
2,4-Dichlorophenol	10	330
1,2,4-Trichlorobenzene	10	330
Naphthalene	10	330

TABLE 2
TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMIT (CRQL)*

Semivolatile Organics	Quantitation Limits[a] Groundwater µg/L	Quantitation Limits[a] Low Soil/Sediment µg/Kg[b]
4-Chloroaniline	10	330
Hexachlorobutadiene	10	330
4-Chloro-3-methylphenol (para-chloro-meta-cresol)	10	330
2-Methylnaphthalene	10	330
Hexachlorocyclopentadiene	10	330
2,4,6-Trichlorophenol	10	330
2,4,5-Trichlorophenol	50	1600
2-Chloronaphthalene	10	330
2-Nitroaniline	50	1600
Dimethylphthalate	10	330
Acenaphthylene	10	330
2,6-Dinitrotoluene	10	330
3-Nitroaniline	50	1600
Acenaphthene	10	330
2,4-Dinirophenol	50	1600
4-Nitrophenol	50	1600
Dibenzofuran	10	330
2,4-Dinitrotoluene	10	330
Diethylphthalate	10	330
4-Chlorophenyl-phenyl-ether	10	330
Fluorene	10	330

TABLE 2
TARGET COMPOUND LIST (TCL) AND
CONTRACT REQUIRED QUANTITATION LIMIT (CRQL)[a]

Semivolatile Organics	Quantitation Limits[a]	
	Groundwater µg/L	Low Soil/Sediment µg/Kg[b]
4-Nitroaniline	50	1600
4,6-Dinitro-2-methylphenol	50	1600
N-Nitrosodiphenylamine	10	330
4-Bromophenyl-phenylether	10	330
Hexachlorobenzene	10	330
Pentachlorophenol	50	1600
Phenanthrene	10	330
Anthracene	10	330
Di-n-butylphthalate	10	330
Fluoranthene	10	330
Pyrene	10	330
Butyl Benzyl Phthalate	10	330
3,3'-Dichlorobenzidine	20	660
Benzo(a)anthracene	10	330
Chrysene	10	330
bis(20Ethylhexyl)phthalate	10	330
Di-n-octylphthalate	10	330
Benzo-(b)fluoranthene	10	330
Benzo-(k)fluoranthene	10	330
Benzo(a)pyrene	10	330
Indeno(1,2,3-cd)pyrene	10	330

TABLE 2
TARGET COMPOUND LIST (TCL) AND
CONTRACT REQUIRED QUANTITATION LIMIT (CRQL)[c]

Semivolatile Organics	Quantitation Limits[a]	
	Groundwater µg/L	Low Soil/Sediment µg/Kg[b]
Dibenz(a,h)anthracene	10	330
Benzo(g,h,i)perylene	10	330

[a] Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

[b] Medium Soil/Sediment Contract Required Quantitation Limits (CRQL) for Volatile TCL Compounds are 125 times the individual Low Soil/Sediment CRDL.

[c] Specific quantitation limits are highly matrix dependent. The quantitation limits listed herein are provided for guidance and may not always be achievable.

Source: Statement of Work for Organic Analysis Multi-Media Multi-Concentration SOW 2/88, Revisions 9/88, 4/89, and 5/89, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C., May 1989.

TABLE 2
TARGET COMPOUND LIST (TCL) AND
CONTRACT REQUIRED QUANTITATION LIMIT (CRQL)[c]

Pesticide/PCBs	Quantitation Limits[a]	
	Groundwater µg/L	Low Soil/Sediment µg/Kg[b]
alpha-BHC	0.05	8.0
beta-BH	0.05	8.0
delta-BHC	0.05	8.0
gamma-BHC	0.05	8.0
Heptachlor	0.05	8.0
Aldrin	0.05	8.0
Heptachlor Epoxide	0.05	8.0
Endosulfan I	0.05	8.0
Dieldrin	0.10	16.0
4,4'-DDE	0.10	16.0
Endrin	0.10	16.0
Endosulfan II	0.10	16.0
4,4'DDD	0.10	16.0
Endosulfan Sulfate	0.10	16.0
4,4'-DDT	0.10	16.0
Methoxychlor	0.05	80.0
Endrin ketone	0.10	16.0
alpha-Chlordane	0.05	80.0
gamma-Chlordane	0.05	80.0
Toxaphene	1.0	160.0
Aroclor-1242	0.5	80.0
Aroclor-1248	0.5	80.0

TABLE 2
TARGET COMPOUND LIST (TCL) AND
CONTRACT REQUIRED QUANTITATION LIMIT (CRQL)[a]

Pesticide/PCBs	Quantitation Limits[a]	
	Groundwater µg/L	Low Soil/Sediment µg/Kg[b]
Aroclor-1061	0.5	80.0
Aroclor-1221	0.5	80.0
Aroclor-1232	0.5	80.0
Aroclor-1254	1.0	160.0
Aroclor-1260	1.0	160.0

[a] Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

[b] Medium Soil/Sediment Contract Required Quantitation Limits (CRQL) for Volatile TCL Compounds are 125 times the individual Low Soil/Sediment CRDL.

[c] Specific quantitation limits are highly matrix dependent. The quantitation limits listed herein are provided for guidance and may not always be achievable.

Source: Statement of Work for Organic Analysis Multi-Media Multi-Concentration SOW 2/88, Revisions 9/88, 4/89, and 5/89, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C., May 1989.

TABLE 3 TARGET ANALYTE LIST (TAL) INORGANICS	
Analyte	**Contract Required Detection Limits* (µg/l)**
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	3
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Vanadium	50
Zinc	20
Cyanide	10

* The reporting limits are instrument detection limits obtained in pure water. The detection limits for samples may be considerably higher depending on the sample matrix.

Source: Statement of Work for Inorganic Analysis Multi-Media Multi-Concentration, SOW No. 788, Revisions 2/89 and 6/89, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency

TABLE 4 DETECTION LIMITS FOR METALS[1]				
	Nominal Water Dectection Limit, mg/L			
Metal	Flame AA	Furnace AA	Other AA	ICP
Aluminum	0.1	0.003	—	0.05*
Antimony	0.2	0.002**	—	0.30*
Arsenic	0.5	0.002*	0.002	0.05*
Barium	0.1	0.002	—	0.005*
Beryllium	0.002	0.0001	—	0.001*
Cadmium	0.005	0.0001**	—	0.002*
Calcium	0.01	—	—	0.01*
Chromium	0.05	0.001	—	0.005*
Cobalt	0.05	0.001	—	0.003*
Copper	0.02	0.001	—	0.002*
Iron	0.03	0.001	—	0.01*
Lead	0.1	0.001*	—	0.02
Magnesium	0.05	0.001	—	0.1*
Manganese	0.01	0.0002	—	0.005*
Mercury	—	—	0.00002*	—
Nickel	0.04	0.001	—	0.01*
Potassium	0.01	—	—	0.3*
Selenium	—	0.002*	0.002	0.075
Silver	0.01	0.0001**	—	0.003*
Sodium	0.002	—	—	0.5*
Thallium	0.1	0.001*	—	0.040
Tin	1	0.05	—	0.03*
Vanadium	0.2	0.004	—	0.002*
Zinc	0.005	0.00005	—	0.004*

* Recommended method for analyses (RMAL).
** More sensitive method sometimes used.
[1] Based upon SW846, 3rd Edition Methods

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TABLE 5
PRECISION, ACCURACY, AND COMPLETENESS OBJECTIVES

Measurement Parameters	Experimental Conditions	Surrogate Percent Recovery	Precision (Relative Percent Difference	Accuracy (Percent Recovery)	Completeness (Percent)	Other EPA CLP Control Limits
Volatile (Purgeable) Organic Target Compounds[1]	Spiked and unspiked field samples	Compound Specific[2]	Compound Specific[3]	Compound Specific[3]	90	Laboratory Blank: ± D.L. Laboratory Duplicate: ±35% RPD Initial Calibration: RRF[4] >.05 and ≤30% RSD[5] Continuing Calibration: >.05 RRF and ≤25% D[6] Internatal Standard GC/MS: -50 to + 100%
Semivolatile (Base/Neutral and Acid) Organic Target Compounds[1]	Spike and unspiked field samples	Compound Specific[2]	Compound Specific[3]	Compound Specific[3]	90	Laboratory Blank: ± D.L. Laboratory Duplicate: ±35% RPD Initial Calibration: RRF[4] >.05 and ≤30% RSD[5] Continuing Calibration: >.05 RRF and ≤25% D[6] Internatal Standard GC/MS: -50 to + 100%
Pesticides and PCBs[1]	Spiked and unspiked field samples	Compound Specific[2]	Compound Specific[3]	Compound Specific[3]	90	Laboratory Blank: ±D.L. Laboratory Duplicate: ±35% RPD Initial Calibration: 10% RSD Continuing Calibration: 15 or 20% RSD DDT/Endrin Degradation: <20%

TABLE 5
PRECISION, ACCURACY, AND COMPLETENESS OBJECTIVES

Measurement Parameters	Experimental Conditions	Surrogate Percent Recovery	Precision (Relative Percent Difference	Accuracy (Percent Recovery)	Completeness (Percent)	Other EPA CLP Control Limits
Mercury[4]	Spiked and Unspiked filed samples		±20 percent provided both sample and duplicate greater than 5 times CRDL ±CRDL if either sample or duplicate less than CRDL	75 to 125 percent unless the sample exceeds the spike concentration by a factor of four or more Not calculated if sample concentration exceeds spike concentration by a factor of four or more	90	Calibration Blank: ±D.L. Calibration Verification: 80-120% Preparation Blank: ±D.L. Duplicate Sample Analysis: ±D.L. or 20%RPD Lab QC Sample Analysis: 80-120%
Cyanide, Total[4]	Spike and unspiked field samples		±20 percent provided both sample and duplicate greater than 5 times CRDL ±CRDL if either sample or duplicate less than CRDL	75 to 125 percent unless the sample exceeds the spike concentration by a factor of four or more	90	Calibration Blank: ±D.L. Calibration Verification: 85-115% Preparation Blank: ±D.L. Duplicate Sample Analysis: ±D.L. or 20%RPD Lab QC Sample Analysis: 80-120%
Target Analyte List (TAL) Metals Other than Mercury[4]	Spiked and unspiked field samples		±20 percent provided both sample and duplicate greater than 5 times CRDL ±CRDL if either sample or duplicate less than 5 times CRDL	75 to 125 percent unless the sample exceeds the spike concentration by a factor of four or more Not calculated if sample concentration exceeds spike concentration by a factor of four or more	90	Calibration Blank: ±D.L. Calibration Verification: 90-110% Preparation Blank: ±D.L. Duplicate Sample Analysis: ±D.L. or 20%RPD Lab QC Sample Analysis: 85-115%

TABLE 5
PRECISION, ACCURACY, AND COMPLETENESS OBJECTIVES

Measurement Parameters	Experimental Conditions	Surrogate Percent Recovery	Precision (Relative Percent Difference	Accuracy (Percent Recovery)	Completeness (Percent)	Other EPA CLP Control Limits
Restricted Target Analyte List (TAL) Metals[4] Calcium Magnesium Potassium Sodium	Unspiked field samples		±20 percent provided both sample and duplicate greater than 5 times CRDL ±CRDL if either sample or duplicate less than CRDL	Not applicable. Matrix spikes not employed with these analytes.	90	Calibration Blank: ±D.L. Calibration Verification: 90-110% Preparation Blank: ±D.L. Duplicate Sample Analysis: ±D.L. or 20%RPD Lab QC Sample Analysis: 85-115%

1 See Table XX for an enumeration of the Target Compound List (TCL) parameters and Contract Required Quantitation Limits (CRQLs).

2 See Table XX for an enumeration of spike surrogate compounds and control limits.

3 See Table XX for an enumeration of matrix spike compounds and control limits.

4 See Table XX for an enumeration of the Target Analyte List (TAL) parameters and Contract Required Detection Limits (CRQLs).

Abbreviations:

AA Atomic Adsorption
CRDL *Contract Required* Detection Limit
D.L. Diction Limit
D Percent Difference
ICP Inductively Coupled Plasma
RPD Relative Percent Difference

TABLE 6

SURROGATE SPIKE RECOVERY LIMITS

ANALYTICAL FRACTION	SURROGATE COMPOUND	RECOVERY LIMITS (%)
Volatile	4-Bromofluorobenzene	86 - 115
	1,2-Dichloroethane-d_4	76 - 114
	Toluene-d_8	88 - 110
Base/Neutral	Nitrobenzene-d_5	35 - 114
	2-Fluorobiphenyl	43 - 116
	p-Terphenyl-d_{14}	33 - 141
Acid	Phenol-d_6	10 - 94
	2-Flurorphenol	21 - 100
	2,4,6-Tribromophenol	10 - 123
Pesticide	Dibutylchlorendate[1]	24 - 154

[1] Recovery limits are for advisory purposes only. They are not used to determine if a sample should be reanalyzed.

Source: Statement of Work for Organic Analysis Multi-Media Multi-Concentration, SOW 2/88, Revisions 9/8, 4/89 and 5/89, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C., May, 1989.

TABLE 7

MATRIX SPIKE RECOVERY AND RELATIVE PERCENT DIFFERENCE CONTROL LIMITS

ANALYTICAL CATEGORY	MATRIX SPIKE COMPOUND	RELATIVE PERCENT DIFFERENCE	RECOVERY LIMITS (%)
Volatile	1,1-Dichloroethene	14	61 - 145
	Trichloroethene	14	71 - 120
	Chlorobenzene	13	75 - 130
	Toluene	13	76 - 125
	Benzene	11	76 - 127
Base/Neutral	1,2,4-Trichlorobenzene	28	39 - 98
	Acenaphthene	31	46 - 118
	2,4-Dinitrotoluene	38	24 - 96
	Di-n-Butylphthalate	40	11 - 117
	Pyrene	31	26 - 127
	N-Nitroso-Di-n-Propylamine	38	41 - 116
	1,4-Dichlorobenzene	28	36 - 97
Acid	Pentachlorophenol	50	9 - 103
	Phenol	42	12 - 89
	2-Chlorophenol	40	27 - 123
	4-Chloro-3-Methylphenol	42	23 - 97
	4-Nitrophenol	50	10 - 80
Pesticide	Lindane	15	56 - 123
	Heptachlor	20	40 - 131
	Aldrin	22	40 - 120

TABLE 7

MATRIX SPIKE RECOVERY AND RELATIVE PERCENT DIFFERENCE CONTROL LIMITS

ANALYTICAL CATEGORY	MATRIX SPIKE COMPOUND	RELATIVE PERCENT DIFFERENCE	RECOVERY LIMITS (%)
	Dieldrin	18	52 - 126
	Endrin	21	56 - 121
	4,4'-DDT	27	38 - 127

Source: Statement of Work for Organic Analysis Multi-Media Multi Concentration, SOW 2/88, Revisions 9/88, 4/89 and 5/89, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C., May, 1989.

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TABLE 8
SAMPLE CONTAINERS, PRESERVATION, AND HOLDING TIMES

Parameter	Container	Preservation	Holding Time
Total Dissolved Solids (TDS)	1,000-ml glass wide-mouth bottle with teflon-lined screw closure, or high density polyethylene bottle	Cool, 4°C	48 hours after collection
Total Organic Carbon (TOC)	500-ml glass bottle cleaned according to Protocol A or B	Cool, 4°C, H_2SO_4 to pH < 2	28 days after collection
Volatiles	Two 40-ml glass vials with teflon-faced silicone septa with open top polyethylene screw closure cleaned according to Protocol B	Cool, 4°C HCl to pH < 2 Zero Headspace Cool, 4°C Zero Headspace	7 days after collection 14 days after collection
Semivolatiles	Two 1,000-ml amber glass wide-mouth bottles with teflon-lined screw closures cleaned according to Protocol A	Cool, 4°C	7 days after collection 40 days after extraction
Chlorides	1,000-ml glass wide-mouth bottle with teflon-lined screw closure or high density polyethylene bottle cleaned according to Protocol A or C	Cool, 4°C	28 days after collection

TABLE 8
SAMPLE CONTAINERS, PRESERVATION, AND HOLDING TIMES

Parameter	Container	Preservation	Holding Time
Metals	1,000-ml glass wide-mouth bottle with teflon-lined screw closure or high density polyethylene bottle cleaned according to Protocol A	HNO_3 to pH < 2	Mercury: 28 days after collection Other Metals: 180 days after collection
Pesticides/PCBs	Two 1,000-ml amber glass wide-mouth bottles with teflon-lined screw closures cleaned according to Protocol A	Cool, 4°C	7 days after collection 40 days after extraction
Nitrate/Nitrite[1]	500-ml glass wide-mouth bottle with teflon-lined screw closure or high density polyethylene bottle cleaned according to Protocol B	Cool, 4°C H_2SO_4 to pH < 2	28 days after collection
Radionuclides	Three 1,000-ml glass wide-mouth bottles with teflon-faced screw closure or high density polyethylene bottle cleaned according to Protocol A	HNO_3 to pH < 2	180 days after collection

TABLE 8
SAMPLE CONTAINERS, PRESERVATION, AND HOLDING TIMES

Parameter	Container	Preservation	Holding Time
Extractables BNA	Four 1,000-ml amber glass wide-mouth bottles with teflon-lined screw closures	Cool, 4°C	7 days after collection 40 days after extraction
Oil and Grease	1,000-ml amber glass wide-mouth bottles with teflon-lined screw closures	Cool, 4°C	28 days after collection
BOD_5	500-ml glass wide-mouth bottle with teflon-lined screw closure, or high density polyethylene bottle	Cool, 4°C	48 hours after collection
Total Suspended Solids (TSS)	1,000-ml glass wide-mouth bottle with teflon-lined screw closure, or high density polyethylene bottle	Cool, 4°C	7 days after collection
Sulfates	1,000-ml glass wide-mouth bottle with teflon-lined screw closure or high density polyethylene bottle	Cool, 4°C	28 days after collection
pH	1,000-ml glass wide-mouth bottle with teflon-lined screw closure or high density polyethylene bottle	Cool, 4°C	immediately upon receipt

TABLE 9

FIELD QUALITY CONTROL SAMPLE FREQUENCY
GROUNDWATER MONITOR WELLS[1]

MATRIX	FIELD DUPLICATE	RINSATE BLANK	TRIP[2] BLANK	MS/MSD[3]
Ground Water	1	1	1	1
Analytical Parameter	All Parameters	VOA and Semi Volatile	VOA	Spike

1 There are less than 20 monitor wells. A sampling event or sample delivery group shall consist of a groundwater sample from each well plus the 5 quality control samples.

2 Trip blanks will be prepared by the laboratory and shipped with the sample containers. One trip blank will be kept with the collected samples and shipped back to the laboratory in the last shipment.

3 Matrix Spiked/Matrix Spiked Duplicate samples will be spiked in the laboratory.

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TABLE 10

DFTPP AND BFB TUNING AND CALIBRATION CRITERIA

	EPA CLP ORGANIC ANALYSIS[1]	SW846 ORGANIC ANALYSIS[2]
EXTRACTABLE ORGANICS (DFTPP)		
51	30.0 - 60.0% of m/z 198	30.0 - 60.0% of m/z 198
68	<2.0% of m/z 69	<2.0% of m/z 69
70	<2.0% of m/z 69	<2.0% of m/z 69
127	40.0 - 60.0% of m/z 198	40.0 - 60.0% of m/z 198
197	<1.0% of m/z 198	<1.0% of m/z 198
198	base peak, 100% relative abundance	base peak, 100% relative abundance
199	5.0 - 9.0% of m/z 198*	5.0 - 9.0% of m/z 198
275	10.0 - 30.0% of m/z 198	10.0 - 30.0% of m/z 198
365	>1.0% of m/z 198	>1.0% of m/z 198
441	present, but less than m/z 443	present, but less than m/z 443
442	>40.0% of m/z 198	>40.0% of m/z 198
443	17.0 - 23.0% of m/z 442	17.0 - 23.0% of m/z 442
VOLATILE ORGANICS (BFB)		
50	15.0 - 40.0% of the base peak	15.0 - 40.0% of the base peak
75	30.0 - 60.0% of the base peak	30.0 - 60.0% of the base peak

TABLE 10

DFTPP AND BFB TUNING AND CALIBRATION CRITERIA

	EPA CLP ORGANIC ANALYSIS[1]	SW846 ORGANIC ANALYSIS[2]
95	base peak, 100% relative abundance	base peak, 100% relative abundance
96	5.0 - 9.0% of the base peak	5.0 - 9.0% of the base peak
173	<2.0% of m/z 174	<1.0% of the base peak
174	>50.0% of the base peak	>50.0% of the base peak
175	5.0 - 9.0% of m/z 174	5.0 - 9.0% of m/z 174
176	>95.0%, but less than 101.0% of m/z 174	>95.0%, but less than
177	5.0 - 9.0% of m/z 176	5.0 - 9.0% of m/z 176

Source: [1]*Statement of work for Organic Analysis Multi-Media Multi-Concentration*, SOW 2/88, Revisions 9/88, 4/89 and 5/89, Office of Solid Waste and Emergency Response, U.S. Environmental Protective Agency, Washington, D.C., May, 1989.

[2]SW846, 3rd Edition

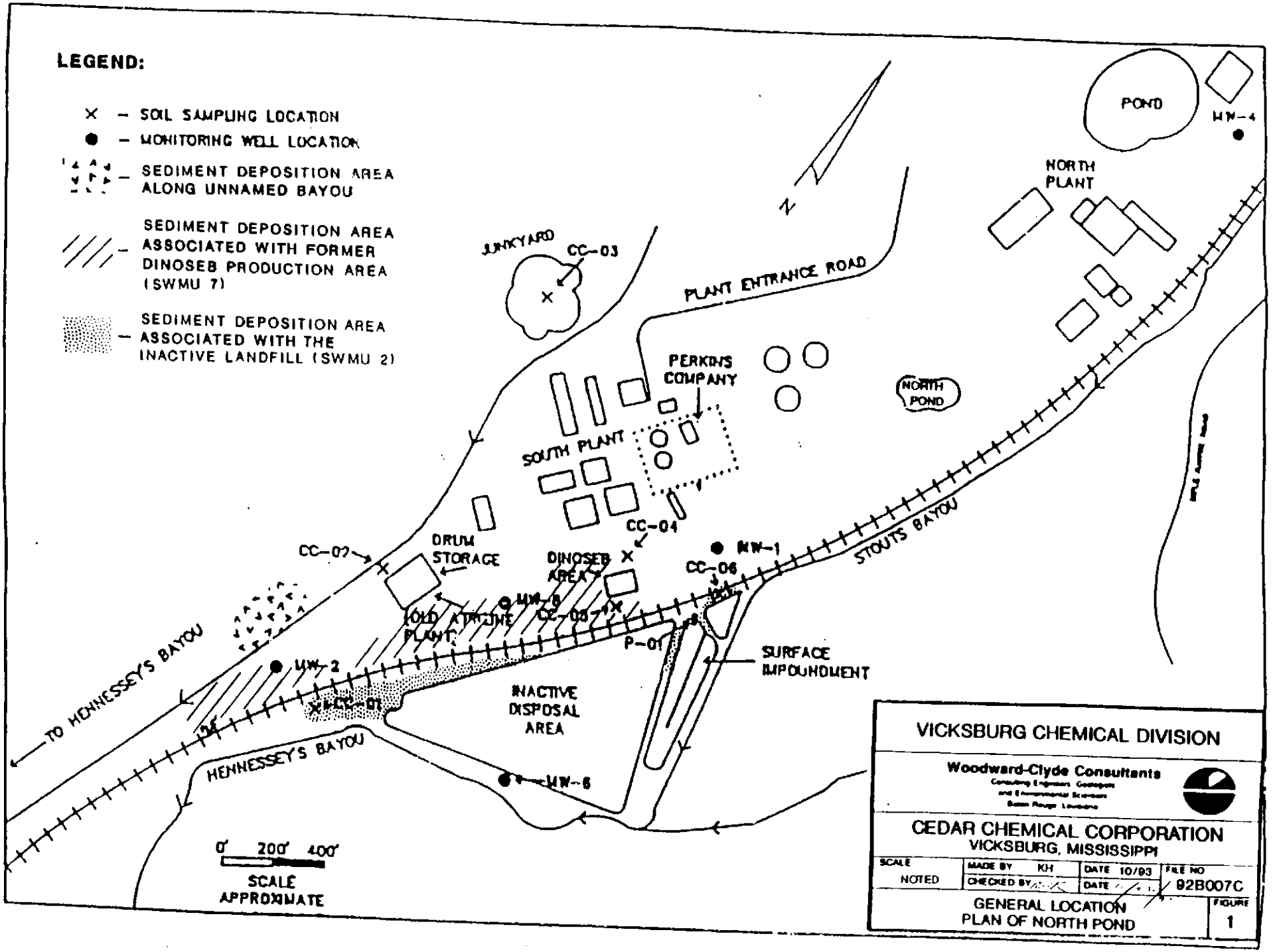
TABLE 11 ANALYTICAL METHOD SUMMARY		
Category/Parameter	Method	Reference
TCL	EPA CLP SOW 2/88	1
TAL	EPA CLP SOW 7/88	2
BOD_5	SW846 or Equivalent Method	3
TSS	SW846 or Equivalent Method	3
TOC	SW846 or Equivalent Method	3
TDS	SW846 or Equivalent Method	3
pH	SW846 or Equivalent Method	3

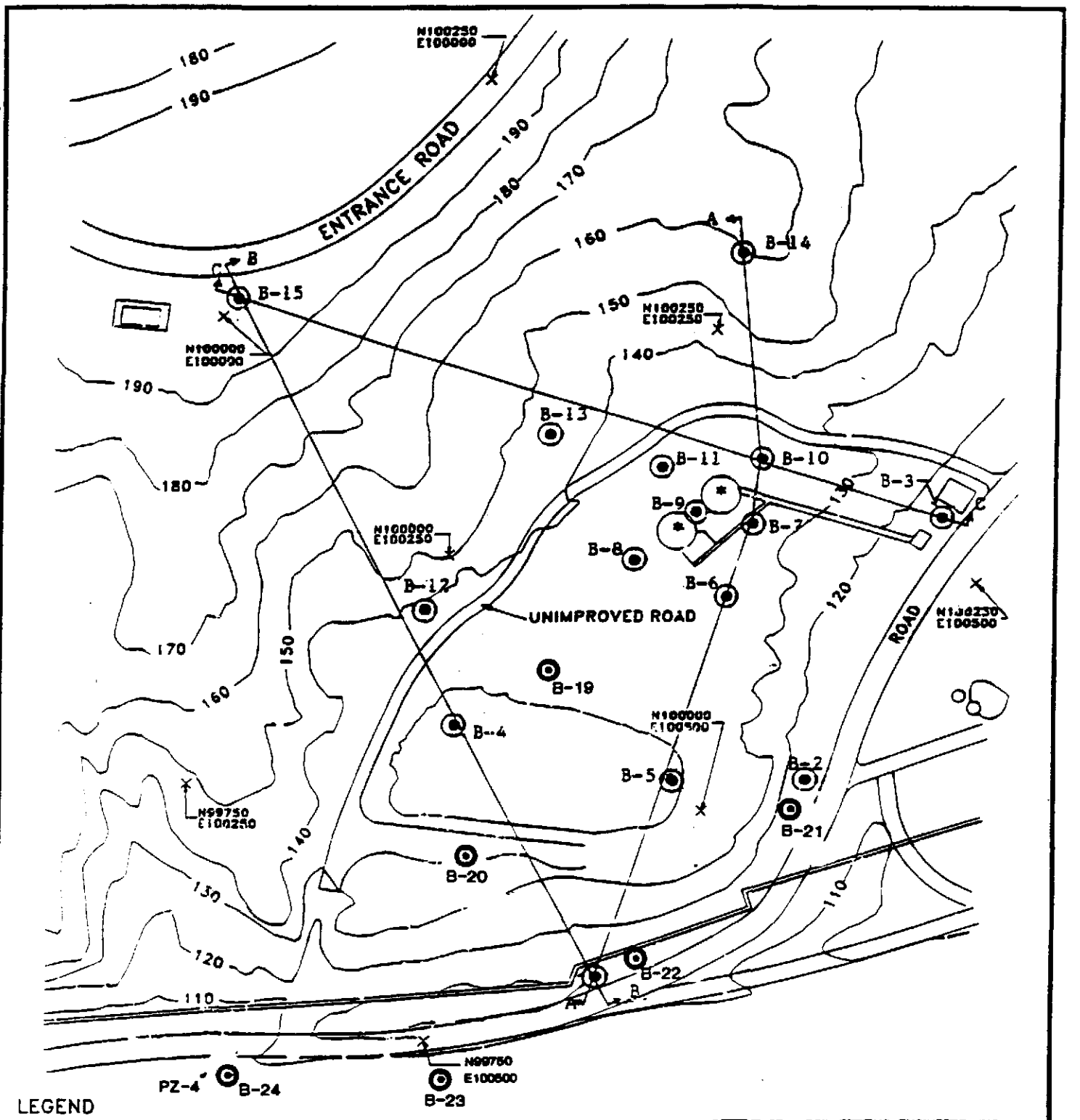
1. Statement of Work for Organic Analysis Multi-Media Multi-Concentration, SOW 2/88, Revision 9/88, 4/89, and 5/89, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C., May 1989.

2. Statement of Work for Inorganic Analysis Multi-Media Multi-Concentration, SOW No. 788, Revisions 2/89 and 6/89, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C., June 1989.

3. SW-846 Methods, from 3rd Edition or equivalent EPA Method.

FIGURES


LEGEND:
X – SOIL SAMPLING LOCATION
● – MONITORING WELL LOCATION
– SEDIMENT DEPOSITION AREA ALONG UNNAMED BAYOU
– SEDIMENT DEPOSITION AREA ASSOCIATED WITH FORMER DINOSEB PRODUCTION AREA (SWMU 7)
– SEDIMENT DEPOSITION AREA ASSOCIATED WITH THE INACTIVE LANDFILL (SWMU 2)
POND
MW-4
NORTH PLANT
JUNKYARD
CC-03
PLANT ENTRANCE ROAD
PERKINS COMPANY
NORTH POND
SOUTH PLANT
CC-04
DRUM STORAGE
CC-02
DINOSEB AREA
MW-1
CC-06
STOUTS BAYOU
MW-5
CC-05
OLD ATRAZINE PLANT
P-01
SURFACE IMPOUNDMENT
MW-2
CC-01
INACTIVE DISPOSAL AREA
TO HENNESSEY'S BAYOU
HENNESSEY'S BAYOU
MW-6
0' 200' 400'
SCALE APPROXIMATE
VICKSBURG CHEMICAL DIVISION
Woodward-Clyde Consultants
CEDAR CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI
SCALE NOTED
MADE BY KH
DATE 10/93
FILE NO 92B007C
CHECKED BY
DATE
GENERAL LOCATION PLAN OF NORTH POND
FIGURE 1



LEGEND

- * ABANDONED FUEL OIL TANK
- GEOTECHNICAL BORINGS
- ENVIRONMENTAL BORINGS & PIEZOMETER LOCATION

REFERENCE : SOIL TESTING ENGINEERS, INC. FILE NO. 93-3076

SCALE

100 0 100 200 FEET

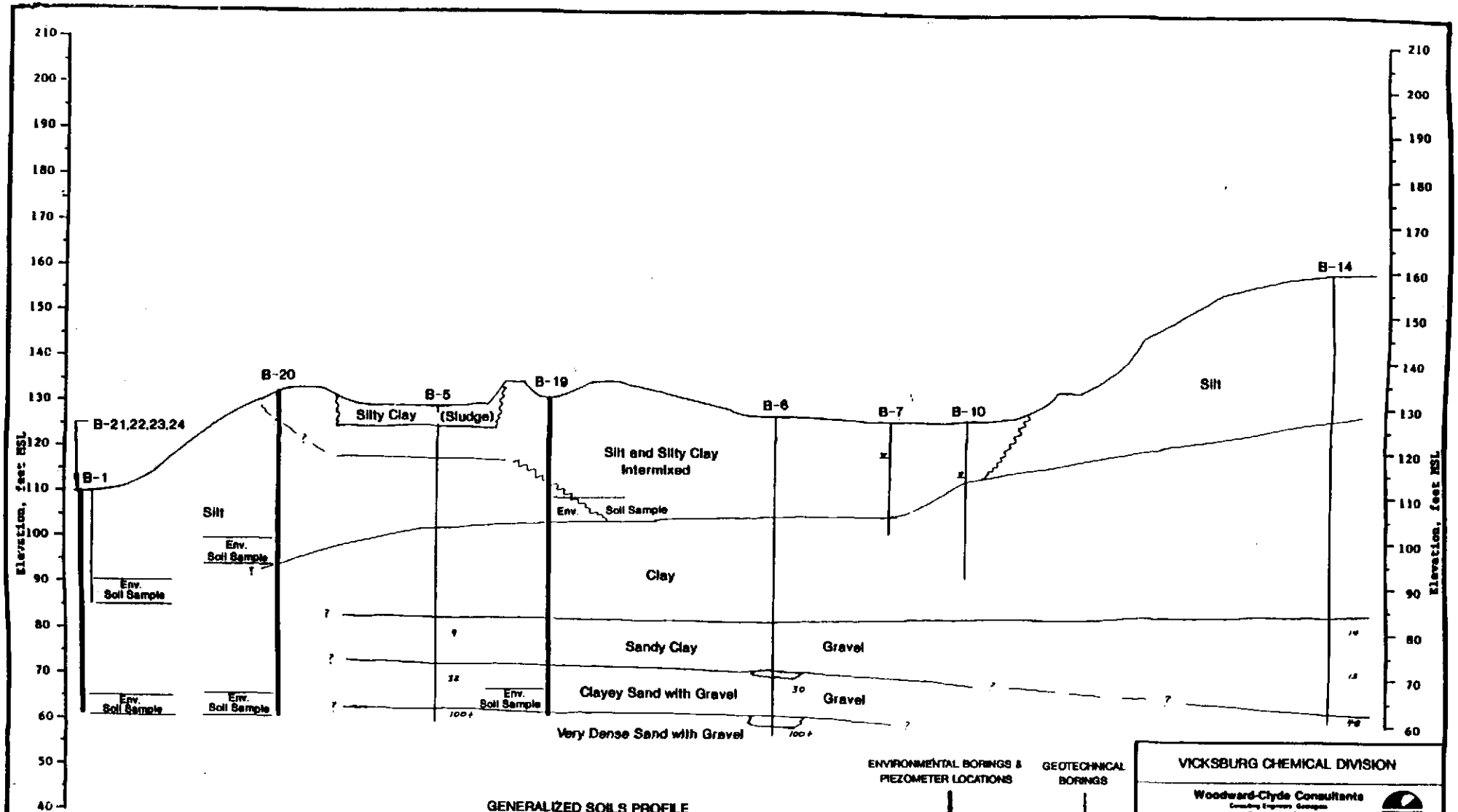
CEDAR CHEMICAL
VICKSBURG, MISSISSIPPI

Woodward-Clyde Consultants
Consulting Engineers, Geologists and Environmental Scientists
Baton Rouge, Louisiana

SCALE: NOTED	DRAWN BY: KH	DATE: 10/93
	CHKD. BY: RDK	DATE: 10/22/93

FILE NO. 92B007C

FIG. NO. 2



GENERALIZED SOILS PROFILE

SECTION A-A

Horizontal Scale: 1"=40'

Vertical Scale: 1"=20'

Revised

STE

Soil Testing Engineers, Inc.

VICKSBURG CHEMICAL DIVISION

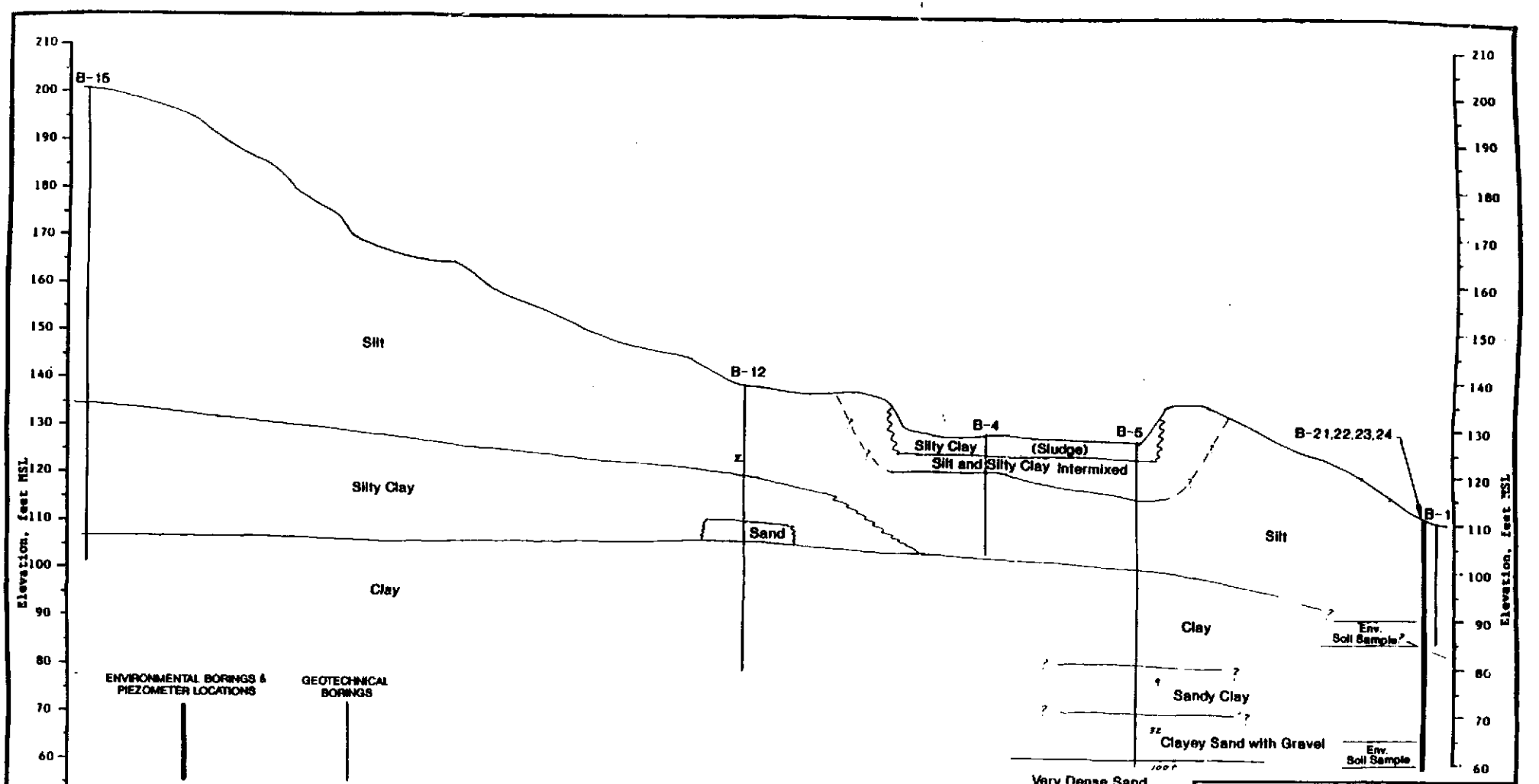
Woodward-Clyde Consultants

CEDAR CHEMICAL CORPORATION

VICKSBURG, MISSISSIPPI

SCALE	MADE BY	DATE	FILE NO
NOTED	CHECKED BY	DATE	92B007C

FIGURE 3



GENERALIZED SOILS PROFILE

SECTION B-B

Horizontal Scale: 1"=40'

Vertical Scale: 1"=20'

STE
Soil Testing Engineers, Inc.

VICKSBURG CHEMICAL DIVISION

Woodward-Clyde Consultants

CEDAR CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

SCALE	MADE BY	DATE	FILE NO
NOTED	CHECKED BY	DATE	928007C

FIGURE 4

Woodward-Clyde

LOG OF BORING

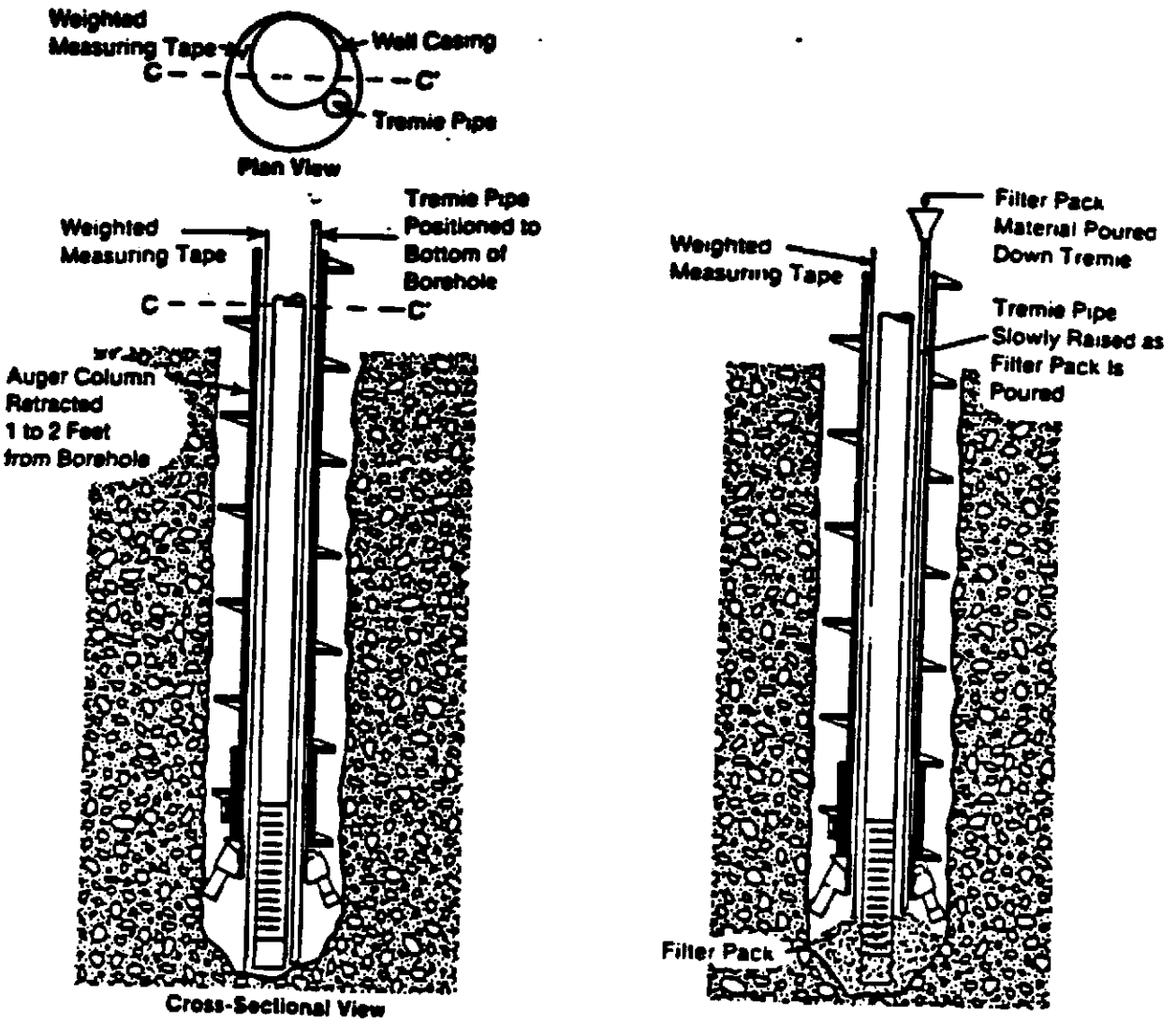
PROJECT

LOCATION

CLIENT

BORING _____
FILE _____
DATE _____
TECHNICIAN _____
APPROVED _____
PAGE ____ of ____

DEPTH (FEET)	SAMPLE	DRY AUGERED				WASH BORED		
		S.P.T. (N/FT) OR PET PEN (TSF)	COMPRESSIVE STRENGTH (TSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	L.L. (%)	P.I. (%)	DESCRIPTION OF STRATUM



a. Weighted Measuring Tape and Tremie Pipe in Retracted Auger Column

b. Filter Pack Poured Through Bottom-Discharge Tremie Pipe

Tremie method of filter pack emplacement with a hollow-stem auger.

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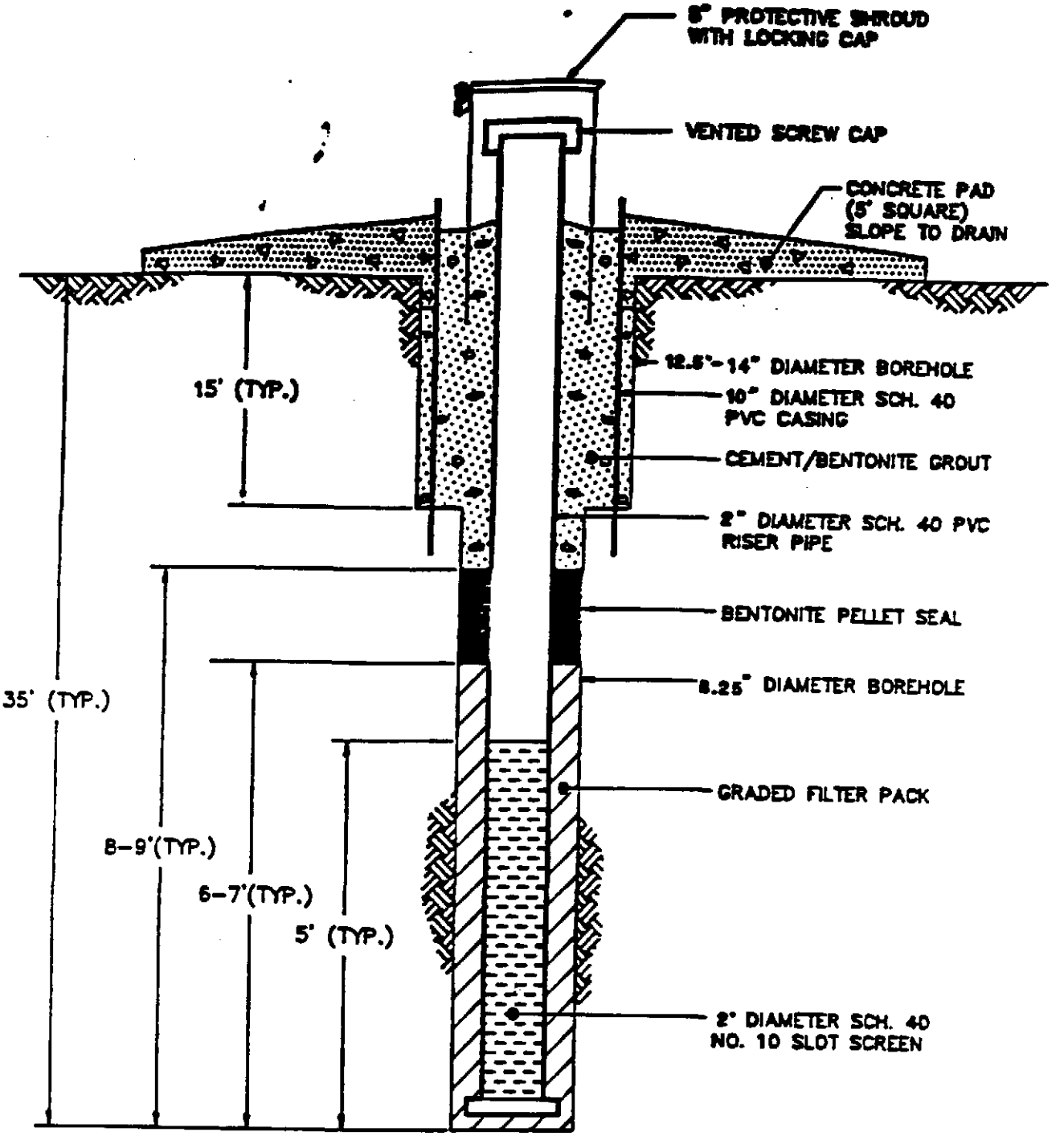


NOTE: IF WELL WIZARD SAMPLER IS INSTALLED, TOP CAP WILL BE OF TYPE MANUFACTURED BY QED INC. OR SIMILAR AND WELL WIZARD PUMP INLET WILL BE POSITIONED AT MIDDLE OF SCREEN

RFI WORKPLAN	Woodward-Clyde Consultants Consulting Engineers, Geologists and Environmental Scientists Baton Rouge, Louisiana	TYPICAL MONITOR WELL CONSTRUCTION DIAGRAM	FILE NO. FIG. NO. 7
	SCALE: NONE / DRAWN BY / DATE		

Woodward-Clyde

MONITOR WELL INSTALLATION REPORT

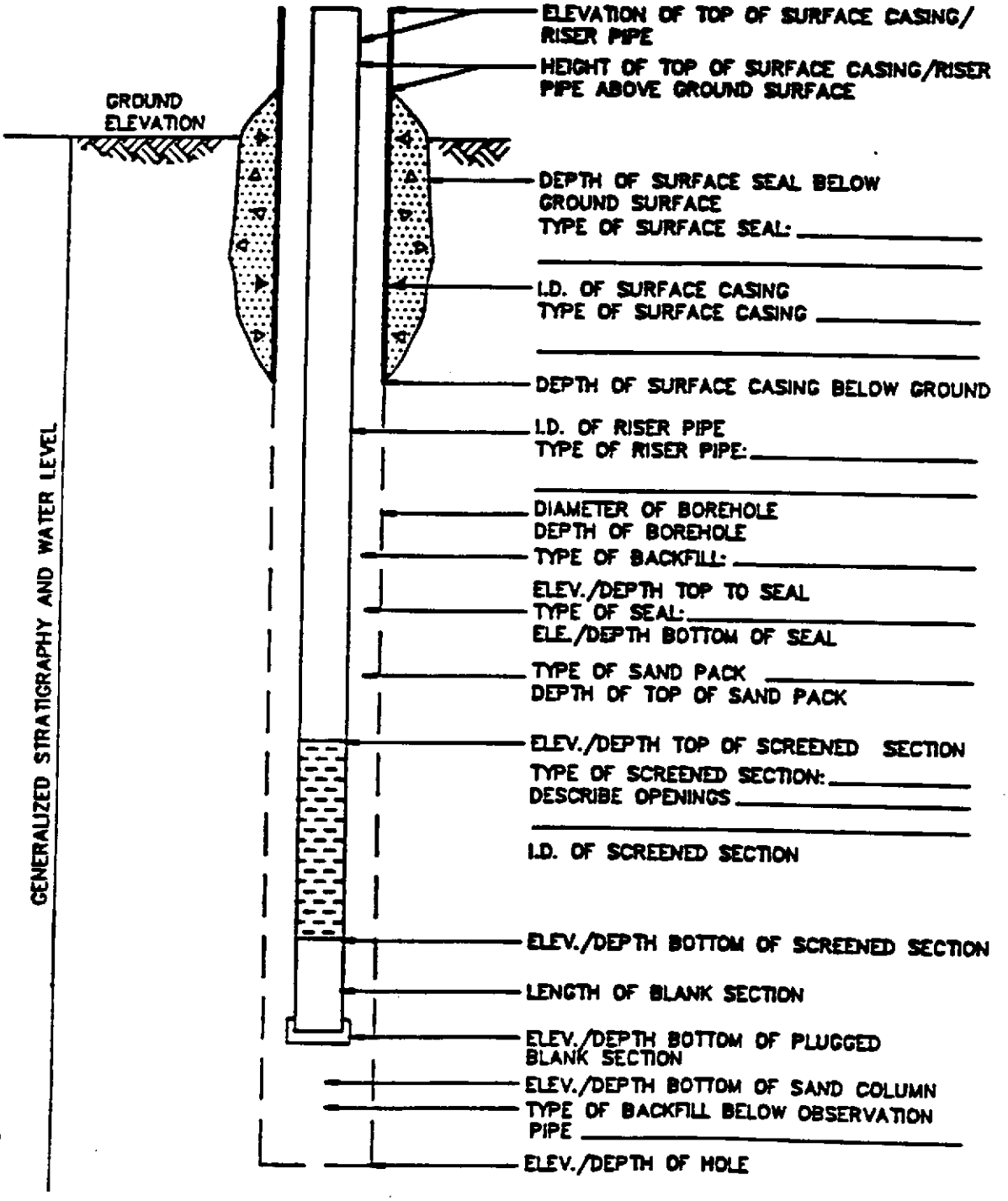
PROJECT _____ PAGE _____ OF _____

LOCATION _____ WELL NO. _____

DATE COMPLETED _____ ORIGINAL DEPTH _____ AQUIFER _____

INSPECTED BY _____ DATE _____ _____

CHECKED BY _____ DATE _____ DEPTH INTERVAL _____



Woodward-Clyde

Project: _____ File: _____

_____ Made by: _____ Date: _____

Well Number: _____ Checked by: _____ Date: _____

GENERAL CONDITIONS:

Depth (ft. TOC/bottom):	Stick-up (ft. TOC/pad):
WCC Representatives:	

PURGING DATA:

Purging (2 min. cycles)			Pressures (psi)		Water Level (ft. TOC)	
Date	Start	Stop	Tank	Working	Before	After

METHODS: _____

PUMPING DATA:

Pumping			Pressures		Water Level		Production (gpm)	Quantity (gallons)	Conditions
Date	Start	Stop	Tank	Working	Before	After			

STABILIZATION DATA:

Time											
Temperature											
Conductivity											
pH											

RECOVERY DATA:

Time (min)	2	5	7	10	15	20	25	30	40	50	60	90	120	240	24hr	final
Level (ft.)																

REMARKS:

_____

Woodward-Clyde

GROUND WATER COLLECTION REPORT

PROJECT NUMBER AND NAME _____ LOCATION _____
COLLECTOR/OPERATOR _____ WELL NO. _____
TYPE OF SAMPLE _____ ( ) GRAB ( ) COMPOSITE ( ) OTHER _____
METHOD OF SAMPLING IF OTHER THAN MONITOR WELL _____ SHUTTLE NO. _____

MONITOR WELL INFORMATION

EVACUATION: DATE/TIME _____ METHOD OF EVACUATION _____
INITIAL DEPTH TO WATER LEVEL _____ TOP OF CASING TO BOTTOM _____
GALLONS PER WELL VOLUME _____ TOTAL GALLONS EVACUATED _____
FINAL DEPTH TO WATER _____ ELEVATION TOP OF CASING _____

SAMPLING: DATE/TIME _____ METHOD OF SAMPLING _____
DEPTH TO WATER LEVEL _____

SAMPLE DATA

FIELD REPLICATE #1 TEMP. _____ pH _____ CONDUCTIVITY _____
FIELD REPLICATE #2 TEMP. _____ pH _____ CONDUCTIVITY _____
FIELD REPLICATE #3 TEMP. _____ pH _____ CONDUCTIVITY _____
FIELD REPLICATE #4 TEMP. _____ pH _____ CONDUCTIVITY _____

GENERAL INFORMATION

WEATHER CONDITIONS AT TIME OF SAMPLING _____
SAMPLING CHARACTERISTICS _____
CONTAINERS AND PRESERVATIVES _____

RECOMMENDATIONS _____

SAMPLING PERSONNEL TIME _____ TO _____

_____ DATE _____
(SIGNED)

LOCK OR SERIAL NUMBER _____ REPLACEMENT SERIAL NUMBER _____

FIGURE 10

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CHAIN - OF - CUSTODY RECORD

SAMPLE NO.	DATE MM/DD/YR	TIME	SAMPLE TYPE		STATION LOCATION	TOTAL NO. CONTAINERS					
			COMP.	GRAB							

SAMPLE COLLECTION:

PROJECT NO. AND NAME _____

LOCATION OF SAMPLE: _____

COLLECTOR'S NAME _____ TELEPHONE: ( ) _____

COMPANY NAME: _____

ADDRESS: _____

WITNESS: _____ COMPANY NAME: _____

FIELD INFORMATION:

TYPES OF SAMPLES: LIQUID GAS SLUDGE SOIL OTHER(SPECIFY) _____

FIELD NOTES: _____

TRANSPORTER: _____ AIRBILL/INVOICE: _____ DESTINATION: _____

SAMPLE TRANSFER (Original must be retained with sample at all times)

		RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1	NAME:				
	COMPANY:				
2	NAME:				
	COMPANY:				
3	NAME:				
	COMPANY:				

TERMINATION OF CHAIN-OF-CUSTODY:

AUTHORIZED BY: _____ DATE: _____ TIME: _____

COMPANY NAME: _____

SAMPLE DISPOSTION: STORAGE _____ DISPOSAL _____ OTHER _____

FIGURE 11

SAMPLE ANALYSIS REQUEST FORM

ROJECT NAME _____
ROJECT NUMBER _____
ROJECT CONTACT _____
EPORTING ADDRESS _____

LOCATION _____
SAMPLING TEAM _____
PURCHASE ORDER NO. _____
PROJECT CONTACT PHONE NO. _____
REQUESTED TURNAROUND _____
LABORATORY DESTINATION _____

SAMPLE NO.	SAMPLE TYPE	SAMPLE VOLUME	PRESERVATIVE	REQUESTED ANALYSIS	COMMENTS

'ECIAL HANDLING (e.g. ICE, DRYROOM, FLAMMABLE, ETC.) _____

ATE SHIPPED: _____ PACKAGED BY: _____
IIPPING METHOD: _____ AIRBILL/INVOICE: _____
CUSTODY ATTACHED? YES NO

FIGURE 12

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CORRECTIVE ACTION REPORT

DATE _____

PROJECT NUMBER AND NAME _____

LOCATION _____

INITIATOR'S NAME AND TITLE _____

NONCONFORMANCE _____

REPORTED TO _____

CORRECTIVE ACTION _____

IMPLEMENTED BY _____

REVIEWED BY _____

cc: PROJECT MANAGER _____

SITE MANAGER _____

QA OFFICER _____

FIGURE 13

Woodward-Clyde Consultants – A Subsidiary of Woodward-Clyde Group, Inc.
2822 O'Neal Lane (70816) • P.O. Box 66317 (70896) • Baton Rouge, Louisiana
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DATA MANAGEMENT PLAN

VICKSBURG CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

October 1993

Woodward-Clyde

Woodward-Clyde Consultants
2822 O'Neal Lane (70816)
P.O. Box 66317 (70896)
Baton Rouge, Louisiana

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1.0
DATA MANAGEMENT PLAN

1.1 INTRODUCTION

During the North Pond RCRA Facility Investigation (RFI), various types of data will be generated. At a minimum, data gathered will consist of field data sheets, field log books, boring logs, chemical data from analysis of soil and groundwater, field parameter measurements, maps and drawings. This Data Management Plan describes procedures that will be used to physically manage project related information. The Data Management Plan addresses:

- Project organization and responsibilities
- Technical approach to data management
- Flow of data (tracking)
- Data validation and reduction
- Data presentation

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

A description of primary project personnel and their responsibilities is presented below. Changes in procedures presented below will be documented.

2.1 AUTHORITY AND RESPONSIBILITIES

2.1.1 Project Manager

Richard D. Karkkainen, Woodward-Clyde Consultants (WCC), Vice President and Principal, will serve as Project Manager. The Project Manager will be the prime contact with Vicksburg Chemical Corporation (VCC) concerning all the work that is done by WCC. Project organization and management procedures will be established by the Project Manager, including reviews and approval of work scope, budget, schedules and reports. The Project Manager will also direct financial reporting and subcontractor recommendations for Cedar's approval.

2.1.2 Site Coordinator

Dr. Yong Goh will be designated for this project. The Site Coordinator's primary responsibility is to oversee all field phases of the activities under the direction of the Project Manager. Additionally, the Site Coordinator will manage onsite files and monitor quality assurance in the field.

2.1.3 Task Leaders

The task leader for data management validation and analytical services is Dr. Charles Westerman. He will be assisted by Anna Saucier.

2.2 PROJECT COMMUNICATIONS

2.2.1 Record Control

The control of records provides for the flow of information both internal and external to WCC.

Following receipt of information from external sources, completion of analyses, and issuance of reports or other transmittals; associated records shall be submitted to the WCC office central project files. This shall include any records generated for WCC by subcontractors. Records shall be legible and easily identifiable. In addition, field records and records transmitted between WCC and contractor offices shall be adequately protected from damage and loss during transfer (e.g., hand carrying or making copies prior to shipment).

Field records, laboratory data summaries, numerical calculations, reports and other data transmittals, copies of proposals, purchase orders, contracts, correspondence, memorandums, telephone records, photographs, and reference material shall be transferred to the project central file.

Records submitted to the project central file, with the exception of correspondence, should be bound, placed in folders or binders, or otherwise secured for filing.

2.2.2 Record Status

All individuals on the Project Staff shall be responsible for reporting obsolete or superseded project-related information to the Project Manager on a periodic basis. In turn, the Project Manager shall notify the Project, Laboratory Staff, and Quality Assurance personnel of the resulting status change in project documents, such as drawings and project procedures. Notification of personnel of status changes in quality assurance procedures shall be the responsibility of the Project Manager.

In general, outdated drawings and other documents shall be marked "void." Any copy of void documents maintained for the project files shall state the reasons for and date of voiding.

To denote that calculations, drawings, and other material which have not been formally checked are preliminary, they shall be marked "preliminary".

2.2.3 Record Retention

Information associated with the project shall be retained in the WCC office central project files.
These files will include the following:

- Project central file (project material except drawing originals, records related to laboratory analysis
- Original drawing file
- Generic quality assurance file

Project records shall be received at the various storage areas by designated personnel. Designated personnel shall check that incoming records have proper identification for filing, are legible, and are in suitable condition for storage. Indexing and filing of records shall be performed only by the designated personnel.

For the project central file, the individual file folders shall be divided into appropriate categories based on content and numbered and filed sequentially within each category.

A numbered index for the project central file shall list the individual file folders and identify the records therein to facilitate locating the records. The index shall be kept in a separate folder at the front of the project file. If appropriate, information on project material not stored in the project central file should be included with the index.

For the original drawing and quality assurance files, all material shall be filed only by project number.

The record storage in the central files shall utilize facilities that provide a suitable environment to minimize deterioration or damage and that prevent loss. The facilities shall, where possible, have controlled access and shall provide protection from excess moisture and temperature extremes. Records shall be secured in binders, placed in folders or envelopes, or otherwise secured for storage in containers (e.g., steel file cabinets).

Storage systems shall provide for the prompt retrieval of information for reference or use outside the storage areas. For the project central file, sign out sheets shall be maintained so that a record of files removed is available.

2.2.4 Onsite Records

Appropriate requirements for the field control and retention of records generated as a result of site investigation, sampling, and testing shall be followed. A file, similar to the project central file, will be established and maintained by the Site Coordinator.

Upon completion of the field program or program phase, the onsite file will be transferred to, and integrated with, the WCC office central project files.

2.2.5 Change Control

It is imperative that the status of work items be up-to-date. A status system includes:

- Formal document and design drawing revision
- Nonconformance identification, documentation, and reporting
- Change documentation and approval

Change from original design documents, procedures, and specifications must be expected. Change does not imply a nonconformance to the work, but simply means that original plans must be altered because of information or events that occur during the work.

Change must be documented, evaluated, and reported as necessary. It is necessary to manage change so that the actual course of the project, not the original plan, can be demonstrated and justified. Changes must be documented so that the actual course of work is known and the effect of the change upon the course of work can be evaluated.

It is the responsibility of project personnel to appropriately record the change and to make the documentation available as appropriate to project or laboratory management. The effect of the change upon the project shall be evaluated by the project or laboratory management, quality assurance personnel, and/or subcontractor management.

Review and written approval for changes which affect the project activities should be provided by the Project Manager. Following the review and approval process, notification of the change should be made to appropriate personnel and affected documents revised as necessary to reflect the work as actually performed.

Project documents and design drawings (as discussed below) must be reviewed, approved, distributed, and revised as necessary. This control will provide approved, up-to-date information and drawings.

3.0
PRINCIPLES OF DATA MANAGEMENT

3.1 GENERAL PRINCIPLES

Three major approaches to database design are the Network, the Hierarchial and the Relational approaches. These three approaches have their respective strengths and weaknesses and in some applications, one approach is more suited than the others. Of the three methods, the relational approach is gaining momentum in the database market and is used in various applications. Because of its popularity, versatility, ease of use and the availability of many commercial relational database packages, WCC has chosen the relational approach for its design of the VCC database.

In the relational approach, the information is stored in tables and columns. A table is called a relation and columns are the attributes of the relation. A good relational design of a database management system minimizes data redundancy, maintains data consistency and ensures data integrity. Data redundancy refers to the storing of the same information in multiple tables. Redundancy can rarely be totally eliminated but can be reduced. Data consistency refers to maintaining redundant data in the same form at all locations in the system. That is, if data is changed at one location, the system should propagate similar changes in that data in other related tables. This action ensures the integrity of the data in the database.

3.2 OBJECTIVES OF THE SYSTEM

The data management, as defined herein for this project, refers to the actual management of the data, but also includes data validation. Quality Assurance/Quality Control (QA/QC) deals with data validation procedures. WCC has identified the following objectives for effectively managing the field data and the laboratory results data from the VCC site:

- Store and organize all field, analytical and other data.
- Track the samples for extraction and analysis holding time deadlines.
- Validate the analytical results.
- Make provisions for transmission of data to VCC.

4.0 TECHNICAL APPROACH

The above objectives are accomplished through a data management task leader and a data validation task leader.

4.1 DATA MANAGEMENT TEAM

The task leader is responsible for the following:

- Design and develop a system to store and organize all field and analytical data.
- Establish procedures to follow as the data arrives from the field and the laboratory.
- Interface with WCC's technical staff and provide the information they request.
- Produce tables for reports to VCC, regulatory agencies and other appropriate groups.
- Maintain and administer the system developed.

The need for an organized system which facilitates easy and instant access to the information desired, is obvious because of the volume of the data generated by this project. Without such a system, the process to organize the data in the desired manner will be very time consuming and labor intensive. Establishment of proper procedures will streamline the operation of data collection, organization and presentation. Once the system is established, maintenance and administration is essential for its continued success.

4.2 DATA VALIDATION TEAM

The task leader is responsible for the following:

- Review the QA/QC information for the samples.
- Validate the analytical results.
- Contact the laboratory, if inconsistencies exist.
- Interface with the data management team to insure the validity of analytical results in the data management system.
- Maintain records of the validation of analytical data.

Validation of analytical results is essential to determine the quality of the analytical data received from the laboratories and assure quality data in the system. The Data Collection Quality Assurance Plan details the method of validation for organic and inorganic analyses.

5.0
SCOPE OF WORK

5.1 ENVIRONMENTAL DATA SYSTEM

Woodward-Clyde has recently completed Version 1.1 of its environmental database EDGE (Environmental Data Grab and Export).

EDGE is a Windows-based front end to an Oracle database. EDGE contains standardized tables for the storage of geological, geotechnical, hydrogeological, hydrological, soil, chemical and hazardous waste data. Seismic, air quality and any other type of data relating to the environment can also be stored. EDGE has point-and-click user friendliness for form design, data entry, query and export of data.

5.1.1 Sample General Information

This module tracks sample information such as sample number, sample location, date collected, time collected, number of containers used, the type of analysis requested, the person collecting, and so forth. This module has the options for adding, editing, browsing, querying, and printing information.

5.1.2 Sample Analysis Information

This module tracks analytical results received from the laboratories. It stores the date extracted, date analyzed, concentration and all pertinent information for each sample. It has the same options as before for adding, editing, deleting, browsing, querying, and printing analytical results information.

5.1.3 Sample Tracking Information

This module provides the sample extraction and analysis holding time deadlines for each sample. Reports of extraction and analysis holding time deadlines can be printed for any sample. This kind of reporting will help with data validation.

5.1.4 Site, Well Information

This module tracks site, monitoring well, and other support information required for the project. The system provides add, edit, delete, browse, query, and print options for each entity for this module.

5.1.5 Export - Import

This module provides the mechanism to both export and import data from laboratories and other consultants on the project. The import facility is laboratory specific. The export facility can provide the data requested by the analytical laboratory and others.

The following are procedures to be followed to effectively manage project data:

- All field and analytical data should be sent to Anna Saucier.
- The field personnel will send a copy of the Chain-of-Custody (COC) form to the Baton Rouge Office via facsimile after sending a batch of samples to the laboratory for analysis.
- When the preliminary analytical results arrive, the results are verified with COC, assuring that samples are identified with correct sample numbers.
- The task leader for data management, validation and analytical services, informs the project manager so if any discrepancies are found in the data, so that discrepancies can be rectified.
- When the final analytical results arrive, the data package is routed for validation.

5.2 DATA REDUCTION AND VALIDATION

Data reduction, validation, and reporting will follow guidelines as presented in this section. The only data that will be reported by WCC will be data that meet the record keeping, quality assurance/quality control criteria, and reporting formats as defined in the Data Collection Quality Assurance Plan.

The following sections describe the procedures to be used in data reduction, validation and reporting of analytical data.

5.2.1 Sampling Data

The intention of these sampling data management procedures is to maintain accurate records of all samples taken and to follow the status of the sample location and analytical results, while minimizing the duplication of record keeping activities and the possibilities for errors.

The tabulation and flow of all data management information can be broken down into the following activities:

- Assignment of sample numbers, sample label preparation, and initial permanent record keeping,
- Preparation and labeling of all sample bottles,
- Sampling and in-the-field record keeping,
- Sample receiving and preparation for shipping, and
- Complete sample record book.

5.2.1.1 Sampling Record Keeping

Prior to collecting a group of samples, the Site Coordinator or designee will assign a sample number and a description to all samples to be collected within the group. Sample numbers will be assigned to all divisions of the original sample, all of which have the same identification number with letters denoting subset containers. The sample number and corresponding description will be entered into a permanent record book. The information in the record book will then be written onto the appropriate sample label. When written, the sample labels will be given to the individual responsible for preparing the sample bottles.

The typed/printed labels for a group of sequentially numbered samples and a copy of the data book pages that include these numbers will be given to the sample bottle preparer and/or the sampler. This individual is responsible for applying all labels on

the appropriate types of bottles. The sample preparer may also be the person who will be doing the sampling. A copy of the data book pages that include information about the samples will also be given to the person doing the sampling in order to provide a list of samples to check off during the sampling activity.

The individual(s) doing the sampling is (are) responsible for verifying that each sample is put in the appropriate sample bottle. At the time of sampling this person must fill in the time sampled, the date sampled, and sign and complete the sample's label. By the end of the sampling day, the sampler must return all samples to the geologist or engineer who will oversee preparation of the samples for shipment (i.e., review chain-of-custody formes, inspect packaging, etc.

The person responsible for shipping the full sample bottles will compare the sample bottles with the appropriate sample data book pages. This person will then prepare the samples for shipping. Chain-of-custody forms must be completed for each sample; the originals must be sent with the samples, and copies will be sent to the sample coordinator to include in the appropriate project files.

5.2.1.2 Sample Data Management

When the samples are ready to be sent to the laboratory, the Site Coordinator will examine the samples and note their condition. Information including the date sampled, time sampled, and method of preservation,for each sample will be entered in the sample record book.

At the time the samples are shipped, the sample coordinator will have a copy of the pages in the sample record book that include information on the sample numbers and the corresponding information on the date sampled, time sampled, and the date shipped.

5.2.2 Analytical Data

5.2.2.1 Data Flow

The laboratory will be responsible for reviewing all sample analyses according to their internal QA/QC procedures. Data validation will be completed by the laboratory prior to the delivery of the data package. Completed data packages will be available for review by the project data validation coordinator and the project QA officer who will also evaluate the laboratory's checks. Any problems will be resolved and all data will be validated before the data are reported. Following satisfactory completion of all QA/QC checks by the laboratory and the project data validation coordinator, the data will be available for external reporting.

5.2.2.2 Data Management

A data validation report will be provided in a timely manner following the completion of the laboratory analytical report. Only data that has been validated are to be released. Data that has been validated will be logged into a data base in which validated results are stored.

5.2.2.3 Data Validation

Data Validation, according to Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans (QAMS-0050/80, Office of Monitoring System and Quality Assurance and Office of Research and Development, U. S. Environmental Protection Agency, Washington, D. C. 20460, December 29, 1980), is "a systematic process for reviewing a body of data against a set of criteria to provide assurance that data are suitable for their intended use", and entails editing, screening, checking, auditing, verification, certification, and review.

The purpose of data validation is to determine if the data conform to specifications and are suitable for the intended project usage. Therefore, all data will be subjected to screening in terms of conformance to project specifications and suitability for use. After completing a sampling program, the field data package (calibration records, chain-of-

custody, field logs, etc.) will be reviewed for completeness and accuracy. Data validation of analytical data will be completed before any of the results are released. The validation process described below will be done separately from the laboratory performing internal laboratory data validation.

The following is a brief description of the methods that will be used during validation of the CLP laboratory data. These data will be reported in a summary data package and evaluated for conformance to the analytical limits set forth in Functional Guidelines for Evaluating Organic Analyses (Hazardous Site Evaluation Division, U. S. Environmental Protection Agency, February, 1988) and Functional Guidelines for Evaluating Inorganic Analyses (Hazardous Site Evaluation Division, U. S. Environmental Protection Agency, July, 1988). These checks will be performed on all samples analyzed, and the results will be summarized in a report for each lot of reported sample data. Qualified data will be reported as such and the appropriate qualifiers will be used for reporting. Non-CLP data and CLP data reported without the CLP summary data packages will be reviewed with respect to holding times, initial and continuing calibrations, method blanks, laboratory control samples, samples, matrix spikes and matrix spike duplicates or duplicates.

If problems occur which would reject data, the following procedures should detect these problems and the problem data will not be reported. However, rejected data will be addressed in the validation report to evaluate completeness goals.

1. Compile a list of all investigative samples.

2. Compile a list of all QC samples, including but not limited to:
   - -Field blanks
   - -Trip blanks
   - -Laboratory blanks
   - -Laboratory duplicates
   - -Performance samples
   - -Matrix spikes
   - -Matrix spike duplicates

-Laboratory control spikes
-Laboratory control spike duplicate

3. Review chain-of-custody documents for completeness and correctness.

4. Review laboratory analytical procedures and instrument performance criteria.
   -Sample media identification
   -Sample location and descriptions
   -Proper concentration units
   -Proper significant figures

5. This data summary will be reviewed for potential data quality problems including:
   -Unexpected results
   -Common laboratory contaminants
   -Unusual spacial concentration/identification relationships
   -Samples in which dilution was necessary
   -Samples which may have exhibited "carry over"

6. A sample summary will be prepared to access precision, accuracy, and completeness of the analytical data.

7. Laboratory records and data package requirements will be checked to access completeness of the data package.

Laboratory performance results will be documented from the validation procedures or from precision or accuracy evaluations. The validation personnel will provide a means to notify the laboratory and initiate the appropriate corrective actions.

Despite all efforts to achieve the objectives of the laboratory QA/QC plan, the potential for error exists in laboratory chemical analyses and in the data reporting process. Every reasonable effort will be made to compare and double-check data reported from the

laboratory, data entered into the data management system and data subsequently reported in accordance with the procedures described herein.

All analytical results are to be classified as quantified, qualified or rejected through data validation activities. Quantified data are to be used in laboratory reports at the numerical value identified. Qualified data are to be used as an estimate and are not to be used as a quantitative measurement. Rejected data are not to be included in the analytical report. No further use for design or other activities is to be made on the basis of rejected data.

5.3 OTHER DATA (CALCULATION, LOGS, COMPUTER PROGRAMS, DRAWINGS) REDUCTION AND VALIDATION

During activities, calculations, logs, drawings, and computer programs may be generated as part of some of the tasks (site characterization, risk assessment, etc.) in the form of potentiometric interpretations, calculations for cancer risk, quantity calculations of contaminants, etc. In order to maintain consistency in the development of the data, the following verification procedures are presented.

Numerical analysis, risk assessment, and environmental modeling, if performed, will be subjected to controls. Any changes to final analysis, assessments, and modeling will be subject to the same level of control used for the original task.

Analysis, assessment, and modeling activities shall be performed in a planned and controlled manner. Performance responsibility rests with the Project Manager. Prior to initiating the activities, the Project Manager shall discuss the scope of the work, contractual and regulatory requirements, and applicable quality assurance/quality control procedures with assigned personnel.

5.3.1 Procedures

To provide evidence of satisfactory work performance, analyses, assessments, modeling, and their results shall be completely documented. Documentation may include calculations, computer programs, logs, drawings, and tables.

Calculations

Calculations shall be legible and in a form suitable for reproduction, filing, and retrieval. Documentation shall be sufficient to permit a technically qualified individual to review and understand the calculations and verify the results.

Calculations shall be performed on standard WCC calculation paper whenever possible. All calculations will proved the originator's name and date of work, the checker's name and date, calculation subject, project number, and page number. All of this information shall be completed for each page. For extra pages, such as large graphs, this information shall also be included.

Calculations should, as appropriate, include a statement of calculation intent, description of methodology used, assumptions and their justification, input data and equation references, numerical calculations including unites, and results. Input data may include:

- Regulatory requirements.
- Performance and operational requirements under various conditions, Material, geological, environmental, and geotechnical requirements.
- Results of field and laboratory testing or calculations.
- Information obtained from external personnel or literature and site data surveys.

Computer printouts that becomes an integral part of the calculations shall be referenced in the calculations by run number or other unique means of identification.

At the end of calculations, the results should be summarized if this will provide clarity.

Computer Programs

Computer output shall be dated and clearly identified as to contents. Large sets of output shall be labeled with project name and number, program used, analysis title, and the user's name.

Logs, Drawings, and Tables

The results of analysis, assessment, and modeling activities may be presented in logs, drawing, and tables of various forms. The format of logs and tables shall be governed by the information to be presented. Drawings shall be uniquely identified by drawing or figure number and appropriate title. Standardized symbols and nationally accepted drafting standards shall be used. References to other drawings and sources of information shall be provided, as necessary.

Drawings shall be signed and dated by the draftsperson performing the work and the project task leader or Project Manager who has checked the drawing.

Revisions shall be noted on the drawing original with a revision number and a brief note describing each revision. The note shall be signed and dated by the draftsperson performing the work and the project task leader or Project Manager who has checked the revision.

Indication of final drawing and revision approval shall be through signing and dating the drawings by the project task leader or Project Manager.

5.3.2 Verification

Calculations, computer program input, logs, drawings, and tables shall be formally checked using the process outlined in the following paragraphs.

Calculations

Verification of calculations shall be performed by an individual(s) other than the persons who performed the original work, or specified the method or input parameters to used. The individual(s) selected shall have technical expertise in the calculation subject.

It is emphasized that a numerical check is not sufficient. The checker is responsible for every item on every sheet-including the completion of the title block and page numbers.

To properly check calculations:

- The originator supplies the designated checker with a machine copy of the calculations. Originals should not leave the originator's possession until they are ready for final checker signing,

- The checker marks the calculation copy with a highlighter for all items he approves,

- The checker marks the calculation copy with a highlighter for all items he approves,

- If the checker disagrees, for any reason, the checker crosses through the item with different colored markers and writes the recommended correction or comment above it,

- The checker initials and dates all pages of the checkprints,

- The checker returns the checkprints to the originator who, in turn, reviews all recommended changes. If a disagreement exists, the originator adds comments to the checkprints using a third color and then confers with the checker until all differences are resolved,

- The originator corrects, or "scrubs," the calculation originals so they agree with the checkprints. A one-to-one correspondence between the originals and checkprints must exist,

- The originator gives the originals the checkprints to the checker who compares them to verify agreed-to-corrections have been made, and

- When the checker is satisfied, he signs and dates the originals.

Computer Program Input

Computer input shall be formally checked using the process outlined above. A single exception to this process is that the checking may be performed on the input originals. The verification shall include a conceptual review of the program itself based on the problem being solved, a review of the computer model employed, a check that the program has been verified, and a formal check of the input data.

Drawings

Drawings shall be checked like calculations using different colored markers. Checkprints of the same drawing shall be marked CP1, CP2, etc., to show progression of the checking process.

If a drawing is revised, the entire checking process shall be repeated for the revised areas only. A new checkprint shall be prepared.

Logs and Tables

Final subsurface logs shall be verified by the responsible member of the Site Coordinator. The verification shall provide that changes from the original field representative's logs to the final log sheets are consistent with the results of other investigations. The final log sheets shall be checked in the same manner as all calculations or drawings, with the checker signing and dating all checkprints.

In addition, all final tables presenting information, data, or the results shall be checked using the process previously described. Checkprints of the same table shall be marked CL1, CL2, etc., to show progression of the checking process.

5.4 DATA PRESENTATION

AutoCAD, a computer aided design program is used for drawing maps and various figures. A base map will be used to produce the site map for field personnel and to produce maps of contaminant concentrations.

5.5 DATA MEASUREMENT ASSESSMENT PROCEDURES

This section summarizes QA/QC procedures for assessing the chemical data derived from the sampling and chemical analysis tasks. This same information is found in the Data Collection Quality Assurance Plan.

The data validation procedures will be used by the QA officer and the data validation coordinator for assessing duplicate and spike samples and checking blank samples that are submitted to the analytical laboratory from the field or generated internally by the laboratory. The purpose of implementing these procedures is to verify that the chemical data generated during the project are accurate, precise, complete, and representative of site conditions.

Detailed discussions of the procedures for data validation are presented in Section 5.2.2.3. The format for QC data assessment reporting is presented below.

5.5.1 Procedures for Assessing Data Accuracy, Precision, and Completeness

Chemical data derived from the project will be assessed for accuracy and precision for both the analytical laboratory and field sample collection programs. The primary goal of the program is to verify that the data reported during the project are representative of conditions in the local study area. To meet this goal, a combination of procedures and qualitative evaluations will be used to check the quality of the data. Sample recollection and analysis will be used only if the data are rejected and sample results are deemed to be critical to the determination of a project objective.

The QA/QC assessment program will evaluate the project's data based on the types of quality control samples described in the Data Collection Quality Assurance Plan. The procedures for evaluating both the project and laboratory QA/QC data are the same and are presented below for QA/QC spikes, blanks, and duplicate and/or replicate samples.

5.5.2 Blanks

The evaluation procedure for blanks is a qualitative review of the chemical analysis data reported by the laboratories. The procedure for assessing blank samples will be as follows:

- Tabulation of the data from the blank samples,
- Identification of any blank samples that have chemicals detected in the sample,
- If no chemicals are detected in the blank samples, the tables are ready for entry into the appropriate report,
- If any chemicals are found in blank samples, the compound(s) and concentration(s) will be reported and the field data for that period of time will be assessed for potential problems with data interpretation. Data may be removed from the data base on the basis of chemicals being detected in blank samples. Appropriate notations, however, will be made in the data base reports,
- Quality control records will be maintained for each source of water which is used. These records shall demonstrate over time the presence/absence and level of contaminants found.

5.5.3 Spikes

The procedure for assessing spike samples will be as follows:

Tabulate spike sample data and calculate the Spiked Sample Recovery (SSR) percent as shown below for each sample.

$$SSR\ (\%) - \frac{(T-X)}{A} \times 100$$

where:
T = total concentration found in spiked sample
X - original concentration in sample prior to spiking
A - actual spike concentration added to sample

A comparison of the spiked sample calculated recoveries will be made to the percent recovery for each spiked analyte as specified within U.S. EPA CLP, as appropriate.

5.5.4 Duplicates

The procedure for assessing duplicate and replicate samples will be as follows:

Tabulate duplicate data and calculate the Relative Percent Difference (RPD) as shown below for each duplicate pair:

$$RPD\ (\%) = \frac{(X1 - X2)}{X} \times 100\%$$

where:
X1 = concentration for Sample 1 of duplicate
X2 = concentration for Sample 2 of duplicate
X = average of Samples 1 and 2

The calculated relative percent difference will be compared to the control limit values given in the EPA CLP, as appropriate for each of the spiked analytes to qualitatively evaluate the significance of the data. The evaluation will focus on historic variations in concentrations, whether problems arise for one particular compound or random compounds and whether the problem is limited to one sampling location, sample homogeneity, the amount of the spike, etc. If data quality problems arise, the analytical data will be annotated, and the laboratory will be notified for corrective action, as appropriate. Data will be reported only if approved by data validation coordinator or the QA officer. The laboratory and the data validation personnel must review the analytical data in a timely fashion for an effective data evaluation process.

The laboratory data verification and review process includes a review of the data file for completeness, the results, and includes a preliminary QA/QC review. The laboratory data package (or report) is reviewed to locate and check the following, where appropriate.

- Laboratory and field blanks for verification of frequency and that there are no contaminants in the associated blanks and, if present, assess their impact on interpretation of the data.
- Field and laboratory duplicates to determine if the data results match adequately and if the frequencies are acceptable.
- Spike recovery data to assure they are within quality acceptance limits and frequencies are acceptable.
- Calibration documentation to verify equipment performance is acceptable.
- Accuracy and precision of Laboratory Control Samples.
- Instrument tuning documentation to verify successful completion.
- Holding time evaluation.

5.5.5 Identification of Outliers

A reported concentration value that is much different from most other values in a data set for the same group is referred to as an "outlier." The reasons for outliers can include:

- Inconsistent sampling or analytical chemistry methodology
- Errors in transcription of data values or decimal points
- Actual but extreme concentration values
- Amended errors in analytical methodologies

The procedures described for data validation and review will identify any outliers that are due to the first two causes mentioned above. Any outlier not attributable to these two causes may be due to actual but extreme concentration values. The data point in question will then be compared to data from similar settings. For example, a reported high concentration of one compound in ground water from a well will be compared to previous data from the same well, if available, and/or compared to data from nearby wells. Also, other aspects of the reported data will be examined to determine if a high reported concentration of a single constituent occurs in other samples but cannot be duplicated in replicate or QC samples. Sample results designated as "outliers" may be resampled and analyzed if deemed to be necessary by WCC.

APPENDIX A

ANALYTICAL DATA EVALUATION

APPENDIX B

DATA QUALIFIER DEFINITIONS

APPENDIX C

DATA ELEMENTS

HEALTH AND SAFETY PLAN

VICKSBURG CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

October 1993

Woodward-Clyde Consultants

Consulting Engineers, Geologists, and Environmental Scientists
2822 O'Neal Lane, Baton Rouge, LA 70896

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1.0
HEALTH AND SAFETY PLAN

Client:	Vickburg Chemical Corporation
Project:	RFI Field Investigation, Groundwater Assessment, and Interim Measures
Project Manager:	Richard D. Karkkainen
Project Number:	92B007C
Date of Plan:	Revised October 22, 1993
Estimated Dates of Work:	North Pond, October 25, 1993 through November 5, 1993, Additional Pending EPA and MSDEQ
Expiration Date:	Pending EPA and MSDEQ

1.1 HEALTH AND SAFETY PLAN APPROVALS

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10/22/93
Date

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10/22/93

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Date

2.0 INTRODUCTION

This Health and Safety Plan establishes guidelines and requirements for the safety of field personnel during the conduct of the field activities associated with the referenced project. The specific activities addressed by this plan are defined in Section 3.0. All employees of Woodward-Clyde Consultants (WCC) involved in this project are required to abide by the provisions of this plan. They are required to read this plan and sign the attached Compliance Agreement.

The health and safety guidelines and requirements presented are based on a review of available information and an evaluation of potential hazards. This plan outlines the health and safety procedures and equipment required for activities at this site to minimize the potential for exposures of field personnel. This plan may be modified by the project manager, the corporate health and safety officer, and the Baton Rouge health and safety officer in response to additional information obtained regarding the potential hazards to field investigative personnel. This plan has been prepared for the exclusive use of WCC Personnel and WCC subcontractors. WCC liability is extended to WCC Personnel and WCC Subcontractors only.

2.1 KEY PERSONNEL

Project management will be handled out of the Baton Rouge Operating Unit of WCC. The following is a description of job responsibilities and authorities:

Project Manager: Richard D. Karkkainen

For this project, the Project Manager has the following responsibilities:

- To see that the project is performed in a manner consistent with the WCC Health and Safety Program.

- To have an approved Health and Safety Plan prepared and properly implemented for this project.

- To provide the Business Unit Health and Safety Officer with project information related to health and safety matters and development of the Health and Safety Plan.

- To implement the Health and Safety Plan.

- To insure compliance with the Health and Safety Plan by WCC and contractor personnel.

- To coordinate with the Business Unit Health and Safety Officer on health and safety matters.

The Project Manager has the authority to take the following actions:

- To determine matters relating to schedule, cost, and personnel assignments on hazardous waste management projects.

- To temporarily suspend field activities, if the health and safety of personnel are endangered, pending further consideration by the Business Unit Health and Safety Officer.

- To temporarily suspend an individual from field activities for infractions of Health and Safety Plan, pending further consideration by the Business Unit Health and Safety Officer.

Health and Safety Officer: Tanya Pawley

The Health and Safety Officer has the following responsibilities:

- To interface with the Project Manager as may be required in matters of health and safety.

- To approve a Health and Safety Plan for the project.
- To appoint or approve a Site Safety Officer to assist in implementing the Health and Safety Plan.
- To monitor compliance with the approved Health and Safety Plan.
- To assist the Project Manager in seeing that proper health and safety equipment is available for the project.
- To approve personnel to work on this site with regard to medical examinations and health and safety training.

The Health and Safety Officer has the authority to take the following actions:

- To suspend work or otherwise limit exposures to personnel, if a Health and Safety Plan appears to be unsuitable or inadequate.
- To direct personnel to change work practices, if they are deemed to be hazardous to health and safety of personnel.
- To remove personnel from the project, if their actions or condition endangers their health and safety or the health and safety of co-workers.

WCC Site Safety Officer: Yong Goh

The Site Safety Officer (SSO) has the following responsibilities:

- To direct health and safety activities on-site.
- To report safety-related incidents or accidents to the Project Manager and Business Unit Health and Safety Officer.

- To assist the Project Manager in all aspects of implementing the Health and Safety Plan.

- To maintain health and safety equipment on-site, as specified in Health and Safety Plan.

- To perform health and safety activities on-site, as specified in the Health and Safety Plan, and report results to the Project Manager and the Business Unit Health and Safety Officer.

The SSO has the authority to take the following actions:

- To temporarily suspend field activities, if the health and safety of personnel are endangered, pending further consideration by the Business Unit Health and Safety Officer.

- To temporarily suspend an individual from field activities for infractions of the Health and Safety Plan, pending further consideration by the Business Unit Health and Safety Officer.

WCC Corporate Health and Safety Officer: Charles Self

The WCC CHSO has the following responsibilities:

- Direct the implementation of the Health and Safety Program of the operating group and provide recommendations for improvement of the program.

- Coordinate health and safety activities of the operating units in the operating group.

- Determine need for project Health and Safety Plans.

- Review and approve Health and Safety Plans.

- Monitor implementation of Health and Safety Plans.
- Investigation reports of incidents or accidents and report accidents or incidents to the CHSA and EVPP.
- Assist CHSA with employee health and safety training in the operating group.
- Determine whether an accidental exposure or injury merits a change in the affected individual's work assignments and whether changes in work practices are required.
- Coordinate business units with regard to health and safety equipment needs.

The WCC CHSO has the authority to take the following actions:

- Approve or disapprove Health and Safety Plans.
- Direct operating unit HSO to prepare project Health and Safety Plans.
- Access project files.
- Direct changes in personnel work practices to improve health and safety of employeees involved in hazardous waste management projects.
- Remove individuals from projects, if their conduct jeopardized their health and safety or that of co-workers.
- Suspend work on any project that jeopardizes the health and safety of personnel involved.

2.2 SITE LOCATION

Vicksburg Chemical Corporation (VCC) is located less than a mile south of Interstate 20 bordering the City of Vicksburg, Mississippi. To the north and west of the site is light residential properties. To the East of the site is light industrial properties including the Vicksburg water treatment facility and an asphalt mixing and gravel drying operation. To the South of the site is light residential to rural properties.

2.3 SITE DESCRIPTION

VCC is located off Highway 61 on Rifle Range Road. The facility is comprised of a North Plant and a South Plant and occupies approximately 640 acres. Currently, the only active areas of the plant include the nitric acid and potassium nitrate plants. All other portion of the plant are no longer in operation. Resources such as a potable water supply, electricity, and telephone service are available at the plant office located at the facility entrance on Rifle Range Road. Chemical on-site relative to the aforementioned active plants include anhydrous ammonia, nitric acid, potassium chloride, chlorine, and occasional nitrogen tetroxide, and nitrogen dioxide. Chemical on-site related to past production activities include atrazine, dinoseb, methyl parathion, monosodium methane arsenate (MSMA), and toxaphene. Other chemicals that have been detected on-site include carbon tetrachloride, chloroform, 1,1-dichloroethylene, ethylbenzene, methylene chloride, toluene, and xylene.

The work sites concerning this plan are associated with the South and North Plants (Figure 1) and include several Solid Waste Management Units (SWMUs) and Other Areas of Concern (OACs).

2.4 SITE HISTORY

In the past, VCC produced various types of pesticides and herbicides such as dinoseb, toxaphene, atrazine, and monosodium methane arsenate. All of these chemicals have been detected in the soil and water by VCC and the state of Mississippi. Concentrations range from less than extractable products on hazardous wastes to an average of about 5 part per million (ppm). Chlorinated solvents have been detected in

sludge sediments in the ppm range for carbon tetrachloride, methylene chloride, chloroform, and 1,1,-dichloroethylene. The source of the chlorinated solvents is unknown as well as the source of xylene toluene, and ethylbenzene, which have been detected in the range of 2-15 ppm.

3.0
PURPOSE AND SCOPE OF PROPOSED WORK

WCC will perform work as required in a Consent Decree effective April 17, 1992. This Consent Decree requires Interim Measures activities, a Groundwater Assessment Program, and a RCRA Facility Investigation be conducted at the facility. These three workplans require geophysical borings, monitor well sampling and installation, subsurface soil sampling, and surface soil sampling. Some construction in conjunction with sump closure may be included in the Interim Measures activities.

4.0
HAZARD ASSESSMENT

The following hazards have been identified and will be protected against:

- Heat stress.
- Biological hazardous.
- Physical hazards.
- Skin contact with organic contaminants.

4.1 BIOLOGICAL HAZARDS

If clearing has not been conducted or if biological hazards develop during work activities, practical guidelines for prevention of exposure to pests should be implemented.

4.2 HEAT STRESS HAZARDS

If heat stress becomes a concern, the heat stress casualty prevention plan, presented in Appendix A shall be implemented.

4.3 PHYSICAL HAZARDS

Personnel should be cognizant of the fact that when protective equipment such as respirators, gloves, and protective clothing are worn, visibility and manual dexterity are impaired. In addition, personnel should be alert to physical hazards such as slipping/tripping/falling potentially associated with dismantled process equipment and piping remnants/ladders/stairways in various stages of disrepair, and uneven ground surface due to foundation fragments distributed throughout the site. Drilling personnel should abide by standard safety guidelines applicable to drilling operation presented in Appendix B.

4.4 CHEMICAL HAZARDS

Due to past production activities at the facility, pesticides, herbicides, chlorinated solvents, and volatile organic solvents have been detected on-site during site characterization efforts conducted by VCC and the state of Mississippi. The constituents detected included dinoseb, toxaphene, atrazine, carbon tetrachloride, methylene chloride, chloroform, 1,1-dichloroethylene, xylene, toluene, and ethylbenzene at concentration report in the parts per million range. Of the constituents detected on-site, carbon tetrachloride, methylene chloride, and chloroform are classified by OSHA and/or ACGIH as known or suspected human carcinogens.

The constituents detected on-site are present in low concentrations. However, exposure to these chemicals may potentially occur through inhalation, ingestion, and/or direct contact. Chemical exposure via multiple exposure pathways is cumulative, therefore it is important to recognize potential exposure situations and to take precautions to minimize exposure to chemical hazards by all routes.

The following potential exposure routes and associated health hazards have been identified:

Inhalation: Chemical hazards associated with inhalation exposures may include irritation of the mucous membranes and respiratory tract or with more sever exposures, may include systemic effects. Table 1 presents recommended exposure limits for potential airborne constituents.

Ingestion. Ingestion of chemical will be controlled on-site by prohibiting eating, smoking, or drinking in the Exclusion Zone and by requiring all field personnel to conduct decontamination procedures prior to leaving the Exclusion Zone.

Direct Contact: Skin and eye contact with chemical hazards may potentially result in irritation, rashes, or burns. If a person should exhibit symptoms of eye or skin irritation, he/she should report to the SSO for immediate medical attention.

Potential hazards may be minimized by utilizing appropriate personal equipment designed to protect the body against contact with known or anticipated chemical hazards. Personal protective equipment is classified by the EPA by the level of protection afforded and is divided into four categories designated as Level A, B, C, and D with Level A providing the most extensive level of protection.

The levels of protection required for the field activities specified by the work scope are presented in Section 5.1

Chemical information sheets for each constituent known to be present at the site are presented in Appendix C. These sheets provide important information concerning physical/chemical properties, chemical/reactive hazards, exposure potentials, health hazards and symptoms of exposures, and appropriate treatment following exposure.

Table 1
Exposure Limits for Potential Airborne Contaminants

Constituent	ACGIH TWA	OSHA PEL-TWA	STEL	IDLH
+Toxaphene	0.5 mg/m^3	0.5 mg/m^3	1 mg/m^3	200 mg/m^3
Atrazine	5 mg/m^3	5 mg/m^3	--	--
+Carbon Tetrachloride	5 ppm	2 ppm	--	Ca
Methylene Chloride	50 ppm	500 ppm	--	Ca
Chloroform	10 ppm	2 ppm	--	Ca
Xylene	100 ppm	100 ppm	150 ppm	1000 ppm
Toluene	100 ppm	100 ppm	150 ppm	2000 ppm
Ethylbenzene	100 ppm	100 ppm	125 ppm	2000 ppm
Lime Kiln Dust	10 mg/m^3	10 mg/m^3	--	--
Ammonia	25 ppm	50 ppm	35 ppm	500 ppm

+ Potential Skin Irritant
Ca Potential Human Carcinogen (Cancer Causing);
-- No IDLH level established.

5.0
GENERAL HEALTH AND SAFETY REQUIREMENTS

5.1 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) required to prevent contact with known or anticipated chemical hazards has been divided into four categories by the USEPA, Levels A, B, C and D, according to the degree of protection afforded. The following personnel protective equipment will be provided to personnel involved in site characterization work at the site.

Mobilization - Level D Protection

- Boots, steel toe and shank
- Hard hat
- safety glasses with side shields

Modified Level D Protection

- Coveralls, chemical resistant; tyvek (polycoated tyvek if splash hazard exists)
- Gloves (outer), chemical resistant, Polyvinyl Alcohol (PVAL)
- Gloves (inner), chemical-resistant, latex
- Boots, chemical-resistant (or bootie covers), steel toe and shank
- Safety glasses with side shields
- Hard hat (with faceshield if splash hazard exists)

Modified Level C Protection

- To include Modified Level D; PPE mentioned above
- Full-face air purifying respirators with organic vapor/pestiide/HEPA combination filter cartridges.

Tyvek coveralls will be discarded after each use or when they become worn or punctured. Suit materials are resistant to all known or anticipated chemicals at the site. If the disposable protective suits appear to be deteriorating under chemical action, the Site Safety Officer should be notified.

In addition to the personal protective equipment listed above, general safety equipment available for use will include a first aid kit, portable eye wash and fire extinguisher.

5.2 WORK ZONES

During activities conducted in Modified Level D PPE, management of this project shall be conducted in such a manner which will restrict access to the job site by unauthorized personnel. If Level D action levels established in Table 2 are exceeded resulting in an upgrade to Level C PPE, work zones as described in the following paragraphs shall be implemented.

To minimize the movement of contaminants from the site to uncontaminated areas, three work zones will be set up during activities conducted under Level C PPE. The three work zones will include the following:

Zone 1:	Exclusion Zone
Zone 2:	Contamination Reduction Zone
Zone 3:	Support Zone

The exclusion zone is the zone where contamination does or could occur. Observations by the site safety officer will determine the extent of the zones. All persons entering this zone must wear at a minimum the level of protection set forth in Section 5.1 (Level C PPE).

Between the exclusion zone and support zone is the personnel contamination reduction zone (CRZ) which provides a transition zone between the contaminated and clean areas of the site. This zone will be located directly outside of the exclusion zone and will be defined as 10-foot zone directly outside the exclusion zone.

The support zone will be an uncontaminated area from which operations will be directed. It is essential that contamination from the site be kept out of this area. Included in this area will be a storage area for decontaminated clothing, additional personal protective equipment, etc.

One additional work zone will be set up for decontaminating equipment.

5.3 DECONTAMINATION PROCEDURES

VCC will have a minimum of one personnel decontamination station, strategically located or in the contamination reduction zone (CRZ) if applicable. The decontamination station will have at least the following items:

- An adequate-sized plastic sheet for flooring
- Boot wash equipment
  - Water/alconox solution container
  - Rinse water container
  - Long-handled plastic brush
- Waste container (disposable PPE, tape, etc.)
- Hand wash equipment
  - Water/alconox solution container
  - Rinse water container
  - Paper towels

5.3.1 Equipment Decontamination

Decontamination of sample collection equipment will be accomplished by the following procedure:

- Washing in a detergent solution (Alconox)
- Triple rinsing with clean deionized water
- Rinsing with methanol
- Triple rinsing with clean deionized water

Decontamination of equipment shall be conducted in Modified Level D PPE as listed in Section 5.1. While utilizing methanol for deconning equipment, personnel shall position themselves upwind of decontamination operations to minimize inhalation exposures to methanol vapors. If this is not feasible, respiratory protection as listed under level C PPE is Section 5.1 shall be worn during methanol use.

5.3.2 Personnel Decontamination

Decontamination of personnel will be performed at a designated location at the perimeter of the work area. Decontamination will consists primarily of soap and water washings and water rinse of exterior protective gear to remove contaminants, followed by doffing of the gear.

Coveralls should be removed by turning the clothing inside out. A general sequence of doffing procedures is outlined below. The extent of washing required, or modifications to the sequence, may be specified as appropriate.

Personnel will be decontaminated by the following procedure:

- Wash and rinse outer protective coverall
- Wash work gloves and boots
- Remove outer protective clothing
- Rinse respirator if worn
- Wash hands and face

Contaminated disposable PPE and all decontamination fluids shall be containerized on-site for subsequent disposal by the direction of VCC.

5.4 MEDICAL EXAMINATION

Before commencing any of the field or laboratory activities defined in Section 3.0, all WCC personnel and all WCC subcontractors must take an annual WCC-approved medical examination as part of WCC's medical surveillance program.

5.5 SAFETY TRAINING DOCUMENTATION

Prior to commencing any of the field activities defined in Section 3.0, all WCC personnel working on-site will supply certificate or equivalent, attesting to completing 40 hours of training as required by OSHA, in 29 CFR 1910.120, to the SSO. Site supervisors will be required to supply documentation indicating that an additional 8 hours of training has been completed. Escorted visitors may be allowed in a defined area without 40 hours training at the discretion of the WCC SSO and the WCC site coordinator.

Documentation concerning respirator fit testing, in accordance with OSHA, 29 CFR 1910.134 shall be required of any WCC employee wearing a respirator.

5.6 COMPLIANCE AGREEMENT

The Project Manager and the Baton Rouge Health and Safety Officer shall hold meetings with all WCC field personnel before work commences. During the meeting, all personnel shall be provided with a copy of this safety plan; the plan shall be reviewed and discussed and questions answered. Signed Compliance Agreement Forms shall be collected by the Project Manager and filed by the Baton Rouge Health and Safety Officer. Individuals refusing to sign the form will not be allowed to work on the site.

5.7 PROJECT MANAGER NOTIFICATION

All field personnel must inform the Project Manager or his designated representative before entering the site. The "buddy system" will be employed during all project work. This means that at least two members of the field crew must be on-site whenever work is performed. Personnel must be in visual contact with each other or carry two-way radios at all times.

5.8 PROJECT SAFETY LOG

A project safety log will be used to record the names, entry and exit dates and times of all WCC and subcontractor personnel and of project site visitors; accidents, injuries, and illnesses; incidence of safety infractions by field personnel; air quality and personal exposure monitoring data; and other information related to safety matters. All accidents, illnesses or other incidence shall be reported immediately to the WCC Project Manager, and the WCC Baton Rouge Health and Safety Officer and subsequently documented for filing on the HS-502 Incident Report Form.

5.9 PROHIBITIONS

- Smoking, eating, drinking, chewing gum or tobacco, storing food or food containers shall not be permitted on the work site. Good personal hygiene should be practiced by field personnel to avoid ingestion of contaminants or spread of contaminated materials.

- Ignition of flammable liquids within, on, or through improvised heating devises or space heaters.

- Approach or entry into areas or spaces where toxic of explosive concentrations of gases or dust may exist without proper equipment available to enable safety entry.

- Conduct of on-site operations without off-site back up personnel.

5.10 SITE SAFETY MEETINGS

During all site characterization activities, daily safety meetings will be held by the site safety officer to review and plan the specific health and safety aspects of scheduled work for that day.

6.0
LABORATORY CONSIDERATIONS

The laboratory director must be informed of any contaminant level in the samples that would require special handling procedures to prevent risk to the health and safety of laboratory personnel.

7.0 PERSONAL PROTECTIVE EQUIPMENT

This section outlines the general usage guidelines for personal protective equipment.

7.1 HEAD PROTECTION

Hard hats must be worn by all personnel working on-site.

7.2 EYE PROTECTION

Safety glasses with side shields or goggles must be worn by all personnel performing activities where potential for eye or face exposure exists due to splash, dust, or vapor, etc. An eyewash station will be set up by the site safety officer prior to commencing field activities and should be placed so that it could be used quickly in an emergency.

7.3 SKIN PROTECTION

Due to the potential for skin absorption and carcinogenic properties chemical resistant gloves and coveralls shall be worn by all personnel during subsurface and sample handling activities. These will be disposed of in a designated sealable drum after each use of when they become worn or punctured.

7.4 FOOTWEAR

Chemical-resistant boots with steel toes and shanks will be worn by field personnel engaged in the field activities at the site. Chemical-resistant booties can be substituted for chemical resistant boots, although work boots to be covered must always maintain steel toes and shanks.

7.5 RESPIRATORY PROTECTION

For respiratory protection against possible volatile organics, full-face air purifying respirators (APR) will be required if Level D air monitoring action levels are exceeded. Specific cartridges to be utilized with the APRs will be combination organic vapor/ammonia filter cartridges. All personnel must be properly fit-tested for the specific brand and size respirator to be used. Documentation of fit testing is to be provided to WCC SSO prior to commencement of work. A respirator which has not been successfully fit-tested cannot be used by an individual on the project. To ensure a proper fit, no facial hair will be allowed that will interfere with mask operation. The site safety officer will determine if facial hair represents such an interference. Air purifying respirators will only be used if the following conditions are met:

- The oxygen content of the air is greater than 19.5 percent.
- Concentration of air contaminants are known and monitored.
- The contaminants of concern all have good warning properties (i.e., odor threshold below PEL value).
- The protection factor is adequate and PELs are not exceeded.
- If concentrations of air contaminants exceed IDLH value, personnel must immediately evacuate.
- Cartridges are changed daily or whenever breakthrough occurs, which ever occurs first.
- Each person has been fit-tested for the specific brand and size of respirator used.
- The respirator is MSHA- and/or NIOSH-approved.

8.0
AIR QUALITY MONITORING

The primary goal of on-site air quality monitoring will be compliance with the specified contaminant action levels. The secondary goal will be documentation of personal exposures as required by OSHA 1920.120.

8.1 AIR QUALITY SURVEY

During modified Level D field activities at the site, an air quality survey will be performed utilizing an HNu-photoionization detector (PID) equipped with an 11.7 ev probe, or equivalent instrument to characterize volatile organics and ammonia concentrations on-site. Standard operating procedures for this instrument are attached as Appendix E. During Level C filed activities, additional sampling utilizing colorimetric tubes specific for detecting chloroform, methylene chloride, and carbon tetrachloride will be used along with the HNu for total organic vapors. At least two sampling events utilizing each of these tubes will be conducted in the breathing zone of personnel closest to the subsurface activities at the site. Table 2 lists air monitoring action levels for Level D and C work.

TABLE 2 AIR MONITORING ACTION LEVELS FOR LEVEL C AND D WORK			
Contaminant	**Instrument***	**Reading**	**Action Taken**
Volatile Organic	HNu or equivalent	<5 ppm	Continued Work in Modified D Level
		5 - 25 ppm	Upgrade to Level C and Expand Work Zones; Commence additional colorimetric tube sampling
		>25 ppm	Evacuate Area

* Sustained reading above background (for 15 minutes continuous) which shall not be exceeded within worker breathing zones or exclusion zones.

9.0
EMERGENCIES/ACCIDENTS

A site map and direction to Vicksburg Hospital are included in Figure 1. Illnesses, injuries, and accidents occurring on-site must be attended to immediately in the following manner:

- Remove the injured or exposed person(s) from immediate danger.
- Render FIRST AID if necessary. Decontaminate affected personnel, if necessary.
- Call ambulance for transport to local. This procedure should be followed even if there is no apparent serious injury. Emergency numbers are listed on the following section.
- Evacuate other personnel on-site to a safe place until the engineer (assisted by the Site Safety Officer) determines that it is safe for work to resume.
- Report the accident to the Health and Safety Officer immediately.
- Develop procedures, in accordance with the Health and Safety Officer, Site Safety Officer, and Project Manager to prevent a recurrence.

In the event that an emergency site evacuation should be necessary for any reason, the Site Safety Officer will render an alarm using a horn and all personnel shall leave the site. The assembly point will be designated in the filed. Personnel will not return to the site until an all-clear has been received from the Site Safety Officer

9.1 EMERGENCY NUMBERS

For any on-site Emergency dial 911.

Emergency Service	Telephone
Fire Department	636-1121
Ambulance	911
Sheriff	636-1761
Vicksburg Police Department	636-2511
National Response Center (NRC)	1-800-424-8802
Poison Control Center	1-800-535-0525
Vicksburg Medical Center	636-2611
Mercy Regional Medical Center	631-2250

10.0
PERSONNEL ASSIGNMENTS

WCC personnel and subcontractors authorized to work on this project and enter the site are:

Project Manager:	Richard D. Karkkainen
Baton Rouge Health and Safety Officer:	Charles Self
Site Safety Officer:	Yong Goh
Field Personnel:	Mike Olson
Subcontractor:	Soil Testing Engineers, Inc.

10.1 PROJECT SAFETY PERSONNEL

Personnel responsible for implementing this Safety Plan are the Project Manager and Site Safety Officer. Their specific responsibilities and authorities for all accountable WCC personnel are listed in this plan as well as Table 2-1 of the WCC Health and Safety manual dated November 1990.

11.0
SAFETY PLAN COMPLIANCE AGREEMENT

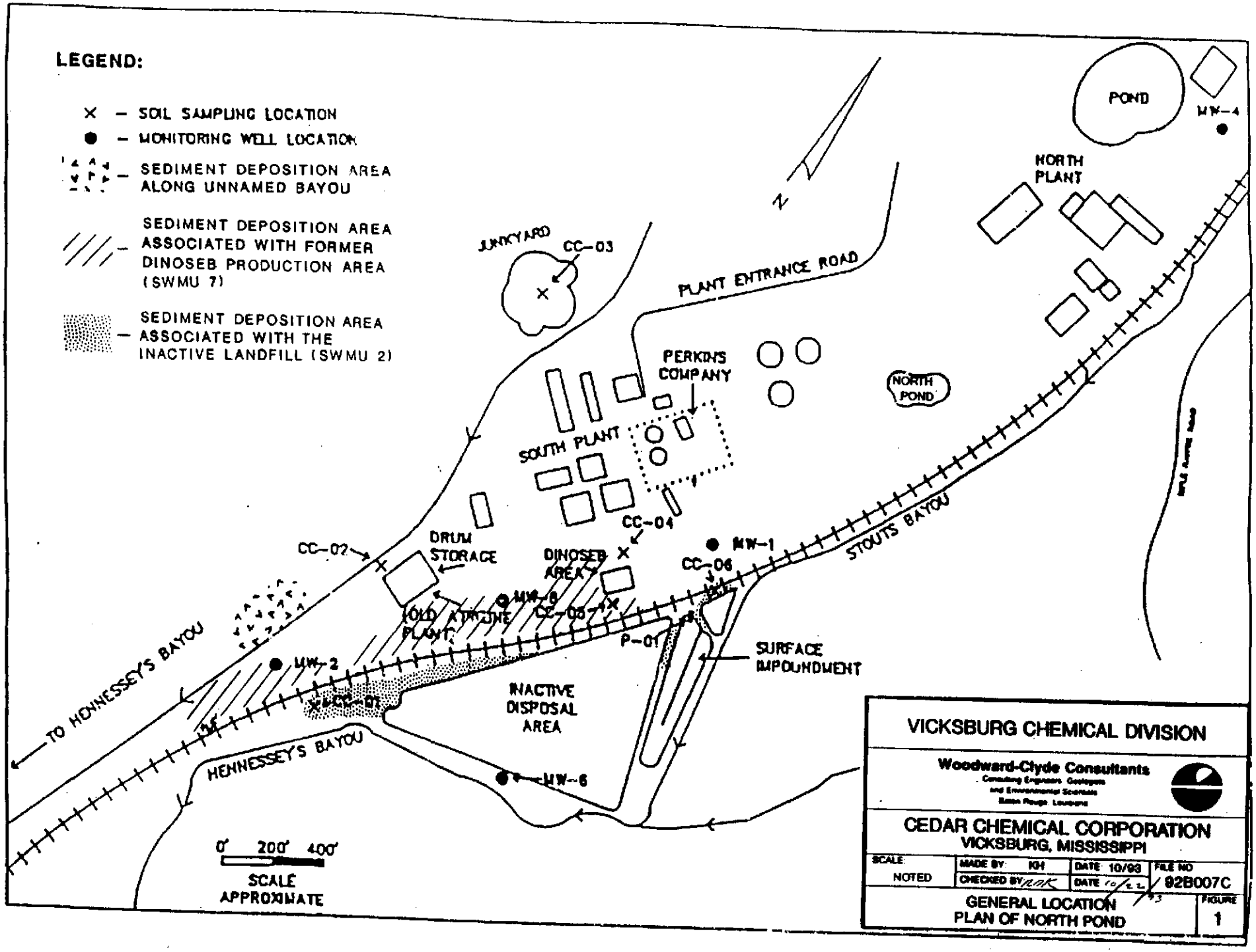
I, _____(print name), have received a copy of the Safety Plan for the Interim Measures, Groundwater Assessment, and RFI Field Investigation Workplans for VCC, Vicksburg, Mississippi (WCC Project No. 90B451C). I have read the plan, understand it, and agree to comply with all of its provisions. I understand that I could be prohibited from working on the project for violating any of the safety requirements specified in the plan.

Signed:

_____ _____

Signature Date

Firm:_____


LEGEND:
× – SOIL SAMPLING LOCATION
● – MONITORING WELL LOCATION
– SEDIMENT DEPOSITION AREA ALONG UNNAMED BAYOU
– SEDIMENT DEPOSITION AREA ASSOCIATED WITH FORMER DINOSEB PRODUCTION AREA (SWMU 7)
– SEDIMENT DEPOSITION AREA ASSOCIATED WITH THE INACTIVE LANDFILL (SWMU 2)
N
POND
MW-4
NORTH PLANT
JUNKYARD
CC-03
PLANT ENTRANCE ROAD
PERKINS COMPANY
NORTH POND
SOUTH PLANT
CC-04
CC-02
DRUM STORAGE
DINOSEB AREA
MW-1
CC-06
STOUTS BAYOU
MW-5
CC-05
OLD ATRAZINE PLANT
P-01
SURFACE IMPOUNDMENT
MW-2
CC-01
INACTIVE DISPOSAL AREA
TO HENNESSEY'S BAYOU
HENNESSEY'S BAYOU
MW-6
0' 200' 400'
SCALE APPROXIMATE
VICKSBURG CHEMICAL DIVISION
Woodward-Clyde Consultants
Consulting Engineers, Geologists and Environmental Scientists
Baton Rouge, Louisiana
CEDAR CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI
SCALE: NOTED
MADE BY: KH
DATE 10/93
FILE NO 92B007C
CHECKED BY RDK
DATE 10/22/93
GENERAL LOCATION PLAN OF NORTH POND
FIGURE 1

APPENDIX A

HEAT STRESS CASUALTY PREVENTION PLAN

APPENDIX A

HEAT STRESS CASUALTY PREVENTION PLAN

Due to the increase in ambient air temperatures and the affects of protective outer wear decreasing body ventilation, there exists an increase in the potential for injury, specifically, heat casualties. Site personnel will be instructed in identification of a heat stress victim, the first-aid treatment procedures for the victim and the preventing of heat stress casualties.

A. IDENTIFICATION AND TREATMENT

1) Heat Exhaustion

a) Symptoms: Usually begins with muscular weakness, dizziness, nausea, and staggering gait. Vomiting is frequent. The bowels may move involuntarily. The victim is very pale, his skin is clammy skin, and he may perspire profusely. The pulse is weak and fast, his breathing is shallow. He may faint unless he lies down. This may pass, but sometimes it remains and death could occur.

b) First Aid: Immediately remove the victim to the Personnel Decontamination Reduction Zone in a shady or cool area with good air circulation. Remove all protective outer wear. Call a physician. Treat the victim for shock. (Make him lie down, raise his feet 6 to 12 inches and loosen all clothing.) Transport victim to a medical facility as soon as possible.

2) Heat Stroke

a) Symptoms: This is the most serious of heat casualties due to the fact that the body excessively overheats. Body temperatures often are between 107 degrees to 110 degrees Fahrenheit. First there is often pain in the head, dizziness, nausea, oppression, and the skin is dry, red and hot. Unconsciousness follows quickly and death is imminent if exposure continues. The attack will usually occur suddenly.

b) First Aid: Immediately evacuate the victim to a cool and shady area in the Personnel Decontamination Reduction Zone. Remove all protective outer wear and all personal clothing. Lay him on his back with his head and shoulders slightly elevated. It is imperative that the body temperature be lowered immediately. This can be accomplished by applying cold wet towels, ice bags, etc., to the head. Sponge off bare skin with cool water or place him in a tub of cool water. The main objective is to cool him without chilling him. Give no stimulants. Transport the victim to a medical facility as soon as possible.

B. PREVENTION OF HEAT STRESS

1) One of the major causes of heat casualties is the depletion of body fluids. On the site there will plenty of fluids available. Personnel should replace water and salts loss from sweating. Salts can be replaced by either 0.1 percent solution, more heavily salted foods, or commercial mixes such as Gatorade. The commercial mixes are advised for personnel on low sodium diets.

2) A work schedule should be established so that the majority of the work day will be during the morning hours of the day before ambient air temperature levels reach their highs.

3) A work/rest guideline will be implemented for personnel required to wear Level B or Level C protection. This guideline is as follows:

Ambient Temperatures	Maximum Working Time
Above 90°F	1/2 hour
80°-90°F	1 hour
70°-80°F	2 hours
60°-70°F	3 hours
50°-60°F	4 hours
40°-50°F	5 hours
30°-40°F	6 hours
Below 30°F	8 hours

A sufficient period will be allowed for personnel to "cool down". This may require shifts of workers during operations.

C. HEAT STRESS MONITORING

For monitoring the body's recuperative ability to excess heat, one or more of the following techniques should be used as a screening mechanism. Monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70 degrees Fahrenheit or above. Frequency of monitoring should increase as the ambient temperature increases or if slow recovery rates are indicated. When temperatures exceed 80 degrees Fahrenheit, workers must be monitored for heat stress after every work period.

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

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

- Body water loss due to sweating should be measured by weighing the worker in the morning and in the evening. The clothing worn should be similar at both weighings; preferably, the worker should be weighed nude. The scale should be accurate to plus or minus one-quarter pound. Body water loss should not exceed 1.5 percent of the total body weight. If it does, workers should be instructed to increase their daily intake of fluids by the weight lost.

Ideally, body fluids should be maintained at a constant level during the work day. This requires replacement of salt lost in sweat as well.

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

APPENDIX B

SAFETY GUIDELINES FOR DRILLING

APPENDIX B

SAFETY GUIDELINES FOR DRILLING

Drill rig maintenance and safety is the responsibility of the drill rig operator. However, safety requires the attention and cooperation of every worker and visitor to the job. The following is provided as a general guideline for safe drilling practices onsite.

OFF-ROAD MOVEMENT OF DRILL RIGS

The following safety guidelines relate to off-road movement:

- Before moving a drill rig, first walk the route of travel, inspecting for depressions, slumps, gullies, ruts and similar obstacles.
- Always check the brakes of a drill rig carrier before traveling, particularly on rough, uneven or hilly ground.
- Discharge all passengers before moving a drill rig on rough or hilly terrain.
- Engage the front axle (for 4x4, 6x6, etc., vehicles or carriers) when traveling off-highway on hilly terrain.
- Use caution when traveling side-hill. Conservatively evaluate side-hill capability of drill rigs because the arbitrary addition of drilling tools may raise the center of mass. When possible, travel directly uphill or downhill.
- Attempt to cross obstacles such as small logs and small erosion channels or ditches squarely, not at an angle.
- Use the assistance of someone on the ground as a guide when lateral or overhead clearance is narrow.

- After the drill rig has been moved to a new drilling site, set all brakes and/or locks. When grades are steep, block the wheels.

- Never travel off-road with the mast (derrick) of the drill rig in the raised or partially raised position.

- Tie-down loads on the drill rig and support trucks during transport.

OVERHEAD AND BURIED UTILITIES

The use of a drill rig near electrical power lines and other utilities requires that special precautions be taken by both supervisors and members of the exploration crew. Electricity can shock, it can burn and it can cause death.

Overhead and buried utilities should be located, noted and emphasized on all boring location plans and boring assignment sheets.

Before raising the drill rig mast (derrick) on a site in the vicinity of power lines, walk completely around the drill rig. Determine what the minimum distance from any point on the drill rig to the nearest power line will be when the mast is raised and/or being raised. Do not raise the mast or operate the drill rig if this distance is less than 20 feet.

Keep in mind that both hoist lines and overhead power lines can be moved toward each other by the wind.

CLEARING THE WORK AREA

Prior to drilling, adequate site cleaning and leveling should be performed to accommodate the drill rig and supplies and provide a safe working area. Drilling should not be commenced when tree limbs, unstable ground or site obstructions cause unsafe tool handling conditions.

NOTE: **In coordination with the Drilling Crew, the Site Health and Safety Manager will review the precautions taken to insure that the drill rig is leveled and stabilized.**

HOUSEKEEPING ON AND AROUND THE DRILL RIG

The first requirement for safe field operations is that the drilling crew safety supervisor understands and fulfills the responsibility for maintenance and "housekeeping" on and around the drill rig.

Suitable storage locations should be provided for all tools, materials and supplies so that they can be conveniently and safely handled without hitting or falling on a member of the drill crew or a visitor.

Avoid storing or transporting tools, materials or supplies within or on the mast (derrick) of the drill rig.

Pipe, drill rods, bits casing, augers and similar drilling tools should be orderly stacked on racks or sills to prevent spreading, rolling or sliding.

Penetration or other driving hammers should be placed at a safe location on the ground or be secured to prevent movement when not in use.

Work areas, platforms, walkways, scaffolding and other accessways should be kept free of materials, obstructions and substances such as ice, excess grease or oil that could cause a surface to become slick or otherwise hazardous.

Keep all controls, control linkages, warning and operation lights and lenses free of oil, grease and/or ice.

Do not store gasoline in any portable container other than a non-sparking, red container with a flame arrester in the fill spout and having the word "gasoline" easily visible.

SAFE USE OF HAND TOOLS

There are almost an infinite number of hand tools that can be used on or around a drill rig. "Use the tool for its intended purpose" is the most important rule. The following are a few specific and some general suggestions which apply to safe use of several hand tools that are often used on and around drill rigs.

- When a tool becomes damaged, either repair it before using it again or get rid of it.
- When using a hammer, any kind of hammer for any purpose, wear safety glasses and require all others near you to wear safety glasses.
- When using a chisel, any kind of chisel, for any purpose, wear safety glasses and require all others around you to wear safety glasses.
- Keep all tools cleaned and orderly stored when not in use.
- Replace hook and heel jaws when they become visibly worn.
- When breaking tool joints on the ground or on a drilling platform, position your hands so that your fingers will not be smashed between the wrench handle and the ground or the platform, should the wrench slip or the joint suddenly let go.

SAFE USE OF WIRE LINE HOISTS, WIRE ROPE AND HOISTING HARDWARE

The use of wire line hoists, wire rope, and hoisting hardware should be as stipulated by the American Iron and Steel Institute's Wire Rope Users Manual.

All wire ropes and fittings should be visually inspected during use and thoroughly inspected at least once a week for abrasion, broken wires, wear, reduction in rope diameter, reduction in wire diameter, fatigue, corrosion, damage from heat, improper weaving, jamming, crushing, bird caging, kinking, core protrusion, and damage to lifting

hardware and any other feature that would lead to failure. Wire ropes should be replaced when inspection indicates excessive damage according to the wire rope users manual.

If a ball-bearing-type hoisting swivel is used to hoist drill rods, swivel bearings should be inspected and lubricated daily to assure that the swivel freely rotates under load.

If a rod slipping device is used to hoist drill rods, do not drill through or rotate drill rods through the slipping device, do not hoist more than 1 foot (0.3m) of the drill rod column above the top of the mast (derrick), do not hoist a rod column with loose tool joints and do not make up, tighten or loosen tool joints while the rod column is being supported by a slipping device. If drill rods should slip back into the borehole, do not attempt to break the fall of the rods with your hands.

Most sheaves on drill rigs are stationary with a single-part line. The number of parts of line should never be increased without first consulting with the manufacturer of the drill rig. Wire ropes must be properly matched with each sheave.

The following procedures and precautions must be understood and implemented for safe use of wire ropes and rigging hardware.

Use tool-handling hoists only for vertical lifting of tools (except when angle-hole drilling). Do not use tool-handling hoists to pull on objects away from the drill rig; however, drills may be moved using the main hoist as the wire rope is spooled through proper sheaves according to the manufacturer's recommendations.

When stuck tools or similar loads cannot be raised with a hoist, disconnect the hoist line and connect the stuck tools directly to the feed mechanism of the drill. Do not use hydraulic leveling jacks for added pull to the hoist line or the feed mechanism of the drill.

When attempting to free a mired vehicle or drill rig carrier, only use a winch on the front or rear of the vehicle or drill rig carrier and stay as far away as possible from the wire rope. Do not attempt to use tool hoists to free a mired vehicle or drill rig carrier.

To minimize shock loading of a wire rope, always apply loads smoothly and steadily.

Some additional safety guidelines that should be followed are:

- Protect wire rope from sharp corners or edges.
- Replace faulty guides and rollers.
- Replace worn sheaves or worn sheave bearings.
- Replace damaged safety latches on safety hooks before use.
- Know the safe working load of the equipment and tackle being used. Never exceed this limit.
- Periodically inspect and test clutches and brakes of hoists.
- Know and do not exceed the rated capacity of hooks, rings, links, swivels, shackles and other lifting aids.
- Always wear gloves when handling wire ropes.
- Do not guide wire ropes on hoist drums with your hands.
- After installation of a new wire rope, lift a light load to allow the wire rope to adjust.
- Never carry out any hoisting operations when the weather conditions are such that hazards to personnel, the public or property are created.
- Never leave a load suspended when the hoist is unattended.

- Keep your hands away from hoists, wire rope, hoisting hooks, sheaves and pinch points as slack is being taken up and when the load is being hoisted.

- Never hoist a load over members of the crew.

SAFE USE OF AUGERS

The following general procedures should be used when advancing a boring with continuous-flight or hollow-stem augers:

- Prepare to start an auger boring with the drill rig level, the clutch or hydraulic rotation control disengaged, the transmission in low gear and the engine running at low RPM.

- The operator and tool handler should establish a system of responsibility for the various activities required for auger drilling, such as connecting and disconnecting auger sections and inserting and removing the auger fork. The operator must assure that the tool handler is well away from the auger column and that the auger fork is removed before starting rotation.

- Use only the manufacturer's recommended method of securing the auger to the power coupling. Do not touch the coupling or the auger with your hands, a wrench or any other tools during rotation.

- Whenever possible, use tool hoists to handle auger sections.

- Never place hands or fingers under the bottom of an auger section when hoisting the auger over the top of the auger section in the ground or other hard surfaces such as the drill rig platform.

- Never allow feet to get under the auger section that is being hoisted.

- When rotating augers, stay clear of the rotating auger and other rotating components of the drill rig. Never reach behind or around a rotating auger for any reason whatever.

- Never use your hands or feet to move cuttings away from the auger.

- When cleaning augers, be sure the drill rig is in neutral and the augers are stopped from rotating.

SAFETY DURING ROTARY AND CORE DRILLING

Rotary drilling tools should be safety-checked before use. In particular, check for the following:

- See that water swivels and hoisting plugs are lubricated and checked for frozen bearings before use.

- Check rod chuck jaws periodically and replace them when necessary.

- Check the capacities of hoists and sheaves against the anticipated weight on the drill rod string plus other expected hoisting loads. Inspect all cables daily.

These other special precautions should be taken for safe rotary or core drilling:

- Drill rods should not be braked during lowering into the hole with drill rod chuck jaws.

- Drill rods should not be held or lowered into the hole with pipe wrenches.

- If a string of drill rods are accidently or inadvertently released into the hole, do not attempt to grab the falling rods with your hands or a wrench.

- In the event of a plugged bit or other circulation blockage, the high pressure in the piping and hose between the pump and the obstruction should be relieved or bled down before breaking the first tool joint.

- When drill rods are hoisted from the hole, they should be cleaned for safe handling with a rubber or other suitable rod wiper. Do not use your hands to clean drilling fluids from drill rods.

- If work must progress over a portable drilling fluid (mud) pit, do not attempt to stand on narrow sides or cross members. The mud pit should be equipped with a rough surface and fitted cover panels of adequate strength to hold drill rig personnel.

- Drill rods should not be lifted and leaned unsecured against the mast. Either provide some method of securing the upper ends of the drill rod sections for safe vertical storage or lay the rods down.

- Inspect all hydraulic lines periodically and replace as needed.

START-UP

All drill rig personnel and visitors should be instructed to "stand-clear" of the drill rig immediately prior to and during starting of an engine.

Make sure all gear boxes are in neutral, all hoist levers are disengaged, all hydraulic levers are in the correct, non-actuating positions, and the cathead rope is not on the cathead before starting a drill rig engine.

SAFETY DURING DRILLING OPERATIONS

Safety requires the attention and cooperation of every worker and site visitor.

Do not drive the drill rig from hole to hole with the mast (derrick) in the raised position.

Before raising the mast (derrick) look up to check for overhead obstructions.

Before raising the mast (derrick), all drill rig personnel and visitors (with exception of the operator) should be cleared from the area immediately to the rear and the sides of the mast. All drill rig personnel and visitors should be informed that the mast is being raised prior to raising it.

Before the mast (derrick) of a drill rig is raised and drilling is commenced, the drill rig must be first leveled and stabilized with leveling jacks and/or solid cribbing. The drill rig should be releveled if it settles after initial set up. Lower the mast (derrick) only when leveling jacks are down and do not raise the leveling jack pads until the mast (derrick) is lowered completely.

Before starting drilling operations, secure and/or lock the mast (derrick) if required according to the drill manufacturer's recommendations.

The operator of a drill rig should only operate a drill rig from the position of the controls. The operator should shut down the drill engine before leaving the vicinity of the drill.

Do not consume alcoholic beverages or other depressants or chemical stimulants prior to starting work on a drill rig or while on the job.

Watch for slippery ground when mounting dismounting from the platform.

All unattended boreholes must be adequately covered or otherwise protected to prevent drill rig personnel, site visitors or animals from stepping or falling into the hole. All open boreholes should be covered, protected, or backfilled adequately and according to local or state regulations on completion of the drilling project.

"Horsing around" within the vicinity of the drill rig and tool and supply storage areas should never be allowed, even when the drill rig is shut down.

Be careful when lifting heavy objects.

Before lifting a relatively heavy object, approach the object by bending at the knees, keeping your back vertical and unarched while obtaining a firm footing. Grasp the object firmly with both hands and stand slowly and squarely while keeping your back vertical and unarched. In other words, perform the lifting with the muscles in your legs, not with the muscles in your lower back.

Drilling operations should be terminated during an electrical storm.

APPENDIX C

CHEMICAL INFORMATION SHEETS

AMMONIA

- **Hazardous substance (EPA)**

Description: NH_3, ammonia is a colorless, strongly alkaline, and extremely soluble gas with a characteristic pungent odor.

Code Numbers: CAS 7664-41-7 RTECS BO0875000 UN 1005

DOT Designation: Nonflammable gas.

Synonyms: Anhydrous ammonia.

Potential Exposures: Ammonia is used as a nitrogen source for many nitrogen-containing compounds. It is used in the production of ammonium sulfate and ammonium nitrate for fertilizers and in the manufacture of nitric acid, soda, synthetic urea, synthetic fibers, dyes, and plastics. It is also utilized as a refrigerant and in the petroleum refining and chemical industries. It is used in the production of many drugs (A-41) and pesticides (A-32).

Other sources of occupational exposure include the silvering of mirrors, glue-making, tanning of leather, and around nitriding furnaces. Ammonia is produced as a by-product in coal distillation and by the action of steam on calcium cyanamide, and from the decomposition of nitrogenous materials.

Incompatibilities: Strong oxidizers, calcium, hypochlorite bleaches, gold, mercury, silver, halogens.

Permissible Exposure Limits in Air: The Federal standard for ammonia is an 8-hour time-weighted average of 50 ppm (35 mg/m^3). NIOSH has recommended 50 ppm expressed as a ceiling and determined by a 5-minute sampling period. ACGIH as of 1983/84 has set TWA values of 25 ppm (18 mg/m^3). The tentative STEL value is 35 ppm (27 mg/m^3). The IDLH level is 500 ppm.

Determination in Air: Collection by midget impinger and colorimetric analysis using Nessler's reagent (A-10). Ammonia may also be determined using long-duration detector tubes (A-11).

Permissible Concentration in Water: EPA in 1976 (A-3) proposed a limit of 0.02 mg/ℓ (as unionized ammonia) for the protection of freshwater aquatic life. As of 1980, EPA (2) first proposed adding ammonia to the list of priority toxic pollutants and developing criteria for it, but then withdrew the proposal. NAS/NRC proposed (A-2) a limit of 0.5 mg/ℓ for drinking water.

Routes of Entry: Inhalation of gas, ingestion, skin and eye contact.

Harmful Effects and Symptoms: *Local* — Contact with anhydrous liquid ammonia or with aqueous solutions is intensely irritating to the mucous membranes, eyes, and skin. Eye symptoms range from lacrimation, blepharospasm, and palpebral edema to a rise of intraocular pressure, and other signs resembling acute-angle closure glaucoma, corneal ulceration, and blindness. There may be corrosive burns of skin or blister formation. Ammonia gas is also irritating to the eyes and to moist skin.

Systemic — Mild to moderate exposure to the gas can produce headache, salivation, burning of throat, anosmia, perspiration, nausea, vomiting, and substernal pain. Irritation of ammonia gas in eyes and nose may be sufficiently intense to compel workers to leave the area. If escape is not possible, there may be severe irritation of the respiratory tract with the production of cough, glottal edema, bronchospasm, pulmonary edema, or respiratory arrest. Bronchitis or pneumonia may follow a severe exposure if patient survives. Urticaria is a rare allergic manifestation from inhalation of the gas.

Points of Attack: Lungs, respiratory system, eyes.

Medical Surveillance: Preemployment physical examinations for workers in ammonia exposure areas should be directed toward significant changes in the skin, eyes, and respiratory system. Persons with corneal disease, and glaucoma, or chronic respiratory diseases may suffer increased risk. Periodic examinations should include evaluation of skin, eyes, and respiratory system, and pulmonary function tests to compare with baselines established at preemployment examination.

First Aid: If this chemical gets into the eyes, irrigate immediately. If this chemical contacts the skin, flush with water immediately. If a person breathes in large amounts of this chemical, move the exposed person to fresh air at once and perform artificial respiration. When this chemical has been swallowed, get medical attention. Do not induce vomiting.

Personal Protective Methods: *Where ammonia hazards exist in concentrations* above the standard, respiratory, eye, and skin protection should be provided. Fullface gas masks with ammonia canister or supplied air respirators, both with full facepieces, afford good protection. In areas where exposure to liquid ammonia occurs, goggles or face shields, as well as protective clothing impervious to ammonia and including gloves, aprons, and boots should be required. Where ammonia gas or concentrated ammonia solution is splashed in eyes, immediate flooding of the eyes with large quantities of water for 15 minutes or longer is advised, followed at once by medical examination.

In heavy concentrations of ammonia gas, workers should be outfitted with complete self-contained protective suits impervious to ammonia, with supplied air source, and full headpiece and facepiece. Appropriate clothing should be worn to prevent any possible skin contact with liquids of >10% content or reasonable probability of contact with liquids of <10% content. Wear eye protection to prevent any possibility of eye contact with liquids of >10% NH_3 content. Employees should wash immediately when skin is wet or contaminated with liquids of >10% content. Remove nonimpervious clothing immediately if wet or contaminated with liquids containing >10% and promptly remove if liquid contains <10% NH_3. Provide emergency showers and eyewash if liquids containing >10% NH_3 are involved.

Respirator Selection:

100 ppm:	CCRS/SA/SCBA
300 ppm:	CCRSF
500 ppm:	GMS/SAF/SCBAF
Escape:	GMS/SCBA

Disposal Method Suggested: Dilute with water, neutralize with HCl and discharge to sewer (A-38). Recovery is an option to disposal which should be considered for paper manufacture, textile treating, fertilizer manufacture and chemical process wastes (A-57).

References

(1) National Institute for Occupational Safety and Health, *Criteria for a Recommended Standard: Occupational Exposure to Ammonia,* NIOSH Doc. No. 74-136, Washington, DC (1974).

(2) U.S. Environmental Protection Agency, "Toxic Pollutant List: Proposal to Add Ammonia," *Federal Register,* 45, No. 2, 803-806 (January 3, 1980) Rescinded by *Federal Register,* 45, No. 232, 79692-79693 (December 1, 1980).

(3) National Research Council, Committee on Medical and Biologic Effects of Environmental Pollutants, *Ammonia,* Baltimore, MD, University Park Press (1979).

(4) Sax, N.I., Ed., *Dangerous Properties of Industrial Materials Report, 2,* No. 1, 65-68, New York, Van Nostrand Reinhold Co. (1982).

(5) See Reference (A-61).

(6) Sax, N.I., Ed., *Dangerous Properties of Industrial Materials Report, 3,* No. 3, 49-53, New York, Van Nostrand Reinhold Co. (1983).

(7) See Reference (A-60).

(8) Parmeggiani, L., Ed., *Encyclopedia of Occupational Health & Safety,* Third Edition, Vol. 1, pp 148-150, Geneva, International Labour Office (1983).

ATRAZINE

ATZ

Common Synonyms
2-Chloro-4-ethylamino-6-isopropylamino-s-triazine
Aspon Herbicide

Solid crystals White

Soluble in water

AVOID CONTACT WITH SOLID AND DUST
PEOPLE AWAY
Wear goggles and self-contained breathing apparatus
Stop spilling. Use water spray to "knock down" dust
Isolate and remove discharged material
Notify local health and pollution control agencies

Fire

Not flammable
POISONOUS GASES MAY BE PRODUCED WHEN HEATED

Exposure

CALL FOR MEDICAL AID

DUST
POISONOUS IF INHALED
Irritating to eyes, nose and throat
Move victim to fresh air
If in eyes, hold eyelids open and flush with plenty of water
If breathing is difficult, give oxygen

SOLID
POISONOUS IF SWALLOWED
Irritating to skin and eyes
Remove contaminated clothing and shoes
Flush affected areas with plenty of water
If in EYES, hold eyelids open and flush with plenty of water
If SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and force vomiting induced vomiting
If SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS do nothing except keep victim warm

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS
May be dangerous if it enters water intakes
Inform local health and wildlife officials
Notify operators of nearby water intakes

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook)
Issue warning-water contamination
Should be removed
Chemical and physical treatment

2. LABEL

2.1 Category: None
2.2 Class: Not pertinent

3. CHEMICAL DESIGNATIONS

3.1 CG Compatibility Class: To be developed
3.2 Formula: $C_8H_{15}N_5O$
3.3 IMO/UN Designation: 6.1/1699
3.4 DOT Hazard Class: [illegible]
3.5 CAS Registry No.: [illegible]

4. OBSERVABLE CHARACTERISTICS

4.1 Physical State (at shipping): Solid
4.2 Color: White
4.3 Odor: Data not available

5. SAFETY MEASURES

5.1 Personal Protective Equipment: [illegible]
5.2 Emergency Breathing Equipment: [illegible]
5.3 [illegible]
[illegible] and subacute therapy
5.4 Threshold Limit Value: 5 mg/m³
5.5 Short Term Inhalation Limits: Data not available
5.6 Toxicity by Ingestion: Category 2; Oral rat LD50 = 3080 mg/kg
5.7 Liver Toxicity: Data not available
5.8 Vapor (Gas) Irritant (Chemical/mucous membrane irritant): [illegible]
5.9 [illegible]
5.10 Odor Threshold: Data not available
5.11 [illegible]

6. FIRE HAZARDS

6.1 Flash Point: Not flammable
6.2 Flammable Limits in Air: No reaction
6.3 Fire Extinguishing Agents: Not pertinent
6.4 Fire Extinguishing Agents Not to Be Used: Data not available
6.5 Special Hazards of Combustion Products: Irritating hydrogen chloride and toxic oxides of nitrogen may be formed
6.6 Behavior in Fire: Not pertinent
6.7 Ignition Temperature: Not pertinent
6.8 Electrical Hazard: Not pertinent
6.9 Burning Rate: Not pertinent
6.10 Adiabatic Flame Temperature: Data not available
6.11 Stoichiometric Air to Fuel Ratio: Data not available
6.12 Flame Temperature: Data not available

7. CHEMICAL REACTIVITY

7.1 Reactivity With Water: No reaction
7.2 Reactivity with Common Materials: No reaction
7.3 Stability During Transport: Stable
7.4 Neutralizing Agents for Acids and Caustics: Not pertinent
7.5 Polymerization: Not pertinent
7.6 Inhibitor of Polymerization: Not pertinent
7.7 Sinker Rate (Pressure): [illegible]
Products: Data not available
7.8 Secondary Storage: Data not available

8. WATER POLLUTION

8.1 Aquatic Toxicity: 12.6 mg/l /48 hr/Rainbow trout/TL_{50}/fresh water
8.2 Waterfowl Toxicity: >2000 mg/kg LD_{50}
8.3 Biological Oxygen Demand (BOD): Data not available
8.4 Food Chain Concentration Potential: None

9. SHIPPING INFORMATION

9.1 Grades of Purity: Various grades. [illegible]
9.2 [illegible]
9.3 [illegible]
9.4 [illegible]

M. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook)
N

11. HAZARD CLASSIFICATIONS

11.1 Code of Federal Regulations: Not listed
11.2 NAS Hazard Rating for Bulk Water Transportation:

Category	Rating
Fire	0
Health	
Vapor Irritant	0
Liquid or Solid Irritant	2
Poisons	C
Water Pollution	
Human Toxicity	3
Aquatic Toxicity	2
Aesthetic Effect	3
Reactivity	
Other Chemicals	-
Water	-
Self Reaction	0

11.3 NFPA Hazard Classification: Not listed

12. PHYSICAL AND CHEMICAL PROPERTIES

12.1 Physical State at 15.6°C and 1 atm: Solid
12.2 Molecular Weight: 215.7
12.3 Boiling Point at 1 atm: Decomposes
12.4 Freezing Point: 347°F = 175°C = 448°K
12.5 Critical Temperature: Not pertinent
12.6 Critical Pressure: Not pertinent
12.7 Specific Gravity: [illegible] 1.2 at 20°C (solid)
12.8 Liquid Surface Tension: Not pertinent
12.9 Liquid Water Interfacial Tension: Not pertinent
12.10 Vapor (Gas) Specific Gravity: Not pertinent
12.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent
12.12 Latent Heat of Vaporization: Not pertinent
12.13 Heat of Combustion: [illegible]
12.14 Heat of Decomposition: [illegible]
12.15 Heat of Sublimation: Not pertinent
12.16 Heat of Polymerization: Not pertinent
12.17 Heat of Hydration: Data not available
12.18 Heating Value: Data not available
12.19 Reid Vapor Pressure: Data not available

Material Safety Data Sheet

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GENIUM PUBLISHING CORP.

No. 22

CALCIUM OXIDE
(Revision C)
Issued: September 1978
Revised: April 1989

SECTION 1. MATERIAL IDENTIFICATION

28

Material: CALCIUM OXIDE

Description (Origin/Uses): Used in the manufacture of steel, aluminum, glass, and paper; also found in plaster, mortar, bricks, stucco, and in other building and construction materials.

Other Designations: Lime; Quicklime; Burnt Unslaked Lime; High-Calcium Lime; CaO; CAS No. 1305-78-8

Manufacturer: Contact your supplier or distributor. Consult the latest edition of *Chemicalweek Buyers' Guide* (Genium ref. 73) for a list of suppliers.

NFPA: 1 (top), 1 (left), 0 (right), - (bottom)

HMIS			
H	1	R	1
F	1	I	2
R	0	S	3
PPG*		K	0

*See sect. 8

SECTION 2. INGREDIENTS AND OCCUPATIONAL EXPOSURE LIMITS

Calcium Oxide, ca 100%

OSHA PEL	ACGIH TLV, 1988-89	Toxicity Data
8-hr TWA: 5 mg/m³	TLV-TWA: 2 mg/m³	Not Listed*

*Monitor NIOSH, *RTECS* (EW3100000), for future data.

SECTION 3. PHYSICAL DATA

Boiling Point: 5162 °F (2850 °C)
Melting Point: 4658 °F (2570 °C)
pH: >10 (Strongly Basic)

Molecular Weight: 56 g/mol
Solubility in Water (%): Reacts
Specific Gravity (H_2O = 1): 3.2 to 3.4

Appearance and Odor: A white or grayish white solid (it can appear yellowish or brownish if iron impurities are present; commercial calcium oxide is available in a wide variety of forms such as lumps, pellets, pebbles, and powders); odorless.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point: *	Autoignition Temperature: *	LEL: *	UEL: *

Extinguishing Media: *Calcium oxide will not burn. Use an extinguishing agent that will put out the surrounding fire. Water reacts dangerously with calcium oxide and is not recommended as an extinguishing agent for fires that involve it. If water must be used, prevent it from coming into direct contact with the calcium oxide. If such contact is unavoidable, apply the water in flooding amounts to safely absorb the heat that will be generated. Unusual Fire or Explosion Hazards: Do not allow water to get inside containers of calcium oxide; reaction with the water will cause the calcium oxide to swell, generate heat, and burst its container. The heat generated by this reaction may ignite nearby combustible materials. Special Fire-fighting Procedures: Wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode.

SECTION 5. REACTIVITY DATA

Stability/Polymerization: Calcium oxide is stable in closed, airtight containers during routine work operations. Hazardous polymerization cannot occur. Chemical Incompatibilities: Calcium oxide can react dangerously with boric oxide and calcium chloride, boron trifluoride, chlorine trifluoride, fluorine, hydrofluoric acid, phosphorus pentoxide, and water. Conditions to Avoid: Control exposure to incompatible chemicals. Always establish the compatibility of calcium oxide with another material before using it in bulk operations by testing small quantities under appropriate conditions. Avoid exposing calcium oxide to air because it reacts with the ambient moisture and carbon dioxide. Hazardous Products of Decomposition: Oxides of calcium may be produced when calcium oxide reacts with other materials during fires.

SECTION 6. HEALTH HAZARD INFORMATION

Carcinogenicity: Calcium oxide is not listed as a carcinogen by the NTP, IARC, or OSHA.
Summary of Risks: Calcium oxide is a strongly alkaline material; its contact with the skin, eyes, or inhalation results in severe irritation. Dust containing 25 mg/m³ of this material causes strong nasal irritation; dust containing 9 to 10 mg/m³ does not. The presence of moisture on the skin or moist mucous membrane of the respiratory system increases the possibility of corrosive tissue damage (chemical burns). Dehydration and thermal effects (the heat generated from reaction with water) are contributing factors to the irritating properties of calcium oxide. Medical Conditions Aggravated by Long-Term Exposure: None reported. Target Organs: Skin, eyes, nose, and respiratory system. Primary Entry: Inhalation and contact with skin and eyes. Acute Effects: Irritation and burns to the skin, eyes, and nose; irritation and inflammation of the respiratory system; coughing; and sneezing. Chronic Effects: Ulceration and perforation of the nasal septum, pneumoni. May cause nails to become brittle and fissure (split). *(Con'd.)*

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SECTION 6. HEALTH HAZARD INFORMATION, continued

FIRST AID

Eyes: Immediately flush eyes, including under the eyelids, gently but thoroughly with flooding amounts of running water for at least 15 minutes. An occupational ophthalmologist should monitor and treat the eye for calcium oxide burns. **Skin:** Do not rinse the affected area with water because severe skin damage is likely to occur if water is applied directly to the calcium oxide on the skin. Before wetting the calcium oxide, try to remove it from the skin with oil or grease; then apply water in a forcefully directed, powerful stream in flooding amounts that will mechanically and immediately remove the calcium oxide particles from the skin. *Inhalation:* Remove the exposed person to fresh air; restore and/or support his or her breathing as needed. Have qualified medical personnel administer oxygen as required. **Ingestion:** Unlikely. Get in plant, paramedic, or community medical help for all exposures. Seek prompt medical assistance for further treatment, observation, and support after first aid. **Note to Physician:** Severe exposure indicates hospitalization for 72 hours with careful monitoring for the delayed onset of pulmonary edema.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

Spill/Leak: Notify safety personnel, prevent accidental contact between the spilled calcium oxide and water, and avoid generating dust. Cleanup personnel need protection against its contact with skin or eyes as well as against inhalation of its dust (see sect. 8). Carefully pick up the solid, creating a minimum of dust, and collect it in metal containers with covers for disposal. Flush the trace residue in the spill area to a drain, using plenty of water.

Waste Disposal: *Consider reclamation, recycling, or destruction rather than disposal in a landfill.* Follow all applicable Federal, state, and local regulations. Large amounts of calcium oxide may require neutralization by acid before disposal. Flush any residue to a sewer after diluting it properly. Alternatively, the waste calcium oxide can be used for neutralizing plant acid waste.

OSHA Designations
Listed as an Air Contaminant (29 CFR 1910.1000 Subpart Z)
EPA Designations
Assigned the RCRA Hazardous Waste No. D003 (40 CFR 261.23)
Assigned the CERCLA Reportable Quantity (RQ): 100 lb (45.4kg) (40 CFR 302.5 [b])

SECTION 8. SPECIAL PROTECTION INFORMATION

Goggles: Always wear protective eyeglasses or chemical safety goggles. Follow OSHA eye- and face-protection regulations (29 CFR 1910.133).

Respirator: Consult Genium reference 88 for recommendations on selecting the proper respirator for use around calcium oxide. Follow OSHA respirator regulations (29 CFR 1910.134). For emergency or nonroutine operations (spills or cleaning reactor vessels and storage tanks), wear an SCBA. **Warning:** Air-purifying respirators will *not* protect workers in oxygen-deficient atmospheres.

Other: Wear *dry* rubber gloves, boots, aprons, gauntlets, and coveralls.

Ventilation: Install and operate general and local ventilation systems powerful enough to maintain airborne concentrations of calcium oxide below the OSHA PEL standard cited in section 2.

Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work areas.

Contaminated Equipment: Contact lenses pose a special hazard; soft lenses may absorb irritants, and all lenses concentrate them. Do *not* wear contact lenses in any work area. Remove contaminated clothing and launder it before wearing it again; clean this material from your shoes and equipment.

Other: Design all work operations in a way that does not generate dust and prevents water from being accidentally introduced into any part of a production system that contains calcium oxide.

Comments: Practice good personal hygiene; always wash thoroughly after using this material and before eating, drinking, smoking, using the toilet, or applying cosmetics. Keep it off your clothing and equipment. Avoid transferring it from your hands to your mouth while eating, drinking, or smoking. Do *not* eat, drink, or smoke in any work area.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Storage/Segregation: Store calcium oxide in sealed, dry, airtight containers in a cool, dry, well-ventilated area separate from incompatible chemicals (see sect. 5). Store it away from strong oxidizing agents, acids, organic materials, water, and combustibles.

Special Handling/Storage: Protect containers of calcium oxide from physical damage. Prevent water from contacting stored calcium oxide. To maintain the full effectiveness of this material, avoid extended contact with air.

Comments: Calcium oxide generates substantial heat when mixed with water. Prevent accidental mixing by following planned work procedures in all shipping, receiving, transferring, and production operations. When calcium oxide is deliberately mixed with water, undertake proper precautions to ensure that the resulting heat can be safely generated. *Always add calcium oxide to water; never add water to calcium oxide.*

Hazardous Materials Table (49 CFR 172.101)

DOT Shipping Name: Calcium Oxide
DOT Hazard Class: ORM-B
DOT ID No.: UN1910
DOT Label: None

References: 1, 26, 38, 84-94, 100, 116

Prepared by: PJ Igoe, BS; **Industrial Hygiene Review:** DJ Wilson, CIH; **Medical Review:** W Silverman, MD

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MATERIAL SAFETY DATA SHEET

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GENIUM PUBLISHING CORP.

NO. 410

CARBON TETRACHLORIDE

Revision A

Date December 1980

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: CARBON TETRACHLORIDE
OTHER DESIGNATIONS: Tetrachlormethane, Perchlormethane, Methane Tetrachloride, CCl_4, GE Material D5B50, CAS #000 056 235
MANUFACTURER: Available from several suppliers, including:
Linden Chemicals & Plastics
PO Drawer J,
Moundsville, WV 26041 Phone: (314) 843-1310

SECTION II. INGREDIENTS AND HAZARDS

SECTION II. INGREDIENTS AND HAZARDS	%	HAZARD DATA
Carbon Tetrachloride *ACGIH (1980 Intended Changes List). OSHA 8-hr TWA is 10 ppm. NIOSH has proposed a 10-hr TWA of 2 ppm. ACGIH and NIOSH recommend labeling as a suspected human carcinogen. (skin) notation indicates absorption through the skin can contribute significantly to overall exposure.	ca 100	8-hr TWA 5 ppm (skin) or 30 mg/m^3* Human, oral LDlo 43 mg/kg Human, inhalation LCLo 1000 ppm TCLo 20 ppm (CNS) Hamsters and mice have developed cancer on long term feeding.

SECTION III. PHYSICAL DATA

Boiling point at 1 atm, deg C	76.7	Specific gravity, 25/4 C	1.585
Vapor pressure @ 20 C, mm Hg	ca 91	Melting point, deg C	-23
Vapor density (Air=1)	5.3	Volatiles, %	ca 100
Solubility in water @ 20 C, wt %	0.08	Molecular weight	153.8

Appearance & Odor: A clear, colorless liquid with a characteristic sweetish odor. Odor recognition threshold (100% of test panel): 21.4 ppm in air when prepared from CS_2; 100 ppm in air when prepared from CH_4. Odor may not be objectionable at acutely toxic levels.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air	LOWER	UPPER

Extinguishing Media: It is nonflammable. Use that which is appropriate for the surrounding fire. Use water spray to cool fire-exposed containers.
When involved in a fire situation, this material will emit highly toxic and irritating fumes and gases. Metals, such as aluminum and magnesium, can react violently with carbon tetrachloride when hot or burning.
Firefighters must wear self-contained breathing apparatus and full protective gear to fight fires involving this material.

SECTION V. REACTIVITY DATA

This material is stable under normal conditions of handling and use. It does not polymerize.
Thermal-oxidative decomposition will produce toxic, corrosive fumes, including phosgene and hydrogen chloride.
Violent reactions or explosions can occur with incompatible materials, such as barium, lithium, sodium, and potassium metal, powdered aluminum, magnesium, dimethylformamide (above 65 C), fluorine, etc. (See NFPA, "Manual of Hazardous Chemical Reactions".)

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SECTION VI. HEALTH HAZARD INFORMATION

TLV 5 ppm (skin) (See Sect. II)

Carbon tetrachloride is highly toxic and irritating by inhalation and ingestion (mean lethal dose is 5-10 ml). It is toxic by skin absorption. Excessive exposure may result in CNS depression and/or gastrointestinal symptoms.* It is irritating to skin and eyes. Eye contact or systemic effects can produce visual disturbances (haze, blind spots, narrowing of visual field, etc.). Skin contacts can cause defatting & dermatitis.

Kidney & liver damage can occur from severe acute or chronic exposure. It is a suspected carcinogen in humans.

FIRST AID:

Eye Contact: Flush eyes with running water for 15 minutes, including under the eyelids. Get medical help if irritation persists or when visual disturbances occur.

Skin Contact: Remove contaminated clothing promptly. Wash exposed skin with soap and water. Get medical help for repeated or gross exposures.

Inhalation: Remove to fresh air. Restore and/or support breathing; have qualified person administer oxygen if needed. Get medical help.

Ingestion: Contact physician for gastric lavage. (If medical help and advice is not readily available, give water to drink and induce vomiting.)

*Also cardic arrhythmias.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Notify safety personnel when large spills occur. Evacuate area. Provided maximum exhaust ventilation. Clean-up personnel must use protection against contact and inhalation (see Sect.VIII). Contain spill; pick up liquid for disposal. Small spills and residues can be absorbed on paper, vermiculite, etc. and allowed to evaporate in a hood. Prevent release of CCl_4 to surface water or sewers. Spills or discharges in 24 hours of 5000 lb or more (proposed RQ* is 1000 lb) must be reported to U.S. Government.

DISPOSAL: Consider recovery and reuse, if feasible. Scrap may be burned in approved, high temperature incinerator with scrubber or it may be disposed of as hazardous waste (EPA number U211 or F001 as a spent degreasing solvent under RCRA). Follow federal, State and Local regulations.

*Reportable Quantity.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide general and local exhaust ventilation to meet TLV. Exhaust hoods need 100 lfm min. face velocity. Ventilate sumps and low lying areas. Use air-supplied or self-contained respirators above TLV, with full face piece above 100 ppm.

PVA or neoprene gloves and protective clothing needed to prevent skin contact. Wear safety goggles and/or face shield for eye protection.

An eyewash station and chemical safety shower should be readily accessible.

Provide preplacement and twice a year medical exams. Workers with obesity, diabetes, alcoholism or pulmonary problems should have a physician's approval before working with CCl_4. Retain medical records for 30 years after termination of employment.

Provide training to those exposed to CCl_4 in the workplace. Monitor vapor levels in the workplace.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Store in closed containers in a cool, dry, well-ventilated, low fire-risk area. Protect containers against physical damage. Keep away from sources of heat, direct sunlight, and incompatible materials (see Sect. V). Prevent exposure of vapors to high temperature to prevent decomposition to toxic and corrosive gases and vapors. No smoking in areas where vapors may be present.

Prevent contact with the skin or eyes. Avoid exposure to vapors. Use good personal hygiene.

CCl_4 toxicity is markedly increased by the synergistic effects of alcohol. When possible, substitute a less hazardous solvent for CCl_4. DOT Classification - ORM-A

DATA SOURCE(S) CODE: 1-12,15,16,21-26,31,37,38,43

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APPROVALS: MIS J. M. Nielsen
CRD

Industrial Hygiene and Safety 12-9-80

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Material Safety Data Sheet

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GENIUM PUBLISHING CORP.

No. 53

CHLORINE
(Revision B)
Issued: July 1979
Revised: April 1988

SECTION 1. MATERIAL IDENTIFICATION

25

Material Name: CHLORINE

Description (Origin/Uses): Used mainly to manufacture chlorinated lime for bleaching fabrics; as a versatile reagent in organic chemistry; in water purification; and as a military poison gas (bertholite).

Other Designations: Bertholite; Molecular Chlorine; Cl_2; NIOSH *RTECS* No. FO2100000; CAS No. 7782-50-5

Manufacturer: Contact your supplier or distributor. Consult the latest edition of the *Chemicalweek Buyers' Guide* (Genium ref. 73) for a list of suppliers.

HMIS
H 3
F 0
R 1
PPG*
*See sect. 8

R 1
I 4
S 4
K 0

SECTION 2. INGREDIENTS AND HAZARDS

	%	EXPOSURE LIMITS
Chlorine, CAS No. 7782-50-5	ca 100	IDLH* Level: 30 ppm **OSHA PEL** Ceiling: 1 ppm, 3 mg/m³ TLV-STEL: 3 ppm, 9 mg/m³ **NIOSH REL** 15-Min Ceiling: 0.5 ppm, 1.45 mg/m³ **Toxicity Data**** Rat, Inhalation, LC_{50}: 293 ppm (1 Hr) Mouse, Inhalation, LC_{50}: 137 ppm (1 Hr)

*Immediately dangerous to life and health
**See NIOSH, *RTECS*, for additional data with references to irritative and mutagenic effects.

SECTION 3. PHYSICAL DATA

Boiling Point: ca -29°F (-34°C)
Vapor Pressure: >760 Torrs (Normal Atmospheric Pressure)
Vapor Density (Air = 1): 1.4085 at 68°F (20°C)
Melting Point: ca -150°F (-101°C)
Molecular Weight: 71 Grams/Mole
Water Solubility: Slight

Appearance and Odor: A greenish yellow, noncombustible gas; pungent, suffocating, nauseating odor. Its odor-recognition threshold is reported to be ca 0.3 ppm.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temperature	Flammability Limits in Air % by Volume	LOWER	UPPER
*	*		*	*

Extinguishing Media: *Chlorine will not burn, but it supports combustion of materials already involved in a fire. Use agents that will extinguish the surrounding fire. Use a water spray to cool fire-exposed tanks and to protect personnel attempting to stop a chlorine leak.
Unusual Fire or Explosion Hazards: Chlorine is a reactive/explosive gas. Fight fires involving it from the maximum possible distance; this gas greatly increases the flammability hazards of other combustibles that are present. **Warning:** Flammable gases, vapors, and mists form dangerously explosive mixtures with chlorine gas.
Special Fire-fighting Procedures: Wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode. Fire fighters must use the maximum personal protective equipment available. If possible, have specially trained personnel remove intact cylinders of chlorine from the fire area and protect them with any available resource such as directed water spray.

SECTION 5. REACTIVITY DATA

Chlorine is stable in closed, pressurized containers at room temperature under normal storage and handling conditions. It does not undergo hazardous polymerization.
Chemical Incompatibilities: Chlorine reacts dangerously with acetylene, ammonia, hydrogen, ether, fuel gas, hydrocarbons, turpentine, finely divided metals, diborane, benzene, and acetaldehyde (see Genium ref. 84, pp. 49-28 and 491M-53 to 491M-56).
Conditions to Avoid: Do not allow open flame, unprotected heaters, lighted tobacco products, electric sparks, or excessive heat in work areas because chlorine gas can form explosive mixtures with other gases. Do not heat pressurized storage tanks or cylinders containing chlorine because they may explode. Do not allow chlorine to be directly exposed to incompatible chemicals (see above).
Hazardous Products of Decomposition: Toxic gases such as carbon monoxide, phosgene, and hydrogen chloride (Genium Industrial MSDSs 35, 66, 30) can be produced in fires involving chlorine and other combustibles.

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SECTION 6. HEALTH HAZARD INFORMATION

Chlorine is not listed as a carcinogen by the NTP, IARC, or OSHA.

Summary of Risks, Warning: This material is a powerful respiratory irritant. The most important acute health effect of exposure is lung damage from hydrochloric acid (HCl) caused by the reaction of chlorine with the moisture in the upper respiratory tract (URT). Fatal pulmonary edema (lungs filled with fluid) may be delayed from 24 to 48 hours after exposure. Erosion of teeth, decreased lung capacity, and increased susceptibility to tuberculosis are chronic effects in workers who handle this gas. **Medical Conditions Aggravated by Long-Term Exposure:** Cardiac, pulmonary, or respiratory problems. Administer preplacement and periodic medical exams emphasizing the respiratory system to workers who regularly handle chlorine. **Target Organs:** Respiratory system. **Primary Entry:** Inhalation, skin contact. **Acute Effects:** Burning and severe irritation of the eyes, skin, and URT; wheezing, shortness of breath; nausea; vomiting; headache; dizziness; and (delayed) pulmonary edema. **Chronic Effects:** Reduced respiratory capacity may result from chronic low-level exposure to chlorine.

FIRST AID: Eyes. Immediately flush eyes, including under the eyelids, gently but thoroughly with plenty of running water for at least 15 minutes. **Skin.** Skin contact with chlorine causes severe damage from frostbite (cryogenic injury) as well as chemical burns. Irrigate the area with water and treat the exposed person accordingly. **Inhalation.** Remove exposed person to fresh air; restore and/or support his or her breathing as needed. Recommended treatment includes administering pure oxygen gas (O_2) as soon as symptoms of exposure develop (Genium ref. 39, p. 1975). Observe exposed person for respiratory effects. **Ingestion.** This type of exposure to chlorine is highly unlikely because it is a gas.

GET MEDICAL HELP (IN PLANT, PARAMEDIC, COMMUNITY) FOR ALL EXPOSURES. Seek prompt medical assistance for further treatment, observation, and support after first aid.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

Spill/Leak: Preplan and carefully explain proper emergency procedures to relevant personnel. Notify safety personnel, evacuate all non-essential personnel, provide maximum explosion-proof ventilation, and eliminate all sources of ignition immediately. Cleanup personnel must wear protection against contact with and inhalation of vapor (see sect. 8). Try to shut off the flow of chlorine gas. Use a water spray to protect personnel attempting to stop the leak.

Waste Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow Federal, state, and local regulations.

OSHA Designations

Air Contaminant (29 CFR 1910.1000 Subpart Z): Not Listed

EPA Designations (40 CFR 302.4)

RCRA Hazardous Waste: Listed without Number

CERCLA Hazardous Substance, Reportable Quantity: 10 lbs (4.54 kg)

SECTION 8. SPECIAL PROTECTION INFORMATION

Goggles: Always wear protective eyeglasses or chemical safety goggles. Follow the eye- and face-protection guidelines in 29 CFR 1910.133. **Respirator:** Use a NIOSH-approved respirator per the *NIOSH Pocket Guide to Chemical Hazards* for the maximum-use concentrations and/or the exposure limits cited in section 2. Follow the respirator guidelines in 29 CFR 1910.134. For emergency or nonroutine use (e.g., cleaning reactor vessels or storage tanks) wear an SCBA with a full facepiece operated in the pressure-demand or positive-pressure mode. **Warning:** Air-purifying respirators will *not* protect workers in oxygen-deficient atmospheres. **Other:** Wear impervious gloves; boots; aprons; and clean, impervious, body-covering clothing to prevent any possibility of skin contact. **Ventilation:** Install and operate general and local ventilation systems powerful enough to maintain airborne levels of chlorine gas strictly below the OSHA PEL standard cited in section 2. Make all ventilation systems of maximum explosion-proof design, e.g., nonsparking, electrically grounded and bonded, etc. **Safety Stations:** Make eyewash stations, washing facilities, and safety showers available in areas of use and handling. **Contaminated Equipment:** Contact lenses pose a special hazard; soft lenses may absorb irritants, and all lenses concentrate them. Do *not* wear contact lenses in any work area. **Other:** Use enclosed-containment processing operations; otherwise, the ventilation systems may not be able to keep airborne levels of chlorine below the legal ceiling limit of 1 ppm (3 mg/m³) set by OSHA. Automatic air-monitoring sensing equipment connected to an alarm system is recommended for continual-use operations. **Comments:** Practice good personal hygiene; always wash thoroughly after using this material. Avoid transferring it from your hands to your mouth while eating, drinking, or smoking. Do *not* eat, drink, or smoke in any work area. Avoid prolonged skin contact with this material.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Storage/Segregation: Store chlorine in a cool, dry, well-ventilated area away from organics, sources of ignition, any flammable or explosive materials, cylinders containing oxygen, and incompatible chemicals (see sect. 5). Use outside or detached storage. Store cylinders upright and secure them tightly. **Special Handling/Storage:** Chlorine is shipped/stored as a pressurized gas in cylinders or tank cars. Protect them against physical damage and regularly inspect them for cracks, leaks, or faulty valves. Follow standard safety procedures for handling compressed, corrosive gases. Electrically ground and bond all containers used in shipping and transferral operations to prevent static sparks. Do not drag or slide cylinders containing chlorine; move them in a carefully supervised manner with a suitable hand truck. Do not smoke in use or storage areas. **Engineering Controls:** All engineering systems (ventilation, production, etc.) must be of maximum explosion-proof design. Use chlorine in closed engineering systems to prevent dispersion of this gas into general work areas. Monitor all piping systems, reactor vessels, and holding tanks for unwanted moisture contamination or buildup. Liquid chlorine levels should be less than 85% of a tank's or cylinder's capacity. **Comments:** Perform all operations with chlorine carefully to prevent accidental ignition of explosive mixtures. Prevent any contact with incompatible chemicals (see sect. 5). Keep the valve-protection cap in place until immediately before using chlorine. Insert a check valve or trap into the transferral line to prevent a dangerous backflow into the original container. Use a pressure-reducing regulator when connecting a storage vessel to a lower-pressure piping system. A trained chemist or safety specialist familiar with the physical and chemical properties of this gas should be present during all work operations.

Transportation Data (49 CFR 172.101-2)

DOT Shipping Name: Chlorine
DOT Class: Nonflammable Gas
References: 1, 2, 12, 73, 84-94, 100, 103.

DOT Label: Nonflammable Gas *and* Poison
DOT ID No. UN1017

IMO Label: Poison Gas
IMO Class: 2.3

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Prepared by PJ Igoe, BS

Industrial Hygiene Review: DJ Wilson, CIH

Medical Review: MJ Hardies, MD

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Material Safety Data Sheet

From Genium's Reference Collection
Genium Publishing Corporation
1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8855

GENIUM PUBLISHING CORP.

No. 315

CHLOROFORM
(Revision D)
Issued: August 1979
Revised: April 1988

SECTION 1. MATERIAL IDENTIFICATION

25

Material Name: CHLOROFORM

Description (Origin/Uses): Used as a solvent for fats, oils, rubber, alkaloids, waxes, and resins; as a cleansing agent.

Other Designations: Trichloromethane; $CHCl_3$; NIOSH *RTECS* No. FS9100000; CAS No. 0067-66-3

Manufacturer: Contact your supplier or distributor. Consult the latest edition of the *Chemicalweek Buyers' Guide* (Genium ref. 73) for a list of suppliers.

HMIS			
H	2		
F	0	R	1
R	0	I	3
PPG*		S	2
*See sect. 8		K	0

SECTION 2. INGREDIENTS AND HAZARDS

Ingredients	%	Exposure Limits
Chloroform, CAS No. 0067-66-3	Ca 100	**OSHA PEL** Ceiling: 50 ppm, 240 mg/m³ **ACGIH TLV, 1987-88** TLV-TWA: 10 ppm, 50 mg/m³ **NIOSH REL** Ceiling: 2 ppm, 9.78 mg/m³ **Toxicity Data*** Human, Oral, LD_{Lo}: 140 mg/kg Rat, Oral, LD_{50}: 908 mg/kg

*See NIOSH, *RTECS*, for additional toxicity data with references to mutagenic, reproductive, tumorigenic, and irritative effects.

SECTION 3. PHYSICAL DATA

Boiling Point: 142°F (61°C)
Melting Point: -82.3°F (-63.5°C)
Vapor Pressure: 158.4 Torrs at 68°F (20°C)
Vapor Density (Air = 1): 4.13

Water Solubility (%): 0.822 ml of $CHCl_3$ per 100 ml of H_2O at 68°F (20°C)
% Volatile by Volume: 100
Molecular Weight: 119 Grams/Mole
Specific Gravity (H_2O = 1): 1.484 at 68°F (20°C)

Appearance and Odor: A heavy, colorless, clear, volatile liquid; characteristic, pleasant, ethereal, sweet odor (recognition threshold: 0.3 mg/m³); sweet taste.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temperature	Flammability Limits in Air % by Volume	LOWER	UPPER
*	*		*	*

Extinguishing Media: *Chloroform does not burn. Use an agent that will put out the surrounding fire.

Unusual Fire or Explosion Hazards: None reported.

Special Fire-fighting Procedures: Wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode.

SECTION 5. REACTIVITY DATA

Chloroform is stable if kept in closed containers and protected from air and sunlight. It does not undergo hazardous polymerization; however, even when stabilized with ethanol, this material develops acidity from prolonged exposure to air and light.

Chemical Incompatibilities: This material is incompatible with strong alkalies.

Conditions to Avoid: Avoid prolonged exposure to air and light and to strong alkalies.

Hazardous Products of Decomposition: Toxic and corrosive gases like hydrochloric acid (HCl), chlorine (Cl_2), carbon monoxide (CO), and oxides of chlorine (ClO_2) can be produced during fires.

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SECTION 6. HEALTH HAZARD INFORMATION

Chloroform is listed as a suspected human carcinogen by ACGIH.

Summary of Risks: Exposure to this material affects the central nervous system (anesthesia): heart (arrhythmia, ventricular tachycardia, bradycardia); liver (necrosis, hepatoma); kidney (necrosis); and it is an embryonic toxin. Fatalities are associated with cardiovascular depression and ventricular fibrillation.
Medical Conditions Aggravated by Long-Term Exposure: Ailments of the heart, liver, and kidneys may be worsened by exposure to chloroform. **Target Organs:** Liver, kidneys, heart, skin, eyes. **Primary Entry:** Skin contact, inhalation.
Acute Effects: Dizziness, mental dullness, nausea, headache, fatigue, and anesthesia. **Chronic Effects:** Possible cancer.
FIRST AID
Eyes: *Immediately flush eyes, including under the eyelids, gently but thoroughly with plenty of running water for at least 15 minutes.*
Skin: Immediately wash the affected area with soap and water. **Inhalation:** Remove the exposed person to fresh air; restore and/or support his or her breathing as needed.
Ingestion: Never give anything by mouth to someone who is unconscious or convulsing. If the exposed person is responsive, give him or her several glasses of milk or water to drink and induce vomiting. Repeat if large quantities were ingested.
Comments: Workers who are regularly exposed to chloroform require preplacement and periodic medical exams emphasizing kidney, liver, skin, and central nervous system functions. Carefully evaluate each exposure that produces a noticeable effect to determine the extent to which factors like alcohol or drugs have affected it.

GET MEDICAL HELP (IN PLANT, PARAMEDIC, COMMUNITY) FOR ALL EXPOSURES. Seek prompt medical assistance for further treatment, observation, and support after first aid.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

Spill/Leak: Notify safety personnel of a chloroform spill or leak. Provide ventilation. Cleanup personnel need protection against contact with and inhalation of vapor (see sect. 8). Chloroform vapor is heavier than air and will collect in low-lying areas. Contain large spills and collect waste or absorb it with an inert material such as sand, earth, or vermiculite. Place waste liquid or absorbent into closable containers for disposal. Keep waste out of sewers, watersheds, and waterways.
Waste Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow Federal, state, and local regulations.
OSHA Designations
Air Contaminant (29 CFR 1910.1000 Subpart Z)
EPA Designations (40 CFR 302.4)
RCRA Hazardous Waste, No. U044
CERCLA Hazardous Substance, Reportable Quantity: 5000 lbs (2270 kg)

SECTION 8. SPECIAL PROTECTION INFORMATION

Goggles: Always wear protective eyeglasses or chemical safety goggles. Where splashing is possible, wear a full face shield as a supplementary protective measure. Follow the eye- and face-protection guidelines in 29 CFR 1910.133. **Respirator:** Wear a NIOSH-approved respirator per the *NIOSH Pocket Guide to Chemical Hazards* for the maximum-use concentrations and/or the exposure limits cited in section 2. Follow the respirator guidelines in 29 CFR 1910.134. For emergency or nonroutine use (e.g., cleaning reactor vessels or storage tanks), wear an SCBA with a full facepiece operated in the pressure-demand or positive-pressure mode. **Warning:** Air-purifying respirators will *not* protect workers in oxygen-deficient atmospheres. **Other:** To prevent contact with skin, wear impervious gloves, boots, aprons, gauntlets, etc., as required by the specific work environment. **Ventilation:** Install and operate general and local ventilation systems that are powerful enough to maintain airborne levels of chloroform below the OSHA PEL standard cited in section 2.
Safety Stations: Make eyewash stations, washing facilities, and safety showers available in use and handling areas. **Contaminated Equipment:** Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. Do *not* wear contact lenses in any work area. Remove contaminated clothing and launder it before wearing it again; clean this material from shoes and equipment. **Comments:** Practice good personal hygiene; always wash thoroughly after using this material. Keep it off of your clothing and equipment. Avoid transferring it from your hands to your mouth while eating, drinking, or smoking. Do *not* eat, drink, or smoke in any work area. Avoid inhalation of vapor!

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Storage/Segregation: Store chloroform in closed containers away from light and alkalies.

Special Handling/Storage: Protect containers from physical damage. Do not transfer chloroform through plastic or rubber hoses or pipes.

Transportation Data (49 CFR 172.101-2)
DOT Shipping Name: Chloroform
DOT Class: *ORM-A*
DOT Label: None
DOT ID No. UN1888
IMO Label: Poison
IMO Class: 6.1

References: 1, 2, 12, 73, 84-94, 100, 103.

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Prepared by PJ Igoe, BS
Industrial Hygiene Review: DJ Wilson, CIH
Medical Review: MJ Hardies, MD

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CEDAR CHEMICAL CORPORATION
MEMPHIS, TENNESSEE

MATERIAL SAFETY DATA SHEET
Equivalent to OSHA form 174

PRODUCT NAME: TECHNICAL DINOSEB DATE: 08/15/86 PAGE 1
EPA REG. NO.: 36077-3

SECTION I

Manufacturer's Name: Cedar Chemical Corporation
5100 Poplar Ave. 24th Floor
Memphis, TN 38137
Emergency Phone Number: 1-800-424-9300
Information Phone Number: 1-601-636-1231
Prepared by: M. S. Bernard

SECTION II HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

INGREDIENT	OSHA PEL	ACGIH TLV	PERCENT
Dinoseb	n/d	0.3mg/m³	95.00
Dinoseb (2-sec-butyl-4,6-dinitrophenol) CAS = 88-85-7			
Impurities	n/d	n/d	5.00

SECTION III PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point(°F)	above 212	Specific Gravity	1.258
Vapor Pressure(mm Hg.)	below 1	Melting Point(°F)	90
Vapor Density(Air=1)	n/a	Evaporation Rate	n/d

Solubility in Water: 0.0052g/100ml
Appearance and Odor: Brown solid, organic acid odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point(Method Used): 350.6°F TCC
Flammable Limits: LEL- n/d UEL- n/d
Extinguishing Media:
Water Fog, Foam, Alcohol Foam, CO_2, and Dry Chemical

CONTINUED ON PAGE 2

Special Fire Fighting Procedures:
Self-contained air supply. Confine water used in fire fighting.

Unusual Fire and Explosion Hazards:
Noxious fumes may form. Material undergoes rapid exothermic decomposition at 190°C. Vapors may ignite.

SECTION V REACTIVITY DATA

Stability: Stable in normal use and storage.
Conditions to Avoid: Heating above 100°C. Product undergoes rapid exothermic decomposition at 190°C. Avoid ignition sources.
Incompatibility: Strong Bases and Strong Oxidizers
Hazardous Decomposition or Byproducts: Oxides of Nitrogen
Hazardous Polymerization: Will not occur. No known conditions to avoid.

SECTION VI HEALTH HAZARD DATA

Route(s) of Entry: Inhalation: Moderate Toxicity
Skin: Readily Absorbed
Ingestion: Highly Toxic

Health Hazards (Acute and Chronic):

Oral Ingestion: High Single Dose Oral Toxicity. LD_{50} for Rats 25 mg/kg. May be fatal if swallowed.

Eye Contact: May cause severe irritation and corneal injury. Corneal injury should heal in 1-2 weeks.

Skin Contact: May cause slight irritation or mild burn. Colors the skin yellow.

Skin Absorption: Readily absorbed through skin, high toxicity. LD_{50} rabbits 80mg/kg.

Inhalation: May be irritating. Cedar industrial guide for Dinoseb is 0.3 mg/m³.

Carcinogenicity: NTP: Negative
IARC Monographs: Negative
OSHA Regulated: Negative

Signs and Symptoms of Exposure:
Fatigue, sweating, thirst, and fever. Increased metabolic rate.

Medical Conditions Generally Aggravated by Exposure:
Liver and kidney problems may be aggravated by extreme exposure.

Emergency and First Aid Procedures:

Oral Ingestion:	Toxic by ingestion. Induce vomiting and seek medical help immediately.
Eye Contact:	Flush immediately with continuous irrigation with flowing water for at least thirty minutes. Seek medical consultation immediately.
Skin Contact:	Immediately flush skin with plenty of water for at least fifteen minutes while removing contaminated clothing. Consult physician. Wash clothing before reuse.
Inhalation:	Remove to fresh air if effects occur. Consult physician.

Note to Physician:
Eyes: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic steroid preparation frequently. Consult ophthalmologist. May cause temporary injury.
Overexposure: Treat for symptoms. No specific antidote. Human effects not established.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to Be Taken in Case Material Is Released or Spilled:
Use proper safety equipment. Absorb spill with absorbant inert material such as oil-dry. Dike area for large spills. Keep out of streams and water supplies.

Waste Disposal Method:
Dispose of in non-crop area away from water supplies or in an approved landfill in accordance with State, Federal, and local regulations.

Precautions to Be Taken in Handling and Storing:
Do not get on skin, on clothing, or in eyes. Keep out of reach of children.

Other Precautions:
Do not breathe spray mists. Keep away from heat or flame.

SECTION VIII CONTROL MEASURES

Respiratory Protection:
None normally needed. During spraying use organic vapor respirator.

Ventilation: Required to control level of dinoseb.

Protective Gloves: Impervious rubber gloves

Eye Protection: Chemical workers' goggles

Other Protective Clothing or Equipment: Rubber boots and apron and body-covering clothing.

Work/Hygenic Practices: Shower after handling.

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Material Safety Data Sheet

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GENIUM PUBLISHING CORP.

No. 385

ETHYL BENZENE
(Revision A)
Issued: August 1978
Revised: November 1988

SECTION 1. MATERIAL IDENTIFICATION

27

Material Name: ETHYL BENZENE

Description (Origin/Uses): Used as a solvent and as an intermediate in the production of styrene monomer.

Other Designations: Phenylethane; Ethylbenzol; $C_2H_5C_6H_5$; CAS No. 0100-41-4

Manufacturer: Contact your supplier or distributor. Consult the latest edition of the *Chemicalweek Buyers' Guide* (Genium ref. 73) for a list of suppliers.

NFPA: 3 / 2 / 0 / -

HMIS	
H 2	R 1
F 3	I 3
R 0	S 2
PPG*	K 4
*See sect. 8	

SECTION 2. INGREDIENTS AND HAZARDS

SECTION 2. INGREDIENTS AND HAZARDS	%	EXPOSURE LIMITS
Ethyl Benzene, CAS No. 0100-41-4	Ca 100	**OSHA PELs** 8-Hr TWA: 100 ppm, 435 mg/m³ 15- Min STEL: 125 ppm, 545 mg/m³ **ACGIH TLVs, 1988-89** TLV-TWA: 100 ppm, 435 mg/m³ TLV-STEL: 125 ppm, 545 mg/m³ **Toxicity Data*** Human, Inhalation, TC_{Lo}: 100 ppm (8 Hrs) Rat, Oral, LD_{50}: 3500 mg/kg
*See NIOSH, *RTECS* (DA0700000), for additional data with references to reproductive, irritative, and mutagenic effects.		

SECTION 3. PHYSICAL DATA

Boiling Point: 277°F (136°C)
Melting Point: -139°F (-95°C)
Vapor Pressure: 7.1 Torrs at 68°F (20°C)
Vapor Density (Air = 1): 3.7
% Volatile by Volume: Ca 100

Molecular Weight: 106 Grams/Mole
Solubility in Water (%): Slight
Specific Gravity (H_2O = 1): 0.86258 at 77°F (25°C)

Appearance and Odor: A clear, colorless, flammable liquid; characteristic aromatic hydrocarbon odor.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point and Method: 64°F (18°C) CC	Autoignition Temperature: 810°F (432.22°C)	LEL: 1% v/v	UEL: 6.7% v/v

Extinguishing Media: Use foam, dry chemical, or carbon dioxide to put out ethyl benzene fires. A water spray may be ineffective in extinguishing the fire, because it can scatter and spread the burning liquid. Use water spray to cool fire-exposed containers of ethyl benzene, to disperse ethyl benzene vapor, and to protect personnel attempting to stop an ethyl benzene leak. **Unusual Fire or Explosion Hazards:** This liquid can readily form explosive vapor-air mixtures, especially when heated. Ethyl benzene vapor is heavier than air and may travel a considerable distance to a low-lying source of ignition and flash back to its origin. **Special Fire-fighting Procedures:** Wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode.

SECTION 5. REACTIVITY DATA

Stability/Polymerization: Ethyl benzene is stable in closed containers during routine operations. Hazardous polymerization cannot occur. **Chemical Incompatibilities:** Hazardous chemical reactions can occur between ethyl benzene and strong oxidizing agents, acids, ammonia, and bases. **Conditions to Avoid:** Avoid any exposure to sources of ignition such as heat, sparks, open flame, and lighted tobacco products, etc., and to incompatible chemicals. Use caution when entering confined spaces, particularly low-lying areas where explosive concentrations of ethyl benzene vapor may be present. Provide good ventilation to such areas to prevent the concentration of this vapor. **Hazardous Products of Decomposition:** Thermal-oxidative degradation can include toxic gases such as carbon monoxide and/or aromatic hydrocarbon gases.

SECTION 6. HEALTH HAZARD INFORMATION

Carcinogenicity: Ethyl benzene is not listed as a carcinogen by the NTP, IARC, or OSHA.

Summary of Risks: Ethyl benzene vapor is severely irritating to the eyes and to the mucous membranes of the respiratory system. Sustained inhalation of excessive levels can cause depression of the central nervous system (CNS) characterized by dizziness, headache, narcosis, and coma. Skin contact with liquid ethyl benzene causes irritation; dermatitis and defatting can also develop. The acute oral toxicity of ethyl benzene is low; however, ingestion of it presents a serious aspiration hazard. Aspirating even a small amount into the lungs can result in extensive edema (lungs filled with fluid) and hemorrhaging of the lung tissue. No systemic effects are expected at the levels that produce pronounced, unignorable, disagreeable skin and eye irritation. The TLVs cited in section 2 are set to prevent this intolerable irritation. **Medical Conditions Aggravated by Long-Term Exposure:** None reported. **Target Organs:** Skin, eyes, respiratory system, and CNS. **Primary Entry:** Inhalation, skin contact **Acute Effects:** Irritation of the skin, eyes, and respiratory system. Also, cardiac-rhythm disturbance due to sensitization; acute bronchitis, bronchospasm, pulmonary and laryngeal edema; euphoria; headache; giddiness; dizziness; and incoordination, as well as possible depression; confusion; and coma. **Chronic Effects:** None reported. **First Aid:** Eyes. Immediately

SECTION 6. HEALTH HAZARD INFORMATION, cont.

flush eyes, including under the eyelids, gently but thoroughly with flooding amounts of running water for at least 15 minutes. **Skin.** Rinse the affected area with plenty of water, then wash it with soap and water. **Inhalation.** Remove the exposed person to fresh air; restore and/or support his or her breathing as needed. Have qualified medical personnel administer oxygen as required. **Ingestion.** Unlikely. Should this type of exposure occur, the aspiration hazard must be considered. Do not induce vomiting unless directed to do so by a physician. To prevent aspiration by spontaneous vomiting, keep the victim's head low (between his or her knees). Get medical help (in plant, paramedic, community) for all exposures. Seek prompt medical assistance for further treatment, observation, and support after first aid. **Note to Physician:** Professional judgment is required as to whether or not to induce vomiting because of the possibility of aspiration. A gastric lavage may be administered, followed by saline catharsis, if this procedure is appropriate to the specific incident. Monitor cardiac and pulmonary functions.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

Spill/Leak: Notify safety personnel, evacuate unnecessary personnel, eliminate all sources of ignition immediately, and provide adequate explosion-proof ventilation. Cleanup personnel need protection against skin or eye contact with this liquid as well as inhalation of its vapor (see sect. 8). Contain large spills and collect waste or absorb it with an inert material such as sand, earth, or vermiculite. Use nonsparking tools to place waste liquid or absorbent into closable containers for disposal. Keep waste out of sewers, watersheds, and waterways. **Waste Disposal:** Contact your supplier or a licensed contractor for detailed recommendations. Follow Federal, state, and local regulations.

OSHA Designations
Listed as an Air Contaminant (29 CFR 1910.1000 Subpart Z).
EPA Designations (40 CFR 302.4)
CERCLA Hazardous Substance, Reportable Quantity: 1000 lbs (454 kg), per the Clean Water Act (CWA), §§ 311 (b) (4) and 307 (a).

SECTION 8. SPECIAL PROTECTION INFORMATION

Goggles: Always wear protective eyeglasses or chemical safety goggles. Where splashing is possible, wear a full face shield. Follow OSHA eye- and face-protection regulations (29 CFR 1910.133). **Respirator:** Wear a NIOSH-approved respirator per Genium reference 88 for the maximum-use concentrations and/or the exposure limits cited in section 2. Follow OSHA respirator regulations (29 CFR 1910.134). For emergency or nonroutine operations (spills or cleaning reactor vessels and storage tanks), wear an SCBA. **Warning:** Air-purifying respirators will *not* protect workers in oxygen-deficient atmospheres. **Other:** Wear impervious gloves, boots, aprons, and gauntlets, etc., to prevent prolonged or repeated skin contact with this material. **Ventilation:** Install and operate general and local maximum, explosion-proof ventilation systems powerful enough to maintain airborne levels of this material below the OSHA PEL standard cited in section 2. Local exhaust ventilation is preferred because it prevents dispersion of the contaminant into the general work area by eliminating it at its source. Consult the latest edition of Genium reference 103 for detailed recommendations. **Safety Stations:** Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work areas. **Contaminated Equipment:** Contact lenses pose a special hazard; soft lenses may absorb irritants, and all lenses concentrate them. Do *not* wear contact lenses in any work area. Remove contaminated clothing and launder it before wearing it again; clean this material from shoes and equipment. **Comments:** Practice good personal hygiene; always wash thoroughly after using this material and before eating, drinking, smoking, using the toilet, or applying cosmetics. Keep it off your clothing and equipment. Avoid transferring it from your hands to your mouth while eating, drinking, or smoking. Do *not* eat, drink, or smoke in any work area. Do not inhale ethyl benzene vapor.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Storage/Segregation: Store ethyl benzene in closed containers in a cool, dry, well-ventilated area away from sources of ignition and strong oxidizers. Protect containers from physical damage. **Special Handling/Storage:** Outside, isolated, detached, or remote storage is recommended for large quantities of ethyl benzene. Isolate bulk storage areas from acute fire hazards. **Engineering Controls:** Make sure all engineering systems (production, transportation) are of maximum explosion-proof design. To prevent static sparks, electrically ground and bond all containers, pipelines, etc., used in shipping, transferring, reacting, production, and sampling operations. **Other:** Use safety cans for transferring small amounts of ethyl benzene.

Transportation Data (49 CFR 172.101-2)

DOT Shipping Name: Ethyl Benzene
DOT Hazard Class: Flammable Liquid
ID No. UN1175
DOT Label: Flammable Liquid
DOT Packaging Exceptions: 49 CFR 173.118
DOT Packaging Requirements: 49 CFR 173.119

IMO Shipping Name: Ethylbenzene
IMO Hazard Class: 3.2
IMO Label: Flammable Liquid
IMDG Packaging Group: II

References: 1, 26, 38, 84-94, 100, 116, 117, 120, 122.

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Prepared by PJ Igoe, BS
Industrial Hygiene Review: DJ Wilson, CIH
Medical Review: W Silverman, MD

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METHANEARSONIC ACID, SODIUM SALT

MSA

Common Synonyms

Disodium methane arsonate
Monosodium methane arsonate
MSAA
DSAA
Disodium methyl arsonate
Monosodium methyl arsonate

Solid

Colorless solid, solution may be red or green — Odorless

Solid may float or sink in water; dissolves and solution mix with water

Stop discharge if possible
Avoid contact with solid and solution
Isolate and remove discharged material
Notify local health and pollution control agencies

Fire

Not flammable
POISONOUS GASES ARE PRODUCED WHEN HEATED
Wear goggles and self-contained breathing apparatus

Exposure

CALL FOR MEDICAL AID

SOLID OR SOLUTION
Irritating to skin and eyes
If swallowed, will cause nausea, vomiting, or loss of consciousness
Remove contaminated clothing and shoes
Flush affected areas with plenty of water
IF IN EYES, hold eyelids open and flush with plenty of water
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm

Water Pollution

Dangerous to aquatic life in high concentrations
May be dangerous if it enters water intakes
Notify local health and wildlife officials
Notify operators of nearby water intakes

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook)
Issue a "Hazardous Water" or "Do not drink"
Should be removed
Chemical and physical treatment

2. LABEL

2.1 Category: Poison
2.2 Class: 6

3. CHEMICAL DESIGNATIONS

3.1 CG Compatibility Class: Not listed
3.2 Formula: $CH_3AsO(OH)ONa$; $CH_4AsO_4Na \cdot 6H_2O$
3.3 IMO/UN Designation: 6.1/1557
3.4 DOT No. [illegible]
3.5 CAS Registry No. [illegible]

4. OBSERVABLE CHARACTERISTICS

4.1 Physical State (at shipment): Solid or water solution
4.2 Color: Colorless; solutions may contain red or green dyes
4.3 Odor: None

5. HEALTH HAZARDS

5.1 Threshold Limit Value: [illegible]
5.2 Short Term Inhalation Limit: [illegible]
5.3 Toxicity by Ingestion: [illegible]
5.4 Lethal Dosage: [illegible]
5.5 Median Toxic Dose: [illegible]
5.6 Liquid or Fumes: [illegible]
5.7 Odor Threshold: [illegible]
5.8 [illegible]

Toxicity of Exposure: INGESTION [illegible] gives water and nausea; gives a saline solution with [illegible] and [illegible] [illegible] physiological [illegible]

6. FIRE HAZARDS

6.1 Flash Point: Not flammable
6.2 Flammable Limits in Air: Not flammable
6.3 Fire Extinguishing Agents: Not pertinent
6.4 Fire Extinguishing Agents that Not to be Used: Not pertinent
6.5 Special Hazards of Combustion Products: Toxic gases may be generated in fires
6.6 Behavior in Fire: Not pertinent
6.7 Ignition Temperature: Not flammable
6.8 Electrical Hazard: Not pertinent
6.9 Burning Rate: Not flammable
6.10 Adiabatic Flame Temperature: Data not available
6.11 Stoichiometric Air to Fuel Ratio: Data not available
6.12 Flame Temperature: Data not available

7. CHEMICAL REACTIVITY

7.1 Reactivity with Water: None
7.2 Reactivity with Common Materials: None
7.3 Stability During Transport: Stable
7.4 Neutralizing Agents for Acids and Caustics: Not pertinent
7.5 Polymerization: Not pertinent
7.6 Inhibitor of Polymerization: Not pertinent
7.7 Molar Ratio (Reactants to Products): Data not available
7.8 Reactivity Group: Data not available

8. WATER POLLUTION

8.1 Aquatic Toxicity: > 1000 ppm/48 hr/bluegill; sunfish/LC_{50}/fresh water
8.2 Waterfowl Toxicity: Data not available
8.3 Biological Oxygen Demand (BOD): Data not available
8.4 Food Chain Concentration Potential: Data not available

9. SHIPPING INFORMATION

9.1 Formulation of Product: [illegible] (DOMA) [illegible] Data [illegible] 50% [illegible]
9.2 Package Recommendations: [illegible]
9.3 Shipping Restrictions: [illegible]
9.4 Shipping Cost: [illegible]

10. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook)

SS

11. HAZARD CLASSIFICATIONS

11.1 Code of Federal Regulations: Poison, B
11.2 NAS Hazard Rating for Bulk Water Transportation: Not listed
11.3 NFPA Hazard Classification: Not listed

12. PHYSICAL AND CHEMICAL PROPERTIES

12.1 Physical State at 15°C and 1 atm: Solid or water solution
12.2 Molecular Weight: 162 (DOMA); 262 (DOMA hexahydrate)
12.3 Boiling Point at 1 atm: Decomposes
12.4 Freezing Point:
(MSAA) 243°F = 117°C = 390°K
(DSMA) 137°F = 58°C = 332°K
12.5 Critical Temperature: Not pertinent
12.6 Critical Pressure: Not pertinent
12.7 Specific Gravity:
(DSMA) 1.9 at 20°C (solid)
(MSAA solution) 1.4-1.5 at 20°C (liquid)
12.8 Liquid Surface Tension: Not pertinent
12.9 Liquid Water Interfacial Tension: Not pertinent
12.10 Vapor (Gas) Specific Gravity: Not pertinent
12.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent
12.12 Latent Heat of Vaporization: Not pertinent
12.13 Heat of Combustion: [illegible]
12.14 Heat of Decomposition: Not pertinent
12.15 Heat of Solution: Not pertinent
12.16 Heat of Polymerization: Not pertinent
12.17 Heat of Fusion: Data not available
12.18 Liquid Water: Data not available
12.19 Solid Vapor Pressure: Data not available

Material Safety Data Sheet

from Genium's Reference Collection
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GENIUM PUBLISHING CORP.

No. 310
METHYLENE CHLORIDE
(Revision F)

Issued: September 1985
Revised: November 1988

SECTION 1. MATERIAL IDENTIFICATION

27

Material Name: METHYLENE CHLORIDE

Description (Origin/Uses): Used widely in paint removers, as a solvent for plastics, as a degreasing agent, in propellant mixtures for aerosol sprays, and as a blowing agent in foams.

Other Designations: Dichloromethane; Freon 30®; Methane Dichloride; Methylene Bichloride; Methylene Dichloride; CH_2Cl_2; CAS No. 0075-09-2

Manufacturer: Contact your supplier or distributor. Consult the latest edition of the *Chemicalweek Buyers' Guide* (Genium ref. 73) for a list of suppliers.

HMIS			
H	2	R	1
F	1	I	3
R	0	S	3
PPG*		K	1
*See sect. 8			

NFPA

SECTION 2. INGREDIENTS AND HAZARDS/EXPOSURE LIMITS

Methylene Chloride, ca 100%

OSHA PEL
8-Hour TWA: 500 ppm
Ceiling: 1000 ppm Acceptable Maximum Peak above the Ceiling: 2000 ppm for 5 Minutes in Any 2-Hour Period

ACGIH TLV, 1988-89
TLV-TWA: 50 ppm, 175 mg/m³
(Adopted 1988-89)

Toxicity Data*
Rat, Oral, LD_{50}: 2136 mg/kg
Human, Inhalation, TC_{Lo}: 500 ppm (8 Hours)

*See NIOSH, *RTECS* (PA8050000), for additional data with references to irritative, reproductive, mutagenic, and tumorigenic effects.

SECTION 3. PHYSICAL DATA

Boiling Point: 103.55°F (39.75°C) at 76 Torrs
Melting Point: -142°F (-96.7°C)
Vapor Density (Air = 1): 2.9
Vapor Pressure: 440 Torrs at 77°F (25°C)
Molecular Weight: 84.94 Grams/Mole
Solubility in Water (%): 1% by Weight
Specific Gravity (H_2O = 1): 1.3255 at 68°F (20°C)
% Volatile by Volume: Ca 100

Appearance and Odor: A clear, colorless, volatile liquid; distinctive, penetrating, ethereal odor. The odor will not serve as a useful warning property because concentrations of 100 ppm are not easily perceptible. Most persons can detect this odor at above 300 ppm.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point*	Autoignition Temperature: 1033°F (556°C)	LEL: 12% v/v	UEL: 19% v/v

Extinguishing Media: *Methylene chloride is not flammable under ordinary conditions. However, flammable vapor-air mixtures can form at approximately 212°F (100°C). Use water spray to cool fire-exposed containers and to flush spills away from exposures. Use extinguishing agents that will put out the surrounding fire. **Unusual Fire or Explosion Hazards:** Methylene chloride vapor is heavier than air and may collect and concentrate in low-lying, confined spaces. The high vapor pressure of methylene chloride means that when it is spilled, its vapor concentration in air can increase rapidly. If this vapor is heated, an explosion hazard is associated with the vapor-air mixture. Containers of this material may rupture violently if they are involved in fires. **Special Fire-fighting Procedures:** Wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode.

SECTION 5. REACTIVITY DATA

Stability/Polymerization: Methylene chloride is stable in closed containers during routine operations. Hazardous polymerization cannot occur. **Chemical Incompatibilities:** Methylene chloride can react dangerously with nitrogen tetroxide, liquid oxygen, potassium, sodium, sodium-potassium alloys, lithium, potassium hydroxide with N-methyl-N-nitroso urea, potassium *t*-butoxide, and finely powdered aluminum and magnesium. **Conditions to Avoid:** Avoid all exposure to sources of ignition, heat, and incompatible chemicals. Prolonged exposure to water may cause hydrolysis to highly corrosive hydrochloric acid when the temperature is above 140°F (60°C). In oxygen-enriched atmospheres or when heated (>212°F [100°C]), methylene chloride vapor can be readily ignited. **Hazardous Products of Decomposition:** Exposure to high temperature (from open flame, hot surfaces, uninsulated steam lines, welding arcs, etc.) can produce toxic and corrosive thermal-oxidative products of decomposition such as hydrogen chloride, carbon monoxide, and even small quantities of phosgene gas, which is extremely poisonous.

SECTION 6. HEALTH HAZARD INFORMATION

Carcinogenicity: Methylene chloride is listed as a suspected human carcinogen by the ACGIH (which classifies it as a group A2 carcinogen). **Summary of Risks:** Accidental contact of liquid methylene chloride with skin or eyes causes painful irritation and possible burns if not promptly removed. Exposure by way of contaminated gloves, clothing, or paint remover formulations can produce these same irritant effects. Long-term exposure to mild or moderate doses of methylene chloride may cause a delayed (24 to 48 hours) onset of dizziness, headache, mental confusion, slurred speech, double vision, and sleeplessness. Medical recovery can be slow. Overexposure to methylene chloride can cause elevated levels of carboxy hemoglobin in the blood (this same effect results from overexposure to carbon monoxide). **Medical Conditions Aggravated by Long-Term Exposure:** None reported. **Target Organs:** Skin, eyes, respiratory system, CNS, liver, kidneys, and blood. **Primary Entry:** Inhalation, skin contact/absorption. **Acute Effects:** Headache, giddiness, stupor, irritability, fatigue, tingling in the limbs, and narcosis that is not usually fatal if the exposure is terminated before anesthetic death occurs. **Chronic Effects:** The ACGIH classification of this material as a suspected human carcinogen implies that cancer is a possible effect of chronic exposure to methylene chloride. **FIRST AID:** Eyes. Immediately flush eyes, including under the eyelids, gently but thoroughly with

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SECTION 6. HEALTH HAZARD INFORMATION, cont.

flooding amounts of running water for at least 15 minutes. **Skin.** Rinse the affected area with flooding amounts of water and then wash it with soap and water. **Inhalation.** Remove the exposed person to fresh air; restore and/or support his or her breathing as needed. Have qualified medical personnel administer oxygen as required. **Note to Attending Physician:** Do not administer adrenalin. **Ingestion.** Unlikely. Should this type of exposure occur, do not induce vomiting because of the danger of aspiration. If spontaneous vomiting should occur, position the exposed person's head below his or her trunk to resist aspiration. Get medical help (in plant, paramedic, community) for all exposures. Seek prompt medical assistance for further treatment, observation, and support after first aid. **Note to Physician:** Absorbed methylene chloride is stored in body fat and metabolizes to carbon monoxide. This produced carbon monoxide increases and sustains carboxyhemoglobin levels in the blood, which concommitantly reduces the oxygen-carrying capacity of the blood. NIOSH advises preplacement and annual medical exams that emphasize liver, kidney, eye, skin, CNS, and respiratory system functions and a complete blood count. Simultaneous exposure to tobacco smoke, alcohol, and carbon monoxide, along with heavy manual labor, increases the body burden of a worker as well as the toxic hazards of the methylene chloride. In significant exposures, serum methylene chloride levels are of no clinical importance. Neurologic and hepatic status as well as carboxy hemoglobin should be monitored.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

Spill/Leak: Notify safety personnel, evacuate unnecessary personnel, eliminate all sources of ignition immediately, and provide adequate explosion-proof ventilation. Cleanup personnel need protection against this liquid's contact with the skin or eyes as well as inhalation of its vapor. Contain large spills and collect waste or absorb it with an inert material such as sand, earth, or vermiculite. Use nonsparking tools to place waste liquid or absorbent into closable containers for disposal. Keep waste out of sewers, watersheds, and waterways. **Waste Disposal:** Contact your supplier or a licensed contractor for detailed recommendations. Follow Federal, state, and local regulations.

OSHA Designations
Listed as an Air Contaminant (29 CFR 1910.1000 Subpart Z).
EPA Designations (40 CFR 302.4)
RCRA Hazardous Waste, NO. U080
CERCLA Hazardous Substance, Reportable Quantity: 1000 lbs (454 kg), per the Clean Water Act (CWA), § 307 (a), and the Resource Conservation and Recovery Act (RCRA), § 3001.

SECTION 8. SPECIAL PROTECTION INFORMATION

Goggles: Always wear protective eyeglasses or chemical safety goggles. Where splashing is possible, wear a full face shield. Follow OSHA eye- and face-protection regulations (29 CFR 1910.133). **Respirator:** Use a NIOSH-approved respirator per Genium reference 88 for the maximum-use concentrations and/or exposure limits cited in section 2. Follow OSHA respirator regulations (29 CFR 1910.134). For emergency or nonroutine operations (spills or cleaning reactor vessels and storage tanks), wear an SCBA. **Warning:** Air-purifying respirators will *not* protect workers in oxygen-deficient atmospheres. **Other:** Wear impervious neoprene, PVA, or Viton gloves, boots, aprons, and gauntlets, etc., to prevent any skin contact with liquid methylene chloride. **Ventilation:** Install and operate general and local maximum, explosion-proof ventilation systems powerful enough to maintain airborne levels of acetone below the exposure limits cited in section 2. Local exhaust ventilation is preferred because it prevents dispersion of the contaminant into the general work area by eliminating it at its source. Consult the latest edition of Genium reference 103 for detailed recommendations. Floor or sump ventilation may be necessary. **Safety Stations:** Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work areas. **Contaminated Equipment:** Contact lenses pose a special hazard; soft lenses may absorb irritants, and all lenses concentrate them. Do *not* wear contact lenses in any work area. Remove contaminated clothing and launder it before wearing it again; clean this material from shoes and equipment. **Other:** Because the health effects of carbon monoxide and methylene chloride are additive (see sect. 6), workplaces should be equipped with automatic sensing equipment that identifies workroom atmospheric levels of both of these materials. **Comments:** Practice good personal hygiene; always wash thoroughly after using this material and before eating, drinking, smoking, using the toilet, or applying cosmetics. Keep it off your clothing and equipment. Avoid transferring it from your hands to your mouth while eating, drinking, or smoking. Do *not* eat, drink, or smoke in any work area. Do not inhale methylene chloride vapor.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Storage/Segregation: Store methylene chloride in closed, moisture-proof containers in a cool, dry, well-ventilated area away from sources of ignition, strong oxidizers, caustics, and incompatible chemicals (see sect. 5). Protect containers from physical damage. **Special Handling/Storage:** Prevent moist air from entering storage containers. Provide ventilation at the floor level in storage areas because methylene chloride vapor is denser than air. Installation of a dryer and a safety seal on each tank is recommended. Aluminum is not recommended for use as a storage material; appropriate storage materials include galvanized iron, black iron, or steel. **Engineering Controls:** Make sure all engineering systems (production, transportation) are of maximum explosion-proof design. Electrically ground and bond all containers and pipelines used in shipping, transferring, reacting, production, and sampling operations to prevent generating static sparks.

Transportation Data (49 CFR 172.101-2)
DOT Shipping Name: Dichloromethane *or* Methylene Chloride
DOT Hazard Class: ORM-A
ID No. UN1593
DOT Packaging Requirements: 49 CFR 173.605
DOT Packaging Exceptions: 49 CFR 173.505

IMO Shipping Name: Dichloromethane
IMO Hazard Class: 6.1
IMO Label: Saint Andrew's Cross (X)*
IMDG Packaging Group: III

*Harmful-Stow away from Foodstuffs.

References: 1, 26, 38, 84-94, 100, 116, 117, 120, 122.

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METHYL PARATHION

MPT

Common Synonyms
Metacid, MPT
Penncap, Alkron
Nitrox, Wedloxon
O, O-Dimethyl O-p-nitrophenyl phosphorothioate
Paramethylparathion

Solid crystals — with a solid or brown paste — Pungent eggs or garlic odor

Solid and liquid are on water, solution floats on water
Melting (freezing) point at 95°F.

AVOID CONTACT WITH LIQUID. Wear goggles and
wear chemical protective suit with self-contained breathing apparatus
Stop discharge if possible
Call fire department
*Dike and remove contaminated material
Notify local health and pollution control agencies

Fire

Combustible
POISONOUS GASES ARE PRODUCED IN FIRE AND WHEN HEATED
Containers may explode in fire
Wear chemical protective suit with self-contained breathing apparatus
Withdraw from fire if possible or if practical to do so
Extinguish with water
Cool exposed containers with water

Exposure

"CALL FOR MEDICAL AID"

LIQUID OR SOLID
POISONOUS IF SWALLOWED OR IF SKIN IS EXPOSED.
Irritating to eyes
Hydrolyzes contaminated clothing and shoes
Flush affected areas with plenty of water
IN EYES: Hold eyelids open and flush with plenty of water
SWALLOWED and victim is CONSCIOUS: Have victim drink water; induce vomiting
IF SKIN and have victim drink or vomit
SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS: Do nothing except keep victim warm

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS
Solution is toxic to crustacea
May be dangerous if it enters water intakes

Notify local health and wildlife officials
Notify operators of nearby water intakes

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook)

Have warning-caution,
water contaminant
Restrict access
Should be removed
Chemical and physical assessment

2. LABEL

2.1 Category: Poison
2.2 Class: 6

3. CHEMICAL DESIGNATIONS

3.1 CG Compatibility Class: Not rated
3.2 Formula: $(CH_3O)_2PSOC_6H_4NO_2$-p
3.3 IMO/UN Designation: 6.1/2783
3.4 DOT ID No.: 2783
3.5 CAS Registry No.: 298-00-0

4. OBSERVABLE CHARACTERISTICS

4.1 Physical State (as shipped): Solid (dust, or solution)
4.2 Color: Colorless solid or brownish liquid
4.3 Odor: Characteristic, like rotten eggs or garlic

5. HEALTH HAZARDS

5.1 Personal Protective Equipment: Approved mask or respirator; natural rubber gloves, overshoes, protective clothing, goggles
5.2 Symptoms Following Exposure: Exposure to fumes from a fire, or to the liquid, causes headache, blurred vision, constricted pupils of the eyes, irritation, nausea, vomiting, diarrhea, and tightness in the chest. Muscle twitch and convulsions may follow. Symptoms may develop over a period of 8 hrs.
5.3 Treatment of Exposure: Speed is essential. INGESTION: call a doctor. If victim is not breathing, immediately initiate artificial respiration by mouth-to-mouth, mouth-to-nose, or mouth-to-endotracheal method, when victim is conscious, give milk, water, or salt-water and induce vomiting immediately. SKIN OR EYES: flood and wash exposed areas thoroughly with water, remove contaminated clothing under a shower.
5.4 Threshold Limit Value: 0.2 mg/m³
5.5 Short Term Inhalation Limits: Data not available
5.6 Toxicity by Ingestion: Grade 4, LD_{50} below 50 mg/kg (rat)
5.7 Late Toxicity: Data not available
5.8 Vapor (Gas) Irritant Characteristics: Not pertinent
5.9 Liquid or Solid Irritant Characteristics: Poisonous when absorbed through skin
5.10 Odor Threshold: Data not available
5.11 IDLH Value: Data not available

6. FIRE HAZARDS

6.1 Flash Point: 115°F O.C.
6.2 Flammable Limits in Air: Data not available
6.3 Fire Extinguishing Agents: Water
6.4 Fire Extinguishing Agents Not to be Used: Not pertinent
6.5 Special Hazards of Combustion Products: Toxic gases are produced in fire.
6.6 Behavior in Fire: Burns may rupture violently
6.7 Ignition Temperature: Data not available
6.8 Electrical Hazard: Not pertinent
6.9 Burning Rate: Data not available
6.10 Adiabatic Flame Temperature: Data not available
6.11 Stoichiometric Air to Fuel Ratio: Data not available
6.12 Flame Temperature: Data not available

7. CHEMICAL REACTIVITY

7.1 Reactivity with Water: Not appreciable in 8 days at 40°C
7.2 Reactivity with Common Materials: Is corrosive to aluminum in vapor, etc., which must be replaced to eliminate poison hazard.
7.3 Stability During Transport: Decomposes above 60°C with possible explosive force
7.4 Neutralizing Agents for Acids and Caustics: Apply caustic or soda ash slurry until yellow stains disappear.
7.5 Polymerization: Not pertinent
7.6 Inhibitor of Polymerization: Not pertinent
7.7 Water Rinse Resistant to Products: Data not available
7.8 Reactivity Group: Data not available

8. WATER POLLUTION

8.1 Aquatic Toxicity:
1.9 ppm/96 hr/bluegill/TL_m/fresh water
0.2 ppm/96 hr/lamprey/TL_m/fresh water
8.2 Waterborne Toxicity: LD_{50} = 10 mg/kg
8.3 Biological Oxygen Demand (BOD): Data not available
8.4 Food Chain Concentration Potential: Data not available

9. SHIPPING INFORMATION

9.1 Grades of Purity: Pure (solid), technical (liquid), 60% in xylene
9.2 Storage Temperature: Below 50°F
9.3 Inert Atmosphere: No requirement
9.4 Venting: Pressure-vacuum

10. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook)

A-E-Y

11. HAZARD CLASSIFICATIONS

11.1 Code of Federal Regulations: Poison, B
11.2 NAS Hazard Rating for Bulk Water Transportation: Not rated
11.3 NFPA Hazard Classification:

Category	Classification*
Health Hazard (Blue)	4
Flammability (Red)	3
Reactivity (Yellow)	2

*Five classes for solution, based for solid

12. PHYSICAL AND CHEMICAL PROPERTIES

12.1 Physical State at 15°C and 1 atm: Solid
12.2 Molecular Weight: 263.2
12.3 Boiling Point at 1 atm: Very high
12.4 Freezing Point: 95°F = 35°C = 291°K
12.5 Critical Temperature: Not pertinent
12.6 Critical Pressure: Not pertinent
12.7 Specific Gravity: 1.360 at 20°C (liquid)
12.8 Liquid Surface Tension: Data not available
12.9 Liquid Water Interfacial Tension: Data not available
12.10 Vapor (Gas) Specific Gravity: Not pertinent
12.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent
12.12 Latent Heat of Vaporization: Not pertinent
12.13 Heat of Combustion: Data not available
12.14 Heat of Decomposition: Not pertinent
12.15 Heat of Solution: Not pertinent
12.16 Heat of Polymerization: Not pertinent
12.26 Heat of Fusion: Data not available
12.30 Limiting Value: Data not available
12.27 Reid Vapor Pressure: Data not available

NOTES

Material Safety Data Sheet

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GENIUM PUBLISHING CORP.

No. 7

NITRIC ACID
(Revision C)
Issued: October 1980
Revised: August 1988

SECTION 1. MATERIAL IDENTIFICATION

26

Material Name: NITRIC ACID

Description (Origin/Uses): Used to dissolve noble metals, for etching and cleaning metals, to make organic nitrates and nitrocompounds, to destroy residues of organic matter, and in explosives.

Other Designations: Red Fuming Nitric Acid; HNO_3; CAS No. 7697-37-2

Manufacturer: *Contact your supplier or distributor. Consult the latest edition of the Chemicalweek Buyers' Guide* (Genium ref. 73) for a list of suppliers.

NFPA: 3 (oxy) 0 0

HMIS
H 3
F 0
R 1
PPG*
*See sect. 8

R 1
I 4
S 4
K 0

SECTION 2. INGREDIENTS AND HAZARDS

	%	EXPOSURE LIMITS
Nitric Acid, CAS No. 7697-37-2	*	**OSHA PEL** 8-Hr TWA: 2 ppm, 5 mg/m³ **ACGIH TLVs, 1987-88** TLV-TWA: 2 ppm, 5 mg/m³ TLV-STEL: 4 ppm, 10 mg/m³ **Toxicity Data**** Mouse, Inhalation, LC_{50}: 67 ppm/4 Hrs

*Contact your supplier to determine the percent by weight of nitric acid in the purchased product. Water is the other component of the product.
**See NIOSH, *RTECS* (QU5775000, QU5900000), for additional data with references to reproductive effects.

SECTION 3. PHYSICAL DATA

Boiling Point: Ca 251°F (122°C)*
Specific Gravity (H_2O = 1): 1.4*
pH: Very Acidic

Water Solubility (%): Complete
Molecular Weight: 63 Grams/Mole
Melting Point: Ca -30°F (-34°C)*

Appearance and Odor: A water white to slightly yellow liquid that darkens to a brownish color on aging and exposure to light; characteristic nitrogen dioxide (NO_2) odor.

*These properties are for the approximately 68%-by-weight nitric acid that is commercially available.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temperature	Flammability Limits in Air	LOWER	UPPER
*	*	% by Volume	*	*

Extinguishing Media: *Nitric acid does not burn. Use extinguishing agents that will put out the surrounding fire. Use a water spray to dilute nitric acid during fires and to absorb liberated oxides of nitrogen.

Unusual Fire or Explosion Hazards: Although nitric acid does not burn, it is a strong oxidizing agent that can react with combustible materials to cause fires. Also, it can react with metals to liberate extremely flammable hydrogen gas. If this happens, direct fire-fighting procedures at this evolved hydrogen gas.

Special Fire-fighting Procedures: Wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode. Choose protective equipment carefully (see sect. 5, Conditions to Avoid).

SECTION 5. REACTIVITY DATA

Nitric acid is stable in closed containers at room temperature under normal storage and handling conditions. It cannot undergo hazardous polymerization.

Chemical Incompatibilities: Nitric acid reacts explosively with metallic powders, carbides, hydrogen sulfide, and turpentine. Contact with organic materials such as wood, paper, sawdust, or alcohol, etc., may cause fires. Combustible materials can attain an increased flammability after being exposed to nitric acid even if they do not immediately catch fire.

Conditions to Avoid: Avoid any contact with incompatible chemicals. Because it is so reactive, always establish another material's compatibility with nitric acid before mixing the two materials. This applies to the selection of safety and handling equipment, because nitric acid can attack some forms of coatings, plastics, and rubber.

Hazardous Products of Decomposition: Various nitrogen oxides, including nitric oxide (NO), nitrogen dioxide (NO_2), nitrous oxide (N_2O), as well as nitric acid mist or vapor, can be produced by the decomposition reactions that can affect the nitric acid during fires.

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SECTION 6. HEALTH HAZARD INFORMATION

Nitric acid is not listed as a carcinogen by the NTP, IARC, or OSHA.

Summary of Risks: This material is corrosive to any body tissue it contacts. Dental erosion is also reported.

Medical Conditions Aggravated by Long-Term Exposure: None reported. **Target Organs:** Skin, eyes, mucous membranes of the respiratory tract, teeth. **Primary Entry:** Inhalation, skin contact. **Acute Effects:** Irritation and/or corrosive burns of skin, eyes, and upper respiratory tract (URT), delayed pulmonary edema, pneumonitis, bronchitis, and dental erosion. **Chronic Effects:** None reported.

FIRST AID: Eyes. Immediately flush eyes, including under the eyelids, gently but thoroughly with plenty of running water for at least 15 minutes. Treat for eye burns. **Skin.** Immediately wash the affected area with soap and water. Watch for chemical skin burns and treat them accordingly. **Inhalation.** Remove the exposed person to fresh air; restore and/or support his or her breathing as needed. If the exposure is severe, hospitilization with careful monitoring by trained medical personnel to detect the delayed onset of severe pulmonary edema (lungs filled with fluid) is recommended for at least 72 hours. **Ingestion.** Call a poison control center. Never give anything by mouth to someone who is unconscious or convulsing. Do not induce vomiting. If the exposed person is responsive, give him or her one or two glasses of milk or water to drink as quickly as possible after exposure.

GET MEDICAL HELP (IN PLANT, PARAMEDIC, COMMUNITY) FOR ALL EXPOSURES. Seek prompt medical assistance for further treatment, observation, and support after first aid. **NOTE TO PHYSICIAN:** Wash affected skin areas with a 5% solution of sodium bicarbonate ($NaHCO_3$). If ingested, the risk versus the benefit of the passage of a naso-gastric tube is debatable. Activated charcoal is of *no* value. Do *not* give the exposed person bicarbonate to neutralize the material.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

Spill/Leak: Notify safety personnel, provide ventilation, and eliminate all sources of ignition immediately in case contact with metals should produce highly flammable hydrogen gas. Cleanup personnel need protection against contact with and inhalation of nitric acid (see sect. 8). Contain large spills and collect waste. Use water sprays to direct nitric acid away from incompatible chemicals (see sect. 5). Neutralize the spilled nitric acid with soda ash or sodium bicarbonate. Use an absorbent such as sand, earth, or vermiculite on the resulting slurry and place the neutralized nitric acid material into containers suitable for eventual disposal, reclamation, or destruction.

Waste Disposal: Consider reclamation, recycling, or destruction rather than disposal in a landfill. Contact your supplier or a licensed contractor for detailed recommendations. Follow Federal, state, and local regulations.

OSHA Designations

Air Contaminant (29 CFR 1910.1000 Subpart Z)

EPA Designations (40 CFR 302.4)

CERCLA Hazardous Substance, Reportable Quantity: 1000 lbs (454 kg), per Clean Water Act (CWA), Section 311 (b) (4)

SECTION 8. SPECIAL PROTECTION INFORMATION

Goggles: Always wear protective eyeglasses or chemical safety goggles. Where splashing of nitric acid solution is possible, wear a full face shield as a supplementary protective measure. Follow OSHA eye- and face-protection regulations (29 CFR 1910.133).

Respirator: Consult the *NIOSH Pocket Guide to Chemical Hazards* (Genium ref. 88) for general recommendations on proper respiratory procedures. Follow OSHA respirator regulations (29 CFR 1910.134). For emergency or nonroutine use (leaks or cleaning reactor vessels and storage tanks), wear an SCBA with a full facepiece operated in the pressure-demand or positive-pressure mode. **Warning:** Air-purifying respirators will *not* protect workers in oxygen-deficient atmospheres. **Other:** Wear impervious gloves, boots, aprons, gauntlets, etc., to prevent skin contact with nitric acid. Choose protective equipment carefully (see sect. 5, Conditions to Avoid).

Ventilation: Install and operate both general and local exhaust-ventilation systems powerful enough to maintain airborne concentrations of nitric acid below the OSHA PEL standard cited in section 2. Construct exhaust ducts and systems with material such as fiberglass, which resists attack by nitric acid. **Safety Stations:** Make emergency eyewash stations, washing facilities, and safety/quickdrench showers available in work areas. **Contaminated Equipment:** Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. Do *not* wear contact lenses in any work area. Remove contaminated clothing and launder it before wearing it again; clean nitric acid from shoes and equipment. **Comments:** Practice good personal hygiene; always wash thoroughly after using this material. Keep it off of your clothing and equipment. Avoid transferring it from your hands to your mouth while eating, drinking, or smoking. Do *not* eat, drink, or smoke in any work area. Provide preplacement and annual medical exams with emphasis on skin irritation to workers who are regularly exposed to nitric acid. Workers must receive training before handling this material in the workplace; even experienced workers should undergo refresher training periodically.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Storage/Segregation: Store nitric acid in a cool, dry, well-ventilated area away from incompatible chemicals (see sect. 5). Consider outside, isolated, or detached storage. Protect containers from direct sunlight.

Special Handling/Storage: Build all storage facilities of nonflammable materials that are resistant to chemical attack by nitric acid. Protect containers from physical damage. Preplan for routine use and emergency response.

Engineering Controls: Proper ventilation is essential in bulk storage areas; consider installing an automatic monitoring system to detect hazardous levels of nitrogen oxides that can develop from this material.

Comments: Separate nitric acid from hydrazine, diethylenetriamine, fluorides, and all other corrosives except sulfuric acid and sulfur trioxide when shipping or transferring it.

Transportation Data (49 CFR 172.101-2)

DOT Shipping Name: (I) Nitric Acid, Fuming or (II) Nitric Acid, Over 40% or (III) Nitric Acid, 40% or Less

DOT Label: (I) Oxidizer and Poison or (II) Oxidizer and Corrosive or (III) Corrosive

DOT Hazard Class: (I) and (II) Oxidizer or (III) Corrosive Material

DOT ID Nos. (I) UN2032; (II) UN2031; (III) NA1760

IMO Class: 8 (All Types of Nitric Acid)

IMO Label: (I) Corrosive, Oxidizer, Poison; or (II) and (III) Corrosive

References: 1, 2, 26, 38, 84-94, 100, 112, 113, 114.

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Prepared by PJ Igoe, BS

Industrial Hygiene Review: DJ Wilson, CIH

Medical Review: MJ Hardies, MD

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NITROGEN TETROXIDE

NOX

Common Synonyms	
Nitrogen tetroxide Nitrogen dioxide Red oxide of nitrogen Oxide of nitrogen Dinitrogen tetroxide	Liquefied compressed gas. Red-brown liquid. Sharp, suffocating chemical odor Boils and reacts with water. Poisonous brown vapor is produced.

AVOID CONTACT WITH LIQUID AND VAPOR. Keep people away.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Stop discharge if possible.
Evacuate area in case of large discharge.
Notify local health and pollution control agencies.

Fire	Not flammable. May cause fire and explosion on contact with combustibles. POISONOUS GASES ARE PRODUCED IN FIRE AND WHEN HEATED. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Flood discharge area with water. Stop flow of gas or liquid. Cool exposed containers with water.
Exposure	CALL FOR MEDICAL AID. VAPOR POISONOUS IF INHALED. Irritating to eyes. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID Will burn skin and eyes. POISONOUS IF SWALLOWED. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. DO NOT INDUCE VOMITING.
Water Pollution	HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook)

Stop discharge, if safe to do so.
Protect people.
Evacuate area.

2. LABEL

2.1 Category: Poison gas; Oxidizer
2.2 Class: 2 and 5

3. CHEMICAL DESIGNATIONS

3.1 DOT Compatibility Class: not listed
3.2 Formula: N_2O_4
3.3 IMO/UN Designation: 2/1067
3.4 DOT ID No.: 1067
3.5 CAS Registry No.: 10102-44-0

4. OBSERVABLE CHARACTERISTICS

4.1 Physical State (at shipping): Liquid
4.2 Color: Red-brown at ambient temperatures; colorless below about 14°F
4.3 Odor: Pungent, acrid, mildly irritating

5. HEALTH HAZARDS

5.1 Personal Protective Equipment: Rubber gloves; safety goggles and face shield; protective clothing; self-contained breathing apparatus; or self-contained breathing apparatus.
5.2 Symptoms Following Exposure: Very concentrated fumes produce coughing, choking, headache, nausea, pain in chest and abdomen; otherwise, few symptoms appear at time of exposure. After symptom-free period of 5-72 hours, pulmonary edema gradually developes, causing fatigue, nonproductive cough, difficulty in breathing, frothy expectoration, mental confusion, lethargy, bluish skin, and cyanosis, rapid pulse. Since NOX interferes with gas exchange in lungs, unconscious, coma and death by asphyxiation can result, usually within a few hours after onset of pulmonary edema.
5.3 Treatment of Exposure: INHALATION: remove patient to fresh air and have him breathe as deeply as possible; put in a quiet, comfortable position for 24-48 hours; keep warm; give oxygen if coughing starts; physician may administer morphine (10 mg.) EYES AND SKIN: flush with water for at least 15 min.
5.4 Threshold Limit Value: 5 ppm
5.5 Short Term Inhalation Limits: 35 ppm for 5 min.
5.6 Toxicity by Ingestion: Data not available
5.7 Latent Toxicity: Data not available
5.8 Vapor (Gas) Irritant Characteristics: Vapors cause severe irritation of eyes and throat and can cause eye and lung injury. They starved be blamed even at low concentrations.
5.9 Liquid or Solid Irritant Characteristics: Severe skin irritant. Causes severe and hemorrhagic burns on short contact and is very injurious to the eyes.
5.10 Odor Threshold: 5 ppm
5.11 IDLH Value: 50 ppm

6. FIRE HAZARDS

6.1 Flash Point: Not flammable
6.2 Flammable Limits in Air: Not flammable
6.3 Fire Extinguishing Agents: Stop flow of gas
6.4 Fire Extinguishing Agents Not to be Used: Not pertinent
6.5 Special Hazards of Combustion Products: Products have gas much heated.
6.6 Behavior in Fire: Does not burn, but supports combustion of combustible materials such as wood. May cause fire or explosion on contact with other materials.
6.7 Ignition Temperature: Not flammable
6.8 Electrical Hazard: Data not available
6.9 Burning Rate: Not flammable
6.10 Adiabatic Flame Temperature: Data not available

(Continued)

7. CHEMICAL REACTIVITY

7.1 Reactivity With Water: Dissolves to form nitric acid and nitric oxide. Nitric oxide reacts with air to form more nitrogen tetroxide.
7.2 Reactivity with Common Materials: Very corrosive to metals when wet. Reacts vigorously with combustible materials such as wood.
7.3 Stability During Transport: Stable
7.4 Neutralizing Agents for Acids and Caustics: Flush with water, then use dilute ash or lime.
7.5 Polymerization: Not pertinent
7.6 Inhibitor of Polymerization: Not pertinent
7.7 Molar Ratio (Reactant to Product): Data not available
7.8 Reactivity Group: Data not available

8. WATER POLLUTION

8.1 Aquatic Toxicity:
72 ppm/96 hr/mosquito fish/TL_{m}/fresh water
320-1600 ppm/48 hr/species/LC_{50}/salt water
8.2 Waterfowl Toxicity: Data not available
8.3 Biological Oxygen Demand (BOD): None
8.4 Food Chain Concentration Potential: None

9. SHIPPING INFORMATION

9.1 Grades of Purity: Data not available
9.2 Storage Temperature: Ambient. Storage and transfer structures shall be equipped with mechanical ventilation systems.
9.3 Inert Atmosphere: No requirement
9.4 Venting: Pressure relief valves on containers

10. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook)

A-4-J-O

11. HAZARD CLASSIFICATIONS

11.1 Code of Federal Regulations: Poison, A
11.2 NAS Hazard Rating for Bulk Water Transportation:

Category	Rating
Fire	0
Health	
Vapor Inhalat.	4
Liquid or Solid Contact	4
Poisons	4
Water Pollution	
Human Toxicity	3
Aquatic Toxicity	3
Aquatic Effect	4
Reactivity	
Other Chemicals	2
Water	0
Self Reaction	

11.3 NFPA Hazard Classifications:

Category	Classification
Health Hazard (Blue)	3
Flammability (Red)	0
Reactivity (Yellow)	0
	ox

12. PHYSICAL AND CHEMICAL PROPERTIES

12.1 Physical State at 15°C and 1 atm: Solution
12.2 Molecular Weight: 92.02
12.3 Boiling Point at 1 atm: 70.1°F = 21.2°C = 294°K
12.4 Freezing Point: 11.3°F = −11.5°C = 262°K
12.5 Critical Temperature: 317.9°F = 158.8°C = 431.4°K
12.6 Critical Pressure: 1470 psia = 100 atm = 10.1 MN/m²
12.7 Specific Gravity: 1.45 at 20°C (liquid)
12.8 Liquid Surface Tension: Not pertinent
12.9 Liquid Water Interfacial Tension: Not pertinent
12.10 Vapor (Gas) Specific Gravity: 3.2
12.11 Ratio of Specific Heats of Vapor (Gas) (est.) 1.302
12.12 Latent Heat of Vaporization: 170 Btu/lb = 99.1 cal/g = 4.15 X 10⁵ J/kg
12.13 Heat of Combustion: Not pertinent
12.14 Heat of Decomposition: Not pertinent
12.15 Heat of Solution: Data not available
12.16 Heat of Polymerization: Not pertinent
12.20 Heat of Fusion: 43.2 cal/g
12.25 Limiting Value: Data not available
12.27 Reid Vapor Pressure: 20 psia

6. FIRE HAZARDS (Continued)

6.11 Stoichiometric Air to Fuel Ratio: Data not available
6.12 Flame Temperature: Data not available

Material Safety Data Sheet

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GENIUM PUBLISHING CORP.

No. 205

POTASSIUM NITRATE

Issued: January 1987

SECTION 1. MATERIAL IDENTIFICATION

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MATERIAL NAME: POTASSIUM NITRATE
DESCRIPTION/USES: Used in pyrotechnics; explosives; matches; as a specialty fertilizer; reagent; to modify burning properties of tobacco; in glass manufacture; tempering steel; curing foods; as an oxidizer in solid rocket propellants.
OTHER DESIGNATIONS: Nitric Acid, Potassium Salt; Niter; Saltpeter; KNO_3; CAS #7757-79-1
MANUFACTURER/SUPPLIER: Available from several suppliers, including: Aldrich Chemical Co., Inc., PO Box 355, Milwaukee, WI 53201; Telephone: (414) 273-3850

HMIS		Nonfire	Fire
H	1		
F	0	R	1
R	1	I	--
PPE*		S	2
*See Sect. 8		K	0

SECTION 2. INGREDIENTS AND HAZARDS

	%	HAZARD DATA
Potassium Nitrate, CAS #7757-79-1	>99%	ACGIH TLV: None Established OSHA PEL: None Established Oral, Rat, LD_{50}: 3750 mg/kg Oral, Rabbit, LD_{50}: 1901 mg/kg

SECTION 3. PHYSICAL DATA

Melting Point ... 633°F (334°C)
Boiling Point ... 400°C (Decomposes)
Specific Gravity @ 16°C ... 2.11
Vapor Pressure @ 20°C ... Negligible
% Volatiles ... 0
Evaporation Rate ... Not Found

Solubility in Water, at 0°C ... 13.3 g/100 cc
at 100°C ... 247 g/100 cc
pH of 5% Solution, at 25°C ... 4.5-7.0
Molecular Weight ... 101.1

Appearance and odor: White crystalline powder or granules. No odor.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temperature	Flammability Limits in Air	LOWER	UPPER
Not Found	Not Found	Not Found	--	--

Potassium nitrate is not combustible. However, it is a strong oxidizer and can initiate and intensify combustion of flammable materials.
EXTINGUISHING AGENTS: Flood fires involving this material with water. Keep fire-exposed containers cool with water spray. Remove containers from the fire area if it can be done safely.
UNUSUAL FIRE/EXPLOSION HAZARDS: At high temperatures this material can fuse or melt; application of water when large quantities are involved can result in extensive scattering of molten material.
SPECIAL FIRE-FIGHTING PROCEDURES: Toxic fumes/gases can be evolved in a fire situation. Fire fighters should use self-contained breathing apparatus and wear full protective gear.

SECTION 5. REACTIVITY DATA

Potassium nitrate is stable at room temperature. It does not polymerize.

Violent reactions (including fire and explosion) may occur on its contact with organic materials, combustible materials, and reducing agents. Specific incompatibles under various conditions include aluminum, titanium, antimony, germanium, zinc, zirconium (and other metals), calcium disilicide, chromium nitride, metal sulfides, boron, carbon, sulfur, phosphorus, phosphides, sodium phosphinate, sodium thiosulfate, citric acid, tin chloride, sodium acetate, and thorium carbide.

Potassium nitrate decomposes at approximately 752°F (400°C) with the evolution of oxygen and oxides of nitrogen (toxic).

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SECTION 6. HEALTH HAZARD INFORMATION

Potassium nitrate has not been identified as a known or suspected carcinogen by the NTP, IARC, or OSHA. This material can enter the body if it is inhaled or swallowed.

EFFECTS OF OVEREXPOSURE: Inhalation of excessive concentrations may be irritating to the nose, throat, and respiratory tract. Prolonged exposure may cause anemia, methemoglobinemia (the presence of methemoglobin, a soluble brown crystalline blood pigment that differs from hemoglobin in that it contains ferric iron and is unable to combine reversibly with molecular oxygen), and kidney injury (nephritis). Ingestion can cause severe gastrointestinal distress with abdominal pain, nausea, vomiting, and diarrhea. Eye contact may cause irritation.

FIRST AID: EYE CONTACT: Flush eyes, including under the eyelids, with a gentle flow of running water. Get medical help.* SKIN CONTACT: Wash affected area with mild soap and water. If irritation persists, prevent further contact and get medical help.* INHALATION: Remove victim from exposure. Get medical help if irritation or discomfort persists.* INGESTION: Give victim a large quantity of water to drink. Induce vomiting and get prompt medical help.* Keep him warm and at rest. NOTE: Never give anything by mouth or induce vomiting if the victim is unconscious.
* GET MEDICAL ASSISTANCE = In plant, community, paramedic. Get medical help for further treatment, observation, and support after first aid.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

Ventilate the potassium nitrate spill area. Prevent contact of spilled material with combustible and incompatible materials. Cleanup personnel should wear personal protective equipment as necessary to prevent skin/eye contact and dust inhalation. Carefully scoop spilled material into a suitable container for reclamation or disposal. Avoid generating dust during cleanup. Absorb small solution spills on inert (noncombustible) material such as dry sand or earth.
Disposal: Potassium nitrate requires disposal as a hazardous waste. Reclaim material when possible. Contact your supplier or a licensed chemical waste disposal contractor for treatment and disposal instructions. Follow all applicable Federal, state, and local regulations.

Reportable Spill Quantity: Not listed in 40 CFR 117.3, "Reportable Quantities of Hazardous Substances."
EPA Hazardous Waste Number: D001 (Ignitable, 40 CFR 261.21)

SECTION 8. SPECIAL PROTECTION INFORMATION

Use local exhaust ventilation to control airborne levels where potassium nitrate dust, mist, or fumes are generated.

Use an appropriate NIOSH-approved respirator for protection against potassium nitrate dust/mist where airborne levels are excessive. Respirator usage must be in accordance with OSHA requirements (29 CFR 1910.134).

Wear protective clothing (aprons, coveralls, etc.) where the possibility of skin or clothing contamination exist. Wear rubber gloves and safety goggles when handling this material.

Eyewash stations and washing facilities should be readily accessible to workers handling this material.

Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. Particles may adhere to contact lenses and cause corneal damage.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Store potassium nitrate in closed containers in a cool, dry location on a noncombustible surface. Store it away from flammable and combustible materials, reducing agents, and other incompatible materials (see sect. 5). Protect containers from physical damage.

Practice good housekeeping. Clean up spills promptly. Use procedures and techniques that minimize dust generation. Practice good personal hygiene. Wash thoroughly after handling this material and before eating, drinking, and smoking. Do not eat, drink, or smoke in the work area. Remove contaminated clothing promptly. Launder it before wearing it again. Do not take this material out of your work area or to your home on your clothing or equipment.

DOT Hazard Classification: Oxidizer (49 CFR 172.101) DOT ID No. UN1486 DOT Label: Oxidizer

Data Source(s) Code: 4, 5, 6, 9, 25, 49, 58, 77, 82, CV

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Material Safety Data Sheet

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GENIUM PUBLISHING CORP.

No. 317
TOLUENE
(Revision D)

Issued: August 1979
Revised: April 1986

SECTION 1. MATERIAL IDENTIFICATION

20

MATERIAL NAME: TOLUENE

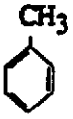
OTHER DESIGNATIONS: Methyl Benzene, Methyl Benzol, Phenylmethane, Toluol, C_7H_8, CAS #0108-88-3

MANUFACTURER/SUPPLIER: Available from many suppliers, including:
Allied Corp., PO Box 2064R, Morristown, NJ 07960; Telephone: (201) 455-4400
Ashland Chemical Co., Industrial Chemicals & Solvents Div., PO Box 2219, Columbus, OH; Telephone: (614) 889-3844

HMIS
H: 2
F: 3
R: 0
PPE*
*See sect. 8

R 1
I 3
S 2
K 4

SECTION 2. INGREDIENTS AND HAZARDS

	%	HAZARD DATA
Toluene 	ca 100	8-hr TLV: 100 ppm, or 375 mg/m^3* (Skin)** Man, Inhalation, TCLo: 100 ppm: Psychotropic*** Rat, Oral, LD_{50}: 5000 mg/kg Rat, Inhalation, LCLo: 4000 ppm/4 hrs. Rabbit, Skin, LD_{50}: 14 gm/kg Human, Eye: 300 ppm

* Current (1985-86) ACGIH TLV. The OSHA PEL is 200 ppm with an acceptable ceiling concentration of 300 ppm and an acceptable maximum peak of 500 ppm/10 minutes.
** Skin designation indicates that toluene can be absorbed through intact skin and contribute to overall exposure.
*** Affects the mind.

SECTION 3. PHYSICAL DATA

Boiling Point ... 231°F (111°C)
Vapor Pressure @ 20°C, mm Hg ... 22
Water Solubility @ 20°C, wt. % ... 0.05
Vapor Density (Air = 1) ... 3.14
Evaporation Rate (BuAc = 1) ... 2.24
Specific Gravity (H_2O = 1) ... 0.866
Melting Point ... -139°F (-95°C)
Percent Volatile by Volume ... ca 100
Molecular Weight ... 92.15

Appearance and odor: Clear, colorless liquid with a characteristic aromatic odor. The odor is detectable to most individuals in the range of 10 to 15 ppm. Because olfactory fatigue occurs rapidly upon exposure to toluene, odor is not a good warning property.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air	LOWER	UPPER
40°F (4°C) CC	896°F (480°C)	% by Volume	1.27	7.1

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, alcohol foam. Do not use a solid stream of water because the stream will scatter and spread the fire. Use water spray to cool tanks/containers that are exposed to fire and to disperse vapors.
UNUSUAL FIRE/EXPLOSION HAZARDS: This OSHA class IB flammable liquid is a dangerous fire hazard. It is a moderate fire hazard when exposed to oxidizers, heat, sparks, or open flame. Vapors are heavier than air and may travel a considerable distance to an ignition source and flash back.
SPECIAL FIRE-FIGHTING PROCEDURES: Fire fighters should wear self-contained breathing apparatus with full facepiece operated in a positive-pressure mode when fighting fires involving toluene.

SECTION 5. REACTIVITY DATA

CHEMICAL INCOMPATIBILITIES: Toluene is stable in closed containers at room temperature under normal storage and handling conditions. It does not undergo hazardous polymerization. This material is incompatible with strong oxidizing agents, dinitrogen tetraoxide, silver perchlorate, tetranitromethane, and uranium hexafluoride. Contact with these materials may cause fire or explosion. Nitric acid and toluene, especially in the presence of sulfuric acid, will produce nitrated compounds that are dangerously explosive.

CONDITIONS TO AVOID: Avoid exposure to sparks, open flame, hot surfaces, and all sources of heat and ignition. Toluene will attack some forms of plastics, rubber, and coatings. Thermal decomposition or burning produces carbon dioxide and/or carbon monoxide.

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SECTION 6. HEALTH HAZARD INFORMATION | TLV

Toluene is not considered a carcinogen by the NTP, IARC, or OSHA. SUMMARY OF RISKS: Vapors of toluene may cause irritation of the eyes, nose, upper respiratory tract, and skin. Exposure to 200 ppm for 8 hours causes mild fatigue, weakness, confusion, lacrimation (tearing) and paresthesia (a sensation of prickling, tingling, or creeping on the skin that has no objective cause). Exposure to higher concentrations may cause headache, nausea, dizziness, dilated pupils, and euphoria, and, in severe cases, may cause unconsciousness and death. The liquid is irritating to the eyes and skin. Contact with the eyes may cause transient corneal damage, conjunctival irritation, and burns if not promptly removed. Repeated and/or prolonged contact with the skin may cause drying and cracking. It may be absorbed through the skin in toxic amounts. Ingestion causes irritation of the gastrointestinal tract and may cause effects resembling those from inhalation of the vapor. Chronic overexposure to toluene may cause reversible kidney and liver injury. FIRST AID: EYE CONTACT: Immediately flush eyes, including under eyelids, with running water for at least 15 minutes. Get medical attention if irritation persists.* SKIN CONTACT: Immediately flush skin (for at least 15 minutes) while removing contaminated shoes and clothing. Wash exposed area with soap and water. Get medical attention if irritation persists or if a large area has been exposed.* INHALATION: Remove victim to fresh air. Restore and/or support breathing as required. Keep victim warm and quiet. Get medical help.* INGESTION: Give victim 1 to 2 glasses of water or milk. Contact a poison control center. Do not induce vomiting unless directed to do so. Transport victim to a medical facility. Never give anything by mouth to a person who is unconscious or convulsing. * GET MEDICAL ASSISTANCE = In plant, paramedic, community. Get medical help for further treatment, observation, and support after first aid, if indicated.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

SPILL/LEAK: Notify safety personnel of large spills or leaks. Remove all sources of heat and ignition. Provide maximum explosion-proof ventilation. Limit access to spill area to necessary personnel only. Remove leaking containers to safe place if feasible. Cleanup personnel need protection against contact with liquid and inhalation of vapor (see sect. 8).
WASTE DISPOSAL: Absorb small spills with paper towel or vermiculite. Contain large spills and collect if feasible, or absorb with vermiculite or sand. Place waste solvent or absorbent into closed containers for disposal using nonsparking tools. Liquid can be flushed with water to an open holding area for handling. Do not flush to sewer, watershed, or waterway.
COMMENTS: Place in suitable container for disposal by a licensed contractor or burn in an approved incinerator. Consider reclaiming by distillation. Contaminated absorbent can be buried in a sanitary landfill. Follow all Federal, state, and local regulations. TLm 96: 100-10 ppm. Toluene is designated as a hazardous waste by the EPA. The EPA (RCRA) HW No. is U220 (40 CFR 261). The reportable quantity (RQ) is 1000 lbs/454 kg (40 CFR 117).

SECTION 8. SPECIAL PROTECTION INFORMATION

Provide general and local exhaust ventilation to meet TLV requirements. Ventilation fans and other electrical service must be nonsparking and have an explosion-proof design. Exhaust hoods should have a face velocity of at least 100 lfm (linear feet per minute) and be designed to capture heavy vapor. For emergency or nonroutine exposures where the TLV may be exceeded, use an organic chemical cartridge respirator if concentration is less than 200 ppm and an approved canister gas mask or self-contained breathing apparatus with full facepiece if concentration is greater than 200 ppm.
Safety glasses or splash goggles should be worn in all work areas. Neoprene gloves, apron, face shield, boots, and other appropriate protective clothing and equipment should be available and worn as necessary to prevent skin and eye contact. Remove contaminated clothing immediately and do not wear it until it has been properly laundered.

Eyewash stations and safety showers should be readily available in use and handling areas.

Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

STORAGE SEGREGATION: Store in a cool, dry, well-ventilated area away from oxidizing agents, heat, sparks, or open flame. Storage areas must meet OSHA requirements for class IB flammable liquids. Use metal safety cans for handling small amounts. Protect containers from physical damage. Use only with adequate ventilation. Avoid contact with eyes, skin, or clothing. Do not inhale or ingest. Use caution when handling this compound because it can be absorbed through intact skin in toxic amounts. SPECIAL HANDLING/STORAGE: Ground and bond metal containers and equipment to prevent static sparks when making transfers. Do not smoke in use or storage areas. Use nonsparking tools. ENGINEERING CONTROLS: Preplacement and periodic medical exams emphasizing the liver, kidneys, nervous system, lungs, heart, and blood should be provided. Workers exposed to concentrations greater than the action level (50 ppm) should be examined at least once a year. Use of alcohol can aggravate the toxic effects of toluene.
COMMENTS: Emptied containers contain product residues. Handle accordingly!
Toluene is designated as a hazardous substance by the EPA (40 CFR 116). DOT Classification: Flammable liquid. UN1294.
Data Source(s) Code: 1-9, 12, 16, 20, 21, 24, 26, 34, 81, 82. CR

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Approvals J.O. Acciaccio, 11/86.
Indust. Hygiene/Safety JW 10-86
Medical Review [signature] Oct 86

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TOXAPHENE

TXP

Common Synonyms Chemical Formula	Waxy solid or in solution: Amber Solid sinks in water, solution floats on water.

Stop discharge if possible. Keep people away.
Call fire department.
Avoid contact with solid and solution.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire	Solid not flammable, but readily dissolves in combustible liquid. POISONOUS GASES ARE PRODUCED IN FIRE. WEAR SELF-CONTAINED BREATHING APPARATUS, and rubber waterproofing (including gloves). Extinguish with foam, dry chemical or carbon dioxide. Water may be ineffective on fire. Cool exposed containers with water.
Exposure	CALL FOR MEDICAL AID. SOLID OR SOLUTION POISONOUS IF SWALLOWED. IRRITANT to skin and eyes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim quiet and warm.
Water Pollution	HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS. Solution is toxic to shellfish. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook)

Issue warning-poison, water contaminant

Should be removed

Chemical and physical treatment

2. LABEL

2.1 Category: None

2.2 Class: Not pertinent

3. CHEMICAL DESIGNATIONS

3.1 CG Compatibility Class: Not listed

3.2 Formula: $C_{10}H_{10}Cl_8$

3.3 IMO/UN Designation: Not listed

3.4 DOT ID No.: 2761

3.5 CAS Registry No.: 8001-35-2

4. OBSERVABLE CHARACTERISTICS

4.1 Physical State (as shipped): Waxy solid

4.2 Color: Amber

4.3 Odor: Mild turpentine odor

5. HEALTH HAZARDS

5.1 Personal Protective Equipment: Chemical-type respirator; rubber gloves; chemical goggles or face shield

5.2 Symptoms Following Exposure: May be absorbed through skin, lungs, or ingested food. Symptoms include salivation, leg and back muscle cramps, nausea, vomiting, hyperexcitability, tremors, shivering, clonic convulsions, then tetanic contractions of all skeletal muscles. Lethal doses cause respiratory failure. Respiration, affected as a result of the exertion from vomiting or convulsions, is first arrested because of tetanic muscular contractions, then depressed in both amplitude and rate as the muscles relax.

5.3 Treatment of Exposure: If symptoms of poisoning appear, promptly remove the undigested pesticide from the stomach by inducing vomiting with warm salty or soapy water (if the patient is conscious) or bathe the skin with soap and water. Keep patient warm and quiet. Call a physician.

5.4 Threshold Limit Value: 0.5 mg/m³

5.5 Short Term Inhalation Limits: Not pertinent

5.6 Toxicity by ingestion: Grade 4, LD_{50} below 50 mg/kg (dog)

5.7 Late Toxicity: Data not available

5.8 Vapor (Gas) Irritant Characteristics: The solid is non-volatile. For solutions, see meta-xylene.

5.9 Liquid or Solid Irritant Characteristics: Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.

5.10 Odor Threshold: Not pertinent

5.11 IDLH Value: 200 mg/m³

6. FIRE HAZARDS

6.1 Flash Points 94°F C.C. (solution)

6.2 Flammable Limits in air: 1.1%-5.4% (solvent only)

6.3 Fire Extinguishing Agents: Foam, dry chemical, or carbon dioxide

6.4 Fire Extinguishing Agents Not to be Used: Water may be ineffective.

6.5 Special Hazards of Combustion Products: Toxic vapors are generated when heated.

6.6 Behavior in Fire: Solution in xylene may produce corrosive products when burned.

6.7 Ignition Temperature: 550°F (solution)

6.8 Electrical Hazard: Not pertinent

6.9 Burning Rate: 0.5 mm/min.

6.10 Adiabatic Flame Temperature: Data not available

(Continued)

7. CHEMICAL REACTIVITY

7.1 Reactivity With Water: No reaction

7.2 Reactivity with Common Materials: No reaction

7.3 Stability During Transport: Stable

7.4 Neutralizing Agents for Acids and Caustics: Not pertinent

7.5 Polymerization: Not pertinent

7.6 Inhibitor of Polymerization: Not pertinent

7.7 Molar Ratio (Reactant to Product): Data not available

7.8 Reactivity Group: Data not available

8. WATER POLLUTION

8.1 Aquatic Toxicity:
0.05 ppm/20 days/goldfish/100% kill/fresh water
0.02 ppm/*/bluegill/100% kill/fresh water
0.0002 ppm/24 hr/shrimp/100% kill/salt water
*Time period not specified.

8.2 Waterfowl Toxicity: 30.5 mg/kg

8.3 Biological Oxygen Demand (BOD): Data not available

8.4 Food Chain Concentration Potential: None

9. SHIPPING INFORMATION

9.1 Grades of Purity: Technical: 40% dust concentrate; 60% solution in xylene

9.2 Storage Temperature: Ambient

9.3 Inert Atmosphere: No requirement

9.4 Venting: Sealed containers or well-ventilated area

10. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook)

S-A-T-U

11. HAZARD CLASSIFICATIONS

11.1 Code of Federal Regulations: CFR-A

11.2 NAS Hazard Rating for Bulk Water Transportation: Not listed

11.3 NFPA Hazard Classification: Not listed

12. PHYSICAL AND CHEMICAL PROPERTIES

12.1 Physical State at 15°C and 1 atm: Waxy solid

12.2 Molecular Weight: 414 (avg.)

12.3 Boiling Point at 1 atm: Decomposes

12.4 Freezing Point: 149—154°F = 65—68°C = 338—341°K

12.5 Critical Temperature: Not pertinent

12.6 Critical Pressure: Not pertinent

12.7 Specific Gravity: 1.6 at 15°C (solid)

12.8 Liquid Surface Tension: Not pertinent

12.9 Liquid Water Interfacial Tension: Not pertinent

12.10 Vapor (Gas) Specific Gravity: Not pertinent

12.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent

12.12 Latent Heat of Vaporization: Not pertinent

12.13 Heat of Combustion: Not pertinent

12.14 Heat of Decomposition: Not pertinent

12.15 Heat of Solution: Not pertinent

12.16 Heat of Polymerization: Not pertinent

12.18 Heat of Fusion: Data not available

12.20 Limiting Value: Data not available

12.27 Solid Vapor Pressure: Data not available

6. FIRE HAZARDS (Continued)

6.11 Stoichiometric Air to Fuel Ratio: Data not available

6.12 Flame Temperature: Data not available

Material Safety Data Sheet

From Genium's Reference Collection
Genium Publishing Corporation
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GENIUM PUBLISHING CORP.

No. 318

XYLENE (Mixed Isomers)
(Revision D)
Issued: November 1980
Revised: August 1988

SECTION 1. MATERIAL IDENTIFICATION

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Material Name: XYLENE (Mixed Isomers)

Description (Origin/Uses): Used as a raw material for the production of benzoic acid, phthalic anhydride, isophthalic and terephthalic acids and their dimethyl esters in the manufacture of polyester fibers; in sterilizing catgut; with Canadian balsam as oil-immersion in microscopy; and as a cleaning agent in microscopic techniques.

Other Designations: Dimethylbenzene; Xylol; C_8H_{10}; CAS No. 1330-20-7

Manufacturer: Contact your supplier or distributor. Consult the latest edition of the *Chemicalweek Buyers' Guide* (Genium ref. 73) for a list of suppliers.

Comments: Although there are three different isomers of xylene (*ortho*, *meta*, and *para*), the health and physical hazards of all three isomers are very similar. This MSDS is written for a xylene mixture of all three isomers, which is usually commercial xylene.

NFPA: 2 3 0 -

HMIS			
H	2	R	1
F	3	I	3
R	0	S	2
PPG*		K	3

*See sect. 8

SECTION 2. INGREDIENTS AND HAZARDS

Ingredients	%	Exposure Limits
Xylene (Mixed Isomers), CAS No. 1330-20-7*	**	IDLH*** Level: 1000 ppm **OSHA PEL** 8-Hr TWA: 100 ppm, 435 mg/m³ **ACGIH TLVs, 1987-88** TLV-TWA: 100 ppm, 435 mg/m³ TLV-STEL: 150 ppm, 655 mg/m³ **Toxicity Data**** Human, Inhalation, TC_{Lo}: 200 ppm Man, Inhalation, LC_{Lo}: 10000 ppm/6 Hrs Rat, Oral, LD_{50}: 4300 mg/kg

o-Xylene, CAS No. 0095-47-6
m-Xylene, CAS No. 0108-38-3
p-Xylene, CAS No. 0106-42-3

**Check with your supplier to determine if there are additions, contaminants, or impurities (such as benzene) that are present in reportable quantities per 29 CFR 1910.

***Immediately dangerous to life and health.

**** See NIOSH, *RTECS* (No. ZE2100000), for additional data with references to reproductive, irritative, and mutagenic effects.

SECTION 3. PHYSICAL DATA

Boiling Point: 275°F to 293°F (135°C to 145°C)*
Melting Point: -13°F (-25°C)
Evaporation Rate: 0.6 Relative to BuAc = 1
Specific Gravity (H_2O = 1): 0.86
Water Solubility (%): Insoluble
Molecular Weight: 106 Grams/Mole
% Volatile by Volume: Ca 100
Vapor Pressure: 7 to 9 Torrs at 68°F (20°C)
Vapor Density (Air = 1): 3.7

Appearance and Odor: A clear liquid; aromatic hydrocarbon odor.

*Materials with wider and narrower boiling ranges are commercially available.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temperature	Flammability Limits in Air (% by Volume)	LOWER	UPPER
81°F to 90°F (27°C to 32°C)	867°F (464°C)		1%	7%

Extinguishing Media: Use foam, dry chemical, or carbon dioxide. Use water sprays to reduce the rate of burning and to cool containers.

Unusual Fire or Explosion Hazards: *Xylene vapor is heavier than air and may travel a considerable distance to a low-lying source of* ignition and flashback.

Special Fire-fighting Procedures: Wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode.

SECTION 5. REACTIVITY DATA

Xylene is stable in closed containers during routine operations. It does not undergo hazardous polymerization.

Chemical Incompatibilities: This material may react dangerously with strong oxidizers.

Conditions to Avoid: Avoid any exposure to sources of ignition and to strong oxidizers.

Hazardous Products of Decomposition: Carbon monoxide (CO) may be evolved during xylene fires.

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SECTION 6. HEALTH HAZARD INFORMATION

Xylene is not listed as a carcinogen by the IARC, NTP, or OSHA.

Summary of Risks: Liquid xylene is a skin irritant and causes erythema, dryness, and defatting; prolonged contact may cause blistering. Inhaling xylene can depress the central nervous system (CNS), and ingesting it can result in gastrointestinal disturbance; and possibly hematemesis (vomiting blood). Effects on the eyes, kidneys, liver, lungs, and the CNS are also reported. **Medical Conditions Aggravated by Long-Term Exposure:** Problems with eyes, skin, central nervous system, kidneys, and liver may be worsened by exposure to xylene. **Target Organs:** CNS, eyes, gastrointestinal tract, blood, liver, kidneys, skin. **Primary Entry:** Inhalation, skin contact/absorption. **Acute Effects:** Dizziness; excitement; drowsiness; incoordination; staggering gait; irritation of eyes, nose, and throat; corneal vacuolization; anorexia; nausea; vomiting; abdominal pain; and dermatitis. **Chronic Effects:** Reversible eye damage, headache, loss of appetite, nervousness, pale skin, and skin rash.

FIRST AID: Eyes. Immediately flush eyes, including under the eyelids, gently but thoroughly with plenty of running water for at least 15 minutes. **Skin.** Immediately wash the affected area with soap and water. **Inhalation.** Remove the exposed person to fresh air; restore and/or support his or her breathing as needed. Have a trained person administer oxygen. **Ingestion.** Never give anything by mouth to someone who is unconscious or convulsing. Vomiting may occur spontaneously, but do not induce it. If vomiting should occur, keep exposed person's head below his or her hips to prevent aspiration (breathing the liquid xylene into the lungs). Severe hemorrhagic pneumonitis with grave, possibly fatal, pulmonary injury can occur from aspiring very small quantities of xylene.

GET MEDICAL HELP (IN PLANT, PARAMEDIC, COMMUNITY) FOR ALL EXPOSURES. Seek prompt medical assistance for further treatment, observation, and support after first aid. If exposure is severe, hospitilization for at least 72 hours with careful monitoring for delayed onset of pulmonary edema is recommended.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

Spill/Leak: Notify safety personnel, provide ventilation, and eliminate all sources of ignition immediately. Cleanup personnel need protection against contact with and inhalation of xylene vapor (see sect. 8). Contain large spills and collect waste or absorb it with an inert material such as sand, earth, or vermiculite. Use nonsparking tools to place waste liquid or absorbent into closable containers for disposal. Keep waste out of sewers, watersheds, and waterways.

Waste Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow Federal, state, and local regulations.

OSHA Designations

Air Contaminant (29 CFR 1910.1000 Subpart Z)

EPA Designations (40 CFR 302.4)

RCRA Hazardous Waste, No. U239

CERCLA Hazardous Substance, Reportable Quantity: 1000 lbs (454 kg), per the Clean Water Act (CWA), section 311 (b) (9)

SECTION 8. SPECIAL PROTECTION INFORMATION

Goggles: Always wear protective eyeglasses or chemical safety goggles. Where splashing is possible, wear a full face shield as a supplementary protective measure. Follow OSHA eye- and face-protection reguiations (29 CFR 1910.133). **Respirator:** Use a NIOSH-approved respirator per the *NIOSH Pocket Guide to Chemical Hazards* for the maximum-use concentrations and/or the exposure limits cited in section 2. Follow OSHA respirator regulations (29 CFR 1910.134). For emergency or nonroutine use (leaks or cleaning reactor vessels and storage tanks), wear an SCBA with a full facepiece operated in the pressure-demand or positive-pressure mode. **Warning:** Air-purifying respirators will *not* protect workers in oxygen-deficient atmospheres. **Other:** Wear impervious gloves, boots, aprons, gauntlets, etc., as required by the specifics of the work operation to prevent prolonged or repeated skin contact with xylene. **Ventilation:** Install and operate general and local maximum, explosion-proof ventilation systems powerful enough to maintain airborne levels of xylene below the OSHA PEL standard cited in section 2. Local exhaust ventilation is preferred because it prevents dispersion of xylene into general work areas by eliminating it at its source. Consult the latest edition of Genium reference 103 for detailed recommendations. **Safety Stations:** Make eyewash stations, safety/quick-drench showers, and washing facilities available in areas of use and handling. **Contaminated Equipment:** Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. Do *not* wear contact lenses in any work area. Remove contaminated clothing and launder it before wearing it again; clean xylene from shoes and equipment. **Comments:** Practice good personal hygiene; always wash thoroughly after using this material. Keep it off of your clothing and equipment. Avoid transferring it from your hands to your mouth while eating, drinking, or smoking. Do *not* eat, drink, or smoke in any work area. Do not inhale xylene vapor.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Storage/Segregation: Store xylene in a cool, dry, well-ventilated area away from sources of ignition and strong oxidizers. Protect containers from physical damage.

Special Handling/Storage: Make sure all engineering systems (production, transportation) are of maximum explosion-proof design. Ground and bond all containers, pipelines, etc., used in shipping, transferring, reacting, producing, and sampling operations.

Transportation Data (49 CFR 172.101-2)

DOT Shipping Name: Xylene
DOT ID No. UN1307

DOT Label: Flammable Liquid
DOT Hazard Class: Flammable Liquid

IMO Label: Flammable Liquid
IMO Class: 3.2 or 3.3

References: 1, 2, 12, 73, 84-94, 100, 103.

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APPENDIX D

INCIDENT REPORT FORM

Woodward-Clyde Consultants

APPENDIX D
FORM HS-502
HAZARDOUS WASTE INCIDENT REPORT

DATE	PROJECT/LOCATION	BUSINESS UNIT

DESCRIPTION OF INCIDENT, INCLUDING INJURIES, PROPERTY DAMAGE AND EMERGENCY ACTION TAKEN AND PERSONNEL INVOLVED (use additional sheets if needed):

WITNESSES OF INCIDENT:

POSSIBLE OR KNOWN CAUSES:

WHAT ACTIONS ARE NEEDED TO PREVENT A SIMILAR INCIDENT?

REPORTER	BUSINESS UNIT SAFETY OFFICER
PROJECT MANAGER	CORPORATE HEALTH AND SAFETY OFFICER

APPENDIX E

HNU PHOTOIONIZATION DETECTOR

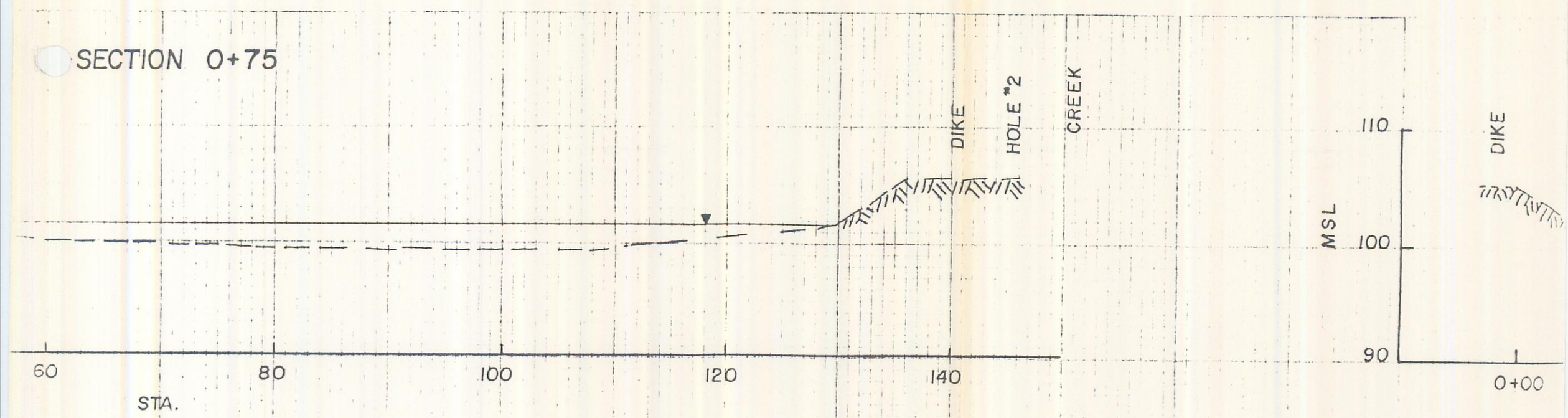
APPENDIX E

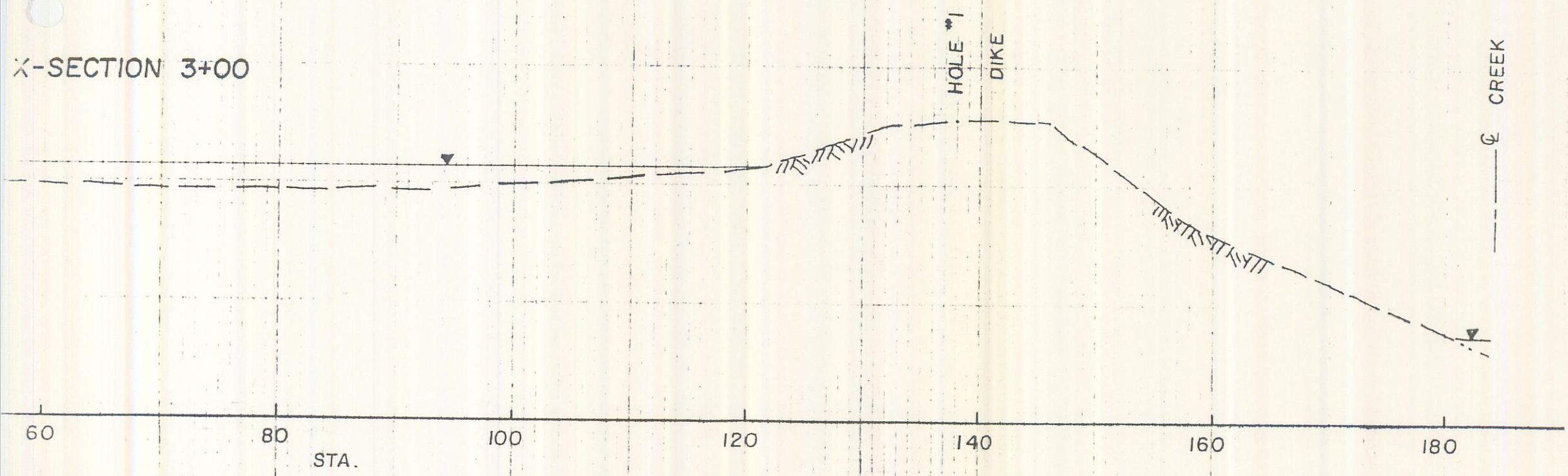
HNU PHOTOIONIZATION DETECTOR (MODEL PI 101)

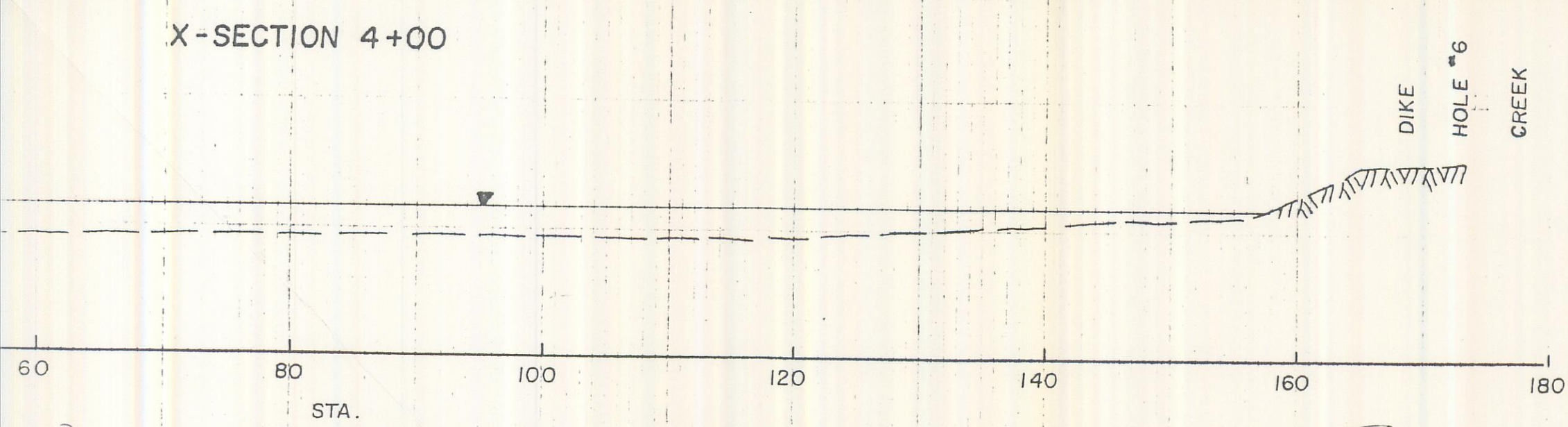
The instrument is turned to the battery check position first. Assuming proper charge, the main control switch is set to the standby position using the zero knob. The instrument is then allowed to warm up for above five minutes in the standby mode. The calibration gas (usually isobutylene from the HNU factory) is attached. The proper range setting is selected (usually 0-200 ppm) and the calibration gas turned on.

The gas flows through a critical orifice which reduces its flow rate to the proper rate for calibration purposes. The normal factory calibration of this instrument is for benzene in air. Isobutylene is used for normal calibration because it is less toxic. The relative response of isobutylene as compared to benzene is about 70 percent with the 10.2 eV and 11.7 eV lamps (there is a slight difference between the relative response of the two different energy probes, but it is not considered significant for most field calibration purposes). Accordingly, a bottle of isobutylene calibration gas that contains 100 ppm isobutylene will read out as about 70 ppm on a factory calibrated instrument. A bottle of factory calibration gas will state the proper readout on the instrument "as benzene".

If the instrument does not calibrate exactly, the span pot knob is normally adjusted to bring the instrument into calibration. The normal "factory" settings are 9.8 for the 10.2 eV lamp and 5.90 for the 11.7 eV lamp. If the instrument cannot be brought into calibration by using the span pot, the lamp may need to be cleaned or other maintenance items performed so that the unit will calibrate accurately.







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CROSS SECTIONS

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